

DISSERTATION

THEORETICAL ANALYSIS OF THE PHILOSOPHY AND PRACTICE OF DISCIPLINED  
INQUIRY

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## ABSTRACT

### THEORETICAL ANALYSIS OF THE PHILOSOPHY AND PRACTICE OF DISCIPLINED INQUIRY

This dissertation theoretically examined the process of disciplined inquiry in the social sciences from its philosophical foundations to its extensions into practice. Key to conceptualization of disciplined inquiry were two regulative ideals: the commitment to the concepts that define the possibility of experience and the commitment to processes for combining the concepts of experience. The paradigm theory of Lincoln, Lynham, and Guba (e.g., Lincoln & Lynham, 2011; Lincoln, Lynham, & Guba, 2011) provided a sophisticated explanation of the possibility of experience that inquirers can commit to when engaging in disciplined inquiries. Review of literature revealed an inadequacy in the state of theoretical understanding of processes for combining the concepts of experience. To develop a theoretical agenda of research for disciplined inquiry, the literature on paradigm theory and theory building was analyzed. A historical analysis of paradigm theory revealed milestones in more than 40 years of inquiry focused on conceptualization of the theory. A reverse engineering analysis theoretically examined paradigm theory and its milestones identified from the historical analysis for key features of the theoretical process. A revised conceptualization of disciplined inquiry was presented and a theoretical agenda for developing the underlying theoretical framework for the processes of combining the concepts of experience was outlined.

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## CHAPTER 1: INTRODUCTION

### Overview of Research

Disciplined inquiry may be considered a diligent, purposeful, and methodical process for forming justified belief—one that makes explicit the underlying belief system, criteria of quality process and product, and respects the role of peer acceptance in justification of knowledge claims (Clovis & Cobban, 2006; Cronbach & Suppes, 1969; Lincoln & Guba, 1986b; Smith, 1981; Shulman, 1997). Even though disciplined inquiry can encompass a number of forms of explicit systematic inquiry (e.g., *the scientific method* or *grounded theory*), it has its background in the behavioral, human, and social sciences, where justification of systematic and methodic practice was a necessity for legitimization of alternative forms of inquiry (e.g., Lincoln & Guba, 1985b). Key to the practice of disciplined inquiry, as well as what makes it different from other forms of inquiry, is the explication of the foundational assumptions of the belief system within which knowledge claims will be made.

The current research proposed that the process of disciplined inquiry may initially be conceptualized at the intersection of two phenomena: the phenomenon of methodology and the phenomenon of inquiry paradigms. It was argued that while the phenomenon of inquiry paradigms was a well-developed and sophisticated theory (Lincoln & Lynham, 2011; Lincoln, Lynham, & Guba, 2011), the phenomenon of inquiry methodology remains somewhat primitive and underdeveloped theoretically. As a consequence, the whole of the conceptualization of disciplined inquiry remains less informative than it could if methodology were better understood, and therefore also less informative for the practice of disciplined inquiry. To address the conceptual gap in understanding of methodology, literature review research methods were

employed (see Appendix A for an examination of literature review research methods in comparison to less formal literature review approaches) to bring together the literature on inquiry paradigms, theory, and theory building, and to begin the work necessary to develop the theoretical underpinnings the phenomenon of inquiry methodology.

### **Statement of Research Problem**

To better position the literature review research conducted, the type of research problem was framed within the problem syllogism articulated by Lincoln and Guba (1985b; see also Guba, 1978b; Guba & Lincoln, 1981). A research problem is both more than a research question and different from a research objective. A research problem may be defined as

...a state of affairs ‘resulting from the interaction of two or more factors... that yields (1) a perplexing or enigmatic state (a conceptual problem); (2) a conflict that renders the choice from among alternative courses of action moot (an action problem); or (3) an undesirable consequence (a value problem)’. The interacting factors may be concepts, empirical data, experiences, or any other elements that, when placed alongside one another, signal some basic difficulty, something that is not understood or explained at that time. (Lincoln & Guba, 1985b, p. 226)

The current research agenda addresses a conceptual problem, i.e., #1, with implications on action, i.e., #2 (Lincoln & Guba, 1985b). Booth, Colomb, and Williams (2008) articulated the nature of these two types of research problems as a contrast between understanding and action, whereby the condition of a practical problem is a state of affairs in the real world within which one does not know what to do. Accordingly, they stated, “The condition of a conceptual problem, however, is always some version of not knowing or not understanding something” (p. 56). To solve a practical problem, they further stated that “someone had to first solve a research problem that improved their *understanding*. Then on the basis of that better understanding, someone had to decided what to *do* to solve the practical problem” (p. 53). Thus, the solution to



a practical problem may be considered knowing what to do in the world, whereas the solution to a conceptual problem is considered as more abstractly answering a question, or set of questions, that improves our understanding and bridges a gap in our knowledge.

Booth et al. (2008) further emphasized the difference between the cost of a practical problem and the consequence of a conceptual problem. The cost associated with a practical problem may be considered an undesirable state in the real world, resulting from not knowing what to do. The consequence associated with a conceptual problem “is a *second* thing that we don’t know or understand because we don’t understand the first one, and that is more significant, more consequential than the first” (p. 57). Therefore, given that the current inquiry addressed a conceptual problem with implications for action, the following problem structure was argued.

- First, as principle tenet, a general state of affairs was defined within which something unknown was presented as a gap in understanding.
- Next, as principle proposition, the condition of knowing within the general state of affairs was made explicit.
- Then, as interactive proposition juxtaposed against principle proposition, the condition of not knowing within the general state of affairs was stated.
- Lastly, as consequence and cost of the interacting proposition, the second more significant thing not understood as a result of the interactive proposition was stated in association with the practical cost related to the more significant lack of understanding.
- In response, a solution was described, with the aim of improving conceptual understanding so that the better understanding could inform improved practice.

## **Principle Tenet**

Disciplined inquiry is a methodical process for forming justified belief comprising (at least) two essential phenomena: the paradigm of inquiry phenomenon and the methodological phenomenon. Interaction of the two essential phenomena make possible the explication of underlying belief system and criteria of quality process and product.

## **Principle Proposition**

Analysis of the literature on paradigms, one of the integral phenomena for understanding disciplined inquiry, revealed a wealth of information on the paradigm of inquiry phenomenon. In particular, review of the past 40 plus years of published literature by Egon Guba, Yvonna Lincoln, Susan Lynham, and colleagues exposed a sophisticated and well-developed theoretical framework for the inquiry paradigm phenomenon.

## **Interactive Proposition**

Analysis of the literature on methodology, the second of two integral phenomena for understanding disciplined inquiry, revealed that the methodological phenomenon remains underdeveloped conceptually and theoretically. Rather, the methodological phenomenon existed as a broad range of possible ideas, principles, and processes, but never unified under a common conceptual framework.

## **Consequence and Cost**

As a result of the underdeveloped methodological phenomenon, both (a) a knowledge gap in conceptual understanding of the process of disciplined inquiry and (b) an applied cost in

the ability to methodically practice disciplined inquiry, given the lack of informing integrated framework, remain. That is, the consequence associated with the lack of theoretical understanding of the methodological phenomenon is a bigger and more important gap in understanding the process of disciplined inquiry. The cost of not fully understanding the process of disciplined inquiry is a gap in knowing how to practice disciplined inquiry; and therefore, a gap in knowing how to form justified beliefs.

### **A Solution**

To better understand the process of disciplined inquiry conceptually, as well as inform the improved practice of disciplined inquiry, the current research began the incremental theoretical work necessary to advance the methodological phenomenon of disciplined inquiry from its primitive, underdeveloped state to a more sophisticated theoretical state. This was accomplished by historically and theoretically analyzing the well-developed theoretical framework for the inquiry paradigm phenomenon. The result of historical and theoretical analysis of paradigm theory was an understanding of the process of theory necessary to conceptually develop the underlying theoretical framework for the methodological phenomenon, and therefore advancing knowledge of disciplined inquiry, as defined by both the paradigm of inquiry and methodological phenomena.

### **Approach**

The ultimate aim of the research was to begin the incremental work of a larger research agenda aimed at conceptualizing an initial theoretical framework for the phenomenon of methodology and synthesizing the framework with the existing paradigm theory to better understand the process of disciplined inquiry. Given the larger agenda of research, just as

conceptualization of the phenomenon of methodology must be completed before integration with paradigm theory, a number of steps must be completed prior to conceptualizing the theoretical framework for the phenomenon of methodology. Due to the steps that must be taken to get to the point of understanding from which the phenomenon of methodology may be conceptualized, multiple studies were (and remain) warranted. The first two studies employed literature review research methods, each with their own research designs for the purpose of building a unique piece of incremental understanding necessary for transition into later phases of the research agenda on disciplined inquiry.

Both the literature reviews conducted examined the work on paradigms of inquiry by Lincoln, Lynham, and Guba (Lincoln & Lynham, 2011; Lincoln et al., 2011) as an exemplar for the theorizing on methodology. The first study was a historical analysis of paradigm theory conducted by reviewing the authors' body of work that contributed to the exemplar. The second study methodologically focused on the theoretical process and product of paradigm theory, with a reverse engineering analysis of the theory. The two studies concluded with a refined research agenda for modeling the phenomenon of methodology and reconceptualization of the model for the practice of disciplined inquiry.

### **Rationale and Significance of the Research**

The research problem argued that because of the underdeveloped phenomenon of methodology, both a knowledge gap in our conceptual understanding of disciplined inquiry and an applied cost in our ability to methodically practice disciplined inquiry exist. The emphasis on both understanding and practice highlights that this is not simply a conceptual problem for the proselytizing methodologist, but an important practical problem for practicing inquirers. As

Becker (1970) stated, “Methodology is too important to be left to the methodologists” (p. 3). If inquirers would like to make knowledge claims at the conclusion of their inquiries, then they must be able to explicitly articulate how the inputs, processes, and outputs led to the formation of justified belief. The articulation should be made both prior to engaging in inquiry as prescription for action to be taken and at the end of inquiry as description of actions taken.

### **Purpose and Objectives**

The purpose of the current research was to study and understand the process of disciplined inquiry. To achieve the purpose, a number of specific research objectives were identified. These objectives were:

- Generation of a historical account of significant contributions and milestones culminating in current thinking (Lincoln & Lynham, 2011) about the inquiry paradigm phenomenon
- Identification and description of the theoretical research process of the exemplar paradigm theory by Lincoln et al. (2011; Lincoln & Lynham, 2011)
- Reevaluation of the initial conceptualization of disciplined inquiry, given any new learning
- Development of a refined and more informed research agenda for generating an initial theoretical framework for methodology and its integration into the conceptualization of the disciplined inquiry

## **Research Questions**

Three general research questions guided the overall research agenda, although a number of more targeted research questions were further specified in each study's respective method chapters. These guiding questions were:

1. How did the exemplar paradigm theory of Lincoln et al. (2011) evolve into its current theoretical state, and what features are characteristic of the paradigm theory?
2. What surrogate theoretical research process can be inferred about the development of the exemplar subject system?
3. Can understanding of disciplined inquiry be advanced given a more complete understanding of the phenomena of methodology and inquiry paradigms?

## **Delimitations, Limitations, and Assumptions**

Research on the process of disciplined inquiry was delimited to the behavioral, human, and social sciences. For the topic of disciplined inquiry and paradigms, the principle literature examined was education evaluation; however, also included were texts on the philosophy of science. For the theory topics that supported the current work, the primarily literatures examined were in the social and behavioral science disciplines of education, sociology, psychology, management, and human resource development. This broad, yet still bounded, scope established the boundary conditions manifest in the conscious exclusionary/inclusionary decisions made across all literature examined. For example, literature about theories, proofs, and models in mathematics were not included, and therefore not representative of the findings. It should further be noted that the author's strongest personal experiences with inquiry were limited to those

within the disciplines of education and psychology; thus, personal experiences with disciplined inquiry in operation can also be restricted to the disciplines of education and psychology.

The research conducted involved literature review research methods. As a consequence, all information and data that can be considered are limited to those available in the literature. The notion of *available in the literature* has at least two important consequences with regard to limitations. The first limitation of literature review research was that the sampled literature must be accessible by reasonable means (i.e., library catalogues, electronic database searches, and Internet searches). Sources that show up in searches but are not accessible by reasonable means limit the source's availability to make a contribution in a literature review. The ongoing copyright issues with ERIC and limited availability of full-text and many conference papers served as such a limitation. The second limitation of literature review research was that any unpublished literature (e.g., course notes, personal communications, and unpublished manuscripts) were often unknown and/or difficult to access, with the rare exception of the "invisible college" (Cooper 1982, p. 295) approach to sampling literature. In meta-analysis, this is known as the *file drawer problem* (Rosenthal, 1979) in reference to negative or null experimental findings that are not disseminated publicly. Therefore, while literature review research in general is not inherently limited to published research, it is limited to literature that the inquirer may consciously become aware of and access through reasonable means.

As a whole, the current research was based on a self-study form of inquiry; therefore, it may be helpful to espouse the nature of meta-research. The term *meta* can generally be understood as reference to something more abstract and highly organized; yet, the meta- prefix is more concrete in its typical usage. For example, *meta-analysis* is the "analysis of analyses"

(Glass, 1976, p. 3); *meta-cognition* is cognition about cognition; and a meta-framework is a framework of frameworks. Disciplined inquiry is an inquiry process; the current research was inquiry about the disciplined inquiry process. As a consequence, the current research was strongly based on the methodological assumption that the study of the application of method produces meaningful understanding about how method *should* be applied.

### **Summary of Research Findings**

The historical analysis of the paradigm theory by Lincoln et al. (2011; Lincoln & Lynham, 2011) revealed the evolution of the theory from an early two-approach model (e.g., Guba, 1978b) to a fully articulated axiomatic form of theory (e.g., Guba & Lincoln, 1982a) to its current five-paradigm, five-axiom subject form (e.g., Lincoln & Lynham, 2011; Lincoln et al., 2011). Also documented in the historical analysis were development of axiom extensions into practice and criteria for basic questions of quality for inquiries.

The reverse engineering analysis of the paradigm theory by Lincoln et al. (2011; Lincoln & Lynham, 2011) revealed it to be an axiomatic form of theory with many similarities to the typological form of theory. The theory building used was interpreted a theory-then-research theorizing process that continuously moved between the conceptual development and operationalization phases of theory-building research. The theory's axiom subjects, axiom positions, paradigms of inquiry, and theorems were also mapped to theoretical units, values taken on by the units, theoretical system states, and theoretical propositions, respectively.

Learning as the result of the conduct of the two reviews gave rise to an expanded model of disciplined inquiry that included a more explicit process for how and where *best-justified*



*belief* (Best-JB) (Jacquette, 2012) might be produced, how warranted assertions accumulate as knowledge, and how accumulated knowledge can inform future disciplined inquiries. A revised conceptualization of disciplined inquiry was proposed. In addition, the theoretical understanding of theory and theory building from studying the exemplar found in paradigm theory helped form a refined research agenda for developing a theoretical framework for the phenomenon of methodology.

### **Suggestions for Future Research**

The solution proposed to the research problem highlighted the larger research agenda that demanded incremental theoretical work to accomplish its goals. The two studies presented in the current manuscript were the first two incremental steps in the larger agenda. The learning resulting from the two studies helped clarify the next steps needed to advance the agenda and begin development of a theoretical framework for the phenomenon of methodology. Future inquiries need to begin concretely addressing what a theory of methodology would explain and identifying the variables and associated values that might define a methodology (e.g., axiom subjects and positions); the theoretical relationships those theoretical positions might have with each other; the boundaries of the explanatory shell for the phenomenon of methodology; the types of research approaches that might be defined by each theoretical system state; and how those system states might be operationalized in a manner grounded in methodological process in action. As each theoretical component of the framework for methodology takes shape, the process should accommodate continuous interaction and re-imagination of the relationship with the conceptualization of disciplined inquiry.

## **Organization of the Manuscript**

Chapter 2 of this manuscript explores the concept of disciplined inquiry philosophically and further examines the current state of knowledge for both the phenomenon of inquiry paradigms and the phenomenon of methodology. The in-depth examination of the two phenomena was used to further develop and support the research problem. Chapter 3 presents the literature review research method used for historical analysis, and chapter 4 presents the results of the historical analysis. Chapter 5 presents the literature review research method used for reverse engineering and theoretical analysis, and chapter 6 presents the results of theoretically reverse engineering paradigm theory. Chapter 7 synthesizes learning from the two studies and looks at the next steps in the research agenda. Appendices A, B, and C are supplemental reviews in support of the research—a methodological review of literature review research methods, a review of theoretical products, and a review of theoretical processes, respectively.

## CHAPTER 2: BACKGROUND LITERATURE REVIEW

### **Purpose and Organization of Background Literature Review**

Chapter 2 presents an overview of the literature supporting the current conceptualization of disciplined inquiry. The topics analyzed and the order in which they are introduced were intentional in order to develop the sufficiency of the research problem and clearly identify the conceptual knowledge gaps to be addressed. Chapter 2 serves as a content background literature review that aims to introduce and synthesize literature on the concept and process of disciplined inquiry, the phenomenon of inquiry paradigms, and the phenomenon of methodology. Each of these three literatures is presented in a manner necessary to formulate the following fundamental argument regarding disciplined inquiry.

Disciplined inquiry is a methodical process for forming justified belief comprising two essential phenomena: the phenomenon of inquiry paradigms and the phenomenon of inquiry methodology. Analysis of the literature revealed that the phenomenon of inquiry paradigms has been explained as a well-developed sophisticated theory with a fully defined theoretical framework. However, the phenomenon of methodology remains underdeveloped theoretically. It has been conceptually defined as a broad range of possible ideas, principles, and processes, yet never unified under a common meta-framework. Consequently, both a knowledge gap in our conceptual understanding of disciplined inquiry and an applied gap in our ability to methodically practice disciplined inquiry, given the lack of developed phenomenon, remain.

Development of the argument in the literature was organized sequentially around three topical areas. In the first area, the review focused on conceptualizing the concept and process of disciplined inquiry philosophically by examining (a) knowledge, (b) inquiry versus disciplined inquiry, and (c) how and why disciplined inquiry can be conceptualized with paradigms of inquiry and methodology. In the second area, the review focused on the paradigm of inquiry phenomenon by examining (a) definitions of the term paradigm, (b) key contributors to the development of the paradigm conceptualization as a phenomenon, and (c) the roles of paradigms of inquiry in the conceptualization and process of disciplined inquiry. In the third area, the review examined the literature on methodology to demonstrate (a) its breadth of definitions as a term and (b) its primitive state as a phenomenon.

### **Conceptualizing Disciplined inquiry**

To conceptualize the concept and process of disciplined inquiry, as presented here, three key areas of the literature were reviewed: (a) knowledge, and more specially, knowledge claims; (b) definitions of inquiry versus disciplined inquiry; and (c) the two *regulative* ideals of disciplined inquiry (i.e., the possibility of experience as an ideal that drives the paradigm phenomenon, and the principles and practices by which the concepts of reality are interrogated as an ideal that drives the methodological phenomenon).

### **Knowledge**

One may ask, “What do we know—what is the extent of our knowledge?” One may also ask, “How do we decide in any particular case *whether* we know—what are the criteria, if any, of knowing?” The “problem of the criterion” arises out of the fact that if we do not have the answer to the second pair of questions, then, it would seem, we have no reasonable procedure for finding out the answer to the first; and if we do not have the

answer to the first pair of questions, then, it would seem, we have no reasonable procedure for finding out the answer to the second. (Chisholm, 1966, p. 3)

The definition of knowledge and the requisite conditions for knowledge have been two highly related yet different conversations. The former can be characterized as a study or analysis of knowledge (i.e., “epistemology,” Goldman, 2002, p. 164), while the latter can be characterized as a study or analysis of the process by which inquirers form the belief(s) upon which they make knowledge claims and upon which inquirers judge whether (or to what extent) they have come to know (i.e., “doxology,” p. 164). Critical to forming a conceptualization of the concept and process of disciplined inquiry was a review of these two conversations (i.e., what constitutes knowledge and what constitutes the conditions necessary to know), with the aim of laying an appropriate philosophical foundation of ends and means, respectively, for inquiry. By first reviewing the philosophical foundations of epistemology and doxology, the proceeding conversations about definitions of inquiry and the defining phenomena of disciplined inquiry were afforded leverage points and the conceptual traction upon which to establish the argument that disciplined inquiry is a methodical process for forming a justified belief that is defined by the paradigm of inquiry phenomenon and the methodological phenomenon.

**Formulations of knowledge.** Ongoing conversations in the literature regarding the question of *what is knowledge* typically involved three general dialogs. These can be described as (a) what is the standard formulation for knowledge, (b) in what ways does the standard formulation fail to account for knowledge, and (c) how might the standard formulation be amended to accommodate the criticisms aimed at its failures to account for actual knowledge.

***The standard formulation of knowledge.*** “Standard accounts” (Goldman, 2002, p. 164) of knowledge have been taken as “justified true belief” (p. 164; Jacquette, 2012, p. 430; Jenkins, 2011, p. 59; Morvan, 2005, p. 145), where a person, *S*, knows that proposition *p*, if and only if:

1. *S* believes that *p*,
2. *S* is justified in believing that *p*, and
3. *p* is true

(Chisholm, 1966; Gettier, 1963; Goldman, 1967, 1979, 2002; Jacquette, 2012; Lehrer, 1979, 1990; Morvan, 2005; Pappas, 1979; Scheffler, 1965)

This core formulation for knowledge holds that much of what a person knows at any given time is jointly based on believing in a proposition; having propositional justification (i.e., evidence) for the belief; and thinking that the external state of affairs in which the justifiably held belief is actually true. Key to this formulation is the idea of propositional belief and justification that is accessible by the knower and can be expressed as a statement or in propositional form (Jenkins, 2011; Moser, 1987; Pappas, 1979). These three conditions for knowledge (i.e., *S* believes that *p*, *S* is justified in believing that *p*, and *p* is actually true) entail the core formulation for the dialog surrounding the question of *what is knowledge*.

Consideration of propositional knowledge as justified true belief (JTB) dates back to Plato’s dialogues Meno and Theaetetus several hundred years BCE (Chisholm, 1966; Gettier, 1963; Jacquette, 2012; Jenkins, 2011; Moser, 1987; Stalkfleet, 2011; Starmans & Friedman, 2012). In early Socratic dialogues, Socrates debated the conditions sufficient for claims to knowledge; the necessity of a justification condition; and in particular, the tensions and deficiencies in the justification status that must be satisfied to know something (Jenkins, 2011).

As argued by Jenkins, many of the principled arguments concerning the justification status originally put forth by Socrates persist today and continue to be reflected in the critiques on the conditions for knowledge more commonly framed as those provided by Gettier (1963) and Gettier-like proponents (e.g., “insufficiency thesis,” Morvan, 2005, p. 152).

*Criticisms of the formulation of knowledge.* While the core formulation of knowledge is fairly straightforward (i.e.,  $S$  believes that  $p$ ,  $S$  is justified in believing that  $p$ , and  $p$  is true), it has not been without its criticisms. The criticisms have been leveled primarily at the last two conditions; that is, justification and the truth condition. The criticisms aimed at justification and the truth condition can be summarized as follows:

$S$  does not know  $p$ , if:

- $S$  believes that  $p$  and  $S$  is justified in believing that  $p$ , but  $p$  is not true, i.e., justified belief that is not true.
- $S$  believes that  $p$  and  $p$  is true, but  $S$  arrives at the belief in  $p$  through a faulty justification process, i.e., true belief that is not justified.

In both of these summarized cases, the claim to knowledge cannot be made, yet the state of insufficient conditions for knowledge is not necessarily accessible to the inquirer’s awareness. That is, the inquirer does not have access to external *truth* against which to see the flaw in the belief, nor any reason to suspect unknowingly engaging in a flawed belief forming process. If the inquirer is not aware that the conditions for knowledge have not been met, the standard account of knowledge as JTB is open to the critiques that the JTB formulation either wholly fails to

account for knowledge or requires amendment to include a more rigorous justification process and/or expansion of the requisite conditions for knowledge.

An examination of the critiques leveled at JTB epistemology cannot proceed without acknowledgment of Gettier's (1963) publication titled *Is Justified True Belief Knowledge?* Even though earlier instances of fault in JTB have been acknowledged in the literature (e.g., "Gettier's point that JTB is not sufficient for knowledge was previously argued by Socrates," Jenkins, 2011, p. 59), Gettier's article represents the perpetual footnote to virtually all post-mid 1960s work discussing whether JTB is sufficient for knowledge. In his seminal paper, Gettier presented two counterexamples in which JTB does not result in knowledge. Both counterexamples outline the potential instances in which (a) a knower can arrive at a justified belief that is not true and (b) a knower only incidentally holds a belief that is true (i.e., true belief that is not justified). Because both counterexamples presented by Gettier somewhat redundantly demonstrate the same flaws in JTB epistemology, only the first case (i.e., that of Smith and Jones) is highlighted here as an example.

Gettier's "Case I" (1963, p. 122) demonstrated how a person may be justified in believing a proposition that is actually true, but the proposition believed in was unknowingly deduced from a false proposition, and as a result, the person only coincidentally arrives at a belief that happens to be true. His example was as follows:

Suppose that Smith and Jones have applied for a certain job. And suppose that Smith has strong evidence for the following conjunctive proposition:

(d) Jones is the man who will get the job, and Jones has ten coins in his pocket.



Smith's evidence for (d) might be that the president of the company assured him that Jones would in the end be selected, and that he, Smith, had counted the coins in Jones's pocket ten minutes ago. Proposition (d) entails:

(e) The man who will get the job has ten coins in his pocket.

Let us suppose that Smith sees the entailment from (d) to (e), and accepts (e) on the grounds of (d), for which he has strong evidence. In this case, Smith is clearly justified in believing that (e) is true.

But imagine, further, that unknown to Smith, he himself, not Jones, will get the job. And, also, unknown to Smith, he himself has ten coins in his pocket. Proposition (e) is then true, though proposition (d), from which Smith inferred (e), is false. In our example, then, all of the following are true: (i) (e) is true, (ii) Smith believes that (e) is true, and (iii) Smith is justified in believing that (e) is true. But it is equally clear that Smith does not know that (e) is true; for (e) is true in virtue of the number of coins in Smith's pocket, while Smith does not know how many coins are in Smith's pocket, and bases his belief in (e) on a count of the coins in Jones's pocket, whom he falsely believes to be the man who will get the job. (p. 122)

In Gettier's example, Smith initially forms a belief in proposition *d* based on evidence *j*, where *j* is the assurance provided by the president and Smith's counting of coins in Jones' pocket. Of course *d* is not true as it turns out because Smith is the man who will get the job; however, due to the strong evidence *j*, Smith is actually justified in believing that *d*. At time *t*, Smith does not have access to the external truth that he and not Jones will be the man who will get the job, so even though Smith believes in *d*, and Smith is justified in believing in *d* based on strong evidence *j*, *d* is not true and Smith has no way of knowing that at *t*. In this instance, Smith (although unknown to him) has formed a justified belief that is not true, yet he does not know that the third condition for knowledge has not been met and has no opposing reason to question his justified belief in *d*.

Next, through a faulty chain of logic, Smith then deduced incidentally true proposition *e* from false proposition *d* due to the entailment of *e* by *d*. Because Smith is operating on the premise that *d* is true, Smith is justified in believing that *e* is true. Through sheer coincidence, in

this instance,  $e$  is actually true, but Smith's belief in  $e$  has nothing to do with Smith being the man who will get the job. Here, Smith believes  $e$ , Smith is justified in believing  $e$  given the assumed truth of  $d$ , and  $e$  is actually true. Smith does not know  $e$ , though, because it is only a matter of luck that Smith is correct (Jenkins, 2011; Lehrer, 1990; Morvan, 2005). According to Jenkins, "The problem is that we do not want to admit that Smith knows ( $e$ ) because he did not actually know that he, and not Jones, would get the job" (p. 60). However, expanding the analysis beyond that of Smith's inference from  $d$  to  $e$  out to the full chain of logic containing  $j$  to  $d$  to  $e$ , it can be understood that Smith's full justification process is flawed; therefore, Smith is not actually justified in believing  $e$ . Goldman acknowledged the necessity of true inputs in his discussion of conditional reliability of the full chain of logic: "A process is conditionally reliable when a sufficient proportion of its output-beliefs are true *given that its input-beliefs are true*" (1979, p. 13).

These critiques undergird Morvan's (2005) discussion of the insufficiency thesis with regard to JTB; that is, "to count any true belief whatsoever as an instance of knowledge, no matter how accidentally or irrationally or unjustifiably formed, does not seem to conform to the standard sense of 'knowledge'" (p. 152). Just because something is true, someone believes it is true, and that person is even justified in believing it is true, if the facts on which the inferences and beliefs are based are not true or only coincidentally lead the person to believing the true proposition, that person cannot be said to know the true proposition, based on the faulty path to it.

False premises in the chain of logic momentarily aside, Smith's initial belief in  $d$  highlights the point made by Jacquette (2012) that a significant shortcoming in JTB

epistemology “is the inclusion of a truth T condition independently of the best justification of which we are capable” (p. 430) as a condition of knowing. Jacquette called into question whether an inquirer can ever truly know if his or her justified belief has met the third condition for knowledge; that is, that the proposition that is justifiably believed in is actually true.

Furthermore, if an inquirer were capable of accessing an external truth, then justification or belief would be unnecessary; the inquirer would simply know. Not having access to the external truth condition creates a flawed circular logic in the JTB formulation in practice. This is, in essence, Chisholm’s (1966) problem of the criterion; that is, in the practice of inquiry, if one has no access to what is true in the capital T sense of truth, then one can judge neither the validity of the knowledge claim nor the processes that produce true knowledge claims.

Smith’s initial belief in *d* emphasizes one of the major weakness in the three conditions of JTB as knowledge (i.e., *S* believes that *p*, *S* is justified in believing that *p*, and *p* is true). According to Gettier (1963), “It is possible for a person to be justified in believing a proposition that is in fact false” (p. 121), but the person has very limited capability to understand whether the third condition has been met. Jenkins (2011) provided further evidence of the difficulty associated with knowing the third condition for knowledge in his example of believing in a hallucination.

If we have never hallucinated before, are not on any drugs, etc.; we can be justified in relying on our reliable cognitive faculties. However, this can lead to the outcome that we are justified in believing that we saw something that we, in fact, did not see. (p. 52)

The issue surrounding whether a person has met the conditions sufficient for knowing (presumably by engaging in some belief-producing process) under the JTB formulation of knowledge might be relegated to the conversations of philosophers, assuming great distance

from the actual practice of inquiry. However, the notion of forming a justified belief about a proposition that is false is quite troublesome for the actual practice of inquiry. If the processes upon which inquirers rely to form the beliefs they feel justified holding are capable of producing beliefs that are in fact false even when rigorously adhered to, then all the resources involved in conduct of inquiry for the purpose of gaining knowledge are arguably somewhat futile. That is, if one cannot have faith, evidence, argument, or some justifying leverage upon which to assume the processes to be fruitful in terms of yielding an improved state of knowing, then one has little reason to engage in the belief-forming process, apart from its intrinsic value to the inquirer.

The argument that one could form a justified belief that is not true might shake the faith of inquirers in the legitimacy of their belief-forming process; however, as indicated by Richmond (1975),

Surely, it is something peculiar about the justificatory status of *S*'s belief that *Q* which leads us to deny to that belief the status of knowledge, however tempted we may be to say that *S* is justified in believing *Q*." (p. 439).

Richmond's statement highlighted that critiques of JTB as knowledge point back to the belief's justification status; that is, any unjustified belief cannot be knowledge, even if incidentally true. More importantly, any justified belief that is not true likely is not really justified to begin with when the full chain of logic is examined or the belief is examined from the broader perspective of *the other*, from which the flaws in justification would be apparent. This public role of *the other* in knowledge claims is one of the integral components of disciplined inquiry.

***Amended formulations of knowledge.*** In response to the critiques of the JTB formulation and the sufficient conditions for knowledge, numerous amendments have been proposed over the years to address various shortcomings. Often, these amended cases are represented as

modifications to indicate some additional requirement (e.g., J\*TB [Jacquette, 2012] and justified true belief (plus) [Goldman, 2002]). A number of the amendments to JTB epistemology are discussed in this section.

One of the simplest modifications to JTB adds the additional requirement of time. Here, as discussed by Chisholm (1966), belief, justification, and truth are all temporally bound such that “*S knows at  $t$  that  $h$  is true, provided: (1)  $S$  believes  $h$  at  $t$ ; (2)  $h$  is true; and (3)  $h$  is evident at  $t$  for  $S$ ” (p. 23), where  $S$  is a person,  $h$  is a proposition, and  $t$  is time. The temporal qualification acknowledges, in part, that what is known is not static, but neither is belief nor the state of being evident static. This amendment resonates with Kuhn’s (1996) analysis of the relationship between myth and fact (discussed later in the section on paradigms of inquiry).*

Two additional amendments to the JTB formulation were proposed by Ayer (1956) and Lehrer (1990). Both proposed amendments attempted to qualify the belief of person  $S$  in proposition  $p$  and the justification status of the belief in  $p$ . Ayer probabilistically qualified knowledge by adding to the belief of person  $S$  in proposition  $p$  that “ $S$  is sure that  $P$  is true” (p. 34) and to the belief’s justification status that “ $S$  has the right to be sure that  $P$  is true” (p. 34). Ayer’s qualification of *the right to be sure* addressed that the person must believe the outcome is likely and can establish the right for the likely belief by providing backing of the position on the grounds of some sort of evidence or proof to satisfy the claim. Less probabilistically, Lehrer suggested that “ $S$  knows that  $p$  if and only if it is true that  $p$ ,  $S$  accepts that  $p$ , and  $S$  is completely justified in accepting that  $p$ ” (1990, p. 16). Lehrer’s proposed amendment similarly attempted to qualify the belief and justification status of the belief with the notion of *acceptance*, where accepting  $p$  and being justified in accepting  $p$  are conditionally tied to available evidence.

As pointed out by Gettier (1963), if a person deduced a belief in a proposition from a false proposition that entailed the deduced proposition (e.g., “Jones is the man who will get the job, and Jones has ten coins in his pocket... The man who will get the job has ten coins in his pocket,” p.122), then the person may actually be justified, in a strict sense, in accepting the deduced proposition or being sure it is based on available evidence, yet fail to have knowledge, in this case, of the man who will get the job. Acknowledging this weakness in how JTB has been interpreted, the idea of a justified belief barring a false premise (Goldman, 1979; Lehrer, 1990) was introduced such that “if *S* knows that *p*, then *S* is completely justified in accepting that *p* in some way that does not depend on any false statement” (Lehrer, p. 18). One of the problems with JTB epistemology (a problem captured by Gettier) is that there is no explicit mandate that the entire chain of reasoning be examined simultaneously. Goldman attempted to reframe the false premise within the full chain of logic by adding that “a reasoning procedure cannot be expected to produce true belief if it is applied to false premises... A process is conditionally reliable when a sufficient proportion of its output-beliefs are true *given that its input-beliefs are true*” (p. 13).

Further modification to the JTB epistemology focused on the requirements of the justification process itself. Two examples of this come in Goldman’s (1967) requirement of causal connections between the belief in a proposition and the fact that *p*, and Pappas’ (1979) requirement of inferential relation between the believed proposition and some reasonable evidence for the proposition. Here, Goldman modified the justified belief condition for knowledge with the requirement that “the fact *p* is causally connected in an ‘appropriate’ way with *S*’s believing *p*” (p. 369), where *appropriate* was qualified as knowledge-producing causal process involving “a causal chain... which is correctly reconstructed by inferences, each of which is warranted (background propositions help warrant an inference only if they are true)” (p.

370). Similarly, Pappas added the requirement that a person has knowledge when the believed proposition, *h*, stands in inferential relation to some total evidence, *e*, where “*S*’s belief that *h* is inferentially based on evidence *e* that *S* has if and only if *h* is deductively or inductively supported by *e*, or *h* is epistemically derivable from *e*” (pp. 51–52).

While Goldman’s (1967) causal links were grounded in cause-and-effect inferential philosophy (e.g., Guba & Lincoln, 1982a; Habermas, 1971), Pappas (1979) offered the requirement in a philosophically neutral inferential framework; however, both philosophers added the requirement of inferential connection between starting evidence and final conclusion. Adding inferential criteria to the belief-forming processes of JTB represents an interesting shift away from *what* person *S* knows or believes, toward *how* the person came to hold his or her belief. The shift in focus onto how the belief was formed represents a significant refocusing of the conditions necessary for knowledge. Even though other issues (e.g., temporal nature; appropriateness of the justification and belief status, given evidence; and exclusion of false premises in the chain of logic) were not ignored, the emphasis here on the inferential connection between starting evidence and final conclusion explicitly highlights how the belief was formed as an indicator of the quality of the belief and therefore the truth merit of the justified belief.

In addition to internal examinations of the belief, justification, and belief-forming processes underlying standard accounts of knowledge, philosophers (e.g., Jacquette, 2012; Lehrer, 1979; Scheffler, 1965) also expanded the conditions for knowledge under JTB epistemology to include analysis of competing claims and evidence. Lehrer formally articulated this external condition as:

Whether a proposition is evident for a person depends, I maintain, on how well the proposition fares in conflict with other propositions. Thus, I propose that *h* is evident for *S* if and only if, for any proposition *c* that competes with *h* for *S*, either *h* beats *c* for *S* or *c* is neutralized with respect to *h* for *S*. (p. 67)

By expanding the conditions for knowledge to competing beliefs and justification processes, JTB epistemology was afforded relative merit, rather than simply sound, absolute justified belief.

Lehrer (1979) further refined the external conditions by defining what was meant by a *competing* proposition, the state of one proposition *beating* a competitor, and the state of one proposition *neutralizing* a competitor. To understand Lehrer's (1979) definition of a competing proposition, first Chisholm's (1966) notion of an *evident* proposition must be reviewed.

Chisholm stated that:

A proposition is *reasonable* or "beyond reasonable doubt," if believing it is more reasonable than withholding it... And a proposition *h* may be said to be *evident* for a subject *S* provided (1) that *h* is reasonable for *S* and (2) that there is no proposition *i* such that it is more reasonable for *S* to believe *i* than it is for him to believe *h*. (p. 22)

Therefore, a proposition is reasonable if it makes more sense to accept it than it does to deny it, and a proposition is evident when it is both reasonable and there is no other proposition that is more reasonable in juxtaposition. Building on Chisholm's idea of what is reasonable, Lehrer defined a competing proposition as "one that diminishes the epistemic worth or reasonableness of accepting the [original] proposition" (p. 67). Formally stated, "*c* competes with *h* if and only if it would be less reasonable for *S* to accept *h* if *c* were certain for *S* than if the denial of *c* were certain for *S*" (pp. 67–68), where being certain is not only a matter of being reasonable or even more reasonable, but maximally reasonable. In other words, two propositions compete on the basis of whether one is more reasonable than the other or calls into question the maximally reasonable proposition.



For a proposition to be beaten or neutralized, it must first be a competitor. If two propositions are not in competition, then one cannot beat or neutralize the other. However,

if  $c$  competes with  $h$  for  $S$ , then  $h$  beats  $c$  if and only if it is more reasonable for  $S$  to accept  $h$  than to accept  $c$ , and  $c$  is neutralized with respect to  $h$  for  $S$  if and only if there is some proposition  $n$  such that the conjunction of  $n$  and  $c$  does not compete with  $h$  for  $S$  and it is as reasonable for  $S$  to accept the conjunction as it is for him to accept just  $c$ . (Lehrer, 1979, p. 68)

Here, Lehrer called attention to a principle of maximal reasonableness for defeating a competing proposition. However, neutralizing a proposition negates the competing proposition's status as a competitor, thereby eliminating reasonableness as a winning criterion. Lehrer demonstrated neutralizing a proposition by creating a conjunctive proposition with the competing proposition that is not in competition with the original proposition and that is as reasonable to accept as the competing proposition by itself. When a proposition is neutralized, no proposition wins, but an alternative proposition is negated as a competing proposition, making it equally reasonable to accept as a third conjunctive proposition that does not compete with the original proposition. In this case, the conjunction of  $n$  and  $c$  does not compete with  $h$ , and as Lehrer stated,

Moreover, it is as reasonable for me to accept the conjunction as it is for me to accept the skeptic's remark alone. So the remark of the skeptic, though not beaten, is neutralized. Many skeptical challenges must be dealt with by neutralization. (p. 69)

Although various JTB amendments have been examined individually, the set of modifications also have been tackled together under an umbrella of *total* or *adequate* evidence (Chisholm, 1966; Scheffler, 1965). Scheffler (1965) defined an "evidence condition" (p. 55) in order to "distinguish genuine knowing from mere true belief, by reference to appropriate evaluation of the belief by the believer" (p. 56). Scheffler's proposal of total or adequate evidence represents an important amendment to the condition required for knowledge. His

proposal tied in the evaluative process more explicitly than did the other examples discussed so far. In addition to acknowledging the time-bound nature of knowing, being able to back up a belief with evidence, and considering competing propositions, Scheffler called attention to three further considerations pertaining to the evaluation of a person's evidence condition: the idea of the total evidence available to the *believer* versus evidence available to the *other*, the appraisal of the believer's grounds for belief according to standards, and the development and demonstration of a proof to support belief.

First, with respect to total evidence, Scheffler (1965) stated,

It appears, then, that we need to put a special interpretation on the condition that *X* has adequate evidence for "*Q*": *X*'s *total* evidence must provide adequate support for "*Q*". His total evidence cannot, of course, generally be expected to be the same as *our* total evidence, but the adequacy of his support for "*Q*" needs to be judged by reference to *every* relevant item of evidence that *he* has; adequacy cannot be bought as the price of ignoring available contrary indications. The totality of evidence available to *X* may, furthermore, change over time, but the question whether *X* knows that *Q*, needs itself, strictly speaking, to be understood as referring to a particular time. Whatever time is in question, it is the totality of *X*'s evidence *at that time* which needs to be adequate. (pp. 56–57)

Scheffler's (1965) presentation of total evidence pointed to two important issues. First, an inquirer must take into consideration all available evidence (i.e., competing, contrary, and the like) if the inquirer can be judged as possessing *adequate* total evidence. In other words, an inquirer cannot simply look within his or her process and conclusion, but must examine the processes and claims of others. Second, an unresolved tension exists between the total evidence the inquirer has available and the total evidence the other (who may be judging adequacy) has available. Scheffler indicated that the inquirer's total evidence cannot "be expected to be the same as *our* total evidence, but the adequacy of his support for '*Q*' needs to be judged by reference to *every* relevant item of evidence that *he* has" (p. 56). Here, Scheffler argued that all

available evidence must be considered, but that the set of all available evidence may not be the same (or cannot be expected to be the same) between the inquirer and the other. This tension in judgment on adequacy of total evidence leaves the appraisal of whether  $X$  knows that  $Q$  unresolved, because Scheffler also acknowledges that

In general, if you think I am mistaken in my belief, you will deny that I know, no matter how sincere you judge me to be and no matter how strong you consider my conviction. For  $X$  to be judged mistaken is sufficient basis for rejecting the claim that he knows. It follows that if  $X$  is admitted to know, he must be judged not to be mistaken, and this is the point of the truth condition... Knowing, it would appear, is incompatible with being wrong or mistaken, and when I describe someone as knowing, I commit myself to his not being mistaken. (p. 23)

Thus, under Scheffler's (1965) formulation, a person may possess adequate total evidence for a proposition at a particular time, yet still be mistaken, and therefore not know, because some relevant contrary evidence that existed was not available to the person at that point in time. This tension stresses Scheffler's idea of adequate total evidence. The path to knowledge was weakened without appropriate appraisal by the other, whose total evidence may be different (or more) than the total evidence available to the inquirer. Without the other's appraisal, an inquirer's total evidence may lead to a state of justified belief, based on "*every* relevant item of evidence that *he* has" (p. 56), which was not true. That is, the inquirer may be justified, given limited evidence, but the belief may not be justified, given a broader body of total evidence.

Second, with respect to appraisal according to standards, Scheffler (1965) stated,

A second feature of the evidence condition that requires interpretation is its implicit reference to *standards*. Adequacy is, after all, a matter of appraisal, involving standards of judgment that may differ from age to age, from culture to culture, and even from person to person. The variability of such standards does not, however, imply that assessments of knowledge are arbitrary or that the would-be assessor is somehow paralyzed. He needs to assess in accord with his own best standards at the time, but he may hold his assessment subject to change, should he later have cause to revise these

standards. The situation is, in principle, no different from other situations involving appraisal. (p. 57)

In addition to consideration of all available evidence between the inquirer and the other in the knowledge, belief, and evidence appraisal process, Scheffler also addressed the appraisal of the believer's grounds for belief according to standards. The standards against which belief and truth are appraised represent the philosophical or epistemological quality criteria matched against indicators in the justification process and resulting belief. However, the commitment to any set of standards at any particular point in time is also a reflection of "epistemological commitments—that is, his espousal of certain standards of evidence by which beliefs are to be appraised as well- or ill-grounded" (p. 58). Therefore, what was to be considered adequate evidence or proof of a claim, an appropriate inferential process, or warranted acceptance of  $p$  and being justified in accepting  $p$ , are all grounded in epistemological assumptions about what truth is, what can be believed about that truth, and what counts as justification for belief in that truth.

Third, with respect to demonstration of a proof to support belief, Scheffler (1965) stated,

We just need to recognize that having adequate evidence for a given statement is not simply having materials adequate for the demonstration of that statement. *Finding* a demonstration is, in general, *not* a routine process [e.g., a priori methodological process], even though *checking* a demonstration, once found, *is* routine [a posteriori methodological process]. Since finding a demonstration is rather a matter of ingenuity and luck—a "creative" outcome rather than a methodical application of rule to available items—possession of rule and items is clearly weaker than having a demonstration: not only is it itself no proof, but it does not routinely or mechanically yield proof, even where such a proof exists. We thus plausibly differentiate having adequate evidence, in the form of an actual proof, from having merely the rules and items adequate to support proof. We ask, in short, that the rules and items be organized and elaborated into an appropriate proof pattern. Having adequate evidence for " $Q$ " is not, in general, simply having materials adequate to yield " $Q$ "; the proper *pattern* of argument must also be "had". (p. 68)

Scheffler's third consideration pertaining to the evaluation of a person's evidence condition highlighted the necessity that an inquirer must both have adequate evidence to be appraised and present that evidence in an appropriate proof pattern or the proper pattern of argument, such that it makes the justified case. This further emphasized the importance, or even obligation, to espouse epistemological commitments, because "knowing in the *strong sense* is more than just true belief, involving also the ability to justify or back up the belief in appropriate manner" (p. 55), where an appropriate manner is tied to the epistemologically grounded standards of appraisal, such that the other can suitably appraise the inquirer's total evidence against all other available evidence. A significant requirement for presenting evidence in an appropriate pattern of proof is understanding both how the epistemological commitment shapes the conditions for knowledge and what counts as the proper pattern of argument, given an epistemological commitment. Only after gaining conscious awareness of those two requirements can inquirers understand that they have evidence and then be able to present it suitably as such.

The most significant proposed amendment to JTB epistemology reviewed was Jacquette's (2012) proposal for Best-JB. Jacquette argued not only for a modification of the justification condition, but more significantly for the replacement of the truth condition altogether with a best-justified condition, thus entirely reformulating the conditions for knowledge from JTB, including the JTB modifications, to Best-JB. He defined Best-JB as

beliefs in the truth of whatever propositions we are (a) justified in believing to be true, (b) when there is no better countermanding justification for their negations... The account preserves truth as a concept, even if it does not make truth a condition of knowledge. It is moreover compatible with the anti-skeptical expectation that truth is a potentially attainable goal for epistemic justification... We are free to suppose that truth is nothing more than the descriptive aptness of a proposition linguistically representing a corresponding existent truth-making state of affairs. Truth is nevertheless a semantic concept, rather than epistemic in the usual sense; so arguably, as others have also

charged, truth philosophically has no business as a condition of knowledge. (pp. 430–431)

Jacquette's reformulation of what it means to know as Best-JB was a fundamental reconceptualization of both knowing and the conditions sufficient for knowledge. Best-JB captured the notion of truth as a regulative ideal (Guba, 1990c; Kant, 1781/2007) and as an idealization of "the possibility of experience" (Kant, p. 250) that exerts normative force on our expectations of knowledge. As an idealization, truth serves in "showing us what it *would* be if it were extracted and refined to its utmost purity" (Kaplan, 2009, p. 11). However, as a condition for knowledge, truth serves only as guide or criterion for what we are able to approximate. Truth as a regulative ideal is something that can never be fully achieved in experience. According to Jacquette, it defines, as an ideal, the hypothetical world of possible experience, but also as an ideal, is incapable of actualization empirically. In other words, by replacing truth as a condition for knowledge, and making truth a regulative ideal in the formulation of knowledge, Jacquette managed to bring the conditions for knowing

Back down to earth, eliminating truth as a condition of knowledge independently of the best justification of which we are capable, but without stepping away from the concept of truth as an attainable goal in the pursuit of best justification. (p. 431)

One of Jacquette's (2012) foundational arguments for replacing truth as a condition for knowledge was grounded in analysis of the accessibility of knowing truth. He argued that our access to belief in what is true or false is limited to our judgments about which propositions are supported by the best available justification. However, if inquirers were actually capable of fully apprehending truth epistemically, then what and how good the justification is becomes an unnecessary issue. That is, if inquirers had actual access to truth rather than their justified beliefs

in a proposition's truth, then they would quite simply know and need not provide justification.

Jacquette made the distinction in knowing between a godlike sense and a supported claim sense:

Justification does the heavy lifting in discovering knowledge and supporting knowledge claims. Truth as a property of propositions transcending what we can learn from the best justification practically available to us is a condition that can only be satisfied by a godlike transcendent intelligence. (p. 431)

All critiques of JTB epistemology that were reviewed (with the exception of Best-JB) were built upon either possessing unjustified belief in the truth of a proposition or the condition for knowledge that *p* is true (i.e., a truth condition that ultimately can only be corroborated or denied, but never truly known in a godlike sense). Inquirers can fix their belief-forming processes to address the justification status of their beliefs, but still potentially hold beliefs in propositions that are not true. Because inquirers and appraisers lack access to godlike intelligence, "the way we actually validate knowledge claims in practice is by appealing to whatever we take to be the best justification for the truth of whatever propositions are supposed to be known" (Jacquette, 2012, p. 432), given the evidence presented and the availability of competing claims at that particular time. Over time, if the chain of evidence presented changes or new competing claims are developed or simply become available for relative appraisal, then judgment of a proposition's truth would change according to whatever is taken as the best justification at that time. Both practically and epistemically speaking, Jacquette made the point that "best justification is the best epistemically that we can do, and therefore the best that we should be expected to do" (p. 434) in the practice of making knowledge claims.

For the Best-JB proposal of propositional knowledge, Jacquette (2012) offered eight theoretical advantages for Best-JB over standard accounts of knowledge (pp. 437–444). Each of the eight advantages offered in defense of Best-JB is briefly paraphrased in Table 1.

Table 1.

*Theoretical Advantages of the Best-JB Formulation for Propositional Knowledge Over the JTB Formulation for Propositional Knowledge*

<b>Theoretical advantage</b>	<b>Explanation</b>
1. Ockham's razor	Best-JB is simpler than JTB. Under Best-JB, justified knowledge claims are temporally unbound and relative to the developmental state of the best, most-informed disciplined methodology.
2. Avoiding epistemic hypocrisy in theory and practice	If the best, most-informed disciplined methodology available for forming justified beliefs does not involve direct access to justification-independent, justification-transcending truth, then truth should not be a theoretical condition for knowing. In practice, it is judgment of the justification in the belief of a proposition's truth as the most adequate, Best-JB that awards the status of knowledge.
3. Projecting a practically attainable ideal of best justification, and hence of knowledge according to the analysis, bringing epistemology pragmatically back down to earth	By treating truth as a regulative ideal rather than a condition for knowledge, and further replacing the justification, <i>J</i> , and truth, <i>T</i> , conditions of JTB epistemology with the best justification condition of Best-JB, the unattainable is swapped out for the practically attainable.
4. Making justification scientific	Because best justification is linked to the temporally unbound and relative developmental state of the most informed disciplined methodologies, what is considered best justification at any point in time is never out of style. That is, best justification is always grounded in what is considered state of the science methodologically.
5. Avoiding what we shall call flimsy Borgesian 'anthill' justifications.	Jacquette argued that JTB epistemology overemphasizes the truth, <i>T</i> , condition and under emphasizes the justification, <i>J</i> , condition. As a result, Gettier (1963) cases have increased merit in the sense of an increased likelihood of forming weakly justified beliefs that are not true. However, by eliminating Truth as a condition for knowledge and replacing the traditional justification, <i>J</i> , condition with a best justification, <i>Best-J</i> , condition, "flimsy" judgments of Gettier-like knowledge are also replaced with judgments based on whether better scientific justification, practically available to others, is available for acceptance instead the negation of the Gettier-like belief.
6. Avoiding Gettier counterexamples without ad hoc provision	In Gettier's counterexample, Smith has weak justification for believing that Jones will get the job. Collectively, not limited to Smith's one interaction with the company president whom indicated that Jones would get the job (p. 122), there is available better justification for the negation of the belief that Jones will get the job. While individually Smith satisfies the justification condition under JTB epistemology, Smith collectively fails to satisfy the <i>Best-J</i> condition under Best-JB. In this sense, Best-JB avoids the Gettier counterexample.
7. Explaining reversals of knowledge claim validations	In a Kuhnian sense of the temporally-based tension between myth and fact, i.e., "if these out-of-date beliefs are to be called myths, then myths can be produced by the same sorts of methods and held for the same sorts of reasons that now lead to scientific knowledge" (1996, p. 2), Best-JB accommodates reversals of knowledge claims when better evidence becomes available. The Best-JB condition is tied to whatever inquirers determine to be the most successful, philosophically and practically speaking, methods of inquiry to date. When disciplined methodologies



	<p>evolve and advance, what is to be judged the Best-JB may also change, and as a result, negate a previously held Best-JB (e.g., “We cannot fault a forensic scientist investigating a crime in 1941 for not using evidence of DNA analysis in order to identify a suspect,” Jacquette, p. 444).</p>
<p>8. Offering at least an equally good solution to the problem of universal ignorance when compared with condition T in JTB and J*TB</p>	<p>Because the Best-JB analysis of the concept of knowledge includes the “concept of defeasible best justification” (Jacquette, p. 446), there is always the possibility of not-<i>p</i>; that is, better justification becoming available for the negation of <i>p</i>. Best justification is temporally bound to the best justification <i>available</i>. Consequently, while an individual may either not know they are not best justified when compared to the collective wisdom (and therefore not <i>know p</i>) or become no longer best justified when better justification avails itself (and again retrospectively be judged to not <i>know p</i>), a collective society may also be universally ignorant that better justification exists. In this universal case, even though the better hypothetical justification was never considered, the collective society remains defeasibly, but not manifestly, justified in their belief in the truth of <i>p</i>. In JTB epistemology, not only is the individual justified in believing a false truth, but the collective society is justified in believing a false truth and neither have knowledge.</p>

Formally, Jacquette’s (2012) formulation for knowledge was as follows, where the *doxastic subject* is an inquirer concerned with the belief forming process:

Best-J: Doxastic subject *S* is best (albeit defeasibly) justified (Best-J) at time *t* in believing proposition *p* = df (a) *S* is justified at time *t* in believing proposition *p*, and (b) there is at *t* no countermanding better or stronger justification available in practice for any doxastic subject to disbelieve proposition *p* or any proposition invoked in justifying belief in the truth of proposition *p*, or to believe instead the negation of proposition *p* or at least one proposition invoked in justifying belief in the truth of proposition *p*. (p. 433)

Altogether, Best-JB encompasses a temporally bound knowing that is not tied (as a condition for knowledge) to an inaccessible godlike truth condition. A Best-JB has no warranted basis for denial, where warranted denial (i.e., not-*p*) is a case in which the best justification for the truth of a believed in proposition may be overturned by better justification for the proposition’s negation. In addition, beliefs in the truth of a proposition must be justified, beat (or neutralize) all available competitors, and be based on premises that themselves are justified, unbeaten by competing propositions, and not false. In a final clarification on the distinction between analyses of knowledge and analyses of knowledge claims, Jacquette stated,

If it is asked in conclusion whether Best-JB is supposed to be an analysis of knowledge itself or only of best justified knowledge claims, the answer is that Best-JB analyzes the concept of knowledge, but that its applications, whenever we get down to individual cases, can only address the justification status of particular knowledge claims. (p. 446)

**Belief.** The prior section reviewed various formulations and definitions of knowledge.

Despite the diversity of available conditions for and assumptions of knowledge, two critical elements persist: belief and justification. In the current section, the concept of belief is examined, followed by an examination of justification in the following section. The overall discussion on knowledge concludes with a review of the importance of justified belief for the process of disciplined inquiry.

*What is a belief and how does believing relate to knowing?* Foundational to knowing is holding a belief, regardless of its status as justified, best justified, or in the truth of the expressed proposition. According to Dewey (1933),

A belief refers to something beyond itself by which its value is tested; it makes an assertion about some matter of fact or some principle or law. It means that a specified state of fact or law is accepted or rejected, that it is something proper to be affirmed or at least acquiesced in. It is hardly necessary to lay stress upon the importance of belief. It covers all the matters of which we have no sure knowledge and yet which we are sufficiently confident of to act upon and also the matters that we now accept as certainly true, as knowledge, but which nevertheless may be questioned in the future. (p. 6)

Dewey's belief definition has three key elements. First, a belief is an acknowledged acceptance of a state of affairs or in a proposition. However, second, the acceptance exists along a continuum of certainty (e.g., "affirmed or at least acquiesced in," p. 6) from accepted as certainly true to sufficiently confident to act upon. Third, the belief must be capable of holding up to scrutiny of its merit. As a building block for knowledge, belief in this sense represents an individual's confidence in a match between an idea and nature (Goldman, 2002).

Even though a belief represents an individual's confidence in the match between fact and nature, belief by itself is neither justified nor haphazard. A belief should be the conclusion formed "as the result of personal mental activity, such as observing, collecting, and examining evidence" (Dewey, 1933, p. 7); however, the belief has not yet been fully vetted according to an external justification process. A belief is the outcome of the orderly process an individual engages in prior to broader acceptance of an idea.

One man, if challenged, could produce little or no evidence for thinking as he does. It is an idea that he has picked up from others and that he accepts because the idea is generally current, not because he has examined into the matter and not because his own mind has taken any active part in reaching and framing the belief. (pp. 6–7)

The active role in reaching and framing belief is what Dewey attributed to distinguishing belief from the thoughts considered mere "mental furniture" (p. 7). Beliefs require an "intellectual and practical commitment" (p. 7) that sooner or later will necessitate or "demand our investigation to find out upon what grounds they rest" (p. 8). It is this propensity of a belief to hold up to future scrutiny that builds the momentum necessary for an inquirer to eventually attempt to substantiate the belief in a manner, or by a process, that itself holds up to scrutiny and concludes with an affirmed, justified belief as its product.

***What is justified belief?*** Justified belief can be defined as an intellectual and practical commitment to "an assertion about some matter of fact" (Dewey, 1933, p. 6) that is based on grounds that have been adequately tested, investigated, and properly affirmed. Critical to the conception of belief justification is how the belief was formed (i.e., tested, investigated, and affirmed). Goldman (1979), focusing on the belief-forming process, tackled the conception of justified belief in his proposed "theory of justified belief" (p. 1). According to Goldman,

A justified belief is, roughly speaking, one that results from cognitive operations that are, generally speaking, good or successful... [such that] If  $S$ 's believing  $p$  at  $t$  results from a reliable cognitive belief-forming process (or set of processes), then  $S$ 's belief in  $p$  at  $t$  is justified. (p. 13)

Central to Goldman's ideas was the formation of belief by reliable process. His theory of justified belief attempted

*An explanation of why we count, or would count, certain beliefs as justified and others as unjustified. Such an explanation must refer to our beliefs about reliability, not to the actual facts. The reason we count beliefs as justified is that they are formed by what we believe to be reliable belief-forming processes. (p. 18)*

While Goldman's (1979) internal (i.e., inquirer-centric mental activities) emphasis on reliable cognitive belief-forming processes fell short of embodying the external scrutiny of belief product and belief-forming process suggested by Jacquette (2012) and Scheffler (1965), it did shift the lion's share of responsibility for a justified belief onto the belief-forming process itself. This is not to say that the process should not have to stand up to competing processes or that the process' output should not have to stand up to competing processes' outputs. However, it does at least add to the appraisal speculation by asking if this belief is justified and how the belief is justified (epistemological and doxological speculations, respectively, whereby epistemology generally speculates about the "conditions definitive of knowing" [Goldman, 2001, p. 346], and doxology generally speculates about what belief-forming processes produce beliefs that meet the conditions for knowing). According to Goldman, "Since knowledge entails belief, a study of the most effective or powerful routes to knowledge must take into account the available routes to belief. Nobody can attain knowledge without attaining belief" (p. 347).

A symbiosis exists between epistemology and doxology in the evaluation of justified belief, because the appropriate routes to belief depend upon assumptions about nature. What

Goldman calls “reliable” (1979, p. 18) is, in this espoused context, a relative term rather than absolute. Belief in this sense represents an individual’s confidence in a match between an idea and nature (Goldman, 2002), so what is a reliable process for the production of belief under one set of epistemological assumptions about nature is not the same under a different set of epistemological assumptions about nature. Nature is relative to assumptions; therefore, so is the reliability of the belief-forming processes. Furthermore, what would be appraised as “an appropriate proof pattern” (Scheffler, 1965, p. 68) in the process and presentation of “the proper *pattern* of argument” (p. 68) in the product would also, by logical association, be a relative evaluation according to an espoused set of epistemological commitments and associated standards of appraisal.

Goldman (1979) stated that “the term ‘justified’ ... is an evaluative term, a term of appraisal” (p. 1). Therefore, when evaluating a belief as justified, what is really ventured is an evaluative “*explanation* of why we count, or would count, certain beliefs as justified and others as unjustified” (p. 18). The tricky part of the justification appraisal is accessing and applying the appropriate standards for belief-forming process and belief product. As indicated by Scheffler (1965), assessments of knowledge are not arbitrary, but even when universally formulated, the content of knowledge remains relative to assumptions about nature, assumptions about the closest a person can come to know something about nature, assumptions about the most appropriate and reliable routes to belief about that nature, and agreement about what counts as proper presentation of justified belief within the relative system of justification status (Jenkins, 2011; Scheffler, 1965).

The appraisal of justified belief is critical to knowledge judgments. The appraisal of status as justified belief serves to distinguish “mere belief” (Goldman, 2002, p. 190) and “mere justification” (Jenkins, 2011, p. 58) from genuine knowing. The distinction of the mere from the genuine safeguards against circumstances wherein “there would be no problem about ‘knowing’ that a theory matches nature; for it is certainly possible for some to *believe* that there is such a match” (Goldman, p. 190); however, the belief must be justified in order to begin consideration as knowledge about nature.

**Justification.** Chisholm (1966) addressed what it means to have evidence and the criteria for determining case by case whether an inquirer actually has evidence:

If one man has made a lucky guess... but doesn't really know, and another man knows, but isn't saying, and doesn't need to guess, what is it that the second man has (if anything) that the first man does not? One may say, of course, that the second man has *evidence* and that the first man does not, or that something is *evident* to the one that is not evident to the other. But what is it to have evidence, and how are we to decide in any particular case whether or not we do have evidence? (p. 1)

Chisholm's question was a theme echoed by Scheffler (1965) in his examination of the evidence condition as means to identify “genuine knowing” (p. 56). There is a proverb that one man's trash is another man's treasure. Both the proverb and Chisholm's quote make clear that each person has something; however, the distinctions between trash and treasure or luck and evidence must be made according to some external and shared standards of merit. The review of knowledge turns to these standards or conditions of merit in the examination of justification.

**What is justification?** Regardless of the formulation of knowledge (i.e., Best-JB, JTB, or JTB plus), all accounts overlap with respect to the requirement of a belief condition; however, they also overlap in their requirement of a justification condition. Even though further conditions

exist, a core feature of knowledge is that the held beliefs are justified. The issue of whether a belief is justified is essentially a matter of being able to state the grounds upon which one holds belief in  $p$ , and then having others judge the grounds as adequate. As expressed by Jenkins (2011), “for justification we must be able to answer the question, ‘How do you know that you know?’” (p. 59).

In response to the question “How do you know that you know?” Jacquette’s (2012) formal definition of Best-JB highlighted the merit of the belief (i.e., output) and its premises (i.e., inputs) in contributing to justification. Not only should no counterfactual claims be better justified or justify the negation of the proposed knowledge claim available for consideration at that particular point in time, but the premises upon which the claim is based must also be justified, unbeaten by competing premises, and not false. In this sense, justification of a belief in  $p$  and its premises is not a dichotomous judgment of justified versus not; rather, it is an evaluation along a justified continuum indicating whether the belief and premises are the best justified set of inputs and outputs “maximally practically attainable... [given] the most strongly corroborated work” (p. 434) available to consider.

In contrast with emphasis on inputs and outputs, Goldman’s (1979, 2001, 2002) writings on justified belief focused on the process by which the belief was formed.

Returning to a categorical concept of justifiedness, we might ask just *how* reliable a belief-forming process must be in order that its resultant beliefs be justified. A precise answer to this question should not be expected. Our conception of justifiedness is *vague* in this respect. It does seem clear, however, that *perfect* reliability isn’t required. Belief-forming processes that *sometimes* produce error still confer justification. It follows that there can be justified beliefs that are false. (p. 11)

Therefore, through Goldman and Jacquette (2012), we have a threefold conception of a justification continuum as merit appraisal of the inputs, process, and outputs that lead or contribute to the justification of knowledge claims.

Interestingly, Goldman (1979) further defined two time-bound uses of the justified condition: “an *ex post* use and an *ex ante* use” (p. 21). The primary difference between the two uses of justified points to the evaluand of the justification appraisal, or subject of the justification evaluation. The *ex post* use describes the evaluation of an existing belief as likely justified or not, given all of the merit considerations of inputs, process, and outputs discussed so far. The *ex ante* use describes an evaluation of the inquirer by whom the justification judgment is made, such that “*p* is (or isn’t) suitable for him [the inquirer] to believe” (p. 21). *Ex ante* justification is independent of the belief itself, such that the *ex ante* use of justification is an evaluation of whether the inquirer is, or would be, justified to hold the belief if or when it is formed; that is, “the *ex ante* use occurs when no such belief exists, or when we wish to ignore the question of whether such a belief exists” (p. 21). In other words, *ex ante* justification establishes the potential to be justified given a set of conditions, which Goldman defined as

Person *S* is *ex ante* justified in believing *p* at *t* if and only if there is a reliable belief-forming operation available to *S* which is such that if *S* applied that operation to his total cognitive state at *t*, *S* would believe *p* at *t-plus-delta* (for a suitably small delta) and that belief would be *ex post* justified. (p. 21)

When associated with cycles of iterative inquiry (e.g., the general method of applied theory building [Lynham, 2002b], living systematic inquiry [Wadsworth, 2010], theory-research-development-practice cycle [Swanson, 2007; Swanson & Holton, 1997]), the *ex ante* use of justification becomes a powerful methodological appraisal. Within this cycle of inquiry context, the appraisal question is whether the potential goal belief is appropriate, given the entry point



into the inquiry cycle, premises used as inputs, and available methodological routes from here to there (Yin, 2009). To better understand these “routes to belief” (Goldman, 2001, p. 347), the background review turns to belief-forming processes.

***What is a belief forming, justification conferring process?*** Prior to jumping directly into the Goldman literature on belief-forming processes (1979, 2002), a more general concept of belief formation can be found in the earlier writings of Dewey (1933):

That operation in which present facts suggest other facts (or truths) in such a way as to induce belief in what is suggested on the ground of real relation in the things themselves, a relation between what suggests and what is suggested. (p. 12)

In reference to the operation, Dewey described a process of reasoning in which the inquirer moves through a progression of initial truths, relations among the initial truths, and finally the suggestion of a new truth. Interestingly, the progression of the inquirer depends upon three facts and three beliefs in the truth of the facts. First, the inquirer begins with a set of givens for which he or she presumably has some grounds for taking as truthful premises; that is, the inquirer feels justified in believing in the truth of the starting facts. Next, the inquirer reasons about the relation or connection among the premises, and forms belief in the truth of the perceived relations. Lastly, the inquirer makes inference about a new fact, which he or she feels justified believing, given the premises and perceived relations among them. The process of inference from premise to conclusion that induces belief is the thing that connects what Dewey refers to as the “relation between what suggests and what is suggested” (p. 12).

The entire reasoning process described by Dewey (1933) contains premises as inputs, inference as process, and belief as outputs. The input-process-output belief-forming process is similar to standard input/process/output (IPO) process models. Conveniently, the IPO process model provides a helpful conceptual framework to capture the idea of a belief-forming process, both as accounted for by Dewey and by Goldman (1979, 2002). Goldman (1979) defined the notion of a belief forming process as

*A functional operation or procedure, i.e., something that generates a mapping from certain states – ‘inputs’ – into other states – ‘outputs’. The outputs in the present case are states of believing this or that proposition at a given moment... But when we say that a belief is caused by a given process, understood as a functional procedure, we may interpret this to mean that it is caused by the particular inputs to the process (and by the intervening events “through which” the functional procedure carries the inputs into the output) on the occasion in question. (p. 11)*

Jacquette (2012) emphasized the justification of input and output, while Goldman (1979) emphasized the justification in the process by which we form “a *mapping* from certain states – ‘inputs’ – into other states – ‘outputs’” (p. 11). It is this mapping, or process of inference from premises to a new state of belief, that encompasses a belief-forming process. However, the belief-forming process can be considered a general case, one in which some belief outputs are justified and some are not. For a belief-forming process to be considered a more specific justified instance, it must conform to certain conditions, just as Jacquette similarly outlined, whereby a premise and formed belief must meet the condition that neither are demonstrated false nor negated or beaten by competitors that are better justified. Here, the justified belief-forming process must both demonstrate a reliable tendency for producing justified beliefs judged as true or best justified in practice, but also hold the promise of producing the same as an idealized process “extracted and refined to its utmost purity” (Kaplan, 2009, p. 11).

Goldman (1979) captured the idea of the conditions necessary for a *justification-conferring process* to be an instance of a belief-forming process in the following statement:

I have characterized justification-conferring processes as ones that have a ‘tendency’ to produce beliefs that are true rather than false. The term ‘tendency’ could refer either to *actual* long-run frequency, or to a ‘propensity’, i.e., outcomes that would occur in merely *possible* realizations of the process. (p. 11)

In Goldman’s statement, the “*actual* long-run frequency” maps to the process’s reliable tendency in practice and the propensity maps to the promise of what would or should produce justified beliefs in idealized form (Goldman, 1979; Kaplan, 2009). However, in both cases (i.e., practice and idealization), the tendency and propensity are of the more general belief-forming process to “produce beliefs that are true rather than false” (p. 11), where ‘true’ is a state or condition of epistemic appraisal.

To disambiguate general belief-forming processes from the more specific justification-conferring, belief-forming processes, Goldman (1979) outlined several types of functional belief-forming operations and examples of both faulty processes and fruitful justification-conferring processes. Four functional operations were defined: (a) “reasoning processes, where the inputs include antecedent beliefs and entertained hypotheses” (p. 11); (b) “functional procedures whose inputs include desires, hopes, or emotional states of various sorts (together with antecedent beliefs)” (pp. 11–12); (c) “memory process, which takes as input beliefs or experiences at an earlier time and generates as output beliefs at a later time” (p. 12); and (d) “perceptual processes” (p. 12), which take environmental stimuli as inputs and transform the stimuli through cognitive information processing into perceptual response-level belief.

Among these four functional belief-forming operations, Goldman (1979) offered examples of both faulty processes and fruitful justification-conferring processes. Examples of belief-forming processes that would be classified as unjustified, or non justification-conferring, were “confused reasoning, wishful thinking... mere hunch or guesswork, and hasty generalization” (p. 9). Each of these examples of faulty process has the tendency to produce belief in something that is not true, where ‘true’ is dependent upon the assumptions concerning the possibility of experience. Originally included in Goldman’s list of faulty processes was “reliance on emotional attachment” (p. 9); however, it seemed an epistemologically laden value judgment (covered in more detail in the section on philosophical paradigms of inquiry), rather than an epistemologically neutral example, and was consequently excluded here. Examples of belief processes that would be classified as justification conferring were “standard perceptual processes, remembering, good reasoning, and introspection” (p. 10). These justification-conferring processes have the tendency to reliably produce output beliefs that are true, where truth is a paradigmatic assumption about knowing whose value judgment is at least partially a product of the belief-forming process that produced it as an output belief.

***How does a belief achieve justification status?*** Two points are important for understanding the status of justified belief. First, as a status, it is something achieved or granted but not given as an absolute upon meeting some set of initial conditions. Meeting an initial set of conditions only provides the inquirer the potential to be justified in holding the belief. Second, upon completion of a justification-conferring belief-forming process, judgment concerning justification must be made externally for a belief to achieve its status as legitimately justified and be considered as a condition for knowledge.

Chisholm (1966) posed the following question:

How are we to decide, in any particular case, *whether* we know? is to refer to the “sources” of our knowledge and to say that an ostensible item of knowledge is genuine if, and only if, it is the product of a properly accredited source. (p. 57)

Here, Chisholm drew attention to the relational value that knowing has to the sources from which knowledge or justified belief were produced. The sources of interest in the production of belief that contribute to the belief’s achieved status as justified (and therefore address the question of whether we know) are the belief inputs, the mapping operation from input sources to output sources, and the belief output.

With regard to having a belief that is justified, Jacquette’s (2012) writing on Best-JB highlighted the importance of the premise beliefs (i.e., inputs) and formed beliefs (i.e., outputs), while Goldman’s writings on belief-forming processes (1979, 2001, 2002) highlighted the importance of process that takes as its inputs a set of premises, and through functional belief-forming operations, produces beliefs as its outputs. As pointed out by Goldman, “a justified belief gets its status of being justified from some processes or properties that make it justified. In short, there must be some justification-conferring processes or properties” (p. 2). These two examples underscore the “evaluands” (Mertens & Wilson, 2012, p. 13) of the justification-appraisal process, indicating that judgments concerning the justification status of a belief must be made about the “process and product” (Lincoln & Guba, 1985b, p. 50). Furthermore, as pointed out by Scheffler (1965), justification evaluation of the process and product evaluands must be made according to standards of quality or merit, but the burden of presenting or demonstrating those evaluands in the proper pattern of argument, such that it makes the justified case, falls upon the inquirer.

The best an inquirer can achieve without external appraisal is Goldman's (1979) concept of ex ante justification, where ex ante justification status suggests whether the inquirer is, or might be, justified to hold the belief if or when it is formed. Demonstrating the possession of quality (or justification-conferring) indicators in process and product essentially establishes whether the inquirer is ex ante justified, such that the inquirer has satisfied some measure of disciplined, methodical inquiry to the best of his or her knowledge. However, the belief produced only possesses the potential for ex post justification until judged externally. In this sense of externally appraised justification, ex post justification is the achieved status that might more commonly be thought of as what it means for a belief to be justified.

It can be concluded that ex ante justification, even though focused on the inquirer, is held to a set of internal standards or judgments, while ex post justification focused on the belief output itself is held to a set of external standards or judgments. These external standards can be summarized as two basic criteria: whether the inquirer is ex ante justified and whether the belief output is more reasonable than any other belief available in the collective at that point in time. This distinction between ex ante justification of the inquirer (i.e., whether the inquirer is justified in making a particular claim) and ex post justification of the belief (i.e., whether a particular claim is itself justified) is important then because the inquirer may input justified premises, engage in satisfactory belief forming process, and even produce belief that is reasonable to accept; however, these three conditions only give good reason for conferring ex ante justification. The produced belief may not be judged ex post justified if a more reasonable belief exists in the collective at that point in time.

Given the distinction between ex ante and ex post justification, more should be said about both forms of justification with regard to the justification-appraisal process. We have already identified ex ante justification as an evaluation of the merit of two evaluands (i.e., the belief premises and the belief-forming process) and identified ex post justification as an evaluation of the merit of one final evaluand, the belief output. However, both evaluations require specific criteria that the evaluands are held accountable to and specific indicators in the evaluands of their inherent criterial value. Ex ante justification is somewhat analogous to evaluation of the inquiry process, while ex post justification appraisal is somewhat analogous to evaluation of the inquiry product. For ex ante justification appraisal, several internal indicators of quality must be evaluated. Goldman (2002) refers to these internal ex ante indicators as *justifiers*:

I shall use the term “justifiers” for facts or states of affairs that determine the justification status of a belief, or the epistemic status a proposition has for an epistemic agent. In other words, justifiers determine whether or not a proposition is justified for an epistemic agent at a given time. (p. 5)

Internally, the inquiry must at a minimum be designed, or in totality also be executed and demonstrated, in an appropriate manner for the inquirer to achieve ex ante justification. Instances may exist in which the inquirer actually holds a belief that is accepted externally, but the inquirer may still not be ex ante justified if acceptable process did not lead to the held belief. That is, “a true belief may be based on superstition, improper authority, or ‘mere chance’; unless it is reached on the basis of an ‘appropriate method’, it is not justified, and does not constitute knowledge” (Richman, 1975, p. 438); that is, “a belief is [ex ante] justified if and only it is ‘*well-formed*’” (Goldman, 1979, p. 14).

Discussion of judgment concerning justification status includes a subtle yet important distinction on the thing that is judged as justified. Even though an inquiry may have merit that

leads to a judgment that the inquirer is *ex ante* justified in believing in the truth of a proposition, the appraisal of *ex post* justified belief must be made about the belief itself in addition to *ex ante* justification of the inquirer holding the belief. This is the difference between Smith being justified in believing that Jones is the man who will get the job (Gettier, 1963) and a belief that is the Best-JB available at the time (Jacquette, 2012).

Scheffler (1965) pointed out that an inquirer's

Total evidence cannot, of course, generally be expected to be the same as *our* total evidence, but the adequacy of his support for "*Q*" [with respect to *ex ante* justification] needs to be judged by reference to *every* relevant item of evidence that *he* has. (p. 56)

However, *ex post* justification is held to external standards in the sense that the total evidence available in the collective is weighed in the judgment of maximally reasonable belief. The tension between what an inquirer does not know that he or she does not know (i.e., evidence beyond the inquirer's total evidence) and what others know that the inquirer does not know (i.e., the total evidence available collectively) has existed in the literature for a long time (e.g., Jacquette, 2012; Richman, 1975; Scheffler, 1965). Somewhat conveniently, the distinction between *ex ante* and *ex post* justification accommodates this tension nicely. The convenient accommodation of the distinction can be inferred from Richmond's statement regarding the point of view from which justification appraisals are made.

It might help if we were to ask not whether *S* was justified in holding *Q*, but whether the belief *Q*, held by *S*, was justified, since the former manner of speaking strongly suggests that the question at issue is one of "subjective justification," i.e., one in which the question of justification is viewed from the point of view of the subject, here *S*. The latter way of speaking has the merit—for present purposes—of leaving that question open. Of course, from *S*'s point of view, and on the basis of evidence available to him, we may say that *S* is justified in believing *Q*. But, again, it is not from that perspective or on that basis, that we make the claim that *S* does not know *Q*. (p. 438)



Ex post justification emphasizes the importance of appropriate demonstration of evidence and belief for the purpose of public scrutiny. It is through the public scrutiny and evaluation of belief output that a belief may either run up against better justified beliefs unavailable to the inquirer or be judged the Best-JB available. While Jacquette (2012) referred to the process of standing up to public appraisal as judgment of best available justification, Lehrer (1979) and Chisholm (1966) referred to the appraisal as judgment concerning the maximally reasonable.

Evaluating whether a belief output is the maximally reasonable belief for the purposes of ex post justification acknowledges the ex ante status of the inquirer and presumed reasonableness of the held belief, but additionally acknowledges whether or not the belief output is evident and no more reasonable belief exists in comparison. Chisholm (1966) framed this relationship in a hierarchy of appraisal terms, where “every proposition that is evident is reasonable, but not conversely; and every proposition that is reasonable is acceptable, but not conversely” (p. 22). Therefore, a proposition is reasonable if it makes more sense to accept it than it does to deny it, and a proposition is evident when it is both reasonable and no other proposition is more reasonable in juxtaposition. In this context, an evident belief is one that has achieved the status of ex post justification from the point of view of the collective’s total evidence.

Judgments about a belief’s justification status are both relative and somewhat circular. That is, judgments about the product of inquiry are made relative to other competing products (or possible products), such that the belief product beats or is the best product available at that time; and similarly, a process is judged reliable, or to demonstrate a reliable tendency, in a relative sense when compared with competing processes (or idealized processes) that also produce beliefs at that particular time. Yet in a circular manner, a belief output may or may not be judged

justified, based on the process by which it was formed, and at the same time, a belief-forming process may or may not be judged as justified, based on the belief output it produced. The inherent circularity is what Chisholm referred to as the “problem of the criterion” (p. 3).

**The importance of justified belief for understanding disciplined inquiry.** Opening the discussion on knowledge, Chisholm (1966) stated, “One may ask, ‘What do we know—what is the extent of our knowledge?’ One may also ask, ‘How do we decide in any particular case *whether* we know—what are the criteria, if any, of knowing?’” (p. 3). Understanding and judging what it means to know has been a contested issue in both philosophy and practice since the time of Socrates. Disciplined inquiry has attempted to address issues of understanding and judgment in both philosophy and practice through an explicit belief system and inspectable and verifiable product and process (Lincoln & Guba, 1985b). Here, it is argued that the answer to the first of Chisholm’s questions is held in the axioms of paradigm theory, and the answer to the second may be held in a theory of methodology; both theories are accommodated under the process and concept of disciplined inquiry.

What counts for knowledge is a contentious and tricky state of affairs. The truth condition and the belief condition must interact at some level, but as should be evident from the past 2000 years of discussion on the requisite conditions sufficient for knowledge claims, the extent and requirements for interaction of truth and belief for knowledge remains unsettled. However, the same conversation (e.g., “Nobody can attain knowledge without attaining belief,” Goldman, 2002, p. 165) should clarify that two fundamental elements must always be present to make propositional knowledge claims: (a) belief in the truth of a proposition, and (b) sufficient (ex post) justification in the held belief.

Standardized accounts of these two elements get messy without explicit recognition of the underlying roles of philosophical commitments (Kuhn, 1996; Scheffler, 1965) to the nature of the relationship between the inquirer and belief, as well as between belief and truth (Guba & Lincoln, 1982a). The assumptions made about the nature of truth and what can be known about that truth define, somewhat precisely, both the extent and requirements for interaction of truth and belief for knowledge claims. Furthermore, what counts as the nature of truth and what inquirers can know about that truth also define what counts as sufficient justification in the beliefs inquirers come to hold. Given the role of the other, or the collective, in confirming and appraising knowledge claims, the criteria for sufficiency must also be made explicit or the appraisal process for a knowledge claim will fall apart. This idea of what counts as sufficient justification needing to be made explicit was precisely what Scheffler was conveying in his statement concerning the “espousal of certain standards of evidence by which beliefs are to be appraised as well- or ill-grounded” (1965, p. 58).

As indicated by Chisholm (1966), in order to know, we must be able to define both what it is possible to know and how we determine whether we can claim to have attained knowledge in any particular occasion. The process of disciplined inquiry incorporates espousal of both what is possible for an inquirer to come to know and the standards against which judgments can be made regarding whether an inquirer has justifiably come to believe something about what is possible to ultimately know. Even though the term *disciplined inquiry* has been around for more than half a century (Cronbach & Suppes, 1969) and has been cited as the underlying framework for both scientific and naturalistic paradigms of inquiry (Guba & Lincoln, 1982a), the concept of disciplined inquiry has received little attention in detail. Consequently, this discussion transitions

from a review of the conditions for knowledge that relate to disciplined inquiry into a detailed examination of the concept of disciplined inquiry.

### **Inquiry Versus Disciplined Inquiry**

Inquiry in general is the process by which inquirers form beliefs. Beliefs can be construed as a best approximation of objective truth or an intersubjective construction of relative truth (Kant, 1781/2007; Lincoln et al., 2011; Scheffler, 1965). Disciplined inquiry is the process by which inquirers form justified beliefs about the assumed truth defining the possibility of experience. The process of disciplined inquiry applies methodological understanding of the “features of the methods or practices used in forming these beliefs” (Goldman, 2002, p. 187) that most regularly align the produced beliefs with the assumed truth values.

Because belief justification, as well as inquirer justification (i.e., ex ante justification), lie in a criterion-based process for producing belief, the criterion-based process should and will be examined in more detail throughout the remainder of this manuscript. In addition, it will be argued in the following section that, while we may generate beliefs (including potentially unjustified beliefs, e.g., “gratuitous” or “unacceptable,” Chisholm, 1966, p. 23) through general processes of inquiry, the criterion-based process of specific interest here is by definition the type of inquiry termed disciplined inquiry. In the present discussion, disciplined inquiry is considered a specific type of inquiry. Consequently, first inquiry is generally defined, and then disciplined inquiry is further defined as a specific form of the more general definition.

**Inquiry defined.** According to Lincoln and Guba, “The purpose of a research inquiry is to ‘resolve’ the problem in the sense of accumulating sufficient knowledge to lead to

understanding or explanation” (1985b, p. 227). Several definitions of inquiry are provided in Table 2, but broadly speaking, inquiry can be thought of as a process of generating and accumulating knowledge that is driven by speculation and curiosity, within which problems and questions are defined, and evidence and answers sought and discovered (Dewey, 1933; Lincoln & Guba, 1985b). Key to Dewey’s conception of inquiry and reflection is the perplexing state, which is a catalyst to inquiry and triggers an examination of the relation between something observed and something suggested in order to arrive at a belief. However, arriving at a belief is not haphazard; rather, it is a process in which “something is believed in (or disbelieved in), not on its own direct account, but through something else which stands as witness, evidence, proof, voucher, warrant; that is, as ground of belief” (Dewey, p. 11), and “it includes a conscious and voluntary effort to establish belief upon a firm basis of evidence and rationality” (p. 9).

Across the breadth of definitions for inquiry, a few fundamental elements of inquiry were reinforced:

- Inquiry is problem and/or question driven (Dewey, 1933; Lincoln & Guba, 1985b; Llewellyn, 2002).
- Inquiry involves deliberate collection, examination, and investigation of relevant facts, evidence, and data (Brunk-Chavez & Foster, 2010; Dewey, 1933; Lincoln & Guba, 1985b; Llewellyn, 2002).
- The aim of inquiry is to generate knowledge that is in the form of belief, speculation, or inference; that is grounded in evidence; and that offers resolution, explanation, or improved understanding of the driving problem and/or question (Brunk-Chavez &

Foster, 2010; Dewey, 1933; Lincoln & Guba, 1985b; Llewellyn, 2002; Rallis & Rossman, 2012).

Lacking from general definitions of inquiry are any references to inherent standards of worth concerning the quality of the speculation or the quality of the process through which the speculation was produced. Furthermore, no external process is included through which judgments are made concerning the speculation as a real solution or actual knowledge.

Disciplined inquiry, in contrast, advances the notion of inquiry further by adding systematic planning, execution, and critique requirements, as well as a philosophical framework of belief tied to ways of knowing, ways of coming to know, and the standards that all the aforementioned advances should measure up to for justification. Because disciplined inquiry advances more stringent and specific standards than those of general inquiry, disciplined inquiry is examined as a specific kind of inquiry in the next section.

Table 2.

### *Definitions of Inquiry*

Source	Definition of inquiry
Dewey, J. (1933). <i>How we think: A restatement of the relation of reflective thinking to the educative process</i> . Boston, MA: D.C. Heath.	Inquiry is the activity “adapted to bring to recognition facts that will answer the question presented” [by an uncertainty or problem] ... For the result of the act is to bring facts before the mind that enable a person to reach a conclusion on the basis of evidence. In so far, then, as the act... was deliberate, was performed with the intention of getting an external basis on which to rest a belief, it exemplifies ... the operation of hunting, searching, inquiring” (p. 13), where the uncertainty or problem is further defined as “whatever – no matter how slight and commonplace in character – perplexes and challenges the mind so that it makes belief at all uncertain, there is a genuine problem, or question, involved in an experience of sudden change” (pp. 12-13).
Dewey, J. (1933). <i>How we think: A restatement of the relation of reflective thinking to the educative process</i> . Boston, MA: D.C. Heath.	[on thinking] “that operation in which present facts suggest other facts (or truths) in such a way as to induce belief in what is suggested on the ground of real relation in the things themselves, a relation between what suggests and what is suggested” (p. 12).
Dictionary.com	“a seeking or request for truth, information, or knowledge”.

<a href="http://www.galileo.org/inquiry-what.html">http://www.galileo.org/inquiry-what.html</a> , accessed on 10.14.12	“Inquiry is a dynamic process of being open to wonder and puzzlement and coming to know and understand the world. As such, it is a stance that pervades all aspects of life and is essential to the way in which knowledge is created. Inquiry is based on the belief that understanding is constructed in the process of people working and conversing together as they pose and solve the problems, make discoveries and rigorously testing the discoveries that arise in the course of shared activity”.
Llewellyn, D. (2002). <i>Inquire within: Implementing inquiry-based science standards</i> . Thousand Oaks, CA: Corwin Press.	“inquiry is the science, art, and spirit of imagination. It can be defined as the scientific process of active exploration by which we use critical, logical, and creative thinking skills to raise and engage in questions of personal interests. Driven by our curiosity and wonder of observed phenomena, inquiry investigations usually involve: [a] Generating a question or problem to be solved, [b] Choosing a course of action and carrying out the procedures of the investigation, [and c] Gathering and recording the data through observation and instrumentation to draw appropriate conclusions. As we communicate and share our explanations, inquiry helps us connect our prior understanding to new experiences, modify and accommodate our previously held beliefs and conceptual models, and construct new knowledge. In constructing newly formed knowledge, students are generally cycled back into the processes and pathways of inquiry with new questions and discrepancies to investigate.” (p. 16).
Brunk-Chavez, B. L. & Foster, H. (2012). In S. F. Rallis, & G. B. Rossman (Eds.), <i>The research journey: An introduction to inquiry</i> (p. 9). New York, NY: The Guilford Press.	Inquiry is “a conscious process of curiosity that guides planned, strategic exploration and investigation” (p. 9)
Rallis, S. F., & Rossman, G. B. (2012). <i>The research journey: An introduction to inquiry</i> . New York, NY: The Guilford Press.	Inquiry “critiques, confirms, or creates knowledge” (p. 10)
Rallis, S. F., & Rossman, G. B. (2012). <i>The research journey: An introduction to inquiry</i> . New York, NY: The Guilford Press.	“inquiry involves ongoing processes of learning about the world, how it works, and how it can be changed” (p. 15)
Rallis, S. F., & Rossman, G. B. (2012). <i>The research journey: An introduction to inquiry</i> . New York, NY: The Guilford Press.	“Ultimately, inquiry is <i>not</i> about proving something, not about establishing certainty. Instead, inquiry—that is, learning—is heuristic, a discovery of possibilities and potential answers or solutions, albeit temporary, ephemeral, and context bound” (p. 16)
Green, J. L., & Chandler, S. (1990). Toward a dialog about implementation within a conceptual cycle of inquiry. In E. G. Guba (Ed.), <i>The paradigm dialog</i> (pp. 202-215). Newbury Park, CA: Sage Publications.	“ <i>Inquiry</i> refers to any examination for the purpose of discovering information or examining particular phenomena” (p. 204)

**Disciplined inquiry defined.** Clovis and Cobban (2006) gave the following definition:

Disciplined inquiry is conceptually and practically distinguishable from other forms of lay inquiry. The systematic process of research is intentional, planned, and executed according to accepted criteria, and the results are critiqued publicly. The process of research is conducted within a framework of beliefs and practices that define the

direction and strategies to be used. There is fundamental agreement regarding the aim of inquiry as a way of knowing and understanding through a systematic approach or discipline that is distinct from other forms of inquiry. Indeed, the uniqueness of the approach includes not only systematic inquiry but also critiquing and dissemination of the results, a process akin to seeking the truth and questioning the acquired wisdom. (p. 26)

Generally, all the definitions of discipline inquiry in Table 3 share features of explicit methodical process and explicit quality criteria that, together, make disciplined inquiry distinct from a more broad Q&A formulation of inquiry. Cronbach and Suppes (1969, p. 15) emphasized the conduct and reporting of inquiry in a manner that lends itself to be “painstakingly examined.” Smith likewise stated, “For an inquiry to qualify as disciplined, it must be conducted and reported so that its logical argument can be carefully examined” (1981p. 585). Lincoln and Guba (1986b, p. 547) offered a definition that closely resonated with that of Cronbach and Suppes (1969) and Smith (1981), but further articulated *conduct* to include the nature, sources, and context of data collection, as well as the treatments, transformations, and interpretations of data analysis—all packaged and transparently presented to the audience for public confirmation. Shulman’s (1997) definition further stressed the ability of the inquiry to stand up to peer critique by adding “that its data, arguments, and reasoning be capable of withstanding careful scrutiny by another member of the scientific community” (p. 3). Hiles’s (1999) definition provided the opposite bookend to Shulman’s by adding that disciplined inquiry is “a form of inquiry that is rigorous and systematic” (p. 1). All in all, Clovis and Cobban (2006) offered the most comprehensive definition of disciplined inquiry.

In addition to the fundamental elements of inquiry outlined previously, across the breadth of definitions for disciplined inquiry, a few additional fundamental elements are reinforced within this more specific form of inquiry:



- Disciplined inquiry is systematic and methodical, such that all inquiry decisions stand in constant relation to each other. That is, justification of any single component (e.g., overarching belief framework, inquiry aim, belief inputs, reasoning process, data, arguments, interpretations, and belief outputs) does not stand on its own merits independent of other components of the disciplined inquiry, but rather stands in a mutual dependence with the entire disciplined inquiry. Consequently, disciplined inquiry is systematic and methodical because its components are logically and meaningfully connected, as well as carefully and intentionally planned and executed.
- Disciplined inquiry demands external critique and scrutiny of the entire inquiry process and product by members of the associated community, whereby the product includes presentation and organization of the belief output and its argument, as well as the method and means of documenting and reporting for public consumption.
- Disciplined inquiry makes explicit the standards of quality for justification appraisal (ex ante and ex post) of knowing, design/execution, and evaluation/critique throughout the entire process of disciplined inquiry (i.e., conception/formulation, design/planning, execution of belief forming process, and presentation/dissemination of belief output).

If knowledge broadly can be conceived of as a commonly accepted and confirmed system of beliefs, then disciplined inquiry is the process through which high-quality beliefs are formed, transformed, and transported throughout that system. The systematic and methodical qualities of disciplined inquiry contribute to initial ex ante justification. The external critique, in addition to ex ante justification, of disciplined inquiry contributes to ex post justification. The explicit

quality standards of disciplined inquiry define what is necessary for ex ante and ex post justification of both the inquirer and the belief output.

Table 3.

### *Definitions of Disciplined Inquiry*

Source	Definition of disciplined inquiry
Shulman, L. S. (1997). Disciplines of inquiry in education. In R. M. Jeager (Ed.) <i>Complementary methods for researchers in education</i> (pp. 3-19). Washington, DC: American Education Research Association.	“What is important about disciplined inquiry is that its data, arguments, and reasoning be capable of withstanding careful scrutiny by another member of the scientific community” (p. 3).
Cronback, L. J., & Suppes, P. (Eds.). (1969). <i>Research for tomorrow's schools: Disciplined inquiry for education</i> . New York, NY: MacMillan.	“Disciplined inquiry has a quality that distinguishes it from other sources of opinion and belief. The disciplined inquiry is conducted and reported in such a way that the argument can be painstakingly examined” (p. 15)
Hiles, D. (1999). <i>Paradigms lost – paradigms regained</i> . A summary of the paper presented to the 18 <sup>th</sup> International Human Science Research Conference, Sheffield, UK, July 26-29. Retrieved from <a href="http://www.psy.dmu.ac.uk/drhiles/Paradigms%20Lost.htm">http://www.psy.dmu.ac.uk/drhiles/Paradigms%20Lost.htm</a>	“The danger here is in forgetting that, first and foremost, the goal of science is an addition to knowledge, and not the method itself. It is a form of inquiry that is rigorous and systematic, and as such it is best conceived as a <i>disciplined inquiry</i> ” (p. 1).
Lincoln, Y. S., & Guba, E. G. (1986b). Research, evaluation, and policy analysis: Heuristics for disciplined inquiry. <i>Review of Policy Research</i> , 5(3), 536–565.	“That is, to qualify as disciplined, the report of an inquiry must inform the reader, in ways that are publicly confirmable, what the nature of the “raw” data is, the sources of those data, and the context in which they were collected... At the same time, the processes for transforming the data into information—interpretations, conclusions, extrapolations, recommendations—must also be apparent to the reader; they too must be publicly confirmable so that their logic and coherence can be tested” (p. 6).
Clovis, J. B., Cobban, S. J. (2006). The theory and method of disciplined inquiry. <i>Canadian Journal of Dental Hygiene</i> , 40(1), 26.	“Disciplined inquiry is conceptually and practically distinguishable from other forms of lay inquiry. The systematic process of research is intentional, planned, and executed according to accepted criteria, and the results are critiqued publicly. The process of research is conducted within a framework of beliefs and practices that define the direction and strategies to be used. There is fundamental agreement regarding the aim of inquiry as a way of knowing and understanding through a systematic approach or discipline that is distinct from other forms of inquiry. Indeed, the uniqueness of the approach includes not only systematic inquiry but also critiquing and dissemination of the results, a process akin to

	seeking the truth and questioning the acquired wisdom” (p. 26).
Smith, M. L. (1981). Naturalistic research. <i>Personnel and Guidance Journal</i> , 59, 585-589.	“For an inquiry to qualify as disciplined, it must be conducted and reported so that its logical argument can be carefully examined; it does not depend on surface plausibility or the eloquence, status, or authority of its author; error is avoided; evidential test and verification are valued; the dispassionate search for truth is valued over ideology. Every piece of research or evaluation, whether naturalistic, experimental, survey, or historical must meet these standards to be considered disciplined” (p. 50)
Cronback, L. J., & Suppes, P. (Eds.). (1969). <i>Research for tomorrow's schools: Disciplined Inquiry for Education</i> . New York: MacMillan.	“The report of a disciplined inquiry has a texture that displays the raw materials entering the argument and the logical processes by which they were compressed and rearranged to make the conclusion credible” (p. 49)
Lincoln, Y. S., & Guba, E. G. (1985b). <i>Naturalistic inquiry</i> . Beverly Hills, CA: Sage Publications.	“The feature that most prominently distinguishes disciplined inquiry from other forms is that it be conducted (the process) and reported (the product) in such a way that all of its aspects can be examined publicly... the twin criteria of inspectable and verifiable <i>process</i> and <i>product</i> ” (pp. 49-50)
Rallis, S. F., & Rossman, G. B. (2012). <i>The research journey: An introduction to inquiry</i> . New York, NY: The Guilford Press.	“Systematic inquiry... is a patterned and deliberate process of making decisions about: how you will define and frame the focus of inquiry; what will constitute evidence; how, where, and from whom you will collect data; how you will make sense of the data and the ensuing information; and how and with whom you will share or report what you learn” (p. 14)
Rallis, S. F., & Rossman, G. B. (2012). <i>The research journey: An introduction to inquiry</i> . New York, NY: The Guilford Press.	“Systematic inquiry is a process of conceptualizing, designing, conducting, documenting, and reporting what is learned” (p. 15)

As a specific form of inquiry, disciplined inquiry is “conceptually and practically distinguishable from other forms of lay inquiry” (Clovis & Cobban, 2006, p. 26) through its explicit underlying beliefs and belief forming process, methodical practices, criteria of quality, and public scrutiny of process and output. Disciplined inquiry involves explicit, intentional, and methodical alignment of thought and action (i.e., “as we think, so do we act,” Lincoln & Guba, 1985b, p. 15), such that “there is fundamental agreement regarding the aim of inquiry as a way of knowing and understanding through a systematic approach” (Clovis & Cobban, 2006, p. 26) for action in relation to the inquiry (e.g., axiology and inquirer posture, Lincoln et al., 2011). To

synthesize, disciplined inquiry can be thought of as a methodical inquiry process consisting of systematic design, execution, and public scrutiny by making explicit inquiry elements, such as underlying beliefs and assumptions about knowing, quality criteria, inquiry aim, methodological process followed, arguments made, and audience for consumption.

***The justifiers embedded in disciplined inquiry.*** In disciplined inquiry, the justification of belief can be considered a function of aligned thought, action, and evidence. The importance of disciplined inquiry for justified belief and knowledge accumulation can be demonstrated in an analysis of the ways that both ex ante and ex post justifiers for the quality of a belief output are manifestly reflected in the process of disciplined inquiry (Goldman, 2002). Recall that Goldman (1979) defined justifiers as “facts or states of affairs that determine the justification status of a belief, or the epistemic status a proposition has for an epistemic agent” (p. 5); ex ante justification as an evaluation of whether the inquirer or epistemic agent is or would be justified to hold the belief if or when it is formed; and ex post justification as the evaluation of an existing belief as likely justified or not, given merit considerations of belief inputs, process, and outputs. The states of affairs embedded in disciplined inquiry that contribute to the justification status of both belief and epistemic agent can be summarized as follows:

- Clearly positioned and explicit underlying framework of beliefs
- Clearly positioned reasoning models and explicit belief forming processes
- Explicit strategies of action and research design for enacting the belief processes in specific methodical practices
- Explicit criteria of quality and the associated justifiers found in product and process

- Explicitly connected and unified approach from problem through to solution; that is, justified alignment of thought and action
- Deliberate presentation of inquiry for public scrutiny of process and output that emphasize and package the entire inquiry in the appropriate pattern of argument and proof (Scheffler, 1965)

As a special case of inquiry, disciplined inquiry sets out the requirements that inquiry must meet “the twin criteria of inspectable and verifiable *process* and *product* better than do conventional inquiries” (Lincoln & Guba, 1985b, p. 50). To further understand the twin criteria of disciplined inquiry, they are visually examined in the context of belief justifiers in Table 4.

Table 4

*Twin Criteria of Product and Process of Inquiry and Inquiry Justifiers*

	Process	Product
<b>Inspectable</b>	<p>Ex ante justification</p> <ul style="list-style-type: none"> <li>• A priori documentation of proposed research problem including associated reasoning and belief forming process aimed at problem resolution.</li> </ul> <p>Ex post justification</p> <ul style="list-style-type: none"> <li>• A posteriori documentation of the entire belief forming process.</li> <li>• A posteriori organization of the reasoning process about the argument and proof produced.</li> </ul>	<p>Ex ante justification</p> <ul style="list-style-type: none"> <li>• A priori documentation of the characteristics of the hypothetical solution that may bring the problem to resolution.</li> </ul> <p>Ex post justification</p> <ul style="list-style-type: none"> <li>• A posteriori documentation of the belief output as solution to the research problem.</li> <li>• A posteriori organization of the belief output within the appropriate pattern of argument and proof.</li> </ul>
<b>Verifiable</b>	<p>Ex ante justification</p> <ul style="list-style-type: none"> <li>• A priori demonstration and description of problem formulation under a belief framework.</li> <li>• A priori demonstration and description of embedded quality indicators in the proposed research strategy and research design.</li> </ul> <p>Ex post justification</p>	<p>Ex ante justification</p> <ul style="list-style-type: none"> <li>• A priori demonstration and description of the alignment of hypothetical solution’s characteristics with the belief framework, research problem, and belief input.</li> </ul> <p>Ex post justification</p>

	<ul style="list-style-type: none"> <li>• A posteriori presentation of the reasoning model underlying the entire belief forming process that was executed.</li> <li>• A posteriori explanation why the argument and proof align problem with solution under a framework of beliefs.</li> </ul>	<ul style="list-style-type: none"> <li>• A posteriori presentation of the belief output as a product of the justified belief forming process.</li> <li>• A posteriori explanation why belief output as a solution takes the research problem towards resolution under the established framework of beliefs.</li> </ul>
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The ex ante justifiers shown in Table 4 should serve as grounds for why the inquirer would be justified if the inquiry were carried out. Inspectability demands documentation and proposal. Verifiability demands demonstration and description of the future or proposed state of affairs. The ex post justifiers shown in Table 4 should serve as grounds for why the belief formed is justified, given the inquiry that was executed. Inspectability demands documentation and organization of the argument, and proof that was developed. Verifiability demands presentation and explanation of the connected and unified approach from formulated problem through developed solution.

Evaluation of the extent that each of the justifiers embedded in a disciplined inquiry meets standards for ex ante and ex post justification can be related back to the philosophical assessments of justified belief discussed. That is, the belief inputs, belief forming processes, and belief outputs exist on a continuum of epistemic value and appraised merit where:

- The belief inputs must be justified, unbeaten by competing premises, and not false.
- The belief forming processes must be “maximally reasonable” (Chisholm, 1966; Lehrer, 1979), both in regard to the appropriateness under the belief framework (i.e., justified as an idealization) and in regard to its reliability in producing beliefs that are epistemically not false (i.e., reflective of what works in practice).
- The belief outputs must be the “maximally practically attainable... [given] the most strongly corroborated work” (Jacquette, 2012, p. 434) available and stand in contrast

to no other counterfactual beliefs that are better justified or that justify the negation of the proposed knowledge claim available for consideration at that particular point in time.

## **The Constructs of Disciplined Inquiry**

The prior sections were aimed at exposing the general ideas of knowledge, belief, justification, belief formation, and inquiry, and then connecting, focusing, and synthesizing those ideas to the specific idea of disciplined inquiry. This section builds upon the prior syntheses by suggesting a partition that conceptually frames disciplined inquiry into two interdependent ideals. The partitioning of disciplined inquiry into two underlying ideals was achieved by first introducing and relating the idea of regulative ideals, then discussing two specific types of regulative ideals, and lastly mapping the two regulative ideals to the two defining phenomena of disciplined inquiry that will occupy the remainder of chapter 2: the phenomena of paradigms of inquiry and methodology.

Briefly, before exploring the phenomena of disciplined inquiry, it may be of further help for understanding disciplined inquiry to examine a statement by Eisner (1990) on the generation and appraisal of the forms that are central to inquiry. Eisner's statement is a relevant transition into discussion about the constructs of disciplined inquiry because it further captured the nature of the conceptual alignment of the act of generating knowledge with the act of evaluating that knowledge product in a connected manner. In his dialog on alternative paradigms of inquiry, Eisner described paradigms as:

Those ideational structures that portray humans as beings who generate different forms through which they hope to understand and represent the world they inhabit and who

believe that the different forms they use to understand and represent that world should be appraised by criteria appropriate to the form. Further, these paradigms hold that ‘truth’ is ultimately a kind of mirage that in principle cannot be achieved because the worlds we know are those crafted by us and because we cannot uncouple mind and matter to know the world as it ‘really’ is. (p. 89)

Eisner highlighted several points relevant to the proceeding discussion. The statement alluded to truth as an unachievable mirage, one that sets the criterion for the forms that inquirers generate. The assumptions made by inquirers a priori about the nature of the world that is central to their inquiries not only bounds the world they will come to know through inquiry, but also a priori defines the kind of understanding and representation that will characterize the forms ultimately produced from their inquiries. However, the forms generated from inquiry are only approximations of a crafted conceptual reality for the purpose of understanding and representing a systematically investigated empirical reality. Consequently, the forms produced for understanding or representation should be held accountable to the standards specific to the mirage upon which the forms were meant to approximate in the manner with which any particular form of that specific mirage would be manifest in experience.

In the following discussion, the idea of truth as a criterion for inquiry and as a driving force that legitimizes inquiry is further discussed broadly as a regulative ideal. The nature of the form’s criterion, or *ideational structure*, is examined as the regulative ideal concerning the possibility of experience (Kant, 1781/2007) and linked to the paradigm of inquiry phenomenon (Lincoln et al., 2011). The nature of the process for generating forms through inquiry is examined as the regulative ideal concerning the rules for the conduct of inquiry (Kant, 1781/2007) and linked to the methodological phenomenon (Kaplan, 2009; Lincoln & Guba, 1985; Popper, 2010).



**The regulative ideal.** According to Phillips (1987),

On all sides in science there is commitment to truth as a *regulative ideal* (as Popper and others have termed it); scientists try to determine the truth and to hold true beliefs—their disputes are about whose views are true. (p. 24).

But what type of truth can be attained, and how does an inquirer know if the attained view is true? Phillips emphasized that inquirers must commit to a form of truth, or idealization of knowing. It is that very commitment to an idealized form of knowledge that regulates both the ends and means of their inquiries. The current section explores the commitment to truth as a regulative ideal and the roles that regulative ideals have in disciplined inquiry.

Underlying the process of disciplined inquiry is a concept-practice relationship; that is, an idealized concept of knowing that shapes both what we experience and how we go about attempting to gain experience of it in practice. This idealization has frequently been referred to as the *regulative ideal* (Guba, 1990), although it was introduced centuries ago by Kant (1781/2007) as various regulative principles in *Critique of Pure Reason*. The role of the regulative ideal is paramount to disciplined inquiry, and therefore must be introduced and examined in fundamental connection with the two phenomena of disciplined inquiry.

Generally speaking, the regulative ideal is precisely a “commitment to truth” (Phillips, 1987, p. 24), whether implicitly/ignorantly or explicitly/intentionally, that defines the empirical world through a metaphysical framework (in disciplined inquiries, the commitment is made explicitly and intentionally). The commitment manifests empirically by defining the types of concepts that can be developed in reference to empirical things, as well as the ways inquirers meaningfully attempt to make sense of concepts (Kant, 1781/2007). However, a gap always exists between the truth committed to and the understanding empirically developed. That is, the

regulative ideal defines what the concept-practice relationship is, but does not promise attainment of concept in practice; rather, the regulative ideal only guides practice. The regulative ideal exerts normative force on our expectations of experience by characterizing “what it *would* be if it were extracted and refined to its utmost purity” (Kaplan, 2009, p. 11).

The normative force of regulative ideals stresses why regulative ideals remain only ideals incapable of ever being perfectly attained empirically in practice. In other words, regulative ideals serve a normative role rather than an attainable role. Kant (1781/2007) articulated his ideas on the regulative ideal as an indispensable illusion:

Thereby concepts of certain objects should be given, and that, if they are so understood, they are merely sophistical (dialectical) concepts. They have, however, a most admirable and indispensably necessary regulative use, in directing the understanding to a certain aim, towards which the directional lines of all its rules converge in one point. And although this point is only an idea (*focus imaginarius*), that is, a point from which, since it lies completely outside the limits of possible experience, the concepts of the understanding do not in reality proceed, it serves nevertheless to impart to these concepts the greatest unity and the greatest expansion. Hence there arises, no doubt, the illusion that those directional lines sprang forth from an object itself, outside the field of empirically possible knowledge (just as objects are seen behind the surface of a mirror). Yet this illusion (by which we need not allow ourselves to be deceived) is nevertheless indispensably necessary if, besides the objects which are before our eyes, we want to see also those which lie far away behind our back; that is to say, the illusion is necessary if, as in our case, we wish to direct the understanding beyond every given experience (as part of the sum total of possible experience), and thus to its greatest possible and most extreme expansion. (p. 533)

Kant’s thoughts are of utmost importance to the process of disciplined inquiry. Ultimately, belief (even true belief) represents some sliver of understanding, some small kernel of knowing, from a seemingly infinite knowledge about the world. The regulative ideal is a type of conceptual commitment to the nature of the world, and therefore to the types of things that can come to be known about that world. However, the conceptual commitment further offers the indispensable illusion that every sliver of understanding gained through empirical inquiry fits together in some

meaningful way that is regulated, governed, or directed by the assurance that the sum total of possible experience is structured in the same meaningful way and is capable of neatly assimilating that kernel of knowing into its gestalt. Kant described the empirical experience as an illusion because inquirers attribute the meaning and understanding gained through inquiry as inherent to the empirical object itself. In other words, “the illusion that those directional lines sprang forth from an object itself” (p. 533) is the product of an a priori conceptual commitment to the nature of the world. Thus, the regulative ideal as concept exerts normative force on experience.

Kant (1781/2007) defined three “mental powers” (p. 172) that comprised general logic: (a) understanding with the function of concepts, (b) reason with the function of inference, and (c) the power of judgment with its function in the application of concepts and inference to the empirical world. Kant described the former two to serve regulative use for inquiry, while the third to serve as a “special talent” (p. 173) for applying the other two in practice. Understanding and reason are described in more detail in the proceeding sections, but the power of judgment only resurfaces later, in the discussion of disciplined inquiry and the power of judgment.

To form a justified belief, an inquirer must apply the principles of reason and understanding to the empirical world (Kant, 1781/2007). That is, the inquirer must apply the rule for “how the empirical regress is to be carried out” (p. 449; i.e., inference as the function of the mental power of reason) to the objects defined within “the possibility of experience” (p. 250; i.e., concepts as the function of the mental power of understanding). The purpose of this, as described by Dewey (1933) is to

Bring facts before the mind that enable a person to reach a conclusion on the basis of evidence. In so far, then, as the act... was deliberate, was performed with the intention of getting an external basis on which to rest a belief. (p. 13). .

In the next two sections, understanding and its concepts are explored as the regulative ideal concerning what Kant calls “the possibility of experience” (p. 250), and reason and its inference are explored as the regulative ideal concerning the rules for “how the empirical regress is to be carried out” (p. 449).

***The regulative ideal concerning the possibility of experience.*** According to Kant (1871/2007), “All principles of the pure understanding are nothing more than a priori principles of the possibility of experience; and to this possibility alone do all a priori synthetic propositions relate... their possibility itself rests entirely on this relation” (p. 250). One of the two *mental powers* discussed by Kant that serves regulative use for inquiry is understanding and its concepts. It is important to comprehend that one type of conceptual commitment made in inquiry is to the regulative ideal concerning “the possibility of experience” (p. 250). A purely empiricist perspective would dictate that the world experienced is the world that inquirers come to know; however, Kant’s regulative ideal concerning the possibility of experience suggested (even argued) that the world that inquirers come to experience is dictated by the world a priori believed to exist. That is, a commitment to the type of empirical world that exists, and further to the form of knowledge that can be attained about that empirical world, defines the types of concepts that might fit that possible experience a priori; therefore, the objects experienced are viewed in the context of those types of concepts when inquirers attempt to make sense out of experience and place their individual experiences in the larger context of the “sum total of possible experience” (p. 533). Even though the specific understanding generated from inquiry can be considered a posteriori knowing, the rules defining the type or form of understanding possible (i.e., the

possibility of experience) were part of an a priori commitment to the types of concepts that could be used to understand experience—an a priori commitment that manifests itself regulatively in the aim of empirical inquiry.

It is of further importance to stress that the commitment by inquirers to the possibility of experience is also a commitment to the aim of inquiry. As examined earlier, the purpose of inquiry is to produce belief and generate knowledge. The possibility of experience as a regulative ideal both sets the standards or benchmarks against which belief output is measured and focuses the belief outputs of inquiry at a structured, idealized goal state. That is, the configuration and design of an inquiry's aim, or belief output, is normatively regulated by the characteristics and conditions sufficient for the nature of the knowledge that was committed to through the commitment to the possibility of experience.

The regulative role of an inquirer's commitment to the possibility of experience can be further understood through examination of the role of concepts in forming understanding. The mental power of understanding takes as its principle focus experiences and empirical things, and for those objects, understanding provides the concepts needed for conceptually grasping and making sense out of them (Banham, 2010; Kant, 1781/2007). That is, the understanding concerns itself “only with the connection whereby series of conditions everywhere come into being according to concepts... [and] unites the manifold in the object by means of ideas, making a certain collective unity the aim of the acts of the understanding” (Kant, 1781/2007, pp. 532–533). The nature of the concepts used to provide meaning and connection are dependent upon, perhaps even determined by, the nature of the possibility of experience that a priori shapes the empirical world.

*The regulative ideal concerning rules for uniting the concepts of experience.* According to Kant (1871/2007),

In order to properly define the meaning of this rule of pure reason, it should be remarked, first of all, that it cannot tell us what the object is, but only how the empirical regress is to be carried out, in order for us to arrive at the complete concept of the object. (pp. 448–449)

The second of Kant's mental powers that serves regulative use for inquiry is reason and its inference. The regulative ideal concerning the unity of the concepts of experience represents another commitment, one to the rules for "how the empirical regress is to be carried out" (p. 449). This regulative ideal is distinct from the regulative ideal for the possibility of experience in two important ways. First, the mental power of reason is independent of the objects of experience rather than interactive with them. Second, the mental power of reason takes as its principal focus the concepts of understanding rather than the objects of experience (Banham, 2010; Kant, 1781/2007). Issues of commensurability plaguing mixed-method research (e.g., see Lincoln, 2010; Lincoln et al., 2011) are strongly tied to arguments about whether the commitment to how inquiries are carried out needs to be tied to the assumptions about the concepts being inquired into.

Inference, as a function of reason, serves inquiry by connecting concepts and facilitates drawing logical conclusions. While numerous types of inference exist (e.g., see Kaplan, 2009; Lipton, 2004; Popper, 2010), they all encapsulate a particular set of rules for arranging the concepts of understanding and moving from premise to conclusion (or vice versa). The rules of the inferential process work because the commitment to the possibility of experience guarantees that the world is structured in a specific way. The mental power of reason is therefore antecedent to and independent of experience; reason serves only to regulatively order the concepts of

understanding according to the believed in systematic nature of knowledge (Kant, 1781/2007).

The relationship between the rules of empirical regress and the possibility of experience is analogous to the following conditional statement: If the presumed possibility of experience is *X* and so dictated is the systematic nature of knowledge, then *Y* are the rules for systematically ordering the concepts of experience such that they can be unified and contribute to the whole of that systematic knowledge. That is,

The proper province of reason is the attempt to establish the systematic nature of that knowledge, that is, its coherence due to one principle. This unity of reason always presupposes an idea, namely, that of the form of a whole of knowledge preceding the determinate knowledge of the parts and containing the conditions according to which we are to determine *a priori* for every part its position and its relations to the other parts. (Kant, 1781/2007, p. 534)

In addition to the discussion about why reason serves as a regulative ideal, it is important to further understand how reason, as a regulative ideal, manifests in the conduct of inquiry.

These rules of empirical regress do more than simply regulate the actions of inquiry; they also attempt to ensure a certain type of belief output by providing an inferential blueprint of sorts.

Earlier it was noted that underlying disciplined inquiry is a concept-practice relationship. While the possibility of experience governs the idea behind the concept part of that relationship, the rules for empirical regress govern the idea of the practice part of that relationship. Concept and practice must be in sync to produce a quality belief output that systematically fits back into the whole of knowledge. In this relationship, the rules for empirical regress are interdependent with the presumed possibility of experience, yet independent of the objects of experience themselves. Therefore reason, “as a rule, postulates what we ought to do in the regress, but does not anticipate what may be given in the object prior to such regress” (Kant, 1781/2007, p. 448).

Inquiry itself is dependent upon—in fact, designed to meet—a world with defined structure and relationships. There is little to no meaning inherent in an empirical world without boundaries and a prior context within which to give meaning to its data, or furthermore to even define what its data are considered to be. The idea of a world defined solely by assumptions may be unsettling. It might seem that the same emotion was being conveyed by others in their references to the world as a “mirage” (Eisner, 1990, p. 89) or “illusion” (Kant, 1781/2007, p. 533) in the same respect; however, that assumption-based chimera of the empirical world is necessary for the mind to make sense of things. Recognizing that inquirers see and act in accordance with structured assumptions and associated rules underlies all of disciplined inquiry. So how does the a priori commitment to the mental power of reason manifest regulatively in the conduct of empirical inquiry, yet independent of the empirical objects? It does so because the rules of empirical regress “are not derived from nature; rather, *we only interrogate nature according to these ideas* [emphasis added], and consider our knowledge as defective as long as it is not adequate to them” (Kant, 1781/2007, p. 534).

In sum, the regulative principles of reasoning “can only refer to the relations of existence” (Kant, 1781/2007, p. 205); that is, they provide the rules for reasoning from which we know a priori the relations between the concepts of objects, but not anything about the concepts of objects themselves. In other words, regulative principles are “schemata” (p. 206) that structure and organize the concepts applied to empirical experience (i.e., “the conditions of the unity of empirical knowledge,” p. 206). They shape the perceived relations of the empirical world a priori, yet do not shape the understanding of the actual objects of empirical experience. For example, cause-and-effect relations are subsumed a priori under the conventional realist/objectivist regulative principles of reasoning. While the regulative principle may compel



one to see cause and effect in the empirical world and act in a manner that would determine the order of the concepts in that relationship, the regulative principle of reason does nothing to inform what is understood about the objects of experience, beyond their relational existence.

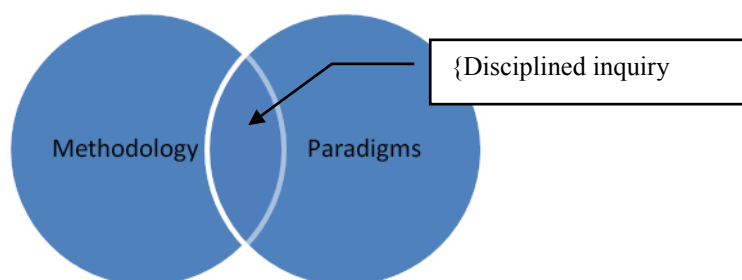
**The proposed constructs of disciplined inquiry.** A breadth of philosophical literature and further framing of that literature within the context of inquiry has been stressed up to this point in the background literature review. While the theme of the review remains the same, the review subtly shifts to viewing the idea of disciplined inquiry as the intersection of two specific phenomena. This framing of the idea of disciplined inquiry as the intersecting space between two phenomena was necessary for both representing the conceptual gap in understanding articulated as part of the research problem, as well as for the conceptual development that is proposed as part of the research solution.

While numerous syntheses have been made throughout chapter 2 thus far, the following proposal represents the first significant conceptual synthesis necessary for the argument being developed in the literature. The first tenet of the developing argument claimed that disciplined inquiry is a methodical process for forming justified belief comprising two essential phenomena: the paradigm of inquiry phenomenon and the methodological phenomenon.

Within this specific framing, the regulative ideals of disciplined inquiry are conceived; that is, disciplined inquiry comprises (a) an ideal defining the possibility of experience in terms of the possible concepts of understanding applied to objects of experience that determines the nature of knowledge and belief and (b) an ideal defining the possible relationships among the concepts of experience that determine how we are to make sense of the concepts we come to experience. The regulative ideals therefore not only shape what we experience, but also shape the

actions of inquiry, and further provide the basis upon which inquirers judge whether the process and product of empirical inquiry meet and fit the criteria of the ideals defined a priori.

The regulation of how empirical acts should be carried out, as well as the regulation of the concepts that can be experienced, are visually represented in Figure 1. Disciplined inquiry was conceptually defined by the paradigm of inquiry and methodological phenomena. The paradigm of inquiry phenomenon embodies the regulative ideal defining the possibility of experience (i.e., the possibility of experience in terms of the possible concepts of understanding applied to experience and the possible relationships among concepts themselves). The methodological phenomenon embodies the regulative ideal defining the principles for organizing the concepts of the possibility of experience, manifest in method, in a manner intended to align actions of inquiry in accordance with possible experience and produce knowledge fitting the criteria of a priori defined empirical concepts.



*Figure 1.* The two proposed phenomena of disciplined inquiry are methodology and paradigms.

Chisholm (1966) presented two principled questions relating to the analysis of knowing: “What do we know—what is the extent of our knowledge?... [and] How do we decide in any

particular case *whether* we know—what are the criteria, if any, of knowing?” (p. 3). If we attempt to frame our understanding of the answers to the pair of questions within the proposed phenomena of disciplined inquiry, then we can argue both what we know and why we might be justified in our claim to know. The frame for our answers to the latter question is held in the theoretical framework of methodology. The frame for our answers to the former question is held in the theoretical framework of a paradigm of inquiry. Together, these two frameworks form the crux of disciplined inquiry thus presented together as initially conceived in Figure 1.

**Disciplined inquiry and the power of judgment.** Given the initial conceptual framing of disciplined inquiry as the intersecting space of the methodological and paradigm of inquiry phenomena developed to guide the present inquiry, attention turns to the process of disciplined inquiry in practice and returns to the third of Kant’s (1781/2007) mental powers of logic: the power of judgment. Recall that Kant defined a threefold division of the higher faculties of logic: understanding, reason, and the power of judgement. The regulative roles of both understanding and reason have been discussed in detail; however, for the examination of the process of disciplined inquiry in practice, it is necessary to discuss the power of judgment as the special talent for applying the other two in real world practice of inquiry.

The power of judgment can be understood as skill in the practice of inquiry. The power of judgment is informed regulatively by the understanding and reason; however, as a skill of practice, it represents the rules in action rather than merely declarative know-how. That is, the two constructs of disciplined inquiry can be learned and mastered conceptually, except that “the power of judgement is a special talent which cannot be taught, but can only be practiced” (Kant, 1781/2007, p. 173). Kant offered the following example:

A physician, a judge or a politician may carry in his head many beautiful pathological, juridical or political rules, even to the degree that he may become an accurate teacher of them, and he may yet in the application of these rules commit many a blunder. For either he is deficient in the natural power of judgement, though not in understanding, and may know the universal *in abstracto*, but yet be unable to distinguish whether a case *in concreto* falls under it; or it may be that his judgement has not been sufficiently trained by examples and practical experience. (p. 174)

Here, Kant argued that conceptual mastery of understanding and reason are a necessary precursor to the power of judgment, yet alone do not guarantee success with the power of judgment.

Practice engaging in disciplined inquiry with explicit recognition of the regulative roles of understanding and reason fosters the power of judgment, and examples “sharpen the power of judgement” (p. 174). However, Kant cautioned against misguided learning that can occur within the tension of the attainable in practice and the ideal in concept “because they only rarely fulfill the conditions of the rule quite adequately (as casus in terminis)” (p. 174). As a result, the gap between the empirically attainable and its ideational state can inadequately inform the inquirer of the true regulative conditions; that is, the naïve inquirer may not be able to distinguish the regulative commitments from the particular circumstances of empirical experience, and therefore build a conceptual misunderstanding of proper inquiry through misguided practice.

The process of disciplined inquiry protects against both poor-quality belief outputs and misguided learning of the power of judgment. Because disciplined inquiry makes explicit the connection of its underlying belief system with the unification and alignment of belief system, problem formulation, planning process, execution process, presentation process, and evaluation process, the power of judgment is truly sharpened not only as a way of thinking about inquiry but also for practicing and evaluating inquiry. The regulative roles ideals play in disciplined inquiry continue to challenge the precision of our approximations and provide explicit benchmarks

against which to compare empirical-conceptual gaps. Nonetheless, the adequacies of experiences against the ideal conditions do not deceive inquirers of the regulative universal conditions.

Previously, numerous justifiers embedded in disciplined inquiry were listed. Through the justifiers embedded in disciplined inquiry, it can be understood that the power of judgment in the practice of disciplined inquiry both carries the conceptual into practice and reinforces the practice of inquiry against the conceptual. Disciplined inquiry, in abstracto and in concreto, demands aligned thought and action, consensus on process and product, and appropriate reinforcement in the development of the power of judgment that leverages the tension between the attainable in practice and the ideal in concept.

**Summary of disciplined inquiry.** From the analyses presented in chapter 2, we can draw two conclusions about disciplined inquiry. First, we can consider the deliberate empirical act of disciplined inquiry, or “special talent” (Kant, 1781/2007, p. 173) of practice (i.e., the “power of judgement,” p. 172) to be the means upon which justified belief is attained. This means is represented here as the process of disciplined inquiry, with its “twin criteria of inspectable and verifiable *process* and *product*” (Lincoln & Guba, 1985b, p. 50). Second, we can consider disciplined inquiry to be undergirded by a twofold regulative ideal that shapes the entirety of the process. Both these ideals are never perfectly attained empirically: the idealized criterion of how is conceived as the methodological construct, and the idealized criterion of what is conceived as the paradigm of inquiry construct.

The next sections explore the two constructs of disciplined inquiry in detail. In addition to providing in-depth reviews of each phenomenon, each section attempts to further develop the interacting propositions of the central argument. In addition to arguing the initial tenet, the

sections on paradigms and methodology present additional background literature for the two juxtaposed conditions that define a conceptual problem that needs to be addressed. The paradigm of inquiry phenomenon is described as a well-developed sophisticated theory, with fully defined theoretical framework, paradigm-specific axioms, and extensions into practice. The methodological phenomenon is described as primitive and underdeveloped; it is under defined as a broad range of possible ideas, principles, and processes, but never unified under a common framework.

### **Paradigms of Inquiry**

For the purpose of the current research, three relevant contributors to the conceptualization of the phenomenon of paradigms are discussed: (a) the theory-bearing, disciplinary oriented Kuhnian (1996) paradigms; (b) the knowledge-constitutive interests oriented paradigms of Habermas (1971); and (c) the axiomatically oriented paradigms of Lincoln et al. (e.g., 2011; Lincoln & Lynham, 2011). Although different in the elements of each paradigm conceptualization, the three contributors each captured the boundary condition for the possibility of experience within inquiry. Before exploring each conceptualization in detail, general definitions of the term paradigm are explored.

#### **What is a paradigm of inquiry?**

Over the past several decades, the term *paradigm* has been examined in great detail, arguably spawned at least in part by the writings of Thomas Kuhn (1996; Hacking, 2012). Even though Kuhn's work has come under criticism for inconsistent usage of the term *paradigm* (Guba, 1990c, p. 17), his gist still comes across as "a term that relates closely to 'normal

science’ ... [or] coherent traditions of scientific research” (Kuhn, 1996, p.10). Other descriptions range from the “basic set of beliefs that guides action” (Guba, 1990c, p. 17) to the net containing a researcher’s metaphysical assumptions (Denzin & Lincoln, 2005, p. 22) to the “particular way in which scientists make sense of the world” (Crotty, 1998, p. 35). Most authors share definitions about the idea that a paradigm of inquiry shapes the inquired-into reality with regard to what is seen, what is not seen, and why that is the case in the context of inquiry. Several definitions of *paradigm* are offered in Table 5.

Table 5

### *Paradigm Definitions*

Source	Definition of paradigm
Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y.S. Lincoln (Eds.), <i>Handbook of qualitative research</i> (pp. 105–117). Thousand Oaks, CA: Sage Publications.	“ <i>Inquiry</i> paradigms define for <i>inquirers</i> what it is they are about, and what falls within and outside the limits of legitimate inquiry” (p. 108).
Eisner, E. W. (1990). The meaning of alternative paradigms of practice. In E. G. Guba, <i>The paradigm dialog</i> (pp. 88-102). Sage Newbury Park, CA: Publications.	“Those ideational structures that portray humans as beings who generate different forms through which they hope to understand and represent the world they inhabit and who believe that the different forms they use to understand and represent that world should be appraised by criteria appropriate to the form.” (p. 89)
Guba, E. G. (1990c). <i>The paradigm dialog</i> . Sage Newbury Park, CA: Publications.	“Basic set of beliefs that guides action.” (p. 17)
Denzin, N., & Lincoln, Y. (2005). <i>The Sage handbook of qualitative research</i> . 3 <sup>rd</sup> ed. Thousand Oaks, CA: Sage Publications.	“The net that contains the researcher’s epistemological, ontological, and methodological premises [metaphysical assumptions].” (p. 22)
Mertens, D. M., & Wilson, A. T. (2012). <i>Program evaluation theory and practice</i> . New York, NY: The Guilford Press,	“Paradigms are broad metaphysical constructs that include sets of logically related philosophical assumptions. Theories provide frameworks for thinking about the interrelationships of constructs and are more limited in scope than paradigms. Hence a variety of theoretical perspectives can be associated with a particular paradigm.” (p. 34)
Lincoln, Y.S., & Guba, E.G. (1985b). <i>Naturalistic inquiry</i> . Beverly Hills, CA: Sage.	“Certain sets of such basic or metaphysical beliefs are sometimes constituted into a system of ideas that either give us some judgment about the nature of reality, or a reason why we must be content with knowing something less than the nature of reality, along with a method

	for taking hold of whatever can be known. We shall call such a systematic set of beliefs, together with their accompanying methods, a paradigm.” (p. 15)
Lincoln, Y. S., & Guba, E. G. (1985b). <i>Naturalistic inquiry</i> . Beverly Hills, CA: Sage. Publications	“A paradigm is a world view, a general perspective, a way of breaking down the complexity of the real world. As such, paradigms are deeply embedded in the socialization of adherents and practitioners; paradigms tell them what is important, legitimate, and reasonable. Paradigms are also normative, telling the practitioner what to do without the necessity of long existential or epistemological consideration. But it is this aspect of paradigms that constitutes both their strength and their weakness—their strength in that it makes action possible, their weakness in that the very reason for action is hidden in the unquestioned assumptions of the paradigm.” (p. 15)
Kuhn, T. (1996). <i>The structure of scientific revolutions</i> (3 <sup>rd</sup> ed.). Chicago, IL: University of Chicago Press.	“Accepted examples of actual scientific practice—examples which include law, theory, application, and instrumentation together—provide models from which spring particular coherent traditions of scientific research.” (p. 10)
Guba, E. G., & Lincoln, Y. S. (1989). <i>Fourth generation evaluation</i> . Newbury Park, CA: Sage Publications.	“It is useful, by way of introduction, to think of a paradigm as a basic set of beliefs, a set of assumptions we are willing to make, which serve as touchstones in guiding our activities [of inquiry]... Now the crucial thing to note here is that these paradigms are basic <i>belief</i> systems; they cannot be proven or disproven, but they represent the most fundamental positions we are willing to take. If we could cite reasons why some particular paradigm should be preferred, then those reasons would form an even more basic set of beliefs. At some level we must stop giving reasons and simply accept wherever we are as our basic belief set—our paradigm.” (p. 80).
Guba, E. G., & Lincoln, Y. S. (1982a). Epistemological and methodological bases of naturalistic inquiry. <i>Educational Communication and Technology</i> , 30(4), 233–252.	“Paradigms are axiomatic systems characterized essentially by their differing sets of assumptions about the phenomena into which they are designed to inquire.” (p. 233)

## Kuhn’s Contributions to the Paradigm Construct

Kuhn’s historical analysis of science (1996; see also Andersson, 1994; Delanty & Strydom, 2003) produced a view for how knowledge accumulated and science progressed that resulted in a counter argument to Popper’s notion of falsification of theory (2010; see also Andersson, 1994; Gorton, 2006). Accordingly, Kuhn observed that science was governed by a tradition of research and underlying paradigm. The underlying paradigm included all “accepted examples of actual scientific practice—examples which include law, theory, application, and instrumentation together—provide models from which spring particular coherent traditions of scientific research” (1996, p. 10). The tradition of research was the scientific community’s



commitment to the paradigm. When both tradition of research and underlying paradigm were in place, Kuhn called the resulting research strategy “normal science” (Kuhn, 1996, p. 90). Normal science represents a research strategy of small incremental refinements, or modifications, to the paradigm through application of the paradigm to solving puzzles. Although the paradigm ensured solution, the primary activities of science involved application of the paradigm to figure out how to solve the puzzles (Andersson, 1994; Kuhn, 1996). Notably, Kuhn’s paradigm definition did not deviate far from a disciplinary perspective. For example, Repko (2008) stated,

The defining elements of a discipline’s perspective include the phenomena it studies, the kind of data it collects, the assumptions it makes about the natural and human world, its epistemology or rules about what constitutes evidence or proof, its theories about the causes and behaviors of certain phenomena, and its methods (the way it gathers, applies, and produces new knowledge)... Members of each discipline... agree on what constitutes an interesting and appropriate question to study, what constitutes legitimate evidence, and what a satisfactory answer to the question should look like. (p. 58)

Essential to Kuhn’s concept of normal scientific activity was the commitment of its scientists to the governing paradigm. “The study of normal-scientific traditions discloses many additional rules, and these provide much information about the commitments that scientists derive from their paradigms” (1996, p. 40). Kuhn listed five such commitments that scientists make to the paradigm:

1. Commitment to law, concepts, and theory
2. Commitment to instrumentation
3. Commitment to metaphysical concepts
4. Commitment to methodological process
5. Commitment to the puzzle solving activity

The first commitment that scientists must make to a paradigm is to its laws, concepts, and theories. “These are explicit statements of scientific law and about scientific concepts and theories. While they continue to be honored, such statements help to set puzzles and to limit acceptable solutions” (Kuhn, 1996, p. 40). By committing to law, concepts, and theory, the scientist is defining the concepts of knowledge and how the basic concepts of knowledge interact, and is bounding the scope of application (both what does matter and what does not matter).

Next Kuhn described the commitment of scientists to the instrumentation of the paradigm. “At a level lower more concrete than that of laws and theories, there is, for example, a multitude of commitments to preferred types of instrumentation and to the ways in which accepted instruments may legitimately be employed” (1996, p. 40). Together with the commitment to laws, concepts, and theories, the commitment to both what tools are used in the process of inquiry and how they are to be used serves to unify the community of scientists toward a common goal, on common ground and with common methods and common processes.

The commitment scientists make to the metaphysical assumptions and methodological process is less explicit than that made to theory and instrumentation. “Less local and temporary, though still not unchanging characteristics of science, are the higher level, quasi-metaphysical commitments that historical study so regularly displays... That nest of commitments proved to be both meta-physical and methodological” (Kuhn, 1996, p. 41). Even though less explicit than to, say, instrumentation, metaphysical and methodology commitments are equally normative. Metaphysical commitments tell scientists what sorts of phenomena the universe does and does

not contain. The methodological commitments tell scientists “what ultimate laws and explanations must be like” (p. 41).

The last commitment Kuhn (1996) described that scientists make to a normal-scientific tradition is to its puzzle-solving activities. The engagement in shared puzzle-solving activities within a paradigm enacts all other commitments (e.g., the nest of commitments in a common scientific pursuit). This common scientific pursuit allows the inquirer to define himself or herself as a scientist. Kuhn explained:

Finally, at a still higher level, there is another set of commitments without which no man is a scientist. The scientist must, for example, be concerned to understand the world and to extend the precision and scope with which it has been ordered. That commitment must, in turn, lead him to scrutinize, either for himself or through colleagues, some aspect of nature in great empirical detail. And, if that scrutiny displays pockets of apparent disorder, then these must challenge him to a new refinement of his observational techniques or to a further articulation of his theories. (p. 42)

Altogether, these five commitments to the paradigm (i.e., conceptual/theoretical, instrumental, metaphysical, methodological, and puzzle-solving pursuit) define and embody Kuhn’s (1996) concept of the tradition of normal science. Without those commitments, neither the science nor the scientist has any relative association upon which to claim belonging to either of those labels. The normal-scientific paradigm, according to Kuhn,

Provides rules that tell the practitioner of a mature specialty what both the world and his science are like, [and as a consequence] he can concentrate with assurance upon the esoteric problems that these rules and existing knowledge define for him. (p. 42)

According to Kuhn (1996), normal science progresses until anomalies emerge for which the paradigm is insufficient for puzzle solving. Here, no amount of paradigm modification can be made to accommodate, and therefore assimilate, the anomaly. The persistence of these anomalies eventually breaks the tradition of research as researchers lose faith in the viability of the

paradigm for ensuring solutions. The loss of faith in the paradigm is called a state of “crisis” (p. 7), and crisis results in researchers seeking alternative paradigms and theories. Kuhn called the research strategy during crisis “extraordinary science” (p. 90). A state of extraordinary science is where a new paradigm is sought out and articulated. It is characterized not only by acting outside the rules of normal science to identify a new explanatory framework, but is “a reconstruction of the field from new fundamentals” (p. 85) that articulates the basis of the new paradigm. The philosophical analysis of fundamental assumptions represents a novel activity for researchers who previously operated on unconditional acceptance of a set of implicit assumptions undergirding the paradigm during the state of normal science. On the effectiveness of the assumption analysis for breaking tradition Kuhn noted:

Indeed, normal science usually holds creative philosophy at arm’s length, and probably for good reasons. To the extent that normal research work can be conducted by using the paradigm as a model, rules and assumptions need not be made explicit... the full set of rules sought by philosophical analysis need not even exist. But that is not to say that the search for assumptions (even for non-existent ones) cannot be an effective way to weaken the grip of a tradition upon the mind and to suggest the basis for a new one. (p. 88)

Eventually crisis is brought to a close through a combination of identification, articulation, and finally acceptance of a new paradigm. The acceptance of a new paradigm yields not simply a different but an entirely new (and fundamentally different) way of viewing phenomena; the types of solutions that can be achieved; and the methods, instruments, and puzzle-solving process afforded by the structure of the paradigm. This “paradigm shift” (Kuhn, 1996, p. 85) represents a change in the gestalt of the researcher, in which

Led by a new paradigm, scientists adopt new instruments and look in new places. Even more important, during revolutions scientists see new and different things when looking with familiar instruments in places they have looked before. It is rather as if the professional community had been suddenly transported to another planet where familiar objects are seen in a different light and are joined by unfamiliar ones as well. (p. 111)

The acceptance ultimately brings researchers to a new state of normal science; “the phase of normal science begins again and will continue until a new crisis occurs” (Andersson, 1994; p. 32). Kuhn (1996) called this move from one paradigm and state of normal science into a new paradigm and new state of normal science a *scientific revolution*: “Scientific revolutions are here taken to be those non-cumulative developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one” (p. 92). The idea of scientific revolutions was crucial to Kuhn’s view on the accumulation of knowledge and progression of science. His view can be used to critique Popper’s (2010) conjecture and refutation of knowledge accumulation and progression of science by contrasting historical states of normal science with historical states of extraordinary science.

In Popper’s view (2010; see also Andersson, 1994; Gorton, 2006), discoveries are cumulatively made when theories and explanations are proposed by conjecture and then deductively tested. Propositions are critically examined and attempts are made to refute them. Here, any form of inductive method never justifies the conclusions. A notable exception to the rejection of induction is when the accumulation of numerous deductive investigations forms an overall inductive trend in which well-corroborated theories “advance towards theories of an ever higher level of universality—as ‘quasi-inductive,’” Popper, 2010, p. 276). In Kuhn’s (1996) view, the Popperian falsification view of science only occurs during states of extraordinary science when discovery and articulation of a new paradigm is the focus of researchers in crisis. In states of normal science, paradigms are not critically tested; rather, they are used as instruments to solve problems (Andersson, 1994). Moreover, as instruments for solving problems, paradigms are continually refined to come into closer alignment with the reality they serve to explain. The process of bringing together the paradigm and reality fulfilled by the

careers of many researchers is what Kuhn termed the *mopping-up operations* (1996, p. 24) of normal science; he said “that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies” (p. 24).

Kuhn’s (1996) view of scientific revolutions as the mechanism for progress additionally requires eventual rejection of an existing paradigm. Kuhn challenged the notion that this process for the rejection of a paradigm follows Popper’s (2010) logic of discovery:

No process yet disclosed by the historical study of scientific development at all resembles the methodological stereotype of falsification by direct comparison with nature [where direct comparison with nature is a critical element in Popper’s view of critically testing a theory]... The decision to reject one paradigm is always simultaneously the decision to accept another, and the judgment leading to the decision involves the comparison of both paradigms with nature and with each other. (p. 77)

Therefore, rejection of a theory requires both the emergence of crisis to call into question an existing paradigm and an alternative paradigm to consider in contrast that is more promising for solving problems (Andersson, 1994).

Yet, beyond the point-counterpoint arguments of competing theories of the philosophy of science and social science, for which there are many (e.g., see Feyerabend, 1987a, 1987b, 1993; Lakatos & Musgrave, 1970; Popper, 2002, 2010 for detailed analyses of contrasting views and see Andersson, 1994; Delanty & Strydom, 2003 for perspective summaries), Kuhn’s (1996) work left a lasting and important impression upon minds in the scientific community. The notion of a paradigm has forever changed the way philosophers of science look upon—and scientists self-identify with—the community of researchers, who despite nuanced differences in their day-to-day activities, all generally agree on what constitutes good inquiry and what problems are worthy of inquiry. While it was necessary to acknowledge the views of Kuhn, Popper, and others

as relating to knowledge accumulation and the progress of science, it was of greater relevance for the current research to illuminate the contribution of Kuhn's work to the development and definition of the term *paradigm*.

### **Habermas's Contribution**

Jurgen Habermas was a German critical theorist of the Frankfurt School who proposed a critical theory of cognitive interests in the social sciences (1971; see also Delanty & Strydom, 2003). Habermas's theory was in reaction to positivism and challenged the "objectivist illusion that deludes sciences with the image of a reality-in-itself" (p. 305) whereby law-like facts as knowledge exist independent of human interests in the world. Central to his theory were knowledge-constitutive interests that drove methodological approaches to inquiry in connection with the desired knowledge sought. Habermas distinguished "three categories of processes of inquiry for which a specific connection between logical-methodological rules and knowledge-constitutive interests can be demonstrated" (p. 308). He termed these three categories, or types, of inquiry the "empirical-analytic sciences" (p. 308), the "historical-hermeneutic sciences" (p. 309), and the "critical social sciences" (p. 310). An inquiry typology of the three ideal types is shown in Table 7; however, prior to Table 7 discussion focuses on the four elements that comprise each type of inquiry described by Habermas and are outlined using his four-category taxonomy shown in Table 6.

Table 6

*Four Category Taxonomy of Habermas's Ideas*

Category	Category attribute
Human interests	Technical
	Practical
	Emancipatory
Knowledge-constitutive interests	Work
	Language
	Power
Methodological processes of inquiry	Objective methodological rules for controlled observation and propositional understanding
	Intersubjective methodological rules for hermeneutic understanding
	Transformative methodological rules for emancipatory awareness
Knowledge sought/produced	Predictive knowledge
	Practical knowledge
	Transformative knowledge

The three types of human interests defined by Habermas (1971) are *technical*, *practical*, and *emancipatory*. Technical interests represents “the cognitive interest in technical control over objectified processes” (p. 309); practical interests represents the cognitive interest in “mutual understanding in the conduct of life” (p. 311); and emancipatory interests represents the cognitive interest in “ideologically frozen relations of dependence that can in principle be transformed” (p. 310). These human interests define the general areas of the world of interest to people. Further defined were three forms of “knowledge-constitutive interests” (p. 313): work, language, and power. A knowledge-constitutive interest is a category of knowledge that is sought within an area of human interest. The work knowledge-constitutive interest is the general category of knowledge sought with the technical human interest area, the language knowledge-constitutive interest is in the practical human interest area, and the power knowledge-constitutive interest is in the emancipatory human interest area.



Habermas (1971) logically connected each category of knowledge-constitutive interest to specific methodological “processes of inquiry” (p. 308) for the production of knowledge associated with each form; that is, the process for generating knowledge of the particular category. The first of these processes of inquiry contains the objective methodological rules for controlled observation and propositional understanding, whereby “theories comprise hypothetico-deductive connections of propositions, which permit the deduction of law-like hypotheses with empirical content. The latter can be interpreted as statements about the covariance of observable events; given a set of initial conditions, they make predictions possible” (p. 308). Predictive statements are translated into and tested under controlled experimental conditions that serve as reliable, objective evidence for or against the success of the prediction.

The second methodological process of inquiry contains the intersubjective methodological rules for hermeneutic understanding, whereby “the subject of understanding establishes communication between both worlds [part and whole]. He comprehends the substantive content of tradition by applying tradition to himself and his situation” (Habermas, 1971, p. 310). This second process of inquiry represents a unification of interpretation, agreement, and application whereby “the understanding of meaning is directed in its very structure toward the attainment of possible consensus among actors in the framework of a self-understanding derived from tradition” (p. 310).

The third methodological process of inquiry contains the transformative methodological rules for emancipatory awareness. It represents psychological movement away from an initial condition of “unreflected consciousness” (Habermas, 1971, p. 310) and toward a state of conscious self-reflection. This third inquiry process embodies the social act of critiquing the

frozen ideological structures, therefore setting “off a process of reflection in the consciousness of those” (p. 310) caught in the state of dependence with the ideology. Here, the process of self-reflection on the ideological structures “releases the subject from dependence on hypostatized powers” (p. 310).

Lastly, Habermas (1971) described three different types of knowledge produced by engaging in each specific process of inquiry: *predictive knowledge*, *practical knowledge*, and *transformative knowledge*. Predictive knowledge is knowledge produced from propositions and deduced hypotheses wherein the “basic statements are not simple representations of facts in themselves, but express the success or failure of our operations. We can say that facts and the relations between them are apprehended descriptively” (pp. 308–309). Practical knowledge, or hermeneutic knowledge, “is always mediated through this [the inquirer’s] pre-understanding, which is derived from the interpreter’s initial situation... hermeneutic inquiry discloses reality subject to a constitutive interest in the preservation and expansion of the intersubjectivity of possible action-orienting mutual understanding” (pp. 309–310). Transformative knowledge is a self-reflective awareness of the dependence upon a frozen ideology.

Table 7

*Habermas’s Inquiry Typology*

Type	Typology characteristic
Empirical-analytic sciences	Technical human interest Work knowledge-constitutive interest Objective methodological rules for controlled observation and propositional understanding Production of predictive knowledge
Historical-hermeneutic sciences	Practical human interest Language knowledge-constitutive interest Intersubjective methodological rules for hermeneutic understanding

Critical social sciences	Production of practical knowledge
	Emancipatory human interest
	Power knowledge-constitutive interest
	Transformative methodological rules for emancipatory awareness
	Production of transformative knowledge

## **The Contributions of Guba, Lincoln, Lynham, and Colleagues**

The paradigm structure proposed by Egon Guba and Yvonna Lincoln, with the additional contributions of Heron and Reason (1997) and Susan Lynham (Lincoln & Lynham, 2011), represented an evolution of more than 40 years of thinking (e.g., Guba, 1969, 1978b, 1979, 1981a, 1987a, 1987b, 1990c; Guba & Lincoln, 1982a, 1988, 1989, 1994, 2005; Heron & Reason, 1997; Lincoln, 1986; Lincoln & Guba, 1985b, 1986a, 1986b, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011). What appeared as alternative quality criteria for the naturalist paradigm early on (e.g., Guba, 1979, 1981a) evolved into a meta-framework of axiomatic subjects and axiomatic systems for the naturalist and positivist paradigms (Guba & Lincoln, 1982a, 1988; Lincoln & Guba, 1985b). Later, the framework expanded to include the postpositivist, critical (Guba, 1990c; Guba & Lincoln, 1994) and participatory paradigms (Guba & Lincoln, 2005; Heron & Reason, 1997; Lincoln & Guba, 2000; Lincoln et al., 2011).

Based on an underlying axiomatic form of theory (Guba & Lincoln, 1982a, 1988; Lincoln & Guba, 1985b, Reynolds, 1971), the modern day paradigm theory (Lincoln & Lynham, 2011; Lincoln et al., 2011) is represented as a set of five “basic beliefs” (Guba & Lincoln, 1989, p. 83):

1. What is there that can be known?
2. What is the relationship of the knower to the known?
3. What are the ways of finding out knowledge?

4. How do values mediate inquiry?
5. To what ends is knowledge gained through inquiry?

The answers given to the set of five basic questions defines the belief system of a paradigm of inquiry (Guba & Lincoln, 1989). The five questions represent the metaphysical subjects of ontology, epistemology, methodology, axiology, and teleology, respectively. The metaphysical subject of ontology (Table 8) pertains to the assumption about the nature of reality. The metaphysical subject of epistemology (Table 9) pertains to the assumption about the nature human knowledge about reality. The metaphysical subject of methodology (Table 10) pertains to the assumption about the nature of the means by which knowledge about reality can be attained. The metaphysical subject of axiology (Table 11) pertains to assumptions about how the inquirer's stance toward inquiry serves to either separate or integrate the set of researcher values from or into the process of inquiry (Lincoln et al., 2011). The metaphysical subject of teleology pertains to the ends to which knowledge is sought through inquiry (Table 12). The full framework of metaphysical subjects and positions is shown in Table 13.

*Ontology* is defined as “that branch of philosophy (specifically, of metaphysics) that is concerned with issues of existence or being” (Guba & Lincoln, 1989, p. 83). Table 8 shows the metaphysical positions on the ontological subject.

Table 8

*Metaphysical Positions on the Ontological Subject*

<b>Metaphysical position</b>	<b>Definition</b>
Naive realism	Assumes a law-like reality that is both external to and independent of the inquirer; “there exists a single reality independent of any observer's interest in it” (Guba, 1987, p. 34).
Critical realism	Similar the realism of positivism in that an external law-like reality is assumed; yet, critical realism assumes a reality that is only capable of being imperfectly perceived and understood “because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena” (Guba & Lincoln, 1994, p. 110). Critical realism therefore differs from the realist position in the assumption about the extent that the <i>real</i> external reality can be apprehended.
Historical realism	In some instances (e.g., Guba, 1990) also referred to as critical realism due to the assumption of an imperfectly apprehensible reality; however, unlike the critical realism of postpositivism, the disjunction between <i>real</i> reality and <i>understood</i> reality is not due to an imperfect objectivity, rather, due to a historically, socially, culturally, economically, and/or politically shaped reality (Guba, 1990; Guba & Lincoln, 1994). In this sense, a real nature is presumed to exist, but that “nature cannot be seen as it ‘really is’ or ‘really works’ except through a value window” (Guba, 1990, p. 24).
Relativism	Assumes a reality that is dependent upon, and exists in relation to, the knower; “there exist multiple socially constructed realities, ungoverned by any natural laws” (Guba, 1987, p. 34). Relativism assumes that the act of apprehension of reality results in “multiple, intangible mental constructions, socially and experientially based, local and specific in nature (although elements are often shared among many individuals and even across cultures), and dependent for their form and content on the individual persons or groups holding the constructions” (Guba & Lincoln, 1994, pp. 110-111).
Participative reality	Assumes a reality that is based on a human participation with the world and other humans resulting in an “interaction of the given cosmos and the way mind engages with it” (Heron & Reason, 1997, p. 279). Based on active participation, reality is assumed to be socially co-created.

*Epistemology* is defined as “that branch of philosophy that deals with the origin, nature, and limits of human knowledge” (Guba & Lincoln, 1989, p. 83). Table 9 shows the metaphysical positions on the epistemological subject.

Table 9

*Metaphysical Positions on the Epistemological Subject*

Metaphysical position	Definition
Dualism/objectivism	Assumes that objective unbiased knowledge of reality can be attained; “it is possible for an observer to exteriorize the reality studied, remaining detached from it and uninvolved with it” (Guba, 1987, p. 34). The duality of “the investigator and the investigated ‘object’ are assumed to be independent entities, and the investigator to be capable of studying the object without influencing it or being influenced by it” (Guba & Lincoln, 1994, p. 110).
Modified dualism/objectivism	Takes an amended position on the objectivism of positivism (in rejection of logical positivism) in order to accommodate some uncertainty in the nature of knowledge. While objective knowing is retained as a regulative ideal, its perfect attainment is reduced to an idealized goal that can at best be only approximated (Guba, 1990); consequently, “special emphasis is placed on external ‘guardians’ of objectivity such as critical traditions (Do the findings ‘fit’ with preexisting knowledge?) and the critical community (such as editors, referees, and professional peers)” (Guba & Lincoln, 1994, p. 110).
Transactional/subjectivism (critical paradigm)	Assumes that what is subjectively known exists in the tension between the historically/socially mediated reality of institutions and a <i>real</i> reality. This tension is crucial to the subjectivist epistemology of the critical paradigm because two states of awareness are assumed: “false consciousness” (Guba, 1990c, p. 24), i.e., the accepted historical reality, and “true consciousness” (p. 24), i.e., external <i>real</i> reality. The <i>false consciousness</i> is real to the knower yet remains a reality mediated by the value system of institutions. Real reality, or <i>true consciousness</i> , becomes the consequence of an interaction with another other in which tension between realities is exposed. In other words, “the investigator and the investigated object are assumed to be interactively linked... what can be known is inextricably intertwined with the interaction between a <i>particular</i> investigator and a <i>particular</i> object or group” (Guba & Lincoln, 1994, p. 110).
Transactional /subjectivism (constructivist paradigm)	Similar to that of the critical paradigm given the assumption of a subjectively constructed knowledge of reality; yet, differs in that the constructivist subjectivism is not power-based. Rather, it assumes a form of knowledge that is intertwined with the knower and created as a transaction between inquirer and inquired. That is, “the investigator and the object of investigation are assumed to be interactively linked so that the ‘findings’ are <i>literally created</i> as the investigation proceeds. The subjectivist form of knowledge as a formed belief is not more or less true in a justified sense; rather, it is more or less informed and sophisticated (Guba, 1990c; Guba & Lincoln, 1994).
Critical subjectivity	Assumes an “extended epistemology. A knower participates in the known, articulates a world, in at least four interdependent ways: experiential, presentational, propositional, and practical” (Heron & Reason, 1997, p. 280). <i>Experiential knowing</i> means “the experiential, the embodied, the emotive qualities of human experience” (Guba & Lincoln, 2005, p. 205). Experiential knowing is a “direct encounter... feeling and imaging the presence of some energy, entity, person, place, process, or thing... knowing through participative, empathic resonance with a being, so that as knower I feel both attuned with it and distinct from it” (Heron & Reason, 1997, pp. 280-281). <i>Presentational knowing</i> is an expression of experiential knowing. <i>Propositional knowing</i> is declarative knowledge; it is knowing <u>that</u> . <i>Practical knowing</i> is knowledge in action; it is one’s know <i>how</i> , such as a skill (Guba & Lincoln, 2005; Heron & Reason, 1997).

*Methodology* is defined as “a more practical branch of philosophy (especially of philosophy of science) that deals with methods, systems, and rules for the conduct of inquiry” (Guba & Lincoln, 1989, p. 83). Table 10 shows the metaphysical positions on the methodological subject.

Table 10

*Metaphysical Positions on the Methodological Subject*

<b>Metaphysical position</b>	<b>Definition</b>
Experimental/manipulative	Also called the “interventionist” methodology, Guba, 1987, p. 34) prescribes a belief forming process in which the independence of investigator and the investigated is meticulous maintained through careful empirical control over nature; that is, inquiry takes place as if “behind a thick wall of one-way glass, observing nature as ‘she does her thing’ ” (Guba, 1990c, p. 19). Within the belief forming process of the experimental/manipulative methodology, “questions and/or hypotheses are stated in propositional form and subjected to empirical test to verify them; possible confounding conditions must be carefully controlled (manipulated) to prevent outcomes from being improperly influenced” (Guba & Lincoln, 1994, p. 110).
Modified experimental/manipulative	The uncertainty of imperfect knowing methodologically shifts the nature of controlled observation. Belief outputs are re-characterized as “ <i>probably</i> true (but always subject to falsification)” (Guba & Lincoln, 1994, p. 110) and an added emphasis was placed “on ‘critical multiplism’ (a refurbished version of triangulation) as a way of falsifying (rather than verifying) hypotheses” (Guba & Lincoln, 1994, p. 110).
Dialogic/dialectical	A transformative, political belief forming process. Here, “the transactional nature of inquiry requires a dialogue between the investigator and the subjects of the inquiry [and/or the readers of an inquiry]; that dialogue must be dialectical in nature to transform ignorance and misapprehensions (accepting historically mediated structures as immutable) into more informed consciousness” (Guba & Lincoln, 1994, p. 110). The methodological position is dialogic in that it demands a conversation between people or literatures and dialectic in that it also demands that the conversation take a point – counterpoint – resolution structure in order to reveal the dominant historical reality, the alternative disempowered reality, and move/transform knowing to a new state of consciousness.
Hermeneutical/dialectical	An iterative and <i>circular</i> belief forming process. The methodology is hermeneutic in the sense that inquirers “must understand the whole from the individual and the individual from the whole” (Gadamer in Connolly & Keutner, 1988, p. 68). Further, the methodology is dialectic in the sense that inquiry demands an iterative comparing and contrasting of constructions to the point of consensus among participants. In other words, “the methodology involves a dialectic of iteration, analysis, critique, reiteration, reanalysis, and so on, leading to the emergence of a joint (combined emic/etic) understanding of a case” (Guba, 1987, p. 34).
Cooperative inquiry	Also called <i>collaborative action inquiry</i> , assumes a political participation in the inquiry processes that is free of traditional roles and boundaries of inquired and

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object (Heron & Reason, 1997; Lincoln et al., 2011). As a belief forming process, cooperative inquiry is a democratic process, “a collaborative form of inquiry, in which all involved engage together in democratic dialogue as coresearchers and as cosubjects” (Heron & Reason, 1997, p. 283). Inquiry iterates democratically through all four forms of knowing, ultimately culminating in an improved practical knowledge to serve an improved human condition. The cooperative process collectively involves coresearchers and cosubjects.

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*Axiology* is defined as “the branch of philosophy dealing with ethics, aesthetics, and religion” (Guba & Lincoln, 2005, p. 200); however, in this paradigm meta-framework, axiology is more specifically defined as a value-mediated position on “how researchers act based on the research they produce” (Lincoln et al., 2011, p. 111). Table 11 shows the metaphysical positions on the axiological subject.

Table 11

*Metaphysical Positions on the Axiological Subject*

<b>Metaphysical Position</b>	<b>Definition</b>
Positivist position	Positivists value “propositional knowing about the world is an end in itself, is intrinsically valuable” (Guba & Lincoln, 2005, p. 198); consequently, the axiological position on how inquirers should act based on the propositional research aim regulates that “researchers should remain distant from the subject so that their actions are not to have influence on populations – only the laws their inquiry produces” (Lincoln et al., 2011, p. 111).
Postpositivist position	Postpositivists also value propositional knowing about the world (as with the positivists), but take the axiological position on inquirer actions that “researchers should attempt to gain better understanding of reality and as close as possible to truth through the use of statistics that explains and describes what is known as reality” (Lincoln et al., 2011, p. 111).
Critical position	Critical inquirers value true consciousness and change; and consequently, take the axiological position on inquirer actions that “researchers seek to change existing education as well as other social institutions’ policies and practice” (Lincoln et al., 2011, p. 111).
Constructivist position	The constructivist values shared understandings; and consequently, takes axiological position on inquirer actions that “propositional, transactional knowing is instrumentally valuable as a means to social emancipation, which is an end in itself, is intrinsically valuable” (Guba & Lincoln, 2005, p. 198).
Participatory position	Participatory inquiry values a balance between “deciding for others, with others, and for oneself” (Heron & Reason, 1997, p. 287); consequently, “the participatory paradigm answers the axiological question in terms of human flourishing, conceived as an end in itself, where such flourishing is construed as an enabling balance within and between people of hierarchy, cooperation, and autonomy” (Heron & Reason, 1997, p. 287).



*Teleology* is defined as “the end to which the knowledge gained through inquiry ought to be applied” (Lincoln & Lynham, 2011, p. 8). Table 12 shows the metaphysical positions on the teleological subject.

Table 12

*Metaphysical Positions on the Teleological Subject*

<b>Metaphysical Position</b>	<b>Definition</b>
Positivist position	“Technical – To explain, in order to replicate, predict and control.” (Lincoln & Lynham, 2011, p. 8)
Postpositivist position	“Technical – To explain, in order to replicate, predict and control.” (Lincoln & Lynham, 2011, p. 8)
Critical position	“Critically informed praxis – ‘to critique and transform, reconstitute and emancipate. Thus, to enlighten and emancipate through the process of critique and identifying potential’ (Guba & Lincoln, 2005, 194), in order ‘to develop more critically informed practice’ (Valentin 2006, 27)” (Lincoln & Lynham, 2011, p. 8)
Constructivist position	“Improved praxis – ‘To make sense of, understand and interpret. To understand and interpret through meaning of phenomena (obtained from the joint construction/reconstruction of meaning of lived experience); such understanding is sought to inform praxis (improved practice)’ (Guba & Lincoln, 2005, 194)” (Lincoln & Lynham, 2011, p. 8)
Participatory position	Not defined

The axiomatic theory explaining the phenomenon of inquiry paradigms (Lincoln & Lynham, 2011; Lincoln et al., 2011) defines the phenomenon primarily through the set of axiom categories articulated as the basic beliefs or metaphysical subjects, the set of meta-physical positions to each axiom category for a particular paradigm, and the operationalized positions on practical issues (Table 13, modified from Guba & Lincoln, 2005; Lincoln & Guba, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011). Structurally, the sets of metaphysical positions defined for each paradigm are similar to the typological structure of Habermas (1971; see Table 7). At least two significant contributions to the paradigm of inquiry theory emerged through organization of the subjects and positions into a meta-framework of paradigmatic belief systems.

Table 13

*Metaphysical Assumptions of the Positivist, Postpositivist, Critical, Constructivist, and Participatory Paradigms*

<b>Metaphysical assumption about...</b>	<b>Paradigm</b>				
	<b>Positivist positions</b>	<b>Postpositivist positions</b>	<b>Critical positions</b>	<b>Constructivist positions</b>	<b>Participatory positions</b>
<i>Ontology</i>	Naïve realism	Critical realism	Historical realism	Relativism	Participative reality
<i>Epistemology</i>	Dualist/objectivist	Modified dualist/objectivist	Transactional/subjectivist	Transactional/subjectivist	Critical subjectivity
<i>Methodology</i>	Experimental/manipulative	Modified experimental/manipulative	Dialogic/dialectical	Hermeneutical/dialectical	Collaborative action inquiry
<i>Axiology</i>	Maintain inquirer distance so inquiry produces law-like propositional knowing	Leverage triangulation in inquiry to produce propositional knowing that approximates truth as close as possible.	Advocate for change in existing social and political structures.	Emphasize “propositional, transactional knowing... as a means to social emancipation” (Guba & Lincoln, 2005, p. 198).	“Practical knowing about how to flourish with a balance of autonomy, cooperation, and hierarchy in a culture is an end in itself” (Guba & Lincoln, 2005, p. 198).
<i>Teleology</i>	The aim of inquiry is to explain in order to predict		The aim of inquiry is to critique, illuminate, and transform in order to emancipate	The aim of inquiry is to describe, make sense of, and interpret the meaning joint constructions in order to improve practice	Not yet defined

First, individual philosophical paradigms of inquiry can be best understood from within each paradigm (or ideal type), based on the underlying set of axioms and theorems expressed as a specific combination of positions on metaphysical assumptions and postures (or operational characteristics of inquiry). The specific lens of each paradigm was made more explicit through each paradigm’s specific framework of ideals. The second significant contribution that emerged through the meta-framework organization was the connectivity of different paradigms of inquiry

at a meta level that facilitated understanding between paradigms. Previously, trying to understand one paradigm from the perspective of another was burdened by issues of commensurability and accommodation, somewhat akin to a form of ethnocentric philosophy science (Guba & Lincoln, 1994; Lincoln & Guba, 2000). Cross-paradigm comparison was achieved with the set of axiomatic subjects systematized into a framework of each paradigm's fundamental of beliefs. Even though achieved previously by Habermas (1971), it had not been achieved with the added sophistication by Lincoln and Guba, nor had it been achieved for the breadth of paradigm frameworks articulated within the sophisticated formulation of the paradigm of inquiry axiomatic theory by Lincoln et al.

With its unifying organization, the paradigm of inquiry theory (Lincoln & Lynham, 2011; Lincoln et al., 2011) defined the general structure, or meta-structure, of a paradigm of inquiry outside the context of any particular paradigm of inquiry. That is, all paradigms of inquiry could be understood within the paradigm meta-framework of axiomatic subjects, even though understanding any particular paradigm of inquiry was accomplished by first substituting a specific axiomatic position for each axiomatic subject, and then understanding all the axiomatic position pieces of the paradigm's framework within their unified gestalt context. As articulated by Guba (1990c) regarding ontology, epistemology, and methodology, "all these past paradigms, as well as emergent contenders, can be characterized by the way their proponents respond to... [its] basic questions" (p. 18).

### **What roles do paradigms of inquiry have in the process of disciplined inquiry?**

Guba (1990c) stated, "Our concern here, however, is with those paradigms that guide disciplined inquiry" (p. 18). To this point, definitions of paradigm have been explored as well as

three key contributors; yet, attention now turns more specifically to exploring the roles that paradigms of inquiry have in the process of disciplined inquiry.

**The roles of Kuhnian paradigms in disciplined inquiry.** Normal science represents a research strategy of small incremental modifications to the paradigm through application of the paradigm to solving puzzles (Andersson, 1994; Kuhn, 1996). According to Kuhn, all activities of normal science fall within one of three “foci” (p. 25) of normal science: “determination of significant fact, matching of facts with theory, and articulation of theory” (p. 34). The editor of the 50<sup>th</sup> anniversary edition of Kuhn’s *The Structure of Scientific Revolutions*, Hacking (2012), did an excellent job describing these foci in layman’s terms. These three foci of normal science determine the form of inquiry to be conducted in relation to the paradigm theory:

- Determination of significant facts: “Theory leaves certain quantities or phenomena inadequately described and only qualitatively tells us what to expect. Measurement and other procedures determine the facts more precisely” (p. xvi).
- Matching of facts with theory: “Known observations don’t quite tally with theory. What’s wrong? Tidy up the theory or show that the experimental data were defective” (p. xvi).
- Articulation of theory: “The theory may have a solid mathematical formulation, but one is not yet able to comprehend its consequences. Kuhn gives the apt name *articulation* to the process of bringing out what is implicit in the theory, often by mathematical analysis” (p. xvi).

Accordingly, normal-science inquiry is completely guided by the paradigm, such that the paradigm itself is applied in only one of three ways, each encapsulated by one of the three foci of

normal science. Alternatively, in “extraordinary science” (Kuhn, 1996, p. 90), the lack of paradigmatic focus guides inquiry in a different manner. Here, inquiry is guided outside the rules of the paradigm and focuses on both seeking out a new paradigmatic framework and re-analysis of typically implicit fundamentals.

**The roles of philosophical paradigms in disciplined inquiry.** Philosophical paradigms of inquiry (e.g., Habermas [1971]; Lincoln et al., [2011]) are conceptual structures for the reality that can be inquired into. The conceptual structure of philosophical paradigms of inquiry make explicit the otherwise implicit, underlying, and undemonstrated metaphysical assumptions, belief systems, or “axioms” (Lincoln & Guba, 1985b, p. 33) that establish what is justified to be known, why, how, and to what end. These metaphysical assumptions “are the starting points or givens that determine what inquiry is and how it is to be practiced” (Guba, 1990c, p. 18).

Recall that disciplined inquiry also makes explicit the underlying belief system and further makes explicit the standards of quality associated with inquiry guided by that belief system. A paradigm of inquiry contextualizes the regulative ideal concerning the possibility of experience within an axiomatic system. The contextualization of a set of axiomatic positions is what disciplined inquiry makes explicit when explicating its underlying belief system. In other words, philosophical paradigms of inquiry have the following roles in disciplined inquiry:

- Provide the assumption structure of knowledge
- Define what it means to know or believe something about the empirical world
- Provide quality criteria for inquiry (i.e., “criteria defined from one perspective may not be appropriate for judging actions taken from another perspective, just as, for

example, it is not appropriate to judge Catholic dogma as wrong from the perspective of say, Lutheran presuppositions” [Lincoln & Guba, 1985b, p. 293])

### **The importance of paradigms of inquiry for understanding the process of inquiry.**

As succinctly expressed by Guba (1990c), paradigms of inquiry are important for understanding the process of inquiry because paradigms “determine what inquiry is and how it is to be practiced” (p. 18). Guba’s statement highlights the dependence of inquiry upon the assumed possibility of experience. Inquiry is not generic. It does not exist empirically in a context free manner. That is, inquiry depends upon the nature of the world being inquired into. The nature of the world inquired into is an assumed and imposed empirical world. That is precisely why paradigms of inquiry are important for understanding disciplined inquiry. Paradigms of inquiry define the nature of the world, and therefore also define what inquiry is.

Crotty (1998) articulated how the scientific paradigm was important to understanding inquiry within the world of the positivist:

The scientific world [of the positivist] is not, of course, the everyday world that people experience. Not even [positivist] scientists experience it that way in their everyday mode of being... In other words, the world addressed by positivist science is not the everyday world we experience.... The scientific world is an abstraction from the ‘lived’ world; it has been distilled from the world of our everyday experiences, distances us from the world of our everyday experiences, and takes us further still from the world of immediate experience lying behind our everyday experiences... The world perceived through the [positivist] scientific grid is a highly systematic, well-organized world. It is a world of regularities, constancies, uniformities, iron-clad laws, absolute principles. As such, it stands in stark contrast with the uncertain, ambiguous, idiosyncratic, changeful world we know at first hand. (p. 28)

Crotty’s *scientific world* presupposes the nature of the world that can be inquired into, and in consequence, defines what inquiry is when conducted within that system of knowledge.

The commitment of scientists to an a priori systematic world regulates both what can be known

and what inquiry should be. Disciplined inquiry embraces this relationship of paradigms with the inquiry appropriate to that paradigm. Disciplined inquiry makes explicit the presupposed belief system, and by association with that belief system, also makes explicit what constitutes quality inquiry within that belief system.

### **Methodology**

“How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known? Again, the answer that can be given to this question is constrained by [the presumed nature of the world inquired into]; that is, not just *any* methodology is appropriate. For example, a “real” reality pursued by an “objective” inquirer mandates control of possible confounding factors, whether the methods are qualitative (say, observational) or quantitative (say, analysis of covariance). (Conversely, selection of a manipulative methodology-the experiment, say-implies the ability to be objective and a real world to be objective about.) The methodological question cannot be reduced to a question of methods; methods must be fitted to a predetermined methodology” (Guba & Lincoln, 1994, p. 108).

Review of the methodological phenomenon for the purpose of the present inquiry sought to demonstrate the breadth of definitions that can found for methodology and distinguish definition of methodology as a term from understanding the idea of methodology as a phenomenon. The contrast of the disconnected state of definitions as a term and the lack of conceptual framework as a phenomenon was used to demonstrate that methodology remains a primitive underdeveloped phenomenon under defined as a broad range of possible ideas, principles, and processes, and never unified under a common framework.

## What is methodology?

In *Pathways to Knowledge*, Goldman (2002) posed the following methodological questions:

If some beliefs are regularly aligned with the truth, how does that transpire? What features of the methods or practices used in forming these beliefs account for this result? If another set of beliefs are not so well aligned with truth, what features of the belief-forming methods or practices produce this result? (p. 187)

If the methodological question is “How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known?” (Guba & Lincoln, 1994, p. 108), then methodology from a disciplinary perspective might be defined as the study of the “features of the methods or practices used in forming these beliefs” (Goldman, 2002, p. 187) that regularly account for both alignment and lack of alignment of what inquirers believe can be known with the actual beliefs formed from their inquiries.

Up to now, the construct of methodology has only been defined as the regulative rule for “how the empirical regress is to be carried out” (Kant, 2007, p. 449) or the basic question asking “how should the inquirer go about finding out knowledge” (Guba, 1990c, p. 18). Although the ultimate goal of the current work is to conceptually structure the phenomenon of methodology, the work begins by focusing on some of the definitions associated with the term *methodology*. Analysis of definitions revealed an inconsistently defined construct that lacks any coherent structure similar to the axiomatic system of paradigms by Lincoln et al. (2011).

Several definitions for the term *methodology* are offered in Table 14. Numerous key descriptors can be pulled from the sample of definitions, such as the rules, procedures, logic, practices, methods, techniques, principles, philosophy, presuppositions, and systems associated



with the conduct of inquiry. Although the descriptors provide some further breadth to the lexicon for describing methodology, they fail to specifically capture the semantics or pragmatics of the term *methodology* in any concrete way. Altogether, they do little more than serve as a list of further adjectives for what has already been described as the rules that govern how inquirers go about acquiring knowledge.

Table 14

*Table of Definitions for the Term Methodology*

Source	Definition of methodology
Popkewitz, T. S. (1990). The meaning of alternative paradigms of practice. In E. G. Guba, <i>The paradigm dialog</i> (pp. 51–52). Newbury Park, CA: Sage Publications.	“Methodology, in this context, is concerned with the relations of the various parts of study with the production of findings. Methodology is concerned with the moral order (the rules, values, and priorities given to social conditions and individual action) presupposed in the practices of science. It is the study of what is defined as legitimate knowledge and how that knowledge is obtained and ordered. Conventional ways of talking about science that conflate methods and procedures provide little understanding of the underlying matrix of assumptions, dispositions, questions, concepts, and procedures that interrelate in the production of knowledge.” (pp. 51–52)
Schwandt, T. R. (1990). Paths to inquiry in the social disciplines: Scientific, constructivist, and critical theory methodologies. In E. G. Guba, <i>The paradigm dialog</i> (pp. 258–276). Newbury Park, CA: Sage Publications.	“To study a methodology is to explore a logic of justification or a meta-framework for understanding the exercise of method, that is, for examining the principles and procedure by which we formulate inquiry problems, develop answers to those problems, and evaluate the correctness and profundity of those answers.” (p. 262)
Guba, E. G., & Lincoln, Y. S. (1989). <i>Fourth generation evaluation</i> . Newbury Park, CA: Sage Publications.	“Methodology is a more practical branch of philosophy (especially of philosophy of science) that deals with methods, systems, and rules for the conduct of inquiry. Another way to phrase the question is: ‘How can we go about finding out things?’” (p. 83)
Creswell, J. W., & Plano Clark, V. L. (2007). <i>Designing and conducting mixed methods research</i> . Thousand Oaks, CA: Sage Publications.	“A methodology refers to the philosophical framework and the fundamental assumptions of research (van Manen, 1990). Because the philosophical framework one uses influences the procedures of research, we define methodology as the framework that related to the entire process of research.” (p. 4)
Guba, E. G., & Lincoln, Y. S. (1989). <i>Fourth generation evaluation</i> . Newbury Park, CA: Sage Publications.	“Methodology is best understood as the overall strategy for resolving the complete set of choices or options available to the inquirer. Far from being merely a matter of making selections among methods, methodology involves the researcher utterly-from unconscious worldview to enactment of that worldview via the inquiry process.” (p. 183)
Bryman, A. (2008a). Of methods and methodology. <i>Qualitative Research in Organizations and Management: An</i>	“Methodology is the study of the methods that are employed. It is concerned with uncovering the practices and assumptions of those who

<i>International Journal</i> , 3(2), pp. 159–168.	use methods of different kinds. However, practices and assumptions are somewhat different matters.” (p. 160)
Bryman, A. (2008a). Of methods and methodology. <i>Qualitative Research in Organizations and Management: An International Journal</i> , 3(2), pp. 159–168.	Methodology “is concerned fundamentally with the nature of what I would call methodic practice. That is, it is concerned with revealing in a systematic manner the practices of researchers and the ideas and presuppositions that lie behind those practices” (p. 167)
Frankfort-Nachimias, C., & Nachimias, D. (1992). <i>Research methods in the social sciences</i> , 4 <sup>th</sup> ed. New York, NY: St. Martin’s Press.	“A system of explicit rules and procedures on which research is based and against which claims for knowledge are evaluated” (p. 555)

This same ambiguity in use of the term *methodology* was noted by Kaplan (2009), who acknowledged two broad uses of methodology: first as a discipline or the actual study of methods through “the description, the explanation, and the justification” (p. 18) of their use, but not the methods themselves, and second, as the method practices of inquiry conventions. However, despite the simplistic dual usage distinguishing the study of from the practice of, he noted uncertainty with use of the latter definition. Kaplan argued that the uncertainty had to do with four particular uses of the term *methodology* in reference to a feature of the process of inquiry: that of technique, that of honorifics, that of epistemology, and that of methods.

The four uses of the term methodology discussed by Kaplan (2009), with respect to the practice of inquiry, can be hierarchically organized in ascending order of magnitude in the following manner: *techniques*, *methods*, *honorifics*, and *epistemology*. Kaplan described techniques as “the specific procedures” (p. 19) used within an accepted context of inquiry within a given discipline. Notably, both Kaplan and Guba (1990c) emphasized that much of the training that occurs for scientists has been traditionally provided at the level of techniques, and as a consequence, greatly distances students from the philosophical basis that established the legitimacy of the techniques being taught.

In science as in any other work... there are better and worse ways of doing it. The techniques of a science are the ways of doing the work of that science which are regarded, for more or less compelling reasons, as being acceptable. Scientific training is to a significant extent the mastery of techniques. (Kaplan, 2009, p. 19)

Several example techniques are offered such as the particular way that a data collection instrument is used; the manner in which a particular test is administered; the specific application of a particular statistical procedure; the use of a specific research design in a particular context (e.g., conducting an interview or setting up an experiment); and so forth (Kaplan, 2009). Sometimes, what is referred to as methodology is often made in reference to the types of techniques just described. “Techniques differ from one another in the scope of their application, some being appropriate only to very narrowly defined contexts, others playing a part in a wide variety of inquiries” (p. 23). In this sense, a scientist skilled at the methodology of the discipline is well versed in the specific, and often compartmentalized, practices of various steps or phases of the research process.

Too direct an association of methodology solely with techniques of inquiry can blur the connectedness and unified process of disciplined inquiry. For example, one team member may have mastery of a range of statistical techniques and be an authority on the appropriate application of those techniques, given a particular data context. However, the same team member may be unaware of the appropriate application of a statistical technique, given the context of the entire research process. Techniques are therefore narrow enough in application to only be descriptive of a small part of the whole of the inquiry process.

As with techniques, the use of methodology in reference to methods applies to a range of applications. However, the range of applications of the method used is at a higher level of

collective techniques. Kaplan (2009) designated the term *methods* to describe references to methodology as follows:

Middle range techniques and principles... sufficiently general to be common to all sciences, or to a significant part of them... [and] include such procedures as forming concepts and hypotheses, making observations and measurements, performing experiments, building models and theories, providing explanations, and making predictions. (p. 23).

Methods in this case (i.e., middle-range techniques and principles) are sufficiently broad enough to encompass the logical and philosophical principles of different forms of inquiry, yet sufficiently specific enough to distinguish different paradigms of inquiry from each other. In this sense, methods are both descriptive and prescriptive of the entire process of inquiry.

The third usage of methodology was that of honorifics. Honorific use was described by Kaplan (2009) as the ritualistic descriptions of a type of research to position the work in a particular area, without much concern for whether the actual inquiry to follow meets that classification. In this sense, honorific methodology is only a verbal expression of adherence and allegiance to a particular research approach, with a concern primarily for whether the output is awarded a particular status and approved as acceptable. “This honorific use of methodology expresses that concern without any clear indication of how the concern was embodied in the inquiry itself” (Kaplan, 2009, p. 20).

The last of the four usages for the term methodology was equated to “works of the mind” (Kaplan, 2009, p. 21). As such, Kaplan argued that the epistemological usage of methodology makes it “indistinguishable” (p. 20) from philosophy of science. This fourth usage of methodology is metaphysically laden and extensible to descriptions of underlying assumptions and guiding principles. “In this sense, the subject-matter of methodology consists—very roughly

speaking—of the most basic questions that can be raised concerning the pursuit of truth” (p. 20). Similar to techniques and methods, epistemological use of the term *methodology* applies to a range of issues that “differ in the breadth of their import” (p. 23). Some, issues, according to Kaplan, “like the problem of the justification of induction, bear on the whole of human knowledge, while other, like the problem of determinism, relate more especially to some particular science or part of it” (p. 23)

The focus on the basic question underlying the quest for knowledge with the epistemological use of the term *methodology* resonates with the methodological question of paradigm framework (e.g., How can the knower go about knowing? Guba, 1987a, 1987b, 1990c; Guba & Lincoln, 1989, 1994, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011). Challenges to the answers to these basic questions often originate from different philosophical perspectives, rather than from problems directly encountered in empirical inquiry. However, this does not mean the answers and problems of the basic question cannot be informed by actual inquiry. Methodology should generally not conform to actual practice or it risks reinforcing “the acceptance of unsatisfactory hypotheses on the ground that this is what everybody is doing” (Kaplan, 2009, p. 25).

Becker (1970) criticized methodology (and methodologists) for its apparent normative force on practice, yet for maintaining existence and merit independent of it. Becker took issue with methodology’s “predominantly proselytizing character” (p. 4), claiming that “methodology is too important to be left to the methodologists” (p. 3). Part of Becker’s case built on the epistemological use of methodology (Kaplan, 2009), and he argued for a more practice-based influence from scientists in the field. Given the shaping of the epistemological use of

methodology from philosophy of science, Becker saw methodology simply as an armchair discipline that preached to scientists how to do things in order to get them to conform to an appropriate method. Kaplan acknowledged this normative tension, but framed the methodologist in the following (more flattering) analogy:

For the criterion being put forward is decidedly not the question whether everybody's doing it, but the very different question whether anything gets done by it. What I am protesting is the conception of the methodologist as baseball commissioner; writing the rules; or at any rate as umpire, with power to thumb an offending player out of the game. He [the methodologist] is at best only a coach, and the merit of his recommendations rests entirely on what the play of the game shows to be effective. (p. 25)

Acknowledging the same confounded use of the term *methodology* as did Kaplan (2009), Bryman (2008a) undertook an examination of what the term might be taken to mean by exploring the practices of researchers and publication trends. Bryman questioned Becker's (1970) assertion and accusation of "proselytizing" (Becker, p. 4), and examined whether methodology was common to the analysis of the practices of those who use methods (i.e., actual methods and/or techniques employed within inquiries) or the analysis of the assumptions that lie behind the practices of those who use methods (i.e., the method rationale). The former option aligned with Kaplan's techniques and methods, while the latter with epistemological use.

For his investigation, Bryman (2008a) offered the following definitions:

[Methods are] the techniques that researchers employ for practicing their craft. "Methods" might be instruments of data collection like questionnaires, interviews or observation; they might refer to the tools used for analyzing data, which might be statistical techniques or extracting themes from unstructured data; or the term might refer to aspects of the research process like sampling. (p. 160)

Bryman ultimately concluded that term *methodology* aligned with both the study of method rationale and method employment. Methodology "is concerned fundamentally with the nature of

what I would call methodic practice. That is, it is concerned with revealing in a systematic manner the practices of researchers and the ideas and presuppositions that lie behind those practices” (p. 167). There is both a sufficiency and efficiency to Bryman’s methodological definition across all sampled meanings of the term provided in Table 14, in addition to alignment with the definition for disciplined inquiry provided by Clovis and Cobban (2006) in Table 3. Consequently, Bryman’s definition of methodology will serve as interim operational definition, with respect to the study of methods, until a more complete conception can be generated.

### **The Primitive State of Methodological Conceptualization**

Aside from the noted limitations of the term *methodology* (i.e., “there are relatively few examinations of what we mean by methodology,” Bryman, 2008a, p. 159]), the idea of methodology as a phenomenon lacks conception of parts, relationships among parts, organization of parts and relationships, operationalized extensions into practice, and an overall way to conceptualize and represent methodology as a whole consisting of those parts and relationships. When compared with the paradigm of inquiry phenomenon, methodology as a phenomenon is missing a systematically conceived abstract scheme that facilitates relating it to other constructs, in addition to lacking any particulars (i.e., concepts) of that scheme that can be extended (and observed and enacted) into the practice of inquiry. In contrast with methodology, the inquiry paradigm phenomenon has been developed into a theoretical scheme that not only conceptualizes the general structure and organization of the parts of a paradigm (e.g., the set of axiomatic subjects or basic questions), but also further offers specific positions (specific axiom positions or answers to basic questions). Together, these positions systematically define a range of specific

paradigms of inquiry and describe the operational characteristics of each of those specific paradigms that can be observed and/or practiced in empirical inquiry.

In the sense just described, through comparison with the inquiry paradigm phenomenon, the methodological phenomenon remains both under defined as a term and underdeveloped as a phenomenon. Not only does the methodological phenomenon lack the theoretical structure necessary for conceptualization and the operational characteristics for extension into practice, but its lack of development as a theoretical phenomenon inhibits it from being related to the paradigm of inquiry phenomenon in a specific theoretical way. This, thus, inhibits both improved understanding and practice of disciplined inquiry.

**Movement from a primitive to sophisticated state.** What specific frameworks of ideals could capture the essences of the myriad of inquiry methodologies available to inquirers? Furthermore, what higher level framework could systematize the organizational structures of specific methodologies? Analysis of the literature on methodology reveals that no such set of frameworks and meta-framework has yet been defined; however, simply because it has not been defined should not imply that it does not exist. Methodologists just need to look in the right places, look for the right things, and clear away the right debris occluding its discovery. The first step in this process is identifying the methodological construct as something, then recognizing it as something that needs to be developed, and then focusing efforts on developing it. For a conception of how to add what is missing, the review turns to Dubin's (1978; see also Lynham, 2002a) discussion on primitive versus sophisticated theoretical units.

In Dubin's (1978; see also Lynham, 2002a) theory-building process, the first step involves identifying and defining the units that will serve as its building blocks. Dubin pointed



out that when an inquirer “deals with logical structures he is constrained to point out that a starting point upon which defined categories rest is one or more undefined or primitive terms” (p. 53). In a similar manner, units of a theory that are undefined are considered primitive, while units that are defined are considered sophisticated. That is, theoretical units need to be defined, structured, and characterized in relation to the overall theoretical structure in order to be considered sophisticated; units that exist as placeholders in the theory but lack the defining characteristics are considered primitive.

A clear intention is associated with defining a construct as primitive: “the admission of a unit as a primitive unit into a theory immediately cries out for translation into a sophisticated unit” (Dubin, 1978, p. 54). The “theoretical scheme” (Kerlinger & Lee, 2000, p. 40) for disciplined inquiry has been initially outlined, and two primary phenomena have been entered into that initial scheme. The tension between sophisticated and primitive in this scheme creates the researchable conceptual problem in the context of theory development. Dubin described this process as one in which the inquirer introduces “an unknown  $X$  into his theory and then spend[s] his time trying to discover the  $X$ ”, (p. 53). In this scenario, “The scientist is perfectly willing to use a primitive unit precisely because it then presents him with an important research problem to turn  $X$  into a sophisticated unit of his theory” (p. 53). The inquirer, when confronted with an intuition or observation that seems to suggest common core underpinnings, initially identifies the primitive construct by applying a name to whatever is presumed to be underlying the intuition or observation. By applying “an identifying label that serves to tag it but not to define it... the scientist is then in a position to focus attention on the tagged thing and bring it into a new theory” (p. 54). Introduction of the unknown  $X$ —here, the primitive methodological

phenomenon—acts as catalyst for focused inquiry, leading to transformation of the methodological phenomenon from primitive to sophisticated.

**An analysis of Schwandt's statement concerning methodology.** Using the sophisticated phenomenon of inquiry paradigms as a model for the phenomenon of methodology provides a conceptual endpoint concerning a potential structure for the methodological framework, and with some recreation, a potential means to that structured conceptual endpoint. However, the paradigm example does little to define the actual elements that should be represented within that structure. Given that conceptually structuring the phenomenon of methodology for improved understanding of disciplined inquiry remains the goal of the larger research agenda, a statement by Schwandt (1990) can be examined as a stepping-off point. In his commentary on methodology as the path between the metaphysical world and the practical world, Schwandt made the following provocative comment:

To study a methodology is not simply to examine the exercise of method, it is to study a way of knowing; in other words, methodology and epistemology are linked. Ways of knowing are guided by assumptions concerning what we are about when we inquire and by assumptions concerning the nature of the phenomenon into which we inquire... [the former assumption stands in relation to methodological 'regulative ideals' and the latter assumption in relation to paradigmatic 'regulative ideals']... Examining how these two sets of assumptions (which themselves evolve) shape our understanding of inquiry and guide the development and evaluation of methods is what makes the study of methodology more than an examination of the "how-to" of inquiry. To study a methodology is to explore a logic of justification or a meta-framework for understanding the exercise of method, that is, for examining the principles and procedure by which we formulate inquiry problems, develop answers to those problems, and evaluate the correctness and profundity of those answers. (p. 262)

Here, Schwandt (1990) implied a methodology comprising a meta-framework extending over all exercises of method to include principles, procedures, problem formation, answer development in connection with identified problems, and evaluation of the aptness of the inquiry

outcomes. If method is taken to mean Kaplan's (2009) "middle range techniques and principles... [that] include such procedures as forming concepts and hypotheses, making observations and measurements, performing experiments, building models and theories, providing explanations, and making predictions" (p. 23), then the exercise of method can be expanded to include formation of concepts, systematic empirical inquiry, generation of theory, and use of models of inference. Given the structural provision of the paradigm phenomenon as theoretical exemplar, along with the writings of scholars such as Schwandt, Kaplan, and many others on the topic of methodology, at the outset of the current research, sufficient basis exists to hypothesize the viability of a theoretical framework for the methodological phenomenon. The current research agenda aimed to begin the theoretical work necessary to develop it.

## CHAPTER 3: METHOD FOR HISTORICAL ANALYSIS OF THE PARADIGM THEORY

### **Chapter 3 Preface**

Chapter 3 describes the method of historical analysis used to move beyond the current state understanding of paradigm theory represented in the second chapter to understanding its changing states overtime. The method of historical analysis describes how the inquiry was conducted that led to characterization of milestones in the phenomenon's evolution. Even though the process of historical analysis specifically targeted understanding of changing states overtime, within the larger research agenda the historical analysis represented the first step towards understanding the theoretical exemplar found in the well-developed, sophisticated conceptualization of paradigms of inquiry.

The process described in chapter 3 follows the integrative literature review research design framework of Appendix A. First, the method chapter specifically positions the historical analysis in the context of its purpose, conceptual frame, research problem, need, and research questions. Next, the method chapter includes details on the literature sampled, the data collected from the sample, the coding scheme used to index the literature, and the strategies used to code and analyze the literature. The novelty of the methodological approach described in chapter 3 should be considered. Few examples of using similar historical analyses as part of theory development work exist.

### **Background Information**

Paradigm theory (Lincoln et al., 2011; Lincoln & Guba, 2011) provides an abstract taxonomy of metaphysical categories (e.g., ontology and epistemology) and specific metaphysical positions (e.g., realist, critical realist, relativist). Together, a set of metaphysical

positions can define the axiomatic system of a particular science by organizing assumptions about reality; what can be known about that reality; and the processes appropriate to coming to know something about that reality (e.g., the hypothetico-deductive scientific method or interpretive hermeneutic science).

Although earlier formations about the traditions and associated processes of inquiry received significant attention (e.g., Feyerabend, 1987a, 1987b; Lakatos & Musgrave, 1970), comprehensive analysis of the parallel ways that alternative forms of inquiry systematically vary had not been done in education prior to the early writing of Guba and Lincoln (1981) explicating a common framework from within which various traditions could be compared as different commitments to similar metaphysical categories (given the obvious acknowledgment of Dewey [1933] and perhaps the exception of critical theorist Habermas [1971]). Initially appearing in the 1970s, Guba and Lincoln began publishing on epistemological differences between naturalist and rationalist inquiry, focusing their arguments on legitimization of naturalist inquiry through examination of parallel trustworthiness criteria (Guba, 1981a). Their efforts to make explicit the quality criteria inherent to a tradition of research by mapping the trustworthiness criteria back to the underlying axiomatic system of metaphysical positions was perhaps the most valuable contribution of their body of work.

Collectively, Guba, Lincoln, and Lynham's publications on the topic near 100 sources (e.g., Guba, 1969, 1978b, 1979, 1990c; Guba & Lincoln, 1981, 1982a, 1989, 1994; Lincoln, 2010; Lincoln & Guba, 1985b, 1986a, 2000; Lincoln & Lynham, 2007; Lincoln et al., 2011). The breadth of literature contains the incremental puzzle pieces of their theoretical thinking; however, little has been done to document and unify their actual puzzle-solving processes and

products throughout the evolution of paradigm theory. Perhaps the best historical account to date is the autoethnographic history provided by Lincoln's (1990) "The Making of a Constructivist," but given the 20-plus years since its publication, it remains midpoint in the historical evolution of the 40-plus year history.

### **Positioning**

The purpose of the historical analysis of paradigm theory (Lincoln et al., 2011; see also Lincoln & Lynham, 2011) was to better understand the foundations of their exemplar theory by tracing and reconstructing the inquiry paradigm's theoretical evolution over time. Fundamental to the review was a need to document and understand a body of work—specifically, the authors' body of work represented in their own publications as contributing pieces to their evolving ideas. Their paradigm theory is a mature topic existing in a single body of literature. The most comprehensive documentation of this evolution exists in the published journal articles, conference papers, and textbooks from approximately the 1960s to the present day. Consequently, a historically organized integrative literature review was an appropriate approach to the research.

Using Cooper's (1988; Randolph, 2009) taxonomy, the following taxonomic positioning of the historical analysis was suggested:

- Focus: Theory (paradigmatic theory)
- Goal: Integration and identification of central issues (contributions and timeline)
- Perspective: Neutral (no espoused position, neutral)
- Coverage: Purposive and semi-exhaustive ancestry (trace references and select key pieces)

- Organization: Historical (reconstructed according to meaningful milestones and time periods)
- Audience: Specialized scholars and practitioners

### **Conceptual Frame**

The phenomenon central to paradigm theory, paradigms of disciplined inquiry, was not something instantaneously talked into existence in a single seminal publication. Rather, the phenomenon was incrementally written into existence over more than four decades of publication. What started out as an initial comparison of research approaches (e.g., Guba, 1978b) evolved into an overarching framework for analogous systems of inquiry (e.g., Guba & Lincoln, 1982a through to Lincoln et al., 2011). The perspective that the conceptualization of the phenomenon evolved over time by building upon prior ideas, adding new ideas, and revising old ones framed the historical analysis of paradigm theory by Lincoln et al. (2011; Lincoln & Guba, 2011). That is, through the process of critical analysis, the literature was viewed as a collection of incremental thinking on the paradigm phenomenon over time. Viewing the phenomenon through its history was a process of understanding paradigm theory through its developmental milestones.

### **Research Problem and Proposed Solution**

The paradigm theory of Lincoln et al. (2011; Lincoln & Guba, 2011) serves as a sophisticated explanation of the phenomenon of an inquiry paradigm. As an exemplar for the development of a theory for the phenomenon of methodology, the theory and its development should be critically and historically understood. Even though an autoethnographic account of the theory's development is available (e.g., Lincoln, 1990), no current documentation extends and

connects the theory's development up through the proceeding 20 years (e.g., Lincoln, 2010). As a consequence, current historical accounts remain incomplete, if not simply out of date.

The gap in historical analysis of paradigm theory demanded a more sophisticated understanding of the evolution of theoretical ideas over time. To update and complete the historical account of paradigm theory by Lincoln et al. (2011; Lincoln & Guba, 2011), and therefore critically examine and understand the theoretical exemplar, the current study reviewed and historical analyzed the authors' body of literature relevant to the topic. Beginning with paradigm theory (Lincoln et al., 2011; Lincoln & Guba, 2011), references were traced backwards through time, and the events and states of the theory's development reconstructed.

### **Need**

As an exemplar theory, it is important to extend understanding of paradigm theory beyond its current state by examining the events that contributed to its development over time. The framework of metaphysical assumptions, positions, and implications on the practice of inquiry of most modern writings on paradigm theory (e.g., post 1990) represent only snapshots in time rather than the rich history of intellectual tradition implicit in the text. To truly understand the authors' paradigm theory is to understand its history; its origins, its response, and its revisions as the authors got smarter and/or changed their minds (e.g., Guba & Lincoln, 2005).

As highlighted by Guba (1990c), to study "intellectual traditions is to consider the relation of rules in historical conditions. A philosophy of science is also its history" (p. 52). Thus, the need addressed by the historical analysis was not one of the visibility of the phenomenon, but rather the need to redress understanding of the current state of the paradigm phenomenon through its history. The historical analysis sought to address inadequate knowledge



on historical conditions, and as a consequence, change the way inquirers understand, and perhaps relate to, the phenomenon through the process of how it came to be rather than simply how it currently exists.

### **Research Questions**

The general research question guiding historical analysis was: *how did the exemplar paradigm theory of Lincoln et al. (2011; Lincoln & Guba, 2011) evolve into its current theoretical state?* In addition, the following more specific research questions further guided historical analysis of paradigm theory:

1. What milestones best characterize paradigm theory's evolution and development?
2. What features are characteristic of paradigm theory?

### **Sample**

Sampling was a systematic and exhaustive process of identifying, locating, reviewing, and filtering relevant literature (exhaustive in terms of the ancestry of citations, but only semi-exhaustive in terms of all the authors' publications). Beginning with Lincoln et al. (2011) and Lincoln and Lynham (2011), an ancestry approach of tracking citations from one source to the next was used to sample literature (Cooper, 1982). Sources were traced back to the earliest relevant sources cited. The ancestry search represented a front-to-back, present-to-past movement through time. Starting with the most recent sources, bibliographies were used to sample older and older works. The ancestry sampling approach highlights within-study exhaustive sampling, given accessibility considerations, but non-exhaustive sampling with regard to an entire population of work. That is, the sampling method produced a subset of an entire body of potential work based on the self-cited sources in relevant work of the authors.

Execution of the ancestry sampling strategy followed two general steps. For each primary source reviewed, first all relevant references within the primary source were identified. Next, the primary sources for each identified reference were retrieved, and again all relevant references were identified for that source. The process was repeated until the chain of *source* → *references* → *source* ended at the earliest cited source. It is important to define the ancestry sampling procedure as a means to initially identify the set of potential sources considered for review. After the full set of potential sources was identified, each source was subject to inclusion criteria.

Each source identified in the ancestry reference sample had to meet four conditions for inclusion in the historical analysis. These inclusion criteria were:

- A primary source must have cited the work in reference to a significant contribution to the conceptualization of the inquiry paradigm phenomenon.
- The sampled source must have been reasonably accessible by means of electronic databases, university libraries, or Internet searches.
- The cited work itself must have discussed a significant contribution to the conceptualization of the inquiry paradigm phenomenon, such that the work contributed to the historical reconstruction of the conceptualization over time.
- The cited work must have been by one of the theory's authors (i.e., Egon Guba, Yvonna Lincoln, or Susan Lynham).

In addition to the ancestry sample, occasionally a pivotal source was included using a purposive sampling strategy. In these instances, the pivotal source that was not part of the ancestry sample was brought in for the purpose of providing additional citation support for an idea that emerged from analysis of the ancestry sample. For example, information on the

participatory paradigm emerged from the ancestry literature as a key milestone in the evolution of paradigm theory; however, in support of the ideas on the participatory paradigm, several pivotal works not of the theory's authors were included to support the body of cited sources on the paradigm (e.g., early works of Heron and Reason). These purposively sampled sources outside the ancestry sample were neither included in the analysis nor in the results of the ancestry sampling discussed next.

A total of 94 sources were sampled from the ancestry searches. Table 15 shows the status of each source in the current review as a result of inclusion criteria. Out of the 94-source sample, 58 sources met the inclusion criteria, 30 were not accessible, and six did not meet the inclusion criteria. Three types of exclusion can be noted. First, a source was located and judged to not meet the inclusion criteria. Second, a source could not be accessed. Third, a source, although in existence and relevant, was not present in the ancestry of cited sources, and therefore was not part of the ancestry sample.

Table 15

*Set of All References From Ancestry Search*

Status in review	Sources (most recent first)
Excluded - Not accessible	Lincoln, Y. S., & Lynham, S. A. (Forthcoming). <i>Criteria for assessing theory in applied disciplines from a critical, and indigenous perspective</i> . Fort Collins, CO: Colorado State University.
Included	Lincoln, Y. S., & Lynham, S. A. (2011). Criteria for assessing good theory in human resource development and other applied disciplines from an interpretive perspective. <i>Human Resource Development International</i> , 14(1), 3-22.
Included	Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluence, revisited, in N. K. Denzin & Y. S. Lincoln (Eds.), <i>The Sage Handbook of Qualitative Research</i> (4 <sup>th</sup> ed.) (pp. 97-128). Thousand Oaks, CA: Sage Publications.
Included	Lincoln, Y. S. (2010). What a long, strange trip it's been: Twenty-five years of qualitative and new paradigm research. <i>Qualitative Inquiry</i> , 16(1), 3-9.

Excluded - Not accessible	Lynham, S. A., & Y. S. Lincoln. (2009). <i>Foundations of educational research</i> . Unpublished course notes. Fort Collins, CO: Colorado State University.
Included	Lincoln, Y. S., & Denzin, N. K. (2008). Epilogue: The lions speak. In N. K. Denzin, Y. S. Lincoln, & L. T. Smith (Eds.), <i>Handbook of critical and indigenous methods</i> (pp. 563-571). Thousand Oaks, CA: Sage Publications.
Included	Lincoln, Y. S., & Lynham, S. A. (2007). Criteria for assessing good theory in human resource development and other applied disciplines from an interpretive perspective. In <i>Proceedings of the Academy of Human Resource Development Conference</i> , In F. M. Nafukho & T. J. Chermack (Eds.), 2007 Academy of Human Resource Development Conference Proceedings (pp. 23-30). Bowling Green: AHRD.
Included	Guba, E. G., & Lincoln, Y. S. (2005). Paradigmatic controversies, contradictions, and emerging confluence. In N. K. Denzin & Y.S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (3 <sup>rd</sup> ed.) (pp. 191–215). Thousand Oaks, CA: Sage Publications.
Included	Lincoln, Y. S. (2005). Content, lived experience, and qualitative research. In R. A. Swanson & E. F. Holton (Eds.), <i>Research in organizations: Foundations and methods of inquiry</i> , (pp. 221–232). San Francisco, CA: Berrett-Koehler.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S., & Cannella, G. S. (2004). Dangerous discourses: Methodological conservatism and governmental regimes of truth. <i>Qualitative Inquiry</i> , 10, 5-14.
Excluded - Not accessible	Lynham, S. A. (2002a). <i>Applied theory building</i> . Unpublished course notes, College Station, TX: Texas A&M University.
Included	Lynham, S. A. (2002b). The general method of theory-building research in applied disciplines. <i>Advances in Developing Human Resources</i> , 4(3), 221–241.
Included	Lynham, S. A., & R. J. Torracco. (2001). <i>HRD theory and theory building preconference</i> . Tulsa, OK: Academy of Human Resource Development.
Excluded - Not accessible	Lynham, S. A. (2000a). <i>The development and operationalization of a theory of responsible leadership for performance</i> . Technical Report. HRD Research Center, St. Paul, MN: UMN.
Included	Lynham, S. A. (2000b). Theory building in the human resource development profession. <i>Human Resource Development Quarterly</i> 11(2), 159–178.
Included	Denzin, N. K., & Y. S. Lincoln (2000). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y.S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (2 <sup>nd</sup> ed.) (pp. 1–32). Thousand Oaks, CA: Sage Publications.
Included	Lincoln, Y.S., & Denzin, N.K. (2000). The Seventh Moment: Out of the Past. In N. K. Denzin & Y.S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (2 <sup>nd</sup> ed.) (pp. 1047–1065). Thousand Oaks, CA: Sage Publications.
Included	Lincoln, Y.S., & Guba, E.G. (2000). Paradigmatic Controversies, Contradictions, and Emerging Confluence. In N. K. Denzin & Y. S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (2 <sup>nd</sup> ed.) (pp. 163-188). Thousand Oaks, CA: Sage Publications.
Excluded - Not accessible	Lincoln, Y. S. (in press 2000). Varieties of validity: Quality in qualitative research. In S. Smart & C. Ethington (Eds.), <i>Higher Education: Handbook of Theory and Research</i> . New York, NY: Agathon Press.
Excluded - Not accessible	Lincoln, Y. S. (1999, June). Courage, vulnerability and truth. Keynote address delivered at the conference <i>Reclaiming Voice II: Ethnographic Inquiry and Qualitative Research in a Postmodern Age</i> . Irvine, CA: University of California.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S. (1998a). Commodification and contradiction in faculty life in the U.S. <i>Studies in Cultures, Organizations, and Societies</i> , 5(1), 1-16.

Included	Lincoln, Y. S. (1998b). From understanding to action: New imperatives, new criteria, new methods for interpretive researchers. <i>Theory and Research in Social Education</i> , 26(1), 12-29.
Included	Lincoln, Y. S. (1998c). The ethics of teaching qualitative research. <i>Qualitative Inquiry</i> , 4, 305-317.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S. (1998d). When research is not enough: Community, care, and love. <i>Presidential Address delivered at the annual meeting of the Association for the Study of Higher Education</i> . Miami, FL. 1998 not accessible; 2000 reviewed in its place: Lincoln, Y.S. (2000). When research is not enough: Community, care, and love. <i>The Review of Higher Education</i> , 23(3), 241-256.
Included	Lincoln, Y. S. (1997a). Reading response-ability: Ethnography and prudential caring. <i>Qualitative Studies in Education</i> , 10(2), 161-164.
Included	Lincoln, Y. S. (1997b). What constitutes quality in interpretive research? In C. K. Kinzer, K. A. Hinchman, and D. J. Leu (Eds.), <i>Inquiries in Literacy: Theory and Practice</i> (pp. 54-68). Chicago, IL: National Reading Conference.
Included	Guba, E. G. (1996). What happened to me on the road to Damascus? In L. Heshusius & K. Ballard (Eds.), <i>From Positivism to Interpretivism and Beyond: Tales of Transformation in Education and Social Research</i> (pp. 43-49). New York, NY: Teachers College Press.
Included	Lincoln, Y. S. (1995a). Emerging Criteria for Quality in Qualitative and Interpretive Research. <i>Qualitative Inquiry</i> , 1(3), 275-289.
Included	Lincoln, Y. S. (1995b). The sixth moment: Emerging problems in qualitative research. <i>Symbolic Interaction Review Annual</i> , 19, 37-55.
Included	Denzin, N. K., & Lincoln, Y. S. (1994). Introduction: Entering the field of qualitative research. In N. K. Denzin and Y. S. Lincoln (Eds.), <i>The Handbook of Qualitative Research</i> (pp. 1-17). Newbury Park, CA: Sage Publications.
Included	Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y.S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (pp. 105-117). Thousand Oaks, CA: Sage Publications.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S. (1994). Emergent Paradigms and the Crisis in Psychology. <i>Interamerican Journal of Psychology</i> , 28(2), 139-154.
Included	Lincoln, Y. S. & Denzin, D. K. (1994). The Fifth Moment. In N. K. Denzin and Y. S. Lincoln (Eds.), <i>Handbook of Qualitative Research</i> (pp. 575-585). Newbury Park, CA: Sage Publications.
Included	Lincoln, Y. S. (1993a). I and thou: Method, voice, and roles in research with the silenced. In D. McLaughlin & W. G. Tierney (Eds.), <i>Naming Silenced Lives: Personal Narratives and the Process of Educational Change</i> (pp. 29-47). New York, NY: Routledge.
Excluded - Not accessible	Lincoln, Y. S. (1993b). <i>Love among the ruins: Higher education in crisis</i> . Paper presented at the annual meeting of the Association for the Study of Higher Education, Pittsburgh, PA.
Excluded - Not accessible	Lincoln, Y. S. (1993c). <i>Notes toward a fifth generation of evaluation: Lessons from the voiceless, or, Toward a postmodern politics of evaluation</i> . Paper presented at the Fifth Annual Meeting of the Southeast Evaluation Association, Tallahassee, FL.
Included	Guba, E. G. (1992). Relativism. <i>Curriculum Inquiry</i> , 22(1), 17-24.
Excluded - Not accessible	Lincoln, Y. S. (1991). <i>The detached observer and the passionate participant: Discourses in inquiry and science</i> . Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Excluded - Not accessible	Guba, E. G. (1990a). <i>Relativism</i> . Paper presented at the meeting of the American Educational Research Association, Boston, MA.
Included	Guba, E. G. (1990b). Subjectivity and objectivity. In E. W. Eisner & A. Peshkin's (Eds.), <i>Qualitative Inquiry in Education: The Continuing Debate</i> (pp. 74-91). New York, NY: Teachers College Press.
Included	Guba, E. G. (1990c). <i>The Paradigm Dialog</i> . Newbury Park, CA: Sage Publications.
Included	Lincoln, Y. S. (1990a). The Making of a Constructivist: A Remembrance of Transformations Past. In E. G. Guba (Ed.) <i>The Paradigm Dialog</i> (pp. 67-87). Newbury Park, CA: Sage Publications.
Included	Lincoln, Y. S. (1990b). Towards a Categorical Imperative for Qualitative Research. In E. W. Eisner & A. Peshkin's (Eds.), <i>Qualitative Inquiry in Education: The Continuing Debate</i> (pp. 277-295). New York, NY: Teachers College Press.
Included	Lincoln, Y. S., & Guba, E. G. (1990). Judging the quality of case study reports. <i>International Journal of Qualitative Studies in Education</i> , 3(1), 53-60.
Included	Guba, E. G., & Lincoln, Y. S. (1989). <i>Fourth Generation Evaluation</i> . Newbury Park, CA: Sage Publications.
Excluded - Not accessible	Lincoln, Y. S. (1989). Trouble in the land: The paradigm revolution in the academic disciplines. In John C. Smart (Ed.), <i>Higher Education: Handbook of Theory and Research</i> , (Volume 5, pp. 57-133). New York, NY: Agathon Press.
Included	Lincoln, Y. S., & Guba, E. G. (1989). Ethics: The failure of positivist science. <i>Review of Higher Education</i> , 12(3), 221-241.
Excluded - Not accessible	Guba, E. G. (1988). <i>Sorting out alternative paradigms for inquiry: Parameters and issues</i> . Unpublished proposal for the International Conference on Alternative Paradigms for Inquiry, San Francisco, CA.
Included	Guba, E. G., & Lincoln, Y. S. (1988). Do inquiry paradigms imply inquiry methodologies? In D.M Fetterman (Ed.), <i>Qualitative approaches to evaluation in education: The silent scientific revolution</i> (pp. 89-115). New York, NY: Praegers Publishers.
Excluded - Not accessible	Lincoln, Y. S. (1988a). <i>A categorical imperative for qualitative inquiry</i> . Paper presented at the Problems in Qualitative Research Conference, Palo Alto, CA: Stanford University.
Excluded - Not accessible	Lincoln, Y. S. (1988b). <i>The role of ideology in naturalistic research</i> . Paper presented at the American Educational Research Association, New Orleans, LA.
Included	Lincoln, Y. S., & Guba, E. G. (1988). Criteria for assessing naturalistic inquiries as reports. <i>Paper presented at the annual meeting of the American Educational Research Association</i> , New Orleans, LA.
Included	Guba, E. G. (1987a). Naturalistic Evaluation. In D.S. Cordray, H.S. Bloom, & R.J. Light (Eds.), <i>Evaluation Practice in Review: New directions for program evaluation</i> , (no 34, pp. 23-43) Jossey-Bass Publishers, San Francisco, CA.
Included	Guba, E. G. (1987b). What have we learned about naturalistic evaluation? <i>Evaluation Practice</i> , 8(1), 23-43.
Included	Guba, E. G., & Lincoln, Y. S. (1987). The countenances of fourth generation evaluation. In D.J. Palumbo (Ed.), <i>The politics of program evaluation</i> (pp. 202-234). Newbury Park, CA: Sage Publications.
Excluded - Not accessible	Lincoln, Y. S. (1987). <i>The passionate participant vs the detached observer</i> . Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.
Excluded - Not accessible	Lincoln, Y. S., & Guba, E. G. (1987). <i>Ethics: The failure of positivist science</i> . Paper presented at the annual meeting of the American Educational Research Association, Washington, D.C..

Excluded - Not accessible	Guba, E. G., & Lincoln, Y. S. (1986). <i>Types of inquiry defined in terms of an insider or outsider stance and inquirer or respondent control</i> . Unpublished mimeograph.
Included	Lincoln, Y. S. (1986). <i>The Development of Intrinsic Criteria for Authenticity: A model for trust in naturalistic researches</i> . Paper prepared for the Symposium "Issues of Trustworthiness and Authenticity in New-Paradigm Research", American Educational Research Association Annual Meeting, San Francisco, CA.
Included	Lincoln, Y. S., & Guba, E. G. (1986a). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. <i>New Directions for Program Evaluation</i> , 30, 73-84.
Included	Lincoln, Y. S., & Guba, E. G. (1986b). Research, Evaluation, and Policy Analysis: Heuristics for Disciplined Inquiry. <i>Review of Policy Research</i> , 5(3), 536-565.
Excluded - Not accessible	Lincoln, Y. S., & Guba, E. G. (1986 in press). <i>Understanding and doing naturalistic inquiry</i> . Beverly Hills, CA: Sage Publications.
Included	Guba, E. G. (1985). The Context of Emergent Paradigm Research. In Y. S. Lincoln (Ed.), <i>Organizational theory and inquiry</i> (pp. 79-104). Beverly Hills, CA: Sage Publications.
Excluded - Not accessible	Guba, E. G., & Lincoln, Y. S. (1985). <i>The Countenances of Fourth Generation Evaluation: Description, Judgment, and Negotiation</i> . Paper presented at Evaluation Network annual meeting, Toronto, Canada.
Included	Lincoln, Y. S. (1985a). Epilogue: Dictionaries for Languages not yet Spoken. In Y. S. Lincoln (Ed.), <i>Organizational theory and inquiry</i> (pp. 221-228). Beverly Hills, CA: Sage Publications.
Included	Lincoln, Y. S. (1985b). Introduction. In Y. S. Lincoln (Ed.), <i>Organizational theory and inquiry</i> (pp. 29-40). Beverly Hills, CA: Sage Publications.
Included	Lincoln, Y. S. (1985c). Preface. In Y. S. Lincoln (Ed.), <i>Organizational theory and inquiry</i> (pp. 21-25). Beverly Hills, CA: Sage Publications.
Included	Lincoln, Y. S. (1985d). The ERS standards for program evaluation: Guidelines for a fledging profession. <i>Evaluation and Program Planning</i> , 8, 251-253.
Included	Lincoln, Y. S. (1985e). The Substance of the Emergent Paradigm: Implications for researchers. In Y. S. Lincoln (Ed.), <i>Organizational theory and inquiry</i> (pp. 137-157). Beverly Hills, CA: Sage Publications.
Excluded - Not accessible	Lincoln, Y. S., & Guba, E. G. (1985a). <i>Ethics and Naturalistic Inquiry</i> . Unpublished manuscript, University of Kansas.
Included	Lincoln, Y. S., & Guba, E. G. (1985b). <i>Naturalistic inquiry</i> . Beverly Hills, CA: Sage Publications.
Included	Guba, E. G. (1984). The Effect of Definitions of Policy on the Nature and Outcomes of Policy Analysis. <i>Educational Leadership</i> , 42, 63-70.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S. (1983). The structure of promotion and tenure decisions in institutions of higher education: A policy analysis. <i>Review of Higher Education</i> , 6, 217-232.
Excluded - Not accessible	Guba, E. G. (1982). <i>The role of client-experienced policy on the nature and outcomes of policy analysis</i> . Unpublished paper. Lawrence, KS: University of Kansas, Center for Public Affairs.
Included	Guba, E. G., & Lincoln, Y. S. (1982a). Epistemological and Methodological Bases of Naturalistic Inquiry. <i>Educational Communication and Technology</i> , 30(4), 233-252.
Included	Guba, E. G., & Lincoln, Y. S. (1982b). The Place of Values in Needs Assessment. <i>Educational Evaluation and Policy Analysis</i> , 4(3), 311-320.
Excluded - Not accessible	Lincoln, Y. S., & Guba, E. G. (1982 in press). <i>Issues in naturalistic inquiry</i> . Manuscript in preparation



Included	Guba, E. G. (1981a). Criteria for Assessing the Trustworthiness of Naturalistic Inquiries. <i>Educational Communication and Technology</i> , 29(2), 75-91.
Included	Guba, E. G. (1981b). Investigative Journalism. In N. L. Smith (Ed.), <i>Metaphors for Evaluation: Sources of New Methods</i> . Beverly Hills, CA: Sage Publications.
Included	Guba, E. G., & Lincoln, Y. S. (1981). <i>Effective Evaluation: Improving the Usefulness of Evaluation Results Through Responsive and Naturalistic Approaches</i> . San Francisco, CA: Jossey-Bass Publishers.
Excluded - Not accessible	Lincoln, Y. S. (1981). <i>Strategies for Insuring the Dependability (reliability) of Naturalistic Studies</i> . Paper presented at the joint annual meeting of the Evaluation Network and the Evaluation Research Society, Austin, TX.
Excluded - Not accessible	Lincoln, Y. S., & Guba, E. G. (1981). <i>Do evaluator wear grass skirts? Going native and ethnocentrism as problems of utilization in evaluation</i> . Paper presented at the joint annual meeting of the Evaluation Network and the Evaluation Research Society, Austin, TX.
Included	Lincoln, Y. S. & Guba, E. G. (1980). The Distinction Between Merit and Worth in Evaluation. <i>Educational Evaluation and Policy Analysis</i> , 2(4), 61-71.
Included	Guba, E. G. (1979). Naturalistic Inquiry. <i>Improving Human Performance Quarterly</i> , 8(4), 268-276.
Excluded - Not accessible	Guba, E. G. (1978a). <i>Metaphor Adaptation Report: Investigative Journalism</i> . Research on Evaluation Project Monograph. Portland, OR: Northwest Regional Educational Laboratory.
Included	Guba, E. G. (1978b). <i>Toward a Methodology of Naturalistic Inquiry in Educational Evaluation</i> . Center for the Study of Evaluation Monograph Series in Evaluation, no. 8.
Excluded - Not accessible	Guba, E. G. (1978c). <i>The Methodological Rigor of Qualitative Methods</i> . Paper presented at University Council for Educational Administration workshop on Qualitative Methods in Administrative Research, Bloomington, IN.
Excluded - Not accessible	Guba, E. G. (1978d). <i>The use of metaphors in constructing theory</i> . Paper and Report Series, No.3, Research and Evaluation Program, Northwest Regional Educational Laboratory, Portland, OR.
Excluded - Not accessible	Lincoln, Y. S. (1978). <i>An Organizational Assessment of the Potential of Bureaus as Agencies for Knowledge Production and Utilization</i> . Unpublished doctoral dissertation, Indiana University.
Excluded - Did not meet inclusion criteria	Lincoln, Y. S., & Guba, E. G. (1978). Reward systems and emergent missions: Higher education's dilemma. <i>Phi Delta Kappan</i> , 59(7), 465-467.
Excluded - Not accessible	Guba, E. G. (1977). The State of the Art of Educational Evaluation. <i>Proceedings of the Evaluation Network Annual Meeting</i> , St. Louis, MO.
Included	Guba, E. G. (1975). Problems in Utilizing the Results of Evaluation. <i>Journal of Research and Development in Education</i> , 8, 42-54.
Included	Guba, E. G. (1969). The Failure of Education Evaluation. <i>Educational Technology</i> , 9(5), 29-38.
Excluded - Not accessible	Guba, E. G. (1967). Report on the Evaluation Provisions of Twenty-One Title III Proposals. <i>Report to the National Panel on Title III Evaluation</i> .

### Data Collection

Each source meeting inclusion criteria was reviewed in its entirety. The process of deconstructing ideas in the sources initially involved summarizing sources for their contributions to the development of the paradigm theory. Each source was summarized with a short citation



and a brief summary of its significant contribution(s) to the conceptualization of the inquiry paradigm phenomenon. The key ideas extracted from each source are summarized in Table 16, organized by publication date (oldest to newest), with a short citation of the source.

Table 16

*Table of Summarized Sources*

Short citation	Publication date	Summary of key ideas
Guba (1969)	1969	Critiques the viability of traditional methods of evaluation for assessing the impact of educational innovations.
Guba (1975)	1975	Provides commentary on “criteria of good evaluation” (p. 44) primarily from the scientific perspective; however, many of the criteria listed, e.g., internal validity and credibility, are early signs of consideration for criteria significant to both the scientific and naturalistic perspectives, respectively. Eleven criteria of good evaluation are discussed: (a) Internal validity, (b) External validity, (c) Reliability, (d) Objectivity, (e) Relevance, (f) Importance, (g) Scope, (h) Credibility, (i) Timeliness, (j) Pervasiveness, and (k) Efficiency.
Guba (1978b)	1978	Important seminal work in the sample. Discusses a number of critical points including: A model of inquiry approaches along two dimensions: high to low control over antecedent conditions and high to low control over noted outcomes or responses of interest. 14 distinctions are made between the lens of the naturalist and the lens of the conventionalist: (a) philosophical base: positivism vs phenomenological, (b) inquiry paradigm: experimental vs ethnographic, (c) inquiry purpose: verification vs discovery of phenomena) (d) stance of the inquirer: reductionist vs expansionist, (e) the framework/design: preordinate, fixed design vs emergent, variable design, (f) the style of coming upon the elements to be studied as intervention: manipulation of independent and dependent variables vs selection of those variables considered critical for inquiry purposes, (g) the reality manifold as a singular, objective reality vs multiple, subjective realities, (h) the value structure of value free neutrality vs advocacy of multiple values, (i) the setting of inquiry such that it is contrived vs a nature, non-contrived environment, (j) Context, as in the role of context inquiry, where inquiry is either context free vs context embedded, (k) conditions of study as controlled vs uncontrolled (invited interference), (l) treatment as the stable and controlled cause of an effect vs anti-treatment or at best antecedent in time, but unstable and variant over time, (m) the scope of inquiry as limited and narrow, e.g., molecular, vs broadly considering any variables, e.g., molar, and (n) inquiry methods emphasizing objective inter-subject agreement between two competent, neutral observers vs confirmability as agreement among a variety of information sources. First discussion of "middle range methodological" issues/questions. Three core middle range problems, or methodological issues, of naturalistic inquiry are discussed. These are (a) Boundary problems, (b) Focusing problems, and (c) Problems of authenticity discussed.

		<p>First presentation of problem syllogism.</p> <p>First presentation of specific criteria of quality for convention and naturalist inquiry.</p>
Guba (1979)	1979	<p>First presentation of specific foundational assumptions for scientific and naturalistic paradigms.</p> <p>The three basic assumptions of the "scientific" model are presented as (a) the assumption of singular reality, (b) the assumption of subject-object duality [e.g., the inquirer will have no effect on the phenomena being studied], and (c) the assumption of generalizability. The three basic assumptions of the naturalist paradigm are presented as (a) the assumption of multiple realities, (b) the assumption of subject-object inter-relatedness, and (c) the assumption of contextuality.</p> <p>Also covers a subset of the 14 "distinctions" made in Guba (1978b)</p>
Lincoln & Guba (1980)	1980	<p>First discussion and definition of merit versus worth in evaluation, which closely parallels scientific judgments of merit and naturalistic judgments of worth. Merit and Worth are referenced numerous times throughout the future publications.</p> <p>"While merit decisions reinforce decisions of worth, and vice versa, they are separate decisions, made on separate criteria, and they require different methodological approaches to be established" (p. 67).</p> <p>Provides a 2x2 of merit/worth by formative/summative evaluations pp. 68-69.</p>
Guba & Lincoln (1981)	1981	<p>Not necessarily seminal (as was Guba [1978b]), but, in the least, first fully unpacked representation of ideas. 4 relevant chapters:</p> <p><u>Chapter 3</u>: Much of chapter 3 echoes the content of Lincoln &amp; Guba (1980) on the concepts of merit and worth. Authors highlight that "...while merit remains more or less constant, at least in the sense that it is not unreasonable to expect that consensus about an entity's merit can be reached, worth can and does change dramatically: <i>change the context and you change the worth</i>" (p. 43).</p> <p><u>Chapter 4</u>: Extensive discussion of three basic (noted as "simplistic and inadequate", p. 56) axioms for the scientific and naturalistic paradigms of inquiry: (a) <i>Assumptions About Reality</i>, (b) <i>Assumptions About the Inquirer-Subject Relationship</i> and, (c) <i>Assumptions About the Nature of "Truth" Statements</i>. Seven general postures of the scientific and naturalistic paradigms are described: (a) Preferred Techniques, (b) Quality Criterion, (c) Source of Theory, (d) Questions of Causality, (e) Knowledge Types Used, (f) Stance, and (g) Inquiry Purpose. Eight specific methodological postures are described: (a) Instrument (b) Timing of the Specification of Data Collection and Analysis Rules, (c) Design, (d) Style, (e) Setting, (f) Treatment, (g) Analytic Units, and (h) Contextual Elements. Another references to 2x2 table of inquirer constraints: "inquiry based on the extent to which the investigator places constraints upon two dimensions: antecedent conditions and outputs." (p. 79).</p> <p><u>Chapter 5</u>: Extensive discussion and description of the three classes of problems: problems of bounding, problems of focusing, and problems of rigor. Early presentation and discussion of four fundamental issues for inquiry, later to be expressed as quality criteria: "The four terms naming these concerns within the scientific paradigm are, of course, internal validity for truth value, external validity or generalizability for applicability, reliability for consistency, and objectivity for neutrality. We propose certain analogous terms as more appropriate to the naturalistic paradigm: credibility for truth value, fittingness for applicability, "auditability" for consistency, and confirmability for neutrality" (p. 104).</p> <p><u>Chapter 6</u>: Early reference to the human or inquirer instrument, i.e., "human beings as instruments" (p. 72). Extensive discussion about seven characteristics of the human instrument: (a) Responsiveness, (b) Adaptability, (c) Holistic Emphasis, (d) Knowledge Base Expansion, (e) Processual Immediacy, (f)</p>

		<p>Opportunities for Clarification and Summarization, and (g) Opportunity to Explore Atypical or Idiosyncratic Responses.</p>
Guba (1981b)	1981	<p>Discusses the process of formalizing a logic-in-use into a reconstructed logic with regard to models of inquiry. The author notes both the costs, i.e., developing a sterile, rote orthodoxy, and the benefits, i.e., guide the novice, offer benchmarks or relative standards for the expert, provide a language for communication and conceptualization. Includes discussion of the adaptation of naturalistic methodology to the field of evaluation.</p>
Guba (1981a)	1981	<p>Early refined side-by-side presentation of key assumptions and positions for the naturalistic versus rationalistic paradigms. Of particular importance is the specification of a general subject (e.g., axiom subject) and paradigmatic position on each subject (e.g., axiom position). Also an early presentation of axiom-like subjects for quality, or “trustworthiness” and expanded discussion on the specific quality criteria, as axiom-like positions, for naturalistic and rationalistic paradigms; the four concerns are (a) Truth value – “How can one establish confidence in the “truth” of the findings of a particular inquiry for the subjects (respondents) with which and the context in which the inquiry was carried out?” (p. 79); (b) Applicability – “How can one determine the degree to which the findings of a particular inquiry may have applicability in other contexts or with other subjects (respondents)?” (pp. 79-80); (c) Consistency – “How can one determine whether the findings of an inquiry would be consistently repeated if the inquiry were replicated with the same (or similar) subjects (respondents) in the same (or similar) context?” (p. 80); and (d) Neutrality – “How can one establish the degree to which the findings of an inquiry are a function solely of subjects (respondents) and conditions of the inquiry and not of the biases, motivations, interests, perspectives, and so on of the inquirer?” (p. 80). Ten key assumptions are discussed upon which rationalistic and naturalistic inquiries differ: (a) The nature of reality: singular versus multiple, (b) The nature of the inquirer/object relationship: the inquirer and object are independent versus the inquirer and respondent/object are interrelated, (c) The nature of truth statements: context free generalizations aimed at nomothetic knowledge versus context dependent working hypotheses aimed at idiographic knowledge, (d) Preference (although not singular reliance upon) of methods: quantitative versus qualitative, (e) Quality criterion: rigor versus relevance, (f) Source of theory for inquiry: a priori, hypothetico-deductive type of theory versus emergent, grounded theory, (g) Knowledge types used: propositional only versus tacit and propositional, (h) Instruments: objective neutral instruments versus use of the self as instrument, (i) Design: preordinate design versus emergent, and (j) Setting: controlled laboratory setting versus natural real world setting. A table is presented that generalizes the ways that rationalists handle issues of trustworthiness in their inquiries. The table has five columns with the following headings: (a) Inquiry can be affected by..., (b) Which produce effects of..., (c) To guard against which we..., (d) In hope this action will lead to..., (e) And produce findings that are...; together the headings with the specific statements from each row (four) can be combined to create four statements for how rationalists handle issues of trustworthiness in inquiry. A second table is presented that generalizes the ways that naturalists handle issues of trustworthiness in their inquiries. The table has five columns with the following headings: (a) Inquiry can be affected by..., (b) Which produce effects of..., (c) To guard against which we... during/after the study, (d) In hope these actions will lead to..., (e) And produce findings that are...; together the headings with the specific statements from each row (four) can also be combined to create four statements, as with the rationalist table, for how naturalists handle issues of trustworthiness in inquiry.</p>

Guba & Lincoln (1982b)	1982	<p>Focuses on needs assessment and the fit of naturalistic inquiry. Need is defined as: "A need is a requisite or desideratum generated as a discrepancy between a target state and an actual state, if and only if the presence of the conditions defined by the target state can be shown significantly to benefit an S and the absence of those conditions can be shown significantly to harm, indispose, or constrain an S." (p. 313)</p>
Guba & Lincoln (1982a)	1982	<p>Early presentation of paradigms as axiomatic systems (first inclusion of values). On the choice of paradigms: "A decision about which of several alternative axiom systems to use in a given case is made by testing the "fit" between each system and the case, a process analogous to (although not nearly as well understood as) testing data for fit to assumptions before deciding on which statistic to use in analyzing them. Hence, the axioms to be described in this section should not be judged on the grounds of their self-evident truth, their common-sense qualities, or their familiarity to the inquirer, but in terms of their fit to the phenomena into which one proposes to inquire" (p. 237). Axioms are defined "as the set of undemonstrated (and undemonstrable) propositions accepted by convention (even if only intuitively) or established by practice as the basic building blocks of some conceptual or theoretical structure or system" (p. 236). These rules, propositions, or 'theorems', may be proven as "by showing them to be logical derivatives from some simple and basic set of 'self-evident truths'" (p. 236) or axioms.</p> <p>Distinguishes rationalist from naturalist paradigms on (a) five basic axioms and (b) six postures taken by practitioners. Suggests a number of methods for responding to the four basic trustworthiness criteria. Axioms: (a) The nature of reality, (b) The inquirer-object relationship, (c) The nature of truth statements, (d) Attribution/explanation of action, and (e) The role of values in inquiry. Postures: (a) preferred methods, (b) source of theory, (c) knowledge types used, (d) instruments, (e) design, and (f) setting. A number of methods for meeting the four basic trustworthiness criteria are discussed; each criterion addresses truth value, applicability, consistency, and neutrality. The four quality criteria are (a) credibility, (b) transferability, (c) dependability, and (d) confirmability.</p>
Guba (1984)	1984	<p>Eight different definitions of policy analysis are considered. For a number of different policy types and definitions, Guba walks through the implications of each upon questions, data types, data sources, methodology, and outputs. The variation in definitions highlights the connection of the paradigm to features of inquiry that are separate features of the inquiry from the methodology. Here, the features listed included:</p> <ul style="list-style-type: none"> <li>- The kinds of questions that are asked.</li> <li>- The kinds of phenomenon-relevant data that are collected.</li> <li>- The sources of data that are collected.</li> <li>- The methodology that is used.</li> <li>- The inquiry products that emerge from the inquiry process.</li> </ul>
Lincoln & Guba (1985b)	1985	<p>Important in-depth treatment of a number of critical issues and concepts, but not necessarily the "first" time the ideas are presented.</p> <p>Extensive discussion of paradigms, axiom systems, and the axiom systems of naturalism and positivism; includes extensive treatment of (a) The nature of reality, (b) The relationship of knower to known, (c) The possibility of generalization, (d) The possibility of causal linkages, and (e) The role of values. Defines characteristics of operationalized axiom systems and presents 14 operational characteristics of naturalistic inquiry.</p> <p>Disciplined inquiry is defined and discussed. Presented in the context of the "twin criteria of <i>inspectable</i> and <i>verifiable</i> process and product".</p> <p>Extensive discussion of naturalistic methodology and research design, including proposal of ten naturalistic research design elements.</p> <p>Extensive discussion of the details of establishing trustworthiness and the special criteria for trustworthiness (operational characteristic #14) for both conventional</p>

		and naturalistic paradigms; four quality <i>subjects</i> : (a) Truth value, (b) Applicability, (c) Consistency, and (d) Neutrality.
Lincoln (1985e)	1985	Discusses paradigms as the foundations that guide action: “most of us carry out our work, whatever that might be, without reflecting about the epistemological foundations (value assumptions) undergirding action. We have internalized a set of beliefs, and we act upon them without much thought.” (p. 137) Presents inquiry in a means-ends relationship, where, “By means and ends I mean what researchers do to gather information and what formats they use to finally report what they found. The argument can be mounted here that these means and ends are synergistic, that they are mutually reinforcing, and that they exhibit value resonance with the axioms... What is suggested is that means and ends, like the axioms that undergird them, have not been considered as a logical set. It is to the means and ends-for most inquirers, the substance of their activities-that this argument is directed.” (p. 140) Fourteen derivatives of the naturalistic axioms are presented and discussed. Further discussion of logical dependence and synergy of derivative postures.
Lincoln (1985d)	1985	Reviews the standards for evaluation proposed by the (ERS Standards Committee, 1982) and discusses the value assumptions underlying the standards. Five assumptions are discussed: (a) evaluation as a linear process, (b) a priori design, (c) identifying cause and effect relations, (d) formal authority vs audience, and (e) value and methodology independence. Early extension of the axiom for “the role of values in inquiry” into methodology and research design.
Lincoln (1985c)	1985	Discusses the metaphor of paradigms as numerous teams all playing on the same field but by different rules and not everybody recognizes that different games are being played simultaneously to different ends. Author discusses personal frustration associated with trying to articulate what the different paradigms were and what their different rules were.
Lincoln (1985b)	1985	Discusses the nature of paradigms and further describes disciplined inquiry: “The other is a paradigm of disciplined inquiry, concerned with how we explore the world, how it is we come to systematize or order knowledge about the world, and what methods might be most appropriate for accomplishing that end.” (p. 31) Discusses the relationship of axiomatic systems and paradigms. Early quote for <i>as we think, so do we act</i> : “Paradigm sets the <i>context</i> of assumptions for the inquiry (these are often implicit; but as we think, so do we act)” (p. 36). Early discussion of postpositivism as the emergent paradigm.
Lincoln (1985a)	1985	Positions the text as a description of a new paradigm. Comments on the time of change occurring: “Guba argues that definitions of what it is we know, what it is that we think we can know, and how we will come to know it can change, and furthermore, are changing. The old rules that governed the conduct of disciplined substantive inquiry are undergoing stress and the structures are unsafe, if not indeed collapse” (pp. 221-222). Describes the nature of creating language to not only describe, but also create. Similar to Weick’s idea of talking a phenomenon into existence: “Some of the battle, however, goes on at the construct level also. In earlier work (Lincoln & Guba, 1985) the example of Orwell’s 1984 was used to remind the reader that when words do not exist for concepts and constructs, there is no recognition that such states are possible... Without words to shape the concepts, the drive for human freedom, for liberty of thought and action slowly disappears.” (p. 222)
Guba (1985)	1985	Early introduction of the critical realist axiom position as something in between the naïve realism of positivism and the multiple, constructed reality of naturalism. Early introduction of a three paradigm framework for positivist, postpositivist, and constructivist paradigms even though termed the “positivist view (normal orthodoxy)”, the “transitional view (retrenchment neo-orthodoxy)”, and the “postpositivist view (emergent nonorthodoxy)”.

		Describes five axioms of the positivist and naturalist paradigms: (a) Axiom 1: The nature of reality (ontology), (b) Axiom 2: The inquirer-respondent relationship (subject-object dualism), (c) Axiom 3: The purpose of inquiry (generalization), (d) Axiom 4: The nature of explanation (causality), and (e) Axiom 5: The role of values in inquiry (axiology).
Lincoln & Guba (1986b)	1986	Disciplined inquiry defined: "That is, to qualify as disciplined, the report of an inquiry must inform the reader, in ways that are publicly confirmable, what the nature of the 'raw' data is, the sources of those data, and the context in which they were collected (for example, a laboratory, the respondents' work places, and the like). At the same time, the processes for transforming the data into information—interpretations, conclusions, extrapolations, recommendations—must also be apparent to the reader; they too must be publicly confirmable so that their logic and coherence can be tested." (p. 447). Three questions are listed that every inquirer should be able to answer about their inquiries if they are to be considered disciplined: "[1] Are the raw materials clearly displayed? [2] Do I understand the logic by which the data were reorganized into the argument? [3] Does the argument exhibit logic and coherence?" (pp. 547-548). Here the authors define and distinguish research, evaluation, and policy analysis as three forms of disciplined inquiry.
Lincoln & Guba (1986a)	1986	Five axiomatic subjects are discussed: (a) Axiom concerned with the nature of reality, (b) Axiom concerned with the nature of "truth" statements, (c) Axiom concerned with explanation, (d) Axiom concerned with the nature of the inquirer-respondent relationship, and (e) Axiom concerned with the role of values in inquiry. Issues of inquiry quality are discussed relevant to four basic questions: "These criteria are intended to respond to four basic questions (roughly, those concerned with truth value, applicability, consistency, and neutrality)" (p. 76). The four basic issues for quality represent the concept of rigor in the conventional paradigm, i.e., truth value (internal validity), applicability (external validity or generalizability), consistency (reliability or replicability), and neutrality (objectivity), and trustworthiness in the naturalistic paradigm, i.e., "thus, we have suggested credibility as an analog to internal validity, transferability as an analog to external validity, dependability as an analog to reliability, and confirmability as an analog to objectivity. We shall refer to these criteria as criteria of trustworthiness (itself a parallel to the term <i>rigor</i> )." (pp. 76-77). In addition, five authenticity criteria are discussed: (a) Fairness, (b) Ontological Authenticity, (c) Educative Authenticity, (d) Catalytic Authenticity, and (e) Tactical Authenticity
Lincoln (1986)	1986	Discusses the trustworthiness criteria of positivism as "internal and external validity, reliability, and objectivity" (p. 3), and the trustworthiness criteria for naturalism, defined in terms that parallel those of positivism, were listed as "credibility, transferability, dependability, and confirmability" (p. 4). Five authenticity criteria are also discussed: (a) Fairness, (b) Ontological Authenticity, (c) Educative Authenticity, (d) Catalytic Authenticity, and (e) Tactical Authenticity. On the advantage of naturalism over positivism through the presence of authenticity criteria: "In positivism, procedural and methodological criteria alone determine the rigor, whereas ethical and authenticity criteria enter in determining the trustworthiness of the inquiry" (p. 21).
Guba & Lincoln (1987)	1987	Merit and Worth are discussed as intrinsic and extrinsic characteristics of the evaluand. Eight distinctive features of fourth-generation are discussed: (a) Evaluation is a social-political process, (b) Evaluation is a learning/teaching process, (c) Evaluation is a continuous, recursive, and divergent process, (d) Evaluation is a process that creates "reality," (e) Evaluation is an emergent process, (f) Evaluation is a process with unpredictable outcomes, (g) Evaluation is a collaborative process, and (h) The agenda for negotiation is best displayed in a

		<p>case-study format, with items requiring negotiation being spelled out in relation to the particulars of the case.</p> <p>Criteria of technical adequacy in evaluations for the conventional scientific paradigm are listed as internal validity, external validity (or generalizability), reliability, and objectivity.</p> <p>Criteria of technical adequacy in evaluations for fourth generation evaluation are listed as credibility, transferability, dependability, and confirmability.</p> <p>Five additional criteria of adequacy for the fourth generation evaluation are proposed: “We propose five additional criteria that are applicable to fourth generation evaluation on the grounds that they “fit” the new style: <i>openness, relevance, fairness, ethicality, and increased understanding.</i>”</p>
Guba (1987b)	1987	<p>Discusses the difference between naturalistic methods and worldview as one of qualitative techniques versus “thinking naturalistically” that “inevitably changes both the meaning and practice of evaluation in similarly revolutionary ways.” (p. 26). A framework is presented for five types of uses for naturalistic inquiry: a) exploration with its goals of discovery and generation, b) description with its goals of contextualization and process monitoring, c) illustration with its goals of insight and exemplification, d) realization with its goal of vicarious experience, and e) testing.</p> <p>Discusses the appropriateness of mixing methods, both naturalistic and conventional paradigm accommodate both quantitative and qualitative methods; however, with regard to mixing paradigms “no possibility exists that there can be an accommodation at the paradigm level” (p. 30)</p> <p>Extensive discussion of axioms systems, using opposite assumptions to derive proofs of axioms, the test of fit of axioms with the real world, theorems as logical derivatives of axioms (versus logical proofs). Three axiom subjects are discussed (Ontology, Epistemology, and Methodology) and the three specific axiom positions to each subject are discussed for the conventional and naturalistic paradigms. (a) Ontology – Realist vs Relativist, (b) Epistemology – Dualist, Objectivist vs Monist, Subjectivist, and (c) Methodology – Interventionist vs Hermeneutic.</p> <p>Early presentation of 13 derivative “theorems” for both positivist and naturalist paradigms; no theorem headings/subjects are provided here, but are provided later in Guba &amp; Lincoln, 1989.</p> <p>High level discussion on criteria of quality.</p>
Guba (1987a)	1987	<p>This source is nearly identical in content to 1987b. All discussion in 1987b pertains here in verbatim.</p>
Lincoln & Guba (1988)	1988	<p>The criteria of quality process in disciplined inquiry are discussed: the “truth value” (internal validity vs credibility), applicability (external validity vs transferability), consistency (reliability vs dependability) and neutrality (objectivity vs confirmability). In addition, the five authenticity criteria are discussed: fairness, ontological authenticity, educative authenticity, catalytic authenticity and tactical authenticity</p> <p>First presentation of quality criteria for the products of inquiry to complement criteria for the process of inquiry. (a) axiomatic criteria, (b) rhetorical criteria, (c) action criteria, and (d) application or transferability criteria.</p>
Guba & Lincoln (1988)	1988	<p>Presents a five axiom framework for the conventional and naturalistic paradigms. Authors critique distinguishing paradigms at the methods level rather than philosophical paradigm level.</p> <p>Analogy to methodology in reference to differences between method and methodology: “Leaving aside the counterargument that could be made against this advice because of its know-nothing nature, we find a more compelling reason to reject it: that this position confuses methodology with method. It may very well be the case that there is no immediate connection discernible between the methods-the tools and techniques-that an investigator uses and the inquiry paradigm that guides him or her. On seeing a man using a hammer, we cannot</p>

		<p>tell -whether he is operating as a carpenter, an electrician, or a plumber. What we be quite sure of, however, is that the way the hammer is used will greatly depend on whether the user construes himself or herself as a carpenter, electrician, or plumber. The hammer may be a method, but using it in the service of carpentry is an instance of methodology. One can mix and match, or blend, hammers, saws, wrenches, levels, and the like, but one cannot mix and match or blend carpentry with, say, plumbing.” (p. 91)</p> <p>First articulation of differentiating characteristics of methodology: (a) what each is directed towards, (b) what each holds inviolable, (c) their posture as systems, (d) their posture as processes, (e) their posture on control, (f) the test for believability, and (g) anticipated outcomes. Extensive discussion of the contexts of discovery and verification. Full models of the methodologies of the conventional and naturalistic paradigms provided graphically and discussed in detail</p> <p>Interesting discussion of the “set of entry conditions or essentials that must be satisfied to warrant beginning... [an] inquiry” (p. 103).</p> <p>Describes four interacting elements of naturalistic research design: sampling, data analysis, theory development, and design development</p> <p>Quality criteria for both paradigms discussed, trustworthiness and authenticity (naturalistic only).</p>
Lincoln & Guba (1989)	1989	<p>Early discussion of the role of ethics in research design. Differentiates ethical manifestations in positivist and naturalistic inquiry.</p>
Guba & Lincoln (1989)	1989	<p>Early reference to “constructivist paradigm” as analog to naturalistic paradigm.</p> <p>Early reference to modern day postpositivism as modified positivism rather than postpositivism as analog to the emerging relativist alternative paradigms.</p> <p>Discusses the history of evaluation as four generations of evaluation: First Generation: Measurement, Second Generation: Description, Third Generation: Description, Fourth Generation: Responsive Constructivist Evaluation.</p> <p>Contrasts methodological implications on evaluation for the postpositivist and constructivist paradigms on what might be characterized as postures towards: (a) entry conditions for inquiry, (b) relationship to hypotheses, (c) relationship of meaning and context, (d) nature of inquiry outcome, and 5) the nature of intent driving outcomes.</p> <p>Three further philosophical issues of the two paradigms are discussed: (a) theory-ladenness of facts and the factual underdetermination of theory, (b) value ladenness of facts, and (c) interactive nature of the knower-known dyad.</p> <p>Early discussion of a paradigm as "a basic belief system" that answers "three basic questions": What is there that can be known? (b) What is the relationship of the knower to the known (or the knowable)?, and (c) What are the ways of finding out knowledge?</p> <p>Extensive discussion of each subject/basic question and axiom position/answer for conventional vs constructivist paradigms. Presentation of 14 theorems for conventional and constructivist paradigms; the only difference between the 13 theorems proposed in by Guba in 1987 and the 14 theorems proposed by Guba and Lincoln in 1989 was the addition of a theorem for the independence of facts and theories (Guba &amp; Lincoln, 1989, p. 105).</p> <p>Methodology defined and full models of the methodology of the conventional paradigm and the naturalistic paradigm are provided graphically and discussed in detail. Further discussion about the “entry conditions” for inquiry.</p> <p>Further discussion on mixing methods versus mixing paradigms.</p> <p>Discussion on convention criteria for rigor and parallel, <u>foundational</u> criteria for trustworthiness in the constructivist paradigm. Discussion on research design techniques for achieving the parallel trustworthiness criteria of constructivism.</p> <p>Discussion of 5 authenticity criteria for the constructivist paradigm and early discussion about differentiation of rigor/trustworthiness as criteria of process/methodology while authenticity as criteria for product/outcome.</p>



		Research design techniques for achieving authenticity criteria are discussed.
Lincoln & Guba (1990)	1990	Continued discussion on the distinction between criteria of quality process and quality product. Four quality criteria of product are presented: (a) resonance, (b) rhetoric, (c) empowerment, and (d) applicability. Possibly modified from Lincoln & Guba, 1988. Extensive discussion of the process and criteria of judging quality product/output; highlights the difference between the process-product relationship for conventional and constructivist paradigm. In the conventional paradigm, rigor in process ensures quality of product, while in the naturalistic paradigm trustworthiness of process only ensures quality process but not necessarily/always quality product.
Lincoln (1990b)	1990	Discussion of ethical issues in quantitative versus qualitative research (and under different metaphysical belief systems as well), e.g., privacy, confidentiality, anonymity, co-construction, inquiry means-ends, etc. Discusses ontological, epistemological, and methodological belief systems of constructivist and positivist paradigms and their relationship to ethical issues such as deception and anonymity and contamination of data. Discusses the need to have adequacy judgments, similar to those for inquiry quality, driving ethical decisions and judgments as well as. Discussion of the manner that ethics should be incorporated into the many decision points in research design. Compares the paradigm shift from conventional to constructivist paradigms to the thinking about the embedded rules for disciplined inquiry within each and calls for a “rethinking of the rules lodged in the old paradigm” (p. 289). Presentation of a categorical imperative and a practical imperative as ethical principles for inquiry. Discussion of a cooperative inquiry model of research.
Lincoln (1990a)	1990	A reflection of Yvonna Lincoln’s history with paradigms. Discusses the movement from three to five and back to three axioms. Discussion of <i>parallel or foundational</i> criteria of quality. Discussion on developing authenticity criteria in Lincoln & Guba, 1986a. Discussion on the distinction between process and data in inquiries. Discussion on the focus on criteria of products and those of the constructivist paradigm. Discussion on the major differences are between paradigms and methodologies. Discussion on the three forms of disciplined inquiry sorted out in Lincoln & Guba, 1986b; Research, evaluation, and policy analysis. Discussion on mixing paradigms and methodologies. Discussion on knowledge accumulation.
Guba (1990c)	1990	The nature and definition of paradigms are discussed. Paradigms are presented as basic belief systems comprising three basic questions: the <i>ontological</i> , the <i>epistemological</i> , and the <i>methodological</i> questions. The positions, or answers to basic questions, are discussed for four paradigms that “guide disciplined inquiry” (p. 18) are discussed: positivist, postpositivist, critical, and constructivist. Discussion on the definition and nature of methodology, and, the relationship to disciplinary training. Discussion on quality criteria of process and product in disciplined inquiries. Extensive discussion on knowledge and knowledge accumulation across postpositivist, critical, and constructivist paradigms. Extensive discussion on regulative ideas in the postpositivist, critical, and constructivist paradigms.
Guba (1990b)	1990	Detailed discussion on objectivity and subjectivity, both definitionally from different paradigms, but also positionally as a product of knowledge under different fundamental belief systems. Discusses five ways to approach objectivity for postpositivists: (a) by focusing on the inquirer with reflexivity and openness, i.e., coming clean, (b) by a focus on the inquiry and its context by emphasis on method, i.e., methodological processes as safeguards, (c) the critical tradition or critical history, (d) critical community, and (e) by aggregating or focusing on groups of inquiries, i.e., meta-analysis.

		<p>The fundamental questions of basic philosophical belief systems are discussed: (a) the ontological question – “What is there that can be known-what is knowable? This question has conventionally been called the <i>ontological</i> question; essentially it deals with the assumptions one is willing to make about the <i>nature</i> of reality.” (p. 86), (b) the epistemological question – “What is the relationship of the knower to the known? This question has conventionally been called the <i>epistemological</i> question; obviously the assumptions one makes about this <i>process</i> aspect depend heavily on what one is willing to assume ontologically” (p. 86), and (c) the methodological question – “How can one go about finding out things? This question is conventionally called the <i>methodological</i> question; how one answers depends heavily on what one has decided earlier at the ontological <i>and</i> the epistemological levels” (p. 86). The idea of the questions asked creating the data discovered is discussed. Quality criteria of new paradigm inquiry products are discussed. Early detailed discussion of the critical realism of postpositivism. The distinction of objectivity as an achievable criterion versus a regulative ideal is discussed.</p> <p>Table of axioms and axiom positions for postpositivism, materialist feminist ethnography, and constructivism. For postpositivism: Ontology – Realist, Epistemology – Dualist, objectivist, Methodology – Descriptive, verifiatory. For materialist feminist ethnography: Ontology – Realist, Epistemology – Interactive, subjective, Methodology – Dialogic, transformative. For constructivist: Ontology – Relativist, consensual, Epistemology – Interactive, subjective, Methodology – hermeneutic/dialectic, reconstructive.</p>
Guba (1992)	1992	<p>Relativism is defined in the context of disciplined inquiry. Brief review of relativism as an assumption of the constructivist paradigm around metaphysical assumptions, truth vs more informed and sophisticated constructions, quantitative and qualitative methods, and criteria of quality.</p>
Lincoln (1993a)	1993	<p>Presents a discussion of quality criteria for critical inquiries, or into those with silenced lives. Early discussion of criteria for the critical paradigm include: (a) persuasiveness, (b) correspondence with the lives of the researched, (c) conveying vicarious experience or <i>feeling tone</i>, (d) provides an auditable methodological and analytic trail, (e) describes the interactive roles of researcher and researched in creating the narratives; (f) by providing texts thick description; (g) and by directing attention to inquiry’s role in the creation of social realities (just and unjust) and in redressing injustice. Discusses the role of the researched in critical inquiries.</p>
Lincoln & Denzin (1994)	1994	<p>Provides a review of the history of qualitative inquiry, i.e., the “moments”, and focuses discussion on the fifth moment as the future vision of qualitative inquiry. Six issues are described that characterize the fifth moment: (a) critique of positivism and postpositivism that is coupled with ongoing self-critique and self-appraisal, (b and c) the crises of representation and legitimation, (d) voice – agenda issues, (e) blurring of borders between science and religion, and (f) the influencing role of technology in qualitative inquiry. Provides discussion of the next/current moment in qualitative history.</p>
Guba & Lincoln (1994)	1994	<p>Extensive review and discussion of paradigms. Paradigm defined as basic belief system that answers three fundamental questions: Ontological, Epistemological, and Methodological. Table of metaphysical positions for positivism, postpositivism, critical theory, and constructivism with detailed descriptions of specific axiom positions for each paradigm.</p> <p>Early presentation of ten “consequences for the practical conduct of inquiry, as well as for the interpretation of findings and policy Choices”: (a) inquiry aim, (b) nature of knowledge, (c) knowledge accumulation, (d) goodness or quality criteria, (e) value, (f) ethics, (g) voice, (h) training, (i) accommodation, and (i) hegemony.</p> <p>Quality criteria for each paradigm are reviewed.</p>

Denzin & Lincoln (1994)	1994	<p>Early discussion of the five moments in the history of qualitative research. Extensive discussion on the nature of qualitative inquiry in general, versus quantitative, in different paradigms.</p> <p>Presents a model of five phases of qualitative inquiry.</p> <p>Paradigms as ontological, epistemological, and methodological belief systems are discussed and expanded upon for the positivist and postpositivist, constructivist-interpretive, critical (Marxist, emancipatory), and feminist-poststructural paradigms.</p> <p>Distinction made between research design and research strategy.</p>
Lincoln (1995b)	1995	<p>Reviews the first five moments of qualitative inquiry and proposes a new moment, the sixth moment: A time of confronting several issues. The sixth moment is characterized by 6 issues: (a) The role of politics, (b) Spirituality and Sacredness, (c) The Brewing Crisis in Ethics, (d) Authorship and Intellectual Property, (e) Problems with Voice, and (f) Whither Discourse. Discusses the nature of the “paradigm wars” and the acknowledgment of the different forms of knowing and the resulting different forms of coming to know.</p>
Lincoln (1995a)	1995	<p>A novel definition of disciplined inquiry offered: “Others of my colleagues seem to be less concerned with method, but disciplined inquiry is still characterized in my mind by thoughtful decisions about design strategies, including methods” (pp. 276-277).</p> <p>The basic question when it comes to quality for those seeking to do, understand, and use research: “...how do we separate good research from poor research across disciplines and traditions? That question still engages many scholars, both those seeking to do such research and those seeking to understand and to use it.” (p. 276). Presentation and discussion of foundational and parallel foundational quality criteria in addition to antifoundational intrinsic authenticity criteria. Eight emerging criteria of quality for interpretive research are discussed: (a) Standards for judging quality in the inquiry community, (b) Positionality, or standpoint judgments, (c) Community as arbiter of quality, (d) Voice, (e) Critical subjectivity, (f) Reciprocity, (g) Sacredness, and (h) Sharing the prerequisites of privilege.</p>
Guba (1996)	1996	<p>Paper offers an important complementary dialog by Guba to Lincoln’s chapter in the Paradigm Dialog on the making of a constructivist. Describes Guba’s shift from positivism to constructivism. A timeline of relevant experiences from the mid 60’s to early 80’s is implicit.</p>
Lincoln (1997b)	1997	<p>Notably reinforces the differences between methodological criteria on process/method and criteria more focused on product. Discussion of the difference between foundational criteria and nonfoundational or antifoundational criteria. Discusses the role of methodological criteria and disciplined inquiry. Presents scientific/conventional criteria for rigor (“methodological criteria” that rely upon method as means of guaranteeing quality): Internal validity (coherence), External validity (isomorphism), Reliability (replicability), and Objectivity (value-freedom). Presents constructivist criteria for trustworthiness (extrinsic “parallel methodological criteria” that rely upon data found in context to guarantee quality): Credibility (plausibility), Transferability (context embeddedness), Dependability (stability), and Confirmability (value explication). Presents constructivist authenticity criteria (intrinsic “authenticity/ethical criteria” that rely upon an internal ethical system and prompt to action to guarantee quality and fidelity in inquiry effort): Fairness, Ontological authenticity, Educative authenticity, Catalytic authenticity, and Tactical authenticity.</p> <p>Discusses the eight emerging criteria of constructivist inquiry that were discussed in Lincoln, 1995a, plus two additional criteria: caring and yearning. (a) Standards for judging quality in the inquiry community, (b) Positionality, or standpoint judgments, (c) Community as arbiter of quality, (d) Voice, (e) Critical</p>

		<p>subjectivity, (f) Reciprocity, (g) Sacredness, (h) Sharing the prerequisites of privilege, (i) Caring, and (j) Yearning.</p> <p>Poses the question of <i>why have criteria of quality?</i> It is not because we know exactly how things should be; rather, it is quite the opposite, it is because we do not know and must make judgment calls.</p>
Lincoln (1997a)	1997	<p>Presents a new conversation both on validity itself, verisimilitude / isomorphism, and teaching disciplined inquiry from the perspective of validity as a regulative ideal. Validity defined and discussed: "At its heart, validity questions the congruence between some representation of an object, context, situation, event, or person and the object that is "signified" by the verbal representation. Validity's logic and justification reside in verisimilitude or isomorphism, the extent to which some signifier's referent can be recognized in a physical or social world. Validity is critical to researchers and research consumers because another question is important to us: What is the "truth" of these findings, and thus, how far can we trust the reported findings to guide action? The purported verisimilitude is what permits "trustworthiness", or the judgments that findings from a given study are worthy of our confidence in their close relationship to some reality on which we have received an account" (p. 161).</p> <p>On the philosophical importance of validity in social inquiry: "...Because the arguments about validity are so critical to the larger debate surrounding usable knowledge of the social world – whose knowledge, generated by whom, for whom, and for what purpose – validity itself may appear the most convincing portal into understanding... research more broadly" (p. 162)</p>
Lincoln (1998c)	1998	<p>Considerable discussion about ethics in inquiry. While some of the discussion is relevant to ethical criteria for interpretive inquiry, largely the discussion was oriented towards how to teach ethics of qualitative inquiry to students.</p>
Lincoln (1998b)	1998	<p>New discussion of emerging criteria and skills for constructivist inquiry. New discussion on shifts that occurred from positivist lenses to constructivist lenses (i.e., the shift from prediction and control to understanding). The nature of social knowledge, conventional knowledge, and constructivist knowledge are reviewed. The criteria for quality in the constructivist paradigm are reviewed. Six skills are discussed for new paradigm inquiry that help inquirers achieve the call to action of new paradigm inquiry: (a) Facilitation and Group Dynamics, (b) Mediation, (c) Collaboration and Cooperation, (d) Orchestration, (e) Commitment to diversity and pluralism, and (f) Portrayal.</p>
Lincoln & Guba (2000)	2000	<p>Revised chapter in the 2<sup>nd</sup> edition of the handbook; revision includes ongoing discussion of many of the same topics, i.e., belief systems of paradigms, legitimacy, hegemony, etc. New conversation on topics such as commensurability and mixing methodologies.</p> <p>Authors expand paradigmatic framework of axiom subjects and axiom positions to include participatory/cooperative paradigm, totaling five paradigms to date: "the paradigms of positivism, postpositivism, critical theory, and constructivism, and the participatory paradigm. Additional supporting tables are updated or provided: "Voice" in the 1994 version of Table 6.2 has been renamed "inquirer posture," and a redefined "voice" has been inserted in the current Table 6.5." (p. 167)</p> <p>Paradigmatic positions on seven practical issues for inquiry are discussed for each of the five paradigms (Positivism, Postpositivism, Critical Theory, Constructivist, and Participatory): (a) Nature of knowledge, (b) Knowledge accumulation, (c) Goodness or quality criteria, (d) Values, (e) Ethics, (f) Inquirer posture, and (g) Training.</p> <p>First presentation of Critical Issues of the time: (a) Axiology, (b) Accommodation and commensurability, (c) Action, (d) Control, (e) Relationship to foundations of truth and knowledge, (f) Extended considerations of validity (goodness criteria), and (g) Voice, reflexivity, and postmodern textual representation.</p>

		<p>Early discussion of rigor in method and rigor in interpretation. On method versus interpretation, two considerations of validity: "...Thus we have two arguments proceeding simultaneously. The first borrowed from positivism, argues for a kind of rigor in the application of method, whereas the second argues for both a community consent and a form of rigor-defensible reasoning, plausible alongside some other reality that is known to author and reader-in ascribing salience to one interpretation over another and for framing and bounding an interpretive study itself. Prior to our understanding that there were, indeed, two forms of rigor, we assembled a set of methodological criteria, largely borrowed from an earlier generation of thoughtful anthropological and sociological methodological theorists. Those methodological criteria are still useful for a variety of reasons, not the least of which is that they ensure that such issues as prolonged engagement and persistent observation are attended to with some seriousness. It is the second kind of rigor, however, that has received the most attention in recent writings. Are we interpretively rigorous? Can our cocreated constructions be trusted to provide some purchase on some important phenomenon?" (pp. 178-179). New discussion of several new validity concepts under extended considerations of validity: Validity as authenticity; Validity as Resistance, Validity as Poststructural Transgression, also called crystalline validity; and Validity as an Ethical Relationship.</p>
Lincoln & Denzin (2000)	2000	<p>Extensive discussion about the current and future moments in the history of qualitative inquiry. Discusses qualitative inquiry's emphasis on studying the world from the perspective of the human.</p> <p>Presents the themes that characterize the sixth (i.e., current) and seventh (i.e., future) moments of qualitative research: "In charting this future, we group our discussion about the following themes, or issues: text and voice; the existential, sacred performance text; the return to narrative as a political act; text, reflexivity, and being vulnerable in the text; and inquiry as a moral act, ethics, and critical moral consciousness. These are the hallmarks of the sixth and seventh moments." (p. 1048).</p> <p>Presents six fundamental issues that are embedded the tensions of the seventh moment: (a) the collapse of foundationalism, (b) the crises of representation, (c) the crisis of legitimation, (d) continued emergence of multi-voice representations, (e) continuing shift in scientific, moral, sacred, and religious discourses, and (f) inquiry as a moral act returns our dialogue to the topics of ethics, vulnerability, and truth.</p> <p>Detailed discussion about the basic questions of representation and legitimization: "The basic issue is simple: How best to describe and interpret the experiences of other peoples and cultures? The problems of representation and legitimization flow from this commitment." (p. 1050)</p>
Denzin & Lincoln (2000)	2000	<p>Expands the discussion of the history of qualitative research to seven moments, including the five moment history presented in the 1<sup>st</sup> edition of the handbook, the six moment published in Symbolic Interaction Review Annual the following year, and a new presentation of the seventh moment.</p> <p>The nature of qualitative research is discussed, e.g., definition, commitments, differences from quantitative research, relationship to paradigms, the process of qualitative research.</p> <p>Discusses the idea that all researchers are philosophers and all research is interpretive.</p> <p>Research design defined and related to issues such as representation and legitimization.</p> <p>Research strategy is also defined; described as a means to "put paradigms of interpretation into motion" (p. 22).</p>
Lincoln (2005)	2005	<p>Discussion of the central question of knowledge creation: "No question is more central to a discipline than how its knowledge is created or constituted. How we get what we think we know—as well as how we go about getting what it is we</p>

		<p>think we do not know, and how we approach the vast un known of what we don't know that we do not know—is a central epistemological question, not only of formal academic inquiry but of life” (p. 222). Discusses the idea that different forms of knowledge represent snapshots of a phenomenon.</p> <p>Defines theory: “They “explain” some reality and consequently permit sense making around that reality. They “stand for” some reality until a smart aleck finds the black swan—or postulates one. If physics is the queen of the hard sciences, then theoreticians are the kings of their disciplines.” (p. 227); and different forms of paradigmatic theory are described.</p> <p>The method versus philosophy distinction is discussed. Presents a discussion of the choice of methodology and research design given analysis of the fit between method and <i>problem</i>.</p>
Guba & Lincoln (2005)	2005	Discussion in the 3 <sup>rd</sup> edition revisits the same relevant topics covered in the 2 <sup>nd</sup> edition.
Lincoln & Lynham (2007)	2007	Provides a review of applied theory and applied theory building. The first 4 of the eventual 5 new interpretive criteria (2011) for evaluating quality of theory are presented/discussed: (a) compellingness, (b) saturation, (c) prompt to action, and (d) fittingness.
Lincoln & Denzin (2008)	2008	Extended discussion on the indigenous paradigm. Indigenous knowledge defined and issues raised concerning intellectual property, copyright, patents, and other legal tools. Indigenous paradigm/knowledge highlights issues of ethics: “Both of the foregoing issues—who speaks for whom and who owns the past -are, in their purest form, ethical issues.” (p. 568)
Lincoln (2010)	2010	Reflective work of Lincoln; covers topics of paradigms, foundation versus non- or anti-foundational criteria, knowledge accumulation, commensurability and mixing methods, and the field of qualitative research. Lincoln outlines three points about the work remaining following 25 years of development in the interpretive, ethnographic, and critical communities: (a) the Self–Other conjunction, (b) Cumulation of knowledge, and (c) Commensurability Versus the Incommensurability Thesis on “mixing”.
Lincoln et al. (2011)	2011	<p>Continues ongoing discussion of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> editions, e.g., legitimacy and hegemony, methodology, Accommodation and commensurability relative to mixed methods or mixing methodologies, the call to action, control, foundations of truth and knowledge in paradigms, validity, and voice, reflexivity, and postmodern textual representation.</p> <p>Tables of metaphysical subjects &amp; positions, practical issues, and critical issues of the time are updated with extended definitions and references. Axiology is again argued (as with the 3<sup>rd</sup> edition) to be a fourth metaphysical subject in a basic belief system or paradigm, although it again is not listed in the table of metaphysical beliefs; rather, axiology is discussed as a critical issues of the time.</p>
Lincoln & Lynham (2011)	2011	<p>First presentation of table of metaphysical subjects and positions expanded to include axiology and teleology for four paradigms covered (positivism, postpositivism, critical, and interpretive paradigms).</p> <p>Discusses the definition, nature, purpose, and quality criteria of theory across positivist, postpositivist, critical, and interpretive paradigms. Somewhat significantly, criteria and associated discussions are presented unique to each of the paradigms covered.</p> <p>Patterson’s eight criteria for good theory are reformulated for interpretive paradigms. The 4 criteria presented in Lincoln &amp; Lynham 2007 are expanded to include the criterion of transferability/transportability: 13 reformulated and new criteria for assessing theory from the interpretive perspective (meaningfulness, thick description and applicability, narrative elegance, transferability, empirical verifiability, fruitfulness, insightfulness and usefulness, compellingness, saturation, prompt to action, fittingness and transferability/transportability).</p>

The process of summarizing sampled sources represented a back-to-front, past-to-present movement through time and analysis of information. Starting with the oldest source sampled and then moving to the next source temporally published, each source was reviewed and summarized in detail. The past-to-present review process allowed the authors' thinking to unfold and first-time expressions of ideas to become initially apparent. Understanding when ideas began emerging in the literature was important for determining milestones later during analysis and overall synthesis of the historical account. The review and summarizing process of each individual source sampled also helped familiarization with the body of literature and helped embed the present inquirer's thinking within its content.

### **Data Coding**

Coding the literature was an emergent, inductive-deductive process of generating coding categories and then applying the codes to the literature. The purpose of coding was to allow categorical discrimination of relevant chunks of text from each source as a whole (but not an attempt to understand each chunk outside the context of the entire text). Coding text facilitated mining of information such that individual ideas could be deconstructed from each source and then later reconstructed across the set of sources that discussed each idea thread. Even though coding was specific to a finite excerpt of text from a source, the codes served as means to indexing the sets of sources that discussed a common idea within their overall topics, with added reference to the specific portions of dialog relevant to each individual idea being traced across the sources. Analysis of coded literature relied upon the connection of ideas (i.e., their reconstruction) across the set of sources indexed with the same codes.

The coding structure that was eventually applied to sources emerged in parallel with the review and summarization process of data collection. Code development and coding of text were of an inductive-deductive nature. During review and summarization of sources, both new and recurrent ideas were continuously compared and contrasted (Glaser & Strauss, 1967; Guba, 1978b; Guba & Lincoln, 1981). Iteratively, ideas that were similar enough to be considered of the same category were conceptually binned together. Binning represented a process within which each excerpt that captured an idea was considered an example of a larger idea.

Establishing a conceptual bin and then adding ideas to it worked in the tension between heterogeneity and homogeneity of ideas represented in the text; excerpts were grouped by their homogeneity to a larger idea, and the idea categories were delimited by their heterogeneity from each other (Guba, 1978b; Guba & Lincoln, 1981). Each category represented a collection of ideas sufficiently homogeneous to warrant distinct binning. Eventually, the homogeneity and heterogeneity crystalized as a coding scheme in which the set of idea categories emerged as the coding structure shown in Table 17.

Table 17

*Coding Scheme Developed for Organizing Text*

<b>Coding category</b>	<b>Coded characteristics</b>
Discussion disciplined inquiry	No, Yes
Relevant details of disciplined inquiry discussed	Excerpt and free text
Number of paradigms discussed	0, 1, 2, 3, 4, 5, 6
Specific paradigms discussed	Excerpt and free text
Axiomatic subjects	No, Yes
Specific axiom subjects discussed	Excerpt and free text
Axiomatic positions	No, Yes
Specific axiom positions discussed	Excerpt and free text
Axiomatic extensions into inquiry	No, Yes
Specific axiomatic extensions discussed	Excerpt and free text
Basic questions/positions on quality	No, Yes



Specific questions/positions on quality discussed	Excerpt and free text
Criteria of quality for paradigms	No, Yes
Specific criteria of quality discussed	Excerpt and free text
New ideas	Excerpt and free text
Reinforced ideas	Excerpt and free text
Comments and/or miscellaneous information	Excerpt and free text

The coding scheme was organized such that the presence of the idea was usually coded as present or not (recall that coding was a means to index the entire source as well as reference a specific excerpt of text from the source), and then free text information was collected that typically included summary notes, quotations, and citation information. In addition, if any information in the excerpt was new, then the specific novel contribution was noted; likewise, if reinforcing previously coded information, that was noted. Lastly, a comment field was added to capture any inquirer comments on the extracted information. The coding scheme was applied to all included sources. Results of coding provided the source indexing shown in Table 18.

Table 18

*Coding Scheme Applied to Included Sources*

<b>Coding category</b>	<b>Number of sources indexed</b>
Disciplined inquiry	10
Paradigms	48
Axiomatic subjects	21
Axiomatic positions	30
Axiomatic extensions into inquiry	15
Basic questions/positions on quality	17
Criteria of quality for paradigms	32

It is important to be explicit that the ideas of interest captured in the coding scheme were ones that stood out as being particularly informative toward an improved understanding of disciplined inquiry. Consequently, the coding scheme should neither be considered exhaustive of all topics discussed in the body of literature reviewed, nor salient outside the context of the current study's interests. Furthermore, categories were not mutually exclusive among excerpts of

text. Many ideas overlapped in the texts of the authors' writings; when ideas coincided textually, the texts were coded with all applicable categories.

### **Strategy for Analyzing Coded Literature**

Reconstructing the literature on the paradigm theory by Lincoln et al. (2011; Lincoln & Lynham, 2011) first involved critically analyzing each category of idea in the coded literature. The entire set of sources included in the review was sorted by coded category to identify the subsets of indexed sources pertinent to each idea. The indexed sources and data excerpts were analyzed within each subset of sources, and the ideas represented in each subset were traced over time. Idea threads were reconstructed and summarized by relevant publications, time periods, milestones, and so on. Separate analyses were conducted for disciplined inquiry, paradigms, axiom subjects and positions, axiom extensions, and basic questions and positions on inquiry quality.

### **Data Synthesis Strategy**

The critically analyzed idea threads were aligned by date to compare concurrent evolutions of the set of coded idea categories. The examination across the analyzed coded categories within time period allowed for identification of larger milestone developments in the paradigm theory by Lincoln et al. (2011; Lincoln & Lynham, 2011). Each milestone identified in the synthesis was judged pertinent to the extent that it captured a landmark in the evolution of the authors' theoretical thinking.

Using the set of paradigm theory milestones as an organizational scheme, a narrative historical account of the development of the inquiry paradigm phenomenon was synthesized. Through the use of milestones, the narrative focused on significant contributions, time periods,

and how each milestone changed the paradigm landscape of the time. The synthesis connected the set of ideas examined in the literature within the holistic context of the paradigm theory central to the integrative literature review. Synthesis was concluded by revisiting the current state of the paradigm theory and focusing on the next inquiry steps, given the learning from the current review.

The overall process of the historical analysis can be situated as an incremental piece of work within an ongoing body of research on disciplined inquiry. The intended output of the synthesis strategy was a historical reconstruction of the development of paradigm theory. The intended outcomes of the research were to better understand paradigm theory as an exemplar so the research agenda for improving the conceptualization and practice of disciplined inquiry could be refined.

## CHAPTER 4: SYNTHESIS OF HISTORICAL ANALYSIS OF LINCOLN, LYNHAM, AND GUBA'S PARADIGM THEORY

### **Chapter 4 Preface**

Chapter 4 presents the outputs of the historical analysis of the paradigm phenomenon. Two levels of results from the historical analysis are described. First, within category analyses are presented for paradigms, axiom subjects and axiom positions, axiomatic extensions into inquiry, and basic questions and positions on inquiry quality. Within each coded category the progression of ideas overtime was documented. Next, an overall synthesis across coded categories is presented. Nine milestone time periods in the historical evolution of the paradigm phenomenon were identified from the cross category synthesis spanning an early two-approach model (e.g., Guba, 1978b) to its current five-paradigm, five-axiom subject form (e.g., Lincoln & Lynham, 2011; Lincoln et al., 2011).

The output of the historical analysis characterized the milestone time periods in the paradigm phenomenon's development and further captured the salient features of the fully developed phenomenon. Within the larger research agenda, the outcome of the historical analysis was a deeper understanding of the exemplar's varied and changing states overtime from to primitive to sophisticated conceptualization. New contributions made to knowledge about paradigms of inquiry include a comprehensive historical account of Lincoln, Lynham, and Guba's incremental thinking on paradigms of inquiry, as well as, individual documentation of the evolution of ideas related specifically to paradigms, axiom subjects and axiom positions, axiomatic extensions into inquiry, and basic questions and positions on inquiry quality.

## **Analysis of Coded Text**

Due to the density of the ideas within each coded category of text, analyses focused separately on the coded categories for paradigms, axiom subjects and positions, axiom extensions, and basic questions and positions on inquiry quality over time, by providing a narrative of the unfolding ideas. Review of text coded for disciplined inquiry is covered in the data synthesis section of this chapter.

### **Paradigms**

The concept of the paradigm emerged and evolved considerably over the 40-plus years of literature reviewed. Analysis of the literature indexed for paradigms revealed several pertinent categories of information important to understanding the evolution of the paradigm concept. These categories were organized into seven themes that captured significant changes in the paradigm concept over time; these themes were:

- Two paradigms emerged
- Paradigms as axiom systems
- Basic belief systems
- Metaphysical assumptions
- Expanding the paradigm framework
- The nature of knowledge and knowledge accumulation across different paradigms
- The nature of theory and theoretical accumulation across different paradigms

**Two paradigms emerge.** Early works of the late 1960s to the mid 1970s highlighted a tension in the field of education evaluation and began a narrative critiquing the efficacy of

traditional approaches to evaluating educational impacts. The critique drew attention to methodological issues, such as whether a lack of statistically significant differences should equate with conclusions of no program improvements/differences (Guba, 1969) and what standards should be used to judge the goodness of inquiries (i.e., “criteria of good evaluation” [Guba, 1975, p. 44]). In response to the identified tension in the field of education evaluation, in 1978 *naturalistic inquiry*, or the *alternative extended view*, was first proposed as a structured, disciplined, and systematic approach to inquiry that stood in contrast with and as alternative to *experimental* or *conventional* models of inquiry. The two approaches to inquiry were contrasted by their location relative to two intersecting dimensions: high-to-low control over antecedent conditions and high-to-low control over outcomes or responses of interest. Naturalistic inquiry was positioned in the low-low control space, while experimental inquiry was positioned in the high-high control space (Guba, 1978b).

The transition in the early 1980s was marked by several notable advances in paradigm-relevant thinking. Around the turn of the decade, the language describing the two paradigms was refined to naturalistic versus *scientistic* or *rationalistic* approaches (Guba, 1979, 1981a; Lincoln & Guba, 1980). Lincoln and Guba also began a parallel discussion about the value concepts in evaluation of merit and worth and cited distinctions in the outcome and methodology of scientistic compared with naturalistic approaches. The former value concept was defined as an extrinsic context-free value characteristic, and the latter as an intrinsic context-dependent value characteristic (Guba, 1978b; Lincoln & Guba, 1980). The early 1980s also represented a shift in the conversation about inquiry from contrasting inquiry *approaches* to contrasting *paradigms* for arriving at and viewing truth (Guba & Lincoln, 1981; Guba, 1981a).

**Paradigms as axiom systems.** Work in the early 1980s placed more emphasis on what was meant by the term *paradigm* and how a paradigm could be conceptually framed. During this time, the idea of a paradigm was aligned with the idea of an axiom system, such that the paradigm's assumptions were discussed as a system of axioms (Guba & Lincoln, 1981, 1982a). Axioms were defined "as the set of undemonstrated (and undemonstrable) propositions accepted by convention (even if only intuitively) or established by practice as the basic building blocks of some conceptual or theoretical structure or system" (Guba & Lincoln, 1982a, p. 236). The axiomatic nature of paradigms provided a convenient way to conceptualize alternative paradigms of inquiry within a framework of axiom subjects; each axiom held by a paradigm was a specific axiom position on an axiom subject. Altogether, the set of axiom positions held by a paradigm comprised a complete philosophical system underlying different paradigms of inquiry. Even though paradigms differed on the specific axiom positions held, the axiom subjects provided a common underlying structure with which to understand the fundamental components of any paradigm defined within the axiomatic structure.

With the new emphasis on paradigms as axiomatic systems of reality also came further positioning of the inquiry conducted within each paradigm as forms of disciplined inquiry, or as forms "aimed at disciplined inquiry" (Guba & Lincoln, 1982a, p. 234). The alignment of paradigms with axiomatic systems and the inquiry conducted within paradigms with disciplined inquiry grounded the conceptualization and practice of alternative forms of inquiry in explicit belief systems about the reality inquired into. This grounding of inquiry in explicit belief systems laid the foundation for future dialog about two important questions: "What is true? and What is good?" (Lincoln, 1995b, pp. 40–41). Explicit recognition that changing the commitment inquirers make to focus on what is considered true within a belief system allowed the

conversation to also change away from evaluating inquiry against a single universal standard toward what may be considered good within each belief system.

**Basic belief systems.** The work in the mid 1980s was marked by the beginning of a subtle rebranding of the axiom nature of paradigms to presentation of paradigms as foundational, basic belief systems that guide action: “Most of us carry out our work, whatever that might be, without reflecting about the epistemological foundations (value assumptions) undergirding action. We have internalized a set of beliefs, and we act upon them without much thought” (Lincoln, 1985e, p. 137). Re-presentation of paradigms as basic belief systems (although still based on a set of axioms) afforded additional key arguments to be built about the role of beliefs and inquiry. First, basic beliefs were argued as implicit assumptions that guide ideas and actions about inquiry (Guba, 1985; Lincoln, 1985b, 1985e; Lincoln & Guba, 1985b); for example, our “paradigm sets the *context* of assumptions for the inquiry (these are often implicit; but as we think, so do we act)” (Lincoln, 1985b, p. 36). Second, new (alternative or emergent) forms of inquiry represented not just different methods (Guba, 1985), but whole shifts in thinking (or “world view” [Lincoln, 1985b, p. 2]) at the paradigm level (Lincoln, 1985a, 1985b, 1985c, 1986). Once these arguments were established, further attention was given to more fully developing the different assumptions of paradigms (Lincoln & Guba, 1985b), and in doing so, the paradigm framework was also more fully developed horizontally across paradigms—for example, “[the] positivist view (normal orthodoxy) [, the] transitional view (retrenchment neo-orthodoxy) [, and the] postpositivist view (emergent nonorthodoxy)” (Guba, 1985, p. 98). The authors were continuously creating new language that was effectively talking the new worlds into existence: “When words do not exist for concepts and constructs, there is no recognition that such states are possible” (Lincoln, 1985a, p. 222).



**Metaphysical assumptions.** From about 1990 up through the present (e.g., 2015) the language about paradigms again shifted; here, specifically away from the axiomatic foundations of the basic belief systems and toward reference to metaphysical assumptions of the basic belief systems (Guba, 1990c; Guba & Lincoln, 1989, 1994, 2005; Lincoln, 2010; Lincoln & Guba, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011). At first, the shift was made only in reference to the ontological assumption (e.g., Guba, 1990c; Guba & Lincoln, 1989). However, by the mid 1990s, the entire set of assumptions undergirding a paradigm almost exclusively referred to the metaphysical assumptions of the paradigm (e.g., Guba & Lincoln, 1994). Even though linguistic emphasis about underlying assumptions shifted away from axioms, axioms still remained at least a small part of the core conversation up through the final source reviewed (e.g., Guba, 1978b, through Lincoln & Lynham, 2011).

The common semantic threads throughout the four-decade discussion of paradigms were the relationship to a set of foundational assumptions and the assumptions that represented different positions on common philosophical and methodological issues. Taken together, these themes further represented “a complete epistemological and philosophical inquiry system” (Lincoln & Guba, 1988, p. 3). The complete metaphysical systems conceptually defined different worlds of inquiry, but alone they did not stand in an ordinal or superiority hierarchy; rather, the decision about which paradigm was best for any given situation was determined by its fit. However, consideration of fit was not a determination of the fit of a paradigm to reality (because the paradigms by definition determined the believed in nature of reality); instead, fit was a judgment of alignment of paradigm with phenomenon and problem (Guba & Lincoln, 1982a). According to Guba & Lincoln, (1988),

[The paradigm] set out very different options among which the investigator must choose... How is he or she to make those choices? In the final analysis, that is a value choice as well. We suggest that the choice ought to be made on the basis of the fit of the paradigm axioms to the presentational phenomenon to be studied. (p. 96).

**Expanding the paradigm framework.** A period of axiom framework expansion and label shifts spans from approximately 1985 to the present. During these 25-plus years, at least three significant evolutions should be noted. First, a shift occurred in the paradigm labels used for the naturalistic paradigm and the re-envisioned, neo-positivist paradigm (i.e., postpositivism). Second, the meta-framework encompassing each paradigm was expanded horizontally to include complete paradigmatic systems of inquiry for the *postpositivist* paradigm (Denzin & Lincoln, 1994, 2000; Guba, 1990b, 1990c, 1992; Guba & Lincoln, 1989, 1994, 2005; Lincoln, 1995b, 1997a; Lincoln & Denzin, 1994, 2000; Lincoln & Guba, 1989, 1990, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011); *critical* paradigm (Denzin & Lincoln, 1994, 2000; Guba, 1990b, 1990c, 1992; Guba & Lincoln, 1994, 2005; Lincoln, 1993a, 1995b, 1997b, 1998b, 2010; Lincoln & Denzin, 1994, 2000; Lincoln & Guba, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011); *constructivist* paradigm (Denzin & Lincoln, 1994, 2000; Guba, 1990b, 1990c, 1992, 1996; Guba & Lincoln, 1989, 1994, 2005; Lincoln, 1990a, 1990b, 1995a, 1995b, 1997b, 1998b; Lincoln & Denzin, 1994, 2000; Lincoln & Guba, 1989, 1990, 2000; Lincoln & Lynham, 2007, 2011; Lincoln et al., 2011); and *participatory* paradigm (Guba & Lincoln, 2005; Heron, 1996; Heron & Reason, 1997; Lincoln, 1990b, 1998b; Lincoln & Guba, 2000; Lincoln & Denzin, 2000; Lincoln et al., 2011; Reason, 1994). Third, the meta-framework was expanded vertically to include more assumptions (i.e., axiom subjects and positions). Only the first two evolutions will be discussed presently; the third (i.e., vertical expansion) will be encompassed under unfolding ideas about axiom subjects and axiom positions.

*The emergence of the postpositivist and constructivist paradigms.* Up to this point in time, postpositivism has been the label associated with the alternative, emergent, or naturalistic paradigm (Guba, 1985; Guba & Lincoln, 1988). However, work in 1989 and 1990 solidified (at least) two important shifts (Guba, 1990c; Guba & Lincoln, 1989). These two significant publications established paradigms as belief systems based on the way that inquirers respond to a set of basic questions that get at an inquirer's foundational assumptions. However, of further significance in these 2 years was a shift in labels for the two paradigms encompassed by the paradigm meta-framework (i.e., naturalism and positivism). Here, the postpositivist and constructivist paradigms took on their modern day usage.

As a paradigm label, postpositivism not only shifted from reference as the “emergent nonorthodoxy” (Guba, 1985, p. 98), which had been associated with naturalism, but became its own paradigm with unique assumptions (i.e., critical realism and modified objectivism) (Denzin & Lincoln, 1994; Guba, 1990b, 1990c, 1992; Guba & Lincoln, 1989; Lincoln & Denzin, 1994; Lincoln & Guba, 1990, 1994). By doing so, postpositivism transcended its prior status that, on the one hand, had at best been considered a modified form of positivism—for example, “transitional view (retrenchment neo-orthodoxy)” (Guba, 1985, p. 98)—or much more simply, the “near cousin” (Lincoln & Guba, 1990, p. 53) of positivism on the other.

The constructivist label for naturalism was introduced in by Guba and Lincoln (1989) as the paradigm of fourth generation evaluation (i.e., responsive constructivist evaluation) and was further articulated in by Guba (1990c). Even though *Fourth Generation Evaluation* (Guba & Lincoln, 1989) and *The Paradigm Dialog* (Guba, 1990c) firmly established the constructivist paradigm label, it has remained in constant association with the more broadly used term of

*interpretivism* (e.g., “constructivist-interpretive” [Denzin & Lincoln, 1994, p. 13]), through present day. Although the constructivist label was new in 1989, shades of it were becoming apparent in prior publications; for instance,

The alternative paradigm rests on a relativist ontology. Reality is multiple; those multiple realities are the constructions made by the human actors involved, and there are as many realities as there are actors. 'Those realities exist only in the minds of their constructors; thus they cannot be broken apart but must be examined holistically. (Guba & Lincoln, 1988, p. 93)

As labels shifted for the postpositivist and constructivist paradigms, the contrast between them remained a center point in much of the ongoing dialog focusing on the complete shift in paradigm (e.g., a “rethinking of the rules lodged in the old paradigm,” [Lincoln, 1990b, p. 289]). One of the key issues at the center of the contrast was divergence versus convergence; that is, does knowledge converge onto an objective reality or does knowledge diverge as more sophisticated understandings are formed? The way in which divergence is addressed for the constructivist has notable connections to Best-JB (Jacquette, 2012). For example,

The construction to be “believed” is that one which, in the opinion of those best able to make such a judgment, is the most informed and sophisticated. All constructions, even under perfect consensus, thus remain problematic and may be refined, or even totally abandoned, in the light of new information or heightened sophistication. And I stress again that the successor construction cannot be seen as more true than the one it replaces, but simply as more informed and sophisticated. (Guba, 1992, p. 20)

***Inclusion of the critical paradigm.*** The critical paradigm was introduced within the paradigm meta-framework in the early 1990s (i.e., Guba, 1990c), but was by no means a new paradigm (e.g., Habermas, 1971). Over the next 20-plus years, the critical paradigm took on a number of labels within the paradigm meta-framework; these included the following:

- Critical theory (Denzin & Lincoln, 1994, 2000; Guba, 1990c, 1992; Guba & Lincoln, 1994, 2005; Lincoln, 1993a, 1995b, 1997b, 1998b; Lincoln & Denzin, 1994, 2000; Lincoln & Guba, 2000; Lincoln & Lynham, 2007, 2011; Lincoln et al., 2011)
- Material feminist ethnography (Guba, 1990b)
- Ideologically oriented paradigms (Guba, 1992; Guba & Lincoln, 1994)
- Neo-Marxism (Guba, 1992)
- Feminist theory (Guba, 1992; Lincoln, 1995b; Lincoln et al., 2011)
- Marxist (Denzin & Lincoln, 1994)
- Emancipatory (Denzin & Lincoln, 1994)
- Feminist-poststructural (Denzin & Lincoln, 1994)
- Standpoint epistemologists (Lincoln, 1995b)
- Critical community (Lincoln, 2010)
- Race theory (Lincoln et al., 2011)

Although different contexts of application defined the specific instances of the critical paradigm, they all shared a common basis in power dynamics and emancipation from the false consciousness created by those in power. In other words, the critical paradigm was routed in the intention to “create change, to the benefit of those opposed by power” (Lincoln et al., 2011, p. 102).

***Inclusion of the participatory, or cooperative, paradigm.*** The participatory paradigm (Lincoln & Guba, 2000), much like the critical paradigm, had been previously defined elsewhere under such names as *human inquiry* (Reason, 1994b, 1996; Reason & Rowan, 1981); *cooperative inquiry* (Heron, 1996; Reason, 1994a; Reason & Heron, 1995); and *participative*

*inquiry* (Reason, 1994a). Early writings by Lincoln eluded to the burgeoning paradigm as forms of “action research” (1998b) and “cooperative inquiry” (1990b); however, it was not until 2000 (Lincoln & Guba, 2000; see also Guba & Lincoln, 2005; Lincoln & Denzin, 2000; Lincoln et al., 2011) that participatory inquiries were fully articulated by the authors as a complete philosophical belief system rather than a mere style of inquiry. Although first presented by Lincoln and Guba (2000) within their paradigm meta-framework, articulation of the form of inquiry as a paradigm was initiated 3 years earlier with a specific positioning of participatory inquiries within the work of Lincoln and Guba by Heron and Reason (1997; for more detail see also Heron, 1996; Reason, 1994a, 1994b; Reason & Heron, 1995; Reason & Rowan, 1981).

#### **The nature of knowledge and knowledge accumulation across different paradigms.**

By the 1990s, the concept of a paradigm of inquiry had been established in the authors’ work as “a basic set of beliefs, a set of assumptions we are willing to make, which serve as touchstones in guiding our activities” (Guba & Lincoln, 1989, p. 80); that is, “a basic set of beliefs that guides action, whether of the everyday garden variety or action taken in connection with a disciplined inquiry” (Guba, 1990c, p. 17). Once the *what* question regarding paradigms had been sufficiently addressed, the question of *to what end* was more fully addressed with in-depth conversation about the output of inquiries; that is, what is the nature of what inquirers know, given disciplined paradigmatic inquiries, and how does that knowing accumulate?

More than a decade before 1990, the distinctions of what could be known within different paradigms had been initially tackled. As early as the 1970s, the authors had made contrasts between a believed-in singular objective reality in which “truth is truth” (Guba, 1978b, p. 15) and a believed-in multiple subjective reality that “exists only in the minds of individual people

and depends heavily on their separate perceptions” (p. 15). In the former, truth is an assertion that is isomorphic with the singular reality; the assertion “stands in a one-to-one relationship to objective reality” (Guba & Lincoln, 1989, p. 86) in a context-free, generalizable manner. In the latter, truth is locally determined in a context-embedded assertion that is the “most informed and sophisticated construction on which there is consensus among individuals most competent (not necessarily most powerful) to form such a construction” (p. 86). However, by the 1990s, the conversation about what could be known came full circle to central issues of truth, knowledge, and how knowledge might accumulate. Of particular note within this part of the paradigm conversation was the eventual addition to the dialog of the role of theory in knowledge accumulation and judgments of quality knowledge descriptions within each paradigm.

Although each paradigm ontologically defined the assumed nature of reality, claims of knowledge were more practically tied to Dewey’s position on warranted assertability:

It is salutary to remember that Dewey preferred not to use the term *truth* but, instead, the term *warranted* assertibility, and he recognized that different types of assertions required different warrants. Furthermore, this change of language highlighted the fact that a warrant is not forever; today’s warrant can be rescinded tomorrow, following further inquiry. (Guba, 1990c, pp. 31–32)

The view of knowledge claims as warranted assertions stressed both that what may be considered warranted needs to be tied to assumptions about the nature of what can be known and that assertions may change over time, given new knowledge. In other words, a warranted assertion requires asking “what is the nature of knowledge in each paradigm?” and “how does knowledge accumulate in each paradigm?” Although these may be philosophically oriented issues to contemplate, the authors reminded readers of their necessity, given that all researchers

are philosophers and all research is interpretive. That is, philosophical beliefs, even when implicit, shape how the researcher perceives and inquires into to the world.

All research is interpretive; it is guided by a set of beliefs and feelings about the world and how it should be understood and studied. Some beliefs may be taken for granted, invisible, only assumed, whereas others are highly problematic and controversial. Each interpretive paradigm makes particular demands on the researcher, including the questions he or she asks and the interpretations the researcher brings to them. (Denzin & Lincoln, 2000, p. 19)

Lincoln (2005) further reminded readers that knowledge creation should be the central question for all inquirers across all disciplines:

No question is more central to a discipline than how its knowledge is created or constituted. How we get what we think we know—as well as how we go about getting what it is we think we do not know, and how we approach the vast unknown of what we don't know that we do not know—is a central epistemological question, not only of formal academic inquiry but of life. (pp. 222–223)

What we know might further be considered mere snapshots of phenomena over time and over paradigms. What is known from one epistemology should not be elevated over what is known from others; however, knowing (as a warranted assertion) must situationally map back to both what we think we can know and what we think is the appropriate means for acquiring that knowledge (Lincoln, 2005).

The question of accumulation of knowledge asks, “How do the outputs of our inquiries build upon each other and build up over time?” The answer is not universal for all paradigms; accumulation of knowledge depends on the nature of the knowledge being accumulated. Key to understanding knowledge accumulation is distinguishing what is actually accumulating: information, knowledge, or truth. With regard to accumulation of truth from inquiries, Guba (199c) commented,



[The] problem is that confusion exists over distinctions among *information*, *knowledge*, and *truth*. The question at issue is this: How can we verify the truth of research results we have generated? My response: Although we can generate and accumulate knowledge in any scientific tradition, we will have a very hard time generating and accumulating truth. (p. 250)

West and Scafetta (2010) concisely captured the general process for how knowledge is generated; note that they made no reference to the production of truth: “*Data*, as the nineteenth century empiricists discussed, is the raw sensory material that processing transforms into *information* and, finally, the interpretation of the information produces our *knowledge* about specific phenomena” (p. 9).

At this point, two things should be clear regarding the production of knowledge (or warranted assertions). First, what might be considered valid data, information, and knowledge can drastically differ across different paradigms. “The question of cumulation revolves about how we know what we know with the knowledge we generate, what that knowledge means when we add it up, and for what purposes it will be used?” (Lincoln, 2010, p. 5). Yet, second, what might be considered appropriate processing of data and interpretation of information to produce knowledge can differ drastically, as well. To help clarify these differences within the context of the paradigms discussed in their paradigm meta-framework, the authors specifically addressed the nature of knowledge and knowledge accumulation for the postpositivist, critical, constructivist, and participatory paradigms (Guba, 1990c; Guba & Lincoln, 1994, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011).

***The nature of knowledge and knowledge accumulation in the postpositivist paradigm.***

Guba (1990c) characterized postpositivist knowledge as theories of “complex, mutually interacting causal relationships among specific constructs or variables... [; that is,]

postpositivists believe that human phenomena can best be explained in terms of causal relationships” (p. 230). However, Guba cautioned that postpositivist knowledge as theory is not overarching grand theory, but rather more modest attempts at time- and context-free generalizations (i.e., small theory, in which ultimate truth is unknowable). Postpositivists accept that a correct single truth about a natural world exists “out there” (p. 230) and that their task as inquirers is to attempt to know it in order to explain and predict it; however, “truth remains a regulative ideal” (p. 230) with “multiple hidden values and variables that prevent ever fully knowing the answer” (Lincoln et al., 2011, p. 107).

As a consequence of the approximate nature of postpositivist knowledge, claims of knowledge (e.g., warranted assertions) in postpositivism are claims of “established regularities or probabilities about human phenomena rather than as universal laws that govern human behavior.” (Guba, 1990c, p. 231). Postpositivists rely upon “statistics and other techniques to get as close as possible to reality. Although it can never be attained, approximations of reality can be made to develop further understanding” (Lincoln et al., 2011, p. 108). Postpositivist knowledge is thought to accumulate in building-block fashion; the task of the postpositivist is “adding a verifiable “brick” to the wall” (Lincoln, 1998b, p. 14). However, a verifiable brick only becomes verified through replication and criticism.

Thus knowledge in postpositivism is accumulated or small theory developed not via the single definitive study but from programs or traditions of empirical research, and past research serves less as the foundation and more as the catalyst for future inquiry. (Guba, 1990c, p. 232)

***The nature of knowledge and knowledge accumulation in the critical paradigm.*** Guba (1990c) characterized the nature of knowledge in the critical paradigm with “three key knowledge-related attributes of critical social science: its embeddedness in history and ideology;

its own ideology, as revealed in the meaning of *critical*; and its dialectical synthesis of historical dualism” (p. 240). Critical knowledge emphasizes the historical, social, power, and value bases of knowing, as well as the resulting contradictions and distortions around truth. Consequently, two types of knowledge claims exist in tension in the critical paradigm: claims based on a false consciousness and claims based on an emancipated, more informed consciousness (Guba, 1990c; Lincoln et al., 2011).

Key to critical knowledge is the change, emancipation, and transformation of both knowers and society; critical knowledge is enlightened knowing and is intended to act as a catalyst to political and social change.

Critical knowledge enlightens an audience by revealing the structural conditions of their existence, specifically, how these conditions came about and what distortions or injustices they currently represent. Such enlightenment carries within it an enabling, motivating force to stimulate action, a catalyst for self-reflection toward greater autonomy and responsibility and for strategic political action toward emancipation. (Guba, 1990c, p. 242)

Therefore, the accumulation of critical knowledge is “based on historical perspective and revision of how history is viewed so that it no longer serves as an oppressive tool by those with structural power” (Lincoln et al., 2011, p. 108).

***The nature of knowledge and knowledge accumulation in the constructivist paradigm.***

In the constructivist paradigm, “the constructed meanings of actors are the foundation of knowledge” (Lincoln et al., 2011, p. 107). Constructed meaning is a form of *verstehen*, “deep knowing, thoughtful and empathetic understanding of social phenomena” (Lincoln, 1998b, p. 15); *verstehen* is “holistic, emic, and intimate” (p. 17). With respect to constructivist inquiries,

[The output] comprises the reconstruction of intersubjective meanings, the interpretive understanding of the meanings humans construct in a given context and how these meanings interrelate to form a whole. Any given interpretive reconstruction is idiographic, time- and place-bound; multiple reconstructions are pluralistic, divergent, even conflictual. Hence, interpretivist knowledge resembles more context-specific working hypotheses than generalizable propositions warranting certainty or even probability. (Guba, 1990c, p. 235)

Constructivist claims of knowledge are a posteriori because constructivist inquiry “generates working hypotheses that are connected not to a priori theory but to a context-specific, often emergent inquiry problem, which may or may not be informed by existing knowledge” (p. 236). In other words, there is neither requirement for nor exclusion of prior knowing in order for constructivist knowledge to accumulate. In both cases, the cumulative output of constructivist inquiry is “more informed and sophisticated reconstructions; vicarious experience” (Lincoln et al., 2011, p. 108).

***The nature of knowledge and knowledge accumulation in the participatory paradigm.***

Knowledge in the participatory paradigm was characterized as “living knowledge” (Lincoln & Guba, 2000, p. 170); that is, it has its practical grounding in human flourishing (Heron & Reason, 1997; Lincoln & Guba, 2000). More specifically, Heron and Reason described the nature of participatory knowledge as a fourfold knowing: experiential knowing, presentational knowing, propositional knowing, and practical knowing. The former three culminate in the fourth form of knowing. “Practical knowing is knowing how to do something, demonstrated in a skill or competence... It fulfills the three prior forms of knowing, brings them to fruition in purposive deeds, and consummates them with its autonomous celebration of excellent accomplishment” (p. 281). Participatory knowledge is very much a social knowledge known by the knower, with a shared awareness of the knowledge by the community of inquirers; that is, “knowers can only be knowers when known by other knowers” (p. 280). Because of the

requirement of mutual awareness, participatory knowledge accumulates in “communities of [participative] inquiry embedded in communities of practice” (Lincoln & Guba, 2000, p. 170).

**The nature of theory and theoretical accumulation across different paradigms.** Early on, the authors (e.g., Guba, 1990c) positioned postpositivist knowledge as theory. Lynham (2002b) more generally (that is, not paradigmatically) defined theories as types of knowledge containers; a theory “encapsulates and ‘contains’ the explanation of the phenomenon, issue, or problem that is the focus of the theory” (p. 229). In other words, theory is one mechanism by which knowledge accumulates. Just as paradigms differ in the nature and accumulation of knowledge, they also fundamentally differ in the theories that contain the knowledge. The final shift noted in the literature coded for paradigms was the shift to more explicit paradigmatic focus on the types of theories associated with knowledge in different paradigms (Lincoln, 2010; Lincoln & Lynham, 2007, 2011; Lynham, 2000a, 2002b; Lynham & Torracio, 2001).

***The nature of postpositivist theory and theoretical accumulation.*** Postpositivist knowledge has been described as being as close in approximation of time- and context- free generalizations as is possible to apprehend human or social phenomena. The purpose of theory in positivism and postpositivism is “to develop grand to mid-range theories, preferably in the form of generalizable laws and explanations that are taken to be true until proven otherwise, and which enable prediction and control of phenomena across multiple settings” (Lincoln & Lynham, 2011, p. 8). Generalized theoretical explanations in postpositivism typically take the form of propositional knowledge claims. Verified knowledge claims are how theoretical knowledge accumulates in postpositivism:

Cumulation of knowledge in the positivist paradigm is fairly straightforward. As the format for propositional knowledge is virtually always theory (or a set of testable hypotheses) and the object of knowledge seeking and knowledge generation is theory development, additions to the knowledge base are accessible and assessable, and the terminus of the intellectual project is frequently a theory that provides for both prediction and control. (Lincoln, 2010, p. 5)

The inquiry process involved in generating, verifying, refining, and applying grand-to-middle range postpositivist theories comprises the work of inquiry in the postpositivist paradigm.

Theories are developed, tested, and refined through empirical research. So, research is intentionally cumulative, and hallmarks of good research studies include clearly defined hypotheses derived from existing theory and results that take the form of generalizable theoretical propositions. The task of the scientist is thus to develop theory. Once developed, scientific theories can be used to address problems or advance life quality in the world of practice. (Guba, 1990c, pp. 227–228)

***The nature of critical theories and theoretical accumulation.*** The nature of knowledge in the critical paradigm was characterized as a change-oriented form of knowing embedded in historical and ideological knowledge and power structures (Guba, 1990c). Critical theories are descriptions of existing power structures that explain who benefits and who is marginalized, silenced, or does not benefit so that awareness can act as a catalyst to change of the status quo.

The nature of critical theories was further described as follows:

Local, historically and socially contextual—Theory is primarily inductively driven and reflexively critiqued; can be formal and informal; results from and is grounded in historical and sociocultural contextual experience of the researcher and the researched, and results in locally situated descriptions and explanations of how phenomena are experienced and thus explained in terms of pre-existing, entrenched historical, social and cultural practices and intent. (Lincoln & Lynham, 2011, p. 8)

The purpose for unveiling the historical, social, and political nature of knowledge in the critical paradigm is to emancipate knowers from the belief that what they know is actually how things are. Therefore, the purpose of theory in the critical paradigm is to “develop critical, co-constructed local to mid-range descriptions and explanations of social phenomena, how they

operate within integrated historical, social and cultural contexts, so as to illuminate oppression, and enable empowered and transformed action” (p. 8).

***The nature of constructivist theory and theoretical accumulation.*** The nature of knowledge in the constructivist paradigm was characterized as local and specific co-constructed reconstructions of reality aimed at understanding meaning in human experiences (Lincoln et al., 2011). In constructivism, meaning is assembled in emergent patterns from data rather than mined from data given a priori assumptions about the patterns that should exist (Lincoln, 2010, p. 5).

[Constructivist theories] long to answer why. They often come with stories, stories that help listeners understand what the theory means to flesh and blood people. [Constructivist] theories are fat with the juice of human endeavor, human decision making, zaftig with human contradiction, human emotion, human frailty. They are rarely purely rational, as any good economist will tell you. In fact, they are often “a-rational” (Lincoln, 1985); that is, they do not appeal to pure reason or statistical logic but rather are derived from pure lived experience. (p. 6)

Constructivist theory is described as *local* and *specific*, meaning that it

[It] proceeds from experience and results a posteriori, that is, it results from and is grounded in experience with the co-constructed and co-understood world; is primarily inductively driven, resulting in locally situated descriptions of how phenomena are experienced and thus explained. (Lincoln & Lynham, 2011, p. 8)

The purpose of theory in the interpretive paradigm is to develop “descriptive local to mid-range explanations of what a phenomenon means and how it works in the co-constructed world of joint and shared experience and perception, which enable and inform co-action towards improved practice, policy and human conditions” (p. 8).

## **Axiomatic Subjects and Positions**

Before axioms were introduced into the paradigm writings of Guba, Lincoln, and Lynham, the points of difference between paradigms were discussed as conceptual differences (Guba, 1978b) and differences in basic assumptions (Guba, 1979, 1981a; Guba & Lincoln). Introduction of the axiom system helped delineate basic beliefs from other assumptions and characteristics of paradigms. However, over time, even post axiom introduction, some of the key assumptions of paradigms shifted with respect to basic beliefs, general assumptions, derivative postures, and operational characteristics of inquiry.

The axiomatic structure of paradigms emerged and evolved in an expanding and contracting fashion as assumptions were added and removed over time. Several significant time periods were pulled forward through analysis of literature coded for axiom subjects and positions to characterize the axiom evolution; these were:

- The pre-axiom, two-paradigm period.
- The two-paradigm, five-axiom subject period
- The three-paradigm, five-axiom subject period
- The two-paradigm, three-axiom subject period (methodology)
- The four-paradigm, three-axiom subject period
- The five-paradigm, three-axiom subject period
- The four-paradigm, five-axiom subject period

**The pre-axiom, two paradigm period.** Originally, in 1978, 14 differences (the first eight conceptual differences and last six operational differences) were presented to distinguish



the naturalistic lens from the experimental lens. For experimental and naturalistic inquiry, respectively, these included (see also Table 1 in Guba, 1978b, p. 18):

1. Philosophical base of logical positivism (understanding facts or causes of social phenomena) versus phenomenological (describing and understanding social phenomena from the actor's own frame of reference)
2. Inquiry paradigm (experimental versus ethnographic)
3. Inquiry purpose (verification through hypothesis testing versus “the discovery of phenomena whose empirical elaboration and testing would be worthwhile” (Guba, 1978b, p. 13))
4. Stance of the inquirer as reductionist (through a priori hypotheses and constraints on antecedent conditions and outputs/responses, focusing specifically on addressing the questions posed) versus expansionist (through description and understanding of phenomena in its holistic complex form, focused on open-minded exploration and explanation)
5. Framework/design using either preordinate, fixed design versus emergent, variable design
6. The style of coming upon the elements to be studied as intervention (manipulation of independent and dependent variables) versus selection (“less a stage manager [as with interventionist] than a member of the audience. He watches the entire play and then selects from it those aspects which he considers critical for his purposes” [Guba, 1978b, p. 14])
7. Reality manifold as a singular, objective reality “which he believes to exist and which his methods can uncover. Truth is truth...” (Guba, 1978b, p. 15) versus multiple,

- subjective reality that “exists only in the minds of individual people and depends heavily on their separate perceptions” (Guba, 1978b, p. 15)
8. Value structure of value free neutrality versus advocacy of multiple values
  9. The setting of inquiry such that it is contrived versus a natural, non-contrived environment
  10. Context, as in the role of context inquiry, wherein inquiry is either context free or context embedded
  11. Conditions of study as controlled versus uncontrolled (invited interference)
  12. Treatment as the stable and controlled cause of an effect versus anti-treatment or at best antecedent in time, but unstable and variant over time
  13. The scope of inquiry as limited and narrow (e.g., molecular) versus broadly considering any variables (e.g., molar)
  14. Inquiry methods emphasizing objective inter-subject agreement between two competent, neutral observers versus confirmability as agreement among a variety of information sources

In 1979–1981, the underlying assumptions of paradigms began to emerge in the authors’ writings as positions. In 1979, three specific sets of positions for scientific and naturalistic inquiry were proposed (Guba, 1979). These two sets of three positions included:

For scientific inquiries:

- The assumption of singular reality; for example, phenomena are real, inquiry can converge on their discovery, and that reality is “fragmentable into subsystems, which, at the extreme, may be conceptualized as variables” (Guba, 1979, p. 269)

- The assumption of subject-object duality; for example, “the inquirer will have no effect on the phenomena being studied” (Guba, 1979, p. 269).
- The assumption of generalizability; for example, inquiries can produce nomothetic statements or “enduring truth statements that are essentially unchanged from context to context” (Guba, 1979, p. 269)

For naturalistic inquiries:

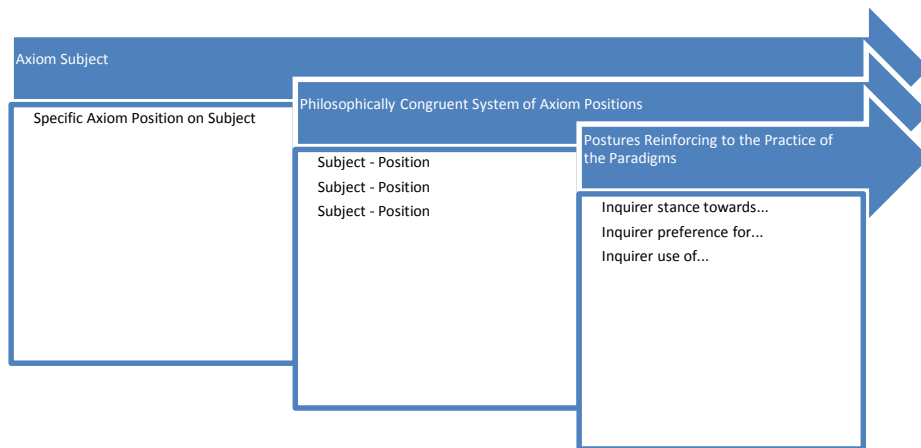
- The assumption of multiple realities; for example, “inquiry diverges onto many realities, no one of which is any more ‘true’ than any other ... [phenomena] cannot be described or understood in terms of separate variables” (Guba, 1979, pp. 269-270)
- The assumption of subject-object inter-relatedness; for example, “inquirers and the objects or entities they investigate are inter-related” (Guba, 1979, p. 270)
- The assumption of contextuality; for example, inquiry produces idiographic understandings or “working hypotheses in a context and thick description of that context to be able to appreciate the way in which it impacts inquiry” (Guba, 1979, p. 270)

By 1981, the organizing subjects upon which inquirers took the positions defined in 1979 were presented explicitly (the 14 organizing subjects were made implicit by Guba [1978b]); the specific positions on each subject for the two paradigms were also further articulated. These three basic assumptions were (a) assumption about reality, (b) assumption about the inquirer-subject/object relationship, and (c) assumption about the nature of truth statements (Guba, 1981a; Guba & Lincoln, 1981). Similar to Guba (1978b), a number of additional operational characteristics, postures, and key assumptions were defined in by Guba (1979, 1981a) and Guba

and Lincoln (1981). However, Guba (1981a) made no distinctions, rather, all 10 subjects were equally presented as key assumptions.

**The two-paradigm, five-axiom subject period.** By 1982, the basic assumptions of paradigms were more formally presented as axiom systems (Guba & Lincoln, 1982a). Upon the introduction, axioms were defined “as the set of undemonstrated (and undemonstrable) propositions accepted by convention (even if only intuitively) or established by practice as the basic building blocks of some conceptual or theoretical structure or system” (p. 236). Furthermore, the rules, propositions, and theorems of the axiom systems, could be proven “by showing them to be logical derivatives from some simple and basic set of ‘self-evident truths’” (p. 236).

As conceptual analogy, the authors used the axioms and theorems of Euclidean geometry to help explain their paradigm axiom structure (Guba, 1987a, 1987b; Guba & Lincoln, 1982a, 1989; Lincoln & Guba, 1985b). An important emphasis in the paradigm structure was the hierarchical and logically consistent relationship of axiom subject and axiom position in relation to the philosophically congruent system of axiom positions, and subsequently to the interdependent, theorem-like, inquirer postures on inquiry that were “reinforcing to the practice of the paradigms” (Guba & Lincoln, 1982a, p. 244). The paradigm structure is graphically represented in Figure 2.



*Figure 2.* Axiom structure for paradigms of inquiry.

Because the Euclidean geometry analogy implied a formal, logical derivative nature between axiom and theorem, Guba and Lincoln (1989) were careful to point out that the axiom position–inquirer posture relationship was not of the same formal derivative nature. Rather, the postures were more simply consistent ways of acting in alignment with the underlying belief system.

We must again stress that our use of the term theorem is different from that of Euclidean geometry. The latter theorems have all been shown, by a formal deductive process, to be logically derivable from, and dependent on, the axioms. The theorems we propose here have not undergone such a rigorous test; we hope, however, that they will appear to be consistent with their respective paradigms on their face. (p. 103)

Whether conceived as formal theory or more simply metaphor for the paradigm construct, introduction of the axiom system began to provide conceptual organization and alignment to the assumption structure fundamental to paradigms, as well as to the operationalized consequences of a complete set of assumption positions bearing on an inquiry.

This relationship between the fundamental assumption structure of a paradigm and the operationalized consequences of a paradigm reflects the idea that:

Naturalistic inquiry is a paradigm of inquiry, that is, a pattern or model for how inquiry may be conducted. It is frequently asserted that its distinguishing features are that it is carried out in a natural setting (hence the term naturalistic), that it uses a case study format, and that it relies heavily on qualitative rather than quantitative methods; however, none of these features is naturalistic inquiry. All of these assertions are essentially correct, but no one of them, nor indeed all of them together, captures the full significance of the term paradigm. Paradigms differ from one another on matters much more fundamental than the locale in which the inquiry is conducted, the format of the inquiry report, or the nature of the methods used-namely, they differ on the basic axioms on which they rest. Paradigms are axiomatic systems characterized essentially by their differing sets of assumptions about the phenomena into which they are designed to inquire. (Guba & Lincoln, 1982a, p. 233)

The presentation of the basic assumptions of paradigms as axiom systems was significant not only as an introduction to the axiomatic structure of paradigms, but also because this period expanded the core set of basic assumptions to include *attribution/explanation of action* and *the role of values in inquiry* as the fourth and fifth axioms (Guba & Lincoln, 1982a). Six derivative-like postures taken by practitioners of a paradigm were also presented. For the rationalist and naturalist paradigms, respectively, attribution/explanation of action defined two positions: “every action can be explained as the result (effect) of a real cause or causes that precede the effect temporally (or are at least simultaneous with it)” (p. 238) and

An action may be explainable in terms of multiple interacting factors, events, and processes that shape it and are part of it; inquirers can, at best, establish plausible inferences about the patterns and webs of such shaping in any given case. (p. 238).

Two positions were also defined for the role of values in inquiry. For the rationalist position, “inquiry is value-free and can be guaranteed to be so by virtue of the objective methodology employed. These methods guarantee inquirer neutrality and inquiry rigor and produce data that ‘speak for themselves’” (p. 238). For the naturalist position, inquiry was defined as “value-

bound” (p. 238). Five corollaries were offered to show how naturalistic inquiries are value bound:

Corollary 1: Inquiries are value-bound by inquirer values, “especially as those values are expressed in the choice of a problem and the framing, bounding, and focusing of that problem” (p. 238).

Corollary 2: Inquiries are value-bound by the “paradigm selected to investigate the problem” (p. 238).

Corollary 3: Inquiries are value-bound by the “choice of substantive theory and methods used to guide the collection and analysis of data relevant to the problem selected and in the interpretation of findings” (p. 238).

Corollary 4: Inquiries are value-bound by the “values inherent in the context...not those that characterize individuals, but those that specifically characterize socio-behavioral, human, organizational phenomena” (p. 238).

Corollary 5: Inquiries are value-bound by the problem, paradigm, method(s), and context resonance or dissonance such that they “must exhibit internal coherence, value fit, and congruence (value resonance) for the inquiry to be deemed appropriate and fitting and to produce meaningful findings” (p. 238).

**The three-paradigm, five-axiom subject period.** In 1985, the five-axiom structure was further explained for the positivist and naturalistic paradigms. This year marked (a) the first formal presentation of the positivist paradigm rather than the scientific, rational, or conventional

paradigm (Guba, 1985; Lincoln & Guba, 1985b, 1986a); (b) the first reference to epistemology as the axiom subject for the subject-object relationship (i.e., “the relationship of knower to known (epistemology)” [Lincoln & Guba, 1985b, p. 37]); (c) the introduction to the “critical realist” (Guba, 1985, p. 98) axiom position; and (d) the initial representation of three distinct axiom systems: the “positivist view (normal orthodoxy)”, the “transitional view (retrenchment neo-orthodoxy)”, and the “postpositivist view (emergent nonorthodoxy)” (p. 98).

The critical realist axiom was defined as the position somewhere between the naïve realism of the positivist and the multiple constructed realities of the naturalist (Guba, 1985) in the context of Kuhn’s (1996) paradigm crisis, in which existing paradigms are modified to accommodate the things they cannot explain. With reference to the earlier writings of Cook and Campbell (1979), Guba (1985) described the critical realist position on reality as one that dually acknowledged the imperfect, subjective human capacities used to perceive causal relationships about the world, without forgetting that the perceived relations were assertions about presumed real phenomena external to the human mind. For this *transitional view*, the positions on the five axioms were:

Axiom 1: The nature of reality (ontology): critical realism, real reality “out there” (p. 98) and external to the mind remains at the core of the position, but acknowledges that “these valid causal relationships cannot be perceived with total accuracy” (p. 97) due to imperfect human sensory capacities.

Axiom 2: The inquirer-respondent relationship (subject-object dualism [epistemology]): reactivity, objectivity remains the ideal, but acknowledges that all situations cannot be



manipulated and require reactive methods of study, e.g., quasi-experimental designs and other unobtrusive measures.

Axiom 3: The purpose of inquiry (generalization): statistical abstraction with multiple orders of interactions and controlling variables can be used to account for contextual complexities; and therefore, permit nomothetic conclusions threatened by the “technical problems” (p. 99) of time or context confounds.

Axiom 4: The nature of explanation (causality): “activity theory” (p. 98), the reliability of causal assertions maybe improved by following a recipe with specific procedures and ingredients for inquiry.

Axiom 5: The role of values in inquiry (axiology): “values influence selection of problem theory, method, and analysis” (p. 98) in contrast to the complete value freedom of positivism and the complete value boundedness of naturalism.

**The two-paradigm, three-axiom subject period.** Guba (1987a, 1987b) revamped the axiom structure to have three axioms, or basic beliefs. Significant to the new paradigm axiom system was the exclusion of what had been axioms three through five and the inclusion of *methodology* as the new third and final axiom. Methodology was presented as the question of “how can the knower go about knowing” (1987a, p. 34). For the conventional paradigm, the axiom position on the methodological subject was that of interventionist, answering the question of *how can a knower go about knowing?* by responding “the context is stripped of its contaminating (confounding) influences so that the inquiry can converge on truth, explaining nature as it really is, leading to the capability to predict and control” (p. 34). For the conventional

paradigm, the methodological axiom stated that “the context is construed as giving meaning and existence to the inquired-into, the methodology involves a dialectic of iteration, analysis, critique, reiteration, reanalysis, and so on, leading to the emergence of a joint (combined emic/etic) understanding of a case” (p. 34).

In 1988, the old five-axiom structure reemerged (Guba & Lincoln, 1988) for a year, but in 1989, the five-axiom structure was replaced by the three-axiom (i.e., ontology, epistemology, methodology) structure (Guba, 1990b, 1990c; Guba & Lincoln, 1989). The five-axiom structure was not seen again for another 22 years (i.e., Lincoln & Lynham, 2011). While still considered an axiomatic structure, during this temporary shift from five to three axioms, the paradigm structure was also more accessibly referred to as the way inquirers respond to three basic questions (Guba & Lincoln, 1989; Guba, 1990b, 1990c):

[Paradigms] can be characterized by the way their proponents respond to three basic questions, which can be characterized as the ontological, the epistemological, and the methodological questions... The answers that are given to these questions may be termed, as sets, the basic belief systems or paradigms that might be adopted. They are the starting points or givens that determine what inquiry is and how it is to be practiced. (Guba, 1990c, p. 18)

Specifically, the three basic questions of a paradigm ask:

[1] What is there that can be known-what is knowable? This question has conventionally been called the ontological question; essentially it deals with the assumptions one is willing to make about the nature of reality. [2] What is the relationship of the knower to the known? This question has conventionally been called the epistemological question; obviously the assumptions one makes about this process aspect depend heavily on what one is willing to assume ontologically. [3] How can one go about finding out things? This question is conventionally called the methodological question; how one answers depends heavily on what one has decided earlier at the ontological and the epistemological levels. (Guba, 1990b, p. 86)

With its reintroduction in 1989–1990, methodology was given further definition than originally provided in 1987 (Guba, 1987a, 1987b). The basic question regarding the methodological belief was defined to task:

What are the ways of finding out knowledge? This is usually called the methodological question. Methodology is a more practical branch of philosophy (especially of philosophy of science) that deals with methods, systems, and rules for the conduct of inquiry. Another way to phrase the question is: "How can we go about finding out things?" It must be clear that there is no way to answer these questions in an unambiguous and certain way or in a way that is capable of proof. The set of answers one gives is the basic belief system or paradigm. (Guba & Lincoln, 1989, p. 83)

**The four-paradigm, three-axiom subject period.** Work in 1989–1990 not only grounded the axiom systems around three basic questions, but also formally reintroduced the postpositivist paradigm; introduced the critical paradigm; and fully articulated axiom systems for the positivist (Guba, 1990c; Guba & Lincoln, 1989), postpositivist (Guba, 1990b, 1990c; Guba & Lincoln, 1989), critical (Guba, 1990b, 1990c), and constructivist (Guba, 1990b, 1990c; Guba & Lincoln, 1989) paradigms. These four axiom systems were presented as follows:

The basic beliefs of positivism:

1. Ontology: Realist—reality exists “out there” and is driven by immutable natural laws and mechanisms. Knowledge of these entities, laws, and mechanisms is conventionally summarized in the form of time- and context-free generalizations. Some of these latter generalizations take the form of cause-effect laws.
2. Epistemology: Dualist/objectivist—it is both possible and essential for the inquirer to adopt a distant, noninteractive posture. Values and other biasing and confounding factors are thereby automatically excluded from influencing the outcomes.

3. Methodology: Experimental/manipulative—questions and/or hypotheses are stated in advance in propositional form and subjected to empirical tests (falsification) under carefully controlled conditions (Guba, 1990c, p. 20).

The basic beliefs of postpositivism:

1. Ontology: Critical realist—reality exists but can never be fully apprehended. It is driven by natural laws that can be only incompletely understood.
2. Epistemology: Modified objectivist—objectivity remains a regulatory ideal, but it can only be approximated, with special emphasis placed on external guardians, such as the critical tradition and the critical community.
3. Methodology: Modified experimental/manipulative—methods emphasize critical multiplism. Imbalances are redressed by doing inquiry in more natural settings, using more qualitative methods, depending more on grounded theory, and reintroducing discovery into the inquiry process (Guba, 1990c, p. 23).

The basic beliefs of critical theory (Guba, 1990c):

1. Ontology: Critical realist—reality exists as in the case of postpositivism, but as a more informed real state than the status quo.
2. Epistemology: Subjectivist—knowing, as in the case of constructivism is the product of inquirer and inquired interaction, but in the sense that ideology mediates knowing.

3. Methodology: Dialogic, transformative—the goal is to eliminate false consciousness and energize and facilitate transformation.

The basic beliefs of constructivism:

1. Ontology: Relativist—realities exist in the form of multiple mental constructions, are socially and experientially based, are local and specific, and depend for their form and content on the persons who hold them.

2. Epistemology: Subjectivist—the inquirer and inquired are fused into a single (monistic) entity. Findings are literally the creation of the process of interaction between the two.

3. Methodology: Hermeneutic, dialectic—individual constructions are elicited and refined hermeneutically, and compared and contrasted dialectically, with the aim of generating one (or a few) constructions on which there is substantial consensus (Guba, 1990c, p. 27).

Throughout the 1990s, little changed with regard to new axioms, but the set of four axiom systems was further detailed and described (e.g., Denzin & Lincoln, 1994; Guba, 1992; Guba & Lincoln, 1994; Lincoln, 1993a, 1997b). In addition to the further axiom detail, 10 “consequences for the practical conduct of inquiry, as well as for the interpretation of findings and policy choices” (Guba & Lincoln, 1994, p. 112) were outlined for each of the five paradigms.

Other details added during the 1990s included further specification of the critical realist axiom position (Guba, 1990b) and extensions of the different paradigm systems into both their respective methodological strategies and criteria of quality (Denzin & Lincoln, 1994; Guba & Lincoln, 1994).

**The five-paradigm, three-axiom subject period.** In 2000, the axiom structure further expanded with the inclusion of a complete set of axiom positions for the participatory paradigm (Lincoln & Guba, 2000). Over the next 10 years, the new five-paradigm framework was further detailed, including additional description of the axiom positions, seven paradigm positions on select practical issues, and seven critical issues of the time (Denzin & Lincoln, 2000; Guba & Lincoln, 2005; Lincoln, 2005, 2010; Lincoln & Guba, 2000). As originally presented in 2000, the participatory axioms for the ontological, epistemological, and methodological axiom subjects, respectively, included:

1. Ontology: “Participative reality—subjective-objective reality, cocreated by mind and given cosmos” (Lincoln & Guba, 2000, p. 195).
2. Epistemology: “Critical subjectivity in participatory transaction with cosmos; extended epistemology of experiential, propositional, and practical knowing; cocreated findings” (Lincoln & Guba, 2000, p. 195).
3. Methodology: “Political participation in collaborative action inquiry; primacy of the practical; use of language grounded in shared experiential context” (Lincoln & Guba, 2000, p. 195).

Other ongoing refinements and subtle distinctions were made during this period regarding the axioms and their implications for inquiry. For example, further clarity was given to

the dualist versus monist epistemological positions. Dualism was defined to position the inquirer (i.e., knower) and the subject (i.e., the to-be-known) in distinct and independent dualistic relation. However, monism “further specifies that the knower and the to-be-known do not exist in dualistic relation—that is, separate from one another—but rather exist as a monistic unit, both teaching and learning from each other in active exchange, or intersubjectively” (Lincoln, 2005, p. 224).

**The four-paradigm, five-axiom subject period.** By 2011, two final publications in the ancestry sample (again) built upon and synthesized the axiom subjects, positions, and implications on inquiry presented across more than four decades of publications. Lincoln et al. (2011) expanded the original seven paradigm positions on select practical issues (Lincoln & Guba, 2000; Guba & Lincoln, 2005) to include 11 positions, along with the same seven critical issues of the time.

Lincoln and Lynham (2011) expanded the axiom subjects from three to five, including axiology and teleology as two additional axiom subjects. Axiom subjects were only defined for the positivist, postpositivist, critical, and constructivist/interpretivist paradigms. Axiology was defined as “the values that should guide the choices made by the researcher/s in selection, conduct, and dissemination of inquiry and its outcomes” (p. 7). The specific axiom positions defined for the axiological axiom subject were:

- Position for positivism: “The disinterested scientist—‘Researchers should remain distant from the subject so that their actions do not have an influence on the populations being studied, but only on the laws that their inquiry produces.

Propositional knowing about the world is an end in itself, and is intrinsically valued’ (Guba and Lincoln 2005, 198).” (Lincoln & Lynham, 2011, p. 7)

- Position for postpositivism: “The disinterested scientist—Researchers should attempt to gain a better understanding of reality and as close as possible to truth through the use of statistics that explain and describe what is known as reality. Like positivism, propositional knowing about the world is an end in itself, and is intrinsically valued.” (p. 7)
- Position for the critical paradigm: “Engaged participant—‘Researchers seek to change existing social and other conditions, policies and practice. Propositional, transactional knowing is instrumentally valuable as a means to social emancipation, which is an end in itself, and taken to be intrinsically valuable’ (Guba and Lincoln 2005, p. 198).” (p. 7)
- Position for the interpretive paradigm: “Passionate participant—‘As with critical inquiry, propositional, transactional knowing is instrumentally valuable as a means to social emancipation, which is an end in itself, and taken to be intrinsically valuable’ (Guba and Lincoln 2005, 198)” (p. 7).

Teleology was defined as “the end to which the knowledge gained through inquiry ought to be applied” (Lincoln & Lynham, 2011, p. 8). The specific axiom positions defined for the teleological axiom subject were:

- Positions for positivism and postpositivism: “Technical—To explain, in order to replicate, predict and control” (p. 8).



- Position for the critical paradigm: “Critically informed praxis—‘. . .to critique and transform, reconstitute and emancipate. Thus, to enlighten and emancipate through the process of critique and identifying potential’ (Guba and Lincoln 2005, 194), in order ‘to develop more critically informed practice’” (Lincoln & Lynham, 2011, p. 8).
- Position for the interpretive paradigm: “Improved praxis—‘To make sense of, understand and interpret. To understand and interpret through meaning of phenomena (obtained from the joint construction/reconstruction of meaning of lived experience); such understanding is sought to inform praxis (improved practice)’” (p. 8).

### **Axiomatic Extensions into Inquiry**

Axiom extensions are defined here as logical implications of a set of axiom positions into the practice of inquiry. These logical implications of axioms suggest ways of acting that are aligned with basic beliefs about the to-be-attained knowledge. From a theoretical perspective, axiom extensions can be thought of analogously to propositional statements of a theory; that is, given the assumptions of the theory that are presumed to be true, these derived propositional statements must also be true within the conceptual scope of the theory.

For example, within communities of postpositivist researchers engaged in accepted practices, it could be tempting to view empirical procedures as the right way to conduct inquiry. However, absent of right/wrong judgments, the procedures can alternatively be understood as the behavioral consequences of a belief system based on an approximate view of an external reality and a desire to come to know that reality as objectively as possible; therefore, carefully planned, executed, and replicated procedures are adhered to that simultaneously control and manipulate a portion of that reality, while systematically factoring the inquirer out of the process. If the

underlying set of axiom positions is changed (i.e., a different set of theoretical assumptions is operating in concert about reality), then the behavioral consequences that logically extend from those axioms must also change to remain as congruent as possible with the assumptions that, by logical extension, can be judged as inquiry behaviors that make sense in practice.

The majority of the extensions of axioms presented in the literature followed the development of the axioms themselves; however, prior to formal presentation of inquiry axioms, the idea that conceptual and operational characteristics of paradigms were at play in inquiries was already apparent (Guba, 1978b). Out of the 14 points of difference presented by Guba that distinguished naturalistic from experimental inquiry, eight were explicitly described as “conceptual” (p. 18) differences, and six were explicitly described as “operational” (p. 18) differences. The conceptual differences were:

1. Philosophical base
2. Inquiry paradigm
3. Inquiry purpose
4. Stance of the inquirer
5. Framework/design
6. The style of coming upon the elements to be studied
7. Reality manifold
8. Value structure

The operational differences were:

1. The setting of inquiry, such that it is contrived, versus a natural, non-contrived environment
2. Context, as in the role of context inquiry, wherein inquiry is context free, versus context embedded
3. Conditions of study as controlled, versus uncontrolled (invited interference)
4. Treatment as the stable and controlled cause of an effect, versus anti-treatment, or at best antecedent in time, but unstable and variant over time
5. The scope of inquiry as limited and narrow (e.g., molecular), versus broadly considering any variables (e.g., molar)
6. Inquiry methods emphasizing objective inter-subject agreement between two competent, neutral observers, versus confirmability as agreement among a variety of information sources

After Guba's original presentation of inquiry characteristics in 1978, it is important to note that Guba (1979) began to present operational characteristics as distinct from a set of three basic assumptions. This distinction between basic assumptions and the extensions of those assumptions remained a consistent division in the features of inquiry approaches discussed from this time period to the present. One exception to this distinction was Guba (1981a).

In 1979, 11 characteristics that differentiated naturalistic from scientific inquiries were presented. Even though explicitly labeled as *operational characteristics*, the 11-characteristic set (Guba, 1979) overlapped with the combined 14 conceptual and operational characteristics presented 1 year prior (Guba, 1978b). Unique to this set of 11 operational characteristics (plus three basic assumptions) were what appeared to be five newly articulated characteristics, but the

characteristics lacked organizing subjects. For scientific versus naturalistic approaches, respectively, these five included (Guba, 1979):

- Use of quantitative versus qualitative methods
- An emphasis on rigor versus relevance
- Use of a priori versus grounded theories
- An examination of whether x can cause y or if x causes y in nature
- A goal of propositional versus tacit knowledge

In the early 1980s Guba and Lincoln (1981; Guba, 1981a) synthesized the assumptions of inquiry approaches from prior years and more fully organized them in a general subject-paradigm position hierarchy. Inquiry characteristics were organized by three basic assumptions, seven general postures, and eight methodological postures. Organization by subject provided a significant conceptual gain over prior years' discussions. Several new subjects were introduced for previously proposed positions, and a couple of entire new subject-position hierarchies were also proposed.

New subjects for previously proposed positions included:

- The “quality criterion” subject for the positions *an emphasis on rigor versus relevance*
- The “sources of theory” subject for the positions *use of a prior versus grounded theories*
- The “questions of causality” subject for the positions *examination of whether x can cause y versus does x cause y in nature*

- The “knowledge types used” subject for the positions *goal of proposition versus tacit knowledge*

In addition, two new subjects and associated positions were added in 1981.

- The “timing of the specification of data collection and analysis rules” subject for the positions *specifying all rules for data collection and analysis in advance of the inquiry versus accruing raw naturalistic data first and then unitizing and categorizing it after the fact*
- The “analytic units” subject for the positions “*the variable, and all relationships are expressed as between variables (or systems of variables)*” (Guba & Lincoln, 1981, p. 75) versus *emphasizing “the complex patternings that are observed in nature”* (Guba & Lincoln, 1981, p. 75)

Also further distinguished in 1981 was instrumentation from method. Here, the two subjects defined were:

- The “preferred methods/techniques” subject for the positions *quantitative emphasis versus qualitative emphasis*
- The “instruments subject” for the positions *use of objective, neutral instruments versus the use of the self as instrument*

The same year the paradigms were formally presented as axiom systems comprising five axioms, Guba and Lincoln (1982a) presented the characteristics (i.e., postures) in quasi-analogy to theorems of the axioms.

These postures are not compelled by the axioms, in the sense that they are necessary, logical derivatives (like the theorems of a geometry), yet they are congenial or reinforcing to the practice of the paradigms and probably would be insisted on by each paradigm's followers. (p. 244)

Although no new postures were introduced in 1982, of note is the greatly reduced set of six postures reinforcing to the practice of the paradigms; these were:

- Preferred methods
- Source of theory
- Knowledge types used
- Instruments
- Design
- Setting

Three years later, Lincoln and Guba (1985b; Lincoln, 1985e) expanded the postures to a list of 14 derivative, means-ends implications. Two additions to the axiom extensions in 1985 are important to highlight: the addition of seven new general posture subjects with associated positions for the naturalistic paradigm (positions for the scientific paradigm were not defined for another two years), and an expanded discussion on synergism of the postures logically extended from the axiom systems. The seven new general posture subjects and specific positions for the naturalistic paradigm are shown in Table 19 (Lincoln, 1985e; Lincoln & Guba, 1985b).

Table 19

*Table of Seven New Naturalistic Postures Added in the Mid 1980s*

<b>Posture subject</b>	<b>Posture position</b>
Logic of analysis	Inductive data analysis: Given the emergent design, inductive analysis is “capable of reflecting multiple realities constructed out of environments” (Lincoln, 1985e, p. 145)
Sampling strategy	Purposive sampling: “grants the naturalist the ability to take account of local context situations, as not everyone on a site will see, or be privy to, the same circumstances. Maximizing the range of perspectives concomitantly maximizes the ability to take account of local conditions, to take account of local influences, and to trace <i>in situ</i> value patterns from one respondent to the next. Naturalists who wish to represent the infinite realities will seek those out, wherever the perspectives are held, regardless of the social caste or class of the respondent” (Lincoln, 1985e, p. 147)
Determining inquiry boundaries	Problem/Focus-determined boundaries: “let the inquiry bound itself as the problem emerges from time on site, rather than to bound it by prior theoretical formulations. In this manner, the problem is defined by participants, actors, and respondents equally with the inquirer, a position supported in the interest of negotiated research... As inquirers come to know what is important to residents and actors, they will come equally to know when the inquiry should stop. At that point the inquiry is bounded, as it has been defined and identified, and data collected have become redundant and duplicative.” (Lincoln, 1985e, pp. 147-148)
The nature of interpretation	Idiographic interpretation: “the particulars of any given context or site shape their data interpretations and conclusions.” (Lincoln, 1985e, p. 148)
Application of findings	Tentative application: “Naturalists tend to be much more modest and reluctant about making sweeping application of their findings, simply because they understand the extent to which local conditions shape and influence those findings... The best naturalists can do is caution about the acquisition of description sufficiently thick to enable similarity of judgments between contexts.” (Lincoln, 1985e, pp. 148-149)
Reporting mode	Case study reporting mode: “case reports are inevitably grounded in the particulars of a given context, because they focus on individual and therefore multiple realities (in seeking interpretations that people attach to their own experiences), because they force the inquirer to take account of and render experiences, because they focus on description and processes, and because they provide vicarious experience to readers. In addition, case studies are peculiarly suited to providing thick description” (Lincoln, 1985e, pp. 149-150)
Research results	Negotiated results: Respondents “contribute directly to hypothesis making, to formulation of final conclusions, and to whatever interactions and processes go on in between... [and] the results of research are shared, bartered, exchanged, or negotiated” (Lincoln, 1985e, p. 151)

Discussion of the synergism of the axiom extensions further characterized the necessary relationships between the postures derived from axioms. Up to this point, the emphasis on axiom extensions had been primarily on the logical dependence to their derived axiom system. However, the axiom extensions were further described to exhibit coherence and interdependence,

as well (Lincoln, 1985e; Lincoln & Guba, 1985b). On the synergism among and between the axiom extensions, Lincoln (1985e) commented that

One cannot easily pick and choose from among them, substituting in their places characteristics of method and setting that fit within the conventional paradigm. To do so forces violence on the epistemological and methodological system, and creates value dissonance inside the inquiry. Together, they form a circular support system, and no matter where one begins, one is led inevitably to other choices from among the characteristics. (Lincoln, 1985e, pp. 153–154)

Toward the end of the 1980s, the set of axiom extensions underwent another revision (Guba, 1987a/b; Guba & Lincoln, 1989), both of general subjects and with explicit reference as theorems of the underlying axiom systems. The theorems were cautiously presented as such and emphasized as ways of acting consistent with the axioms; however, even though the distinction was drawn differentiating the axioms theorems of paradigms from the axiom theorems of geometry, Guba (1987a, 1987b) noted having “every confidence and dare assert, however, that each theorem could be shown to be a logical derivative from the ontological, epistemological, and methodological axioms of its particular root paradigm” (p. 33).

The newly formulated theorems are shown in Table 20 (adapted from Guba [1987] and Guba & Lincoln [1989]). The only difference between the 13 theorems proposed by Guba in 1987 and the 14 theorems proposed by Guba and Lincoln in 1989 was the addition of a theorem for the “independence of facts and theories” (Guba & Lincoln, 1989, p. 105). This theorem is marked with an asterisk to denote its novelty in the two otherwise parallel sets of theorems.



Table 20

*Theorems of the Axiomatic Systems for Convention and Naturalistic*

<b>Theorem subject</b>	<b>Theorem for the conventional inquiry paradigm</b>	<b>Theorem for the naturalist inquiry paradigm</b>
<i>Inquiry problematic</i>	Conventional inquiry is not problematic, because it is the natural way to determine the definitive and enduring truth about states of affairs.	Naturalistic inquiry is problematic, because it is the humanly devised way to entertain constructions about states of affairs that are subject to continuous refinement, revision, and, if necessary, replacement.
<i>The nature of truth</i>	The truth of any proposition (its factual quality) can be determined by testing it empirically in the natural world. Any proposition that has withstood such a test is true; such truth is absolute.	The “truth” of any proposition (its credibility) can be determined by submitting it semiotically to the judgment of a group of informed and sophisticated holders of (initially) different constructions.
<i>Limits of truth</i>	A proposition that has not been tested empirically cannot be known to be true. Likewise, a proposition incapable of empirical test can never be confirmed to be true.	A proposition is neither tested nor untested; it can only be known to be “true” (credible) in relation to the constructions of informed and sophisticated constructors and groups of constructors.
<i>Measurability</i>	Whatever exists does so in some measurable amount. If it cannot be measured it does not exist.	Constructions exist only in the minds of constructors and cannot be divided into measureable entities; if it can be measured it is probably trivial.
<i>Independence of facts and theories*</i>	Facts are aspects of the natural world that do not depend on the theories that happen to guide any given inquiry. Observational and theoretical languages are independent.	"Facts" are always theory-laden, that is, they have no independent meaning except within some theoretical framework. There can be no separate observational and theoretical languages.
<i>Independence of facts and values</i>	Facts and values are independent. Facts can be uncovered and arrayed independently of the values that may later be brought to bear to interpret or give meaning to them. There are separate factual and valuational languages, the former describing "isness" and the latter "oughtness".	“Facts” and “values” are interdependent; “facts” have no meaning except within some “value” framework; there can be no separate observational and theoretical languages. (The distinction between “facts” and “values” is irrelevant to the naturalist paradigm).
<i>Causation</i>	Every observed action (effect) has a cause, and every cause has an effect.	Any observed action is the instantaneous resolution of a large number of mutual and simultaneous shapers, each of which is constantly shaping, and being shaped, by every other shaper.
<i>Root causes</i>	It is always possible, in principle, to determine the root cause of any observed action (although that may prove to be virtually intractable in practice).	A “predominant” or “operational” shaper of any observed action may be singled out arbitrarily for some specific purpose, as for example, the form of a new curriculum (the evaluand, say) may be taken to be the dominant shaper of learning by a curriculum developer, while a school ethnographer may single out the school’s cultural setting for that honor.

<i>Successful inquiry</i>	The determination of root causes is the basis for scientific prediction and control. The success of a science can be judged on whether it displays ever-increasing ability to predict and control its phenomena (the ultimate pragmatic criterion for scientific inquiry, Hesse, 1980).	The positing of “predominant” or “operational” shapers provides a basis for purposefully simplifying an otherwise very complex phenomenal field. The success of naturalistic inquiry can be judged by its increasing understanding of its phenomena (the ultimate constructivist criterion for naturalistic inquiry).
<i>The genesis of problems</i>	Phenomena, including problems, scientifically identified are real and have widespread significance, that is, they will be noted in many contexts, and they are generalizable.	Phenomena—including problems—identified through naturalistic inquiry are constructions (as are the realities within which they putatively exist) and have no meaning except in that context in which they are identified.
<i>Applicability of problem solutions</i>	Scientifically devised problem solutions have widespread applicability.	Problem solutions devised through naturalistic inquiry have local applicability only.
<i>Stability of problem solutions</i>	Problem solutions are stable; when these solutions are introduced into specific contexts they will maintain their characteristics over time.	Problem solutions are variable; when these solutions are introduced into specific contexts they will be at least as much affected (changed by those contexts as they are likely to affect them).
<i>The change process</i>	Change is a process that must be stimulated by outside forces. The natural state of affairs is at best to maintain the status quo and at worst to disintegrate to the lowest organizational/energy level possible (entropy). Change is a process that must be managed.	Change is a continuously ongoing process which requires neither outside stimulation nor direction, even though at times such intervention may be useful. Outside management may often impede change rather than promote it.
<i>Implementing the change process</i>	Change is a linear process that moves through stages from research (basic inquiry) through development (applied inquiry) through diffusion to adoption. Each stage looks to the preceding one for its inputs and provides output to the following stage.	Change is a non-linear process which involves the infusion of new information and increased sophistication in its use into the constructions of the involved human constructors; the infusion derived from naturalistic inquiry is but one kind of information that will be (and probably should be) taken into account.

Following the significant revisions (i.e., Guba & Lincoln, 1994, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011) to the axiomatic systems of paradigms published in the four editions of *The Sage Handbook of Qualitative Research* (Denzin & Lincoln, 1994, 2000, 2005, 2011), the associated axiom extensions were also revised accordingly and expanded to accommodate the additional paradigms of inquiry defined across subsequent editions of the handbook.

Guba and Lincoln (1994) again rethought the axiom extensions and termed them “consequences for the practical conduct of inquiry, as well as for the interpretation of findings

and policy choices” (p. 112). Ten *consequences* were presented and set the framework for continued discussion of axiom extensions over the next 15 years:

1. Inquiry aim
2. Nature of knowledge
3. Knowledge accumulation
4. Goodness or quality criteria
5. Value
6. Ethics
7. Voice
8. Training
9. Accommodation
10. Hegemony

For the first time, the authors also discussed the differential importance each paradigm puts on the axiom extensions.

The first four issues (inquiry aim, nature of knowledge, knowledge accumulation, and quality criteria) are among those deemed especially important by positivists and postpositivists; they are therefore the issues on which alternative paradigms are most frequently attacked. The fifth and sixth (values and ethics) are issues taken seriously by all paradigms, although conventional and emergent responses are quite different. Finally, the last four issues (voice, training, accommodation, and hegemony) are those deemed especially important by alternative proponents; they represent areas on which the received view is considered particularly vulnerable. (pp. 112–113)

In the second and third editions of *The Sage Handbook of Qualitative Research* (Denzin & Lincoln, 2000, 2005), the axiom consequences were elaborated upon; expanded to include positions for five paradigms (i.e., positivism, postpositivism, critical theory, constructivist, and

participatory); and re-presented as positions on practical issues and critical issues of the time. In addition to the reorganization into two categories of axiom extensions, the post-millennium period offered several newly advanced positions on practical issues over the 10 presented by Guba and Lincoln (1994). These included a reconceptualization of voice (Guba & Lincoln, 1994) into inquirer posture (Guba & Lincoln, 2005; Lincoln & Guba, 2000) and redefinition of the voice implication treated under critical issues of the time (Guba & Lincoln, 2005; Lincoln & Guba, 2000). Previously, voice represented the manner in which the inquirer's position was manifest in the inquiry (Guba & Lincoln, 1994). Voice was re-labeled as inquirer posture, but retained voice's definition (Guba & Lincoln, 2005; Lincoln & Guba, 2000). Voice was redefined to represent the narrative position reflected in the finished inquiry product (Guba & Lincoln, 2005; Lincoln & Guba, 2000).

Seven positions on practical issues of inquiry were also defined in the post-millennium time period (Guba & Lincoln, 2005; Lincoln & Guba, 2000). The positions were defined as the consequence of axiom acceptance. These seven consequences included (see Table 6.5 in Lincoln & Guba, 2000, pp. 172–173):

1. Nature of knowledge
2. Knowledge accumulation
3. Goodness or quality criteria
4. Values
5. Ethics
6. Inquirer posture
7. Training

The seven critical issues of the time included:

1. Axiology
2. Accommodation and commensurability
3. Action
4. Control
5. Foundations of truth and knowledge
6. Extended considerations of validity (goodness criteria)
7. Voice, reflexivity, and postmodern textual representation

Lincoln et al. (2011) updated the positions on practical issues and synthesized the axiom extensions across previous publications. Specifically, the axiom extensions were expanded from the previous seven positions on practical issues of inquiry to 11, and additional detailed definitions were added throughout. The paradigm positions on select practical issues included the subjects distinguishing between inquirer posture and voice, and subjects were added for inquiry aim, accommodation, and hegemony. The revised set of 11 positions on practical issues were:

1. Inquiry aim: “The goals of research and the reason why inquiry is conducted. What are the goals and knowledge we seek?” (Lincoln et al., 2011, p. 106)
2. Nature of knowledge: “How researchers view the knowledge that is generated through inquiry research” (p. 106)
3. Knowledge accumulation: “How does knowledge build off prior knowledge to develop a better understanding of the subject or field?” (p. 108)
4. Goodness or quality criteria: “How researchers judge the quality of inquiry” (p. 108)

5. Values: “What do researchers seek as important products within inquiry research?” (p. 109)
6. Ethics: “The interaction and relationship between the researcher and the subject as well as the effect inquiry research has on populations” (p. 109)
7. Voice: “Who narrates the research that is produced?” (p. 110)
8. Training: “How are researchers prepared to conduct inquiry research” (p. 110)
9. Inquirer posture: “The point of view in which the researcher operates. How does the researcher approach the inquiry process” (p. 110)
10. Accommodation: “What needs are provided by the inquiry research?” (p. 111)
11. Hegemony: “The influence researchers have on others. Who has the power in inquiry and what is inquired” (p. 111)

The same seven critical issues of the time presented in 2000 and 2005 were again offered by Lincoln et al. in the fourth edition of *The Sage Handbook of Qualitative Research* (Denzin & Lincoln, 2011), but more detailed definitions were provided:

1. Axiology: “How researchers act based on the research they produce also the criteria of values and value judgments especially in ethics” (Lincoln et al., 2011, p. 111)
2. Accommodation and commensurability: “Can the paradigm accommodate other types of inquiry... Can the results of inquiry accommodate each other... Can the paradigms be merged together to make an overarching paradigm?” (p. 112)
3. Action: “What is produced as a result of the inquiry process beyond the data? How does society use the knowledge generated?” (p. 113)
4. Control: “Who dictates how the research is produced and used?” (p. 113)

5. Relationship to foundations of truth and knowledge: “Helps make meaning and significance of components explicit” (p. 114)
6. Extended considerations of validity (goodness criteria): “Bringing ethics and epistemology together (the moral trajectory)” (p. 114)
7. Voice, reflexivity, and postmodern textual representation: Voice – “Can include the voice of the author, the voice of the respondents (subjects), and the voice of the researcher through their inquiry” (p. 115); reflexivity – “The process of reflecting critical on the self as researcher, the ‘human instrument’” (p. 115); postmodern textual representation – “The approach researchers take in understanding how social science is written and presented to avoid “dangerous illusion” which may exist in the text” (p. 115).

### **Basic Questions and Positions on Inquiry Quality**

As early as 1975, before introducing naturalistic inquiry as an alternative to conventional inquiry, Guba (1975) was writing about the criteria of good evaluation. Eleven criteria of good evaluation were discussed without making any distinctions among inquiry paradigms for the quality criteria; these included:

1. Internal validity
2. External validity
3. Reliability
4. Objectivity
5. Relevance
6. Importance

7. Scope
8. Credibility
9. Timeliness
10. Pervasiveness
11. Efficiency

From these 11 general criteria of quality, the criteria evolved into parallel sets of quality criteria conventional and naturalistic inquiries, and then further evolved into distinct criteria for both the outcomes of inquiry as well as the process of inquiry. In the 1990s, the conversation on quality criteria exploded with several new proposal of criteria, expansion to paradigms not previously encompassed by the old criteria, inclusion of ethical criteria, and criteria for issues of representation and legitimation. The quality conversation continued to evolve into questions of validity and rigor, and lastly, to criteria of quality for the theories that contained the knowledge produced by the various paradigms of inquiry.

**Parallel criteria emerge.** Guba (1978b) made distinctions between the general criteria of scientific adequacy for the naturalist and conventional paradigms. Although no organizing subjects for quality were presented, four analogously paired criteria for adequacy were presented for both paradigms. These four included, for scientific and naturalistic inquiries, respectively: “intrinsic adequacy in lieu of internal validity, extrinsic adequacy in lieu of external validity or generalization, replicability in lieu of reliability, and impartiality in lieu of objectivity” (p. 62). The analogous naturalistic criteria were defined as:

- Intrinsic adequacy – The degree of isomorphism between study data and the study phenomenon



- Extrinsic adequacy – The degree of isomorphism between the study findings and the natural world, whether the nature world is viewed as a context free generalization or a context laden special instance of the real world (e.g., the specific situation studied)
- Replicability – The degree of reproducibility of findings through an audit trail or other methods
- Neutrality/Impartiality – The degree of reliable and confirmable data, a case demonstrated for single subject subjective responses as well as multiple subject intersubjective responses; both were also demonstrated as potentially unreliable and biased (see 2x2 figure, p. 74).

By 1981 the criterial subjects for quality emerged as organizing subjects for the quality criteria of the two paradigms (Guba, 1981a, Guba & Lincoln, 1981). These four criteria subjects for quality set the foundation for all discussions of quality that followed in the next 30-plus years of literature. The four criteria subjects, or *basic concerns*, for quality were:

1. Truth value: How can one establish confidence in the "truth" of the findings of a particular inquiry for the subjects with which and the context within which-the inquiry was carried out?
2. Applicability: How can one determine the degree to which the findings of a particular inquiry may have applicability in other contexts or with other subjects'?
3. Consistency: How can one determine whether the findings of an inquiry would be consistently repeated if the inquiry were replicated with the same (or similar) subjects in the same (or a similar) context?

4. Neutrality: How can one establish the degree to which the findings of an inquiry are a function solely of the subjects and conditions of the inquiry and not of the biases, motives, interests, perspectives, and so on of the inquirer? (Guba & Lincoln, 1981, p. 104)

Somewhat interesting was that two slightly different sets of naturalistic positions were presented by Guba (1981a) and Guba and Lincoln (1981). The two paradigm positions on quality are presented together in Table 21. The set presented in Guba (1981a) won out and remained the standard in the proceeding 30-plus years of literature (e.g., Guba & Lincoln, 1982a; Lincoln & Guba, 1985b, 1986a; Lincoln, 1986; Lincoln et al., 2011).

Table 21

*Criteria of Quality Subjects and Positions for Scientific and Naturalistic Approaches*

Subject	Scientific position		Naturalistic position	
	Guba (1981a)	Guba & Lincoln (1981)	Guba (1981a)	Guba & Lincoln (1981)
Truth value	Internal validity	Internal validity	Credibility	Credibility
Applicability	External validity	External validity	<i>Transferability</i>	<i>Fittingness</i>
Consistency	Reliability	Reliability	<i>Dependability</i>	<i>Auditability</i>
Neutrality	Objectivity	Objectivity	Confirmability	Confirmability

For the scientific paradigm, the four criteria of quality were defined as:

- Internal validity – “internal validity is logically determinable by demonstrating isomorphism or verisimilitude between the data of an inquiry and the phenomena those data represent” (Guba, 1981a, p. 80)
- External validity or Generalizability – “requires that the inquiry be conducted in ways that make chronological and situational variations irrelevant to the findings. If that

condition can be met, the findings obviously will have relevance in any context” (p. 80)

- Reliability – “instruments must produce stable results if those results are to be meaningful. Validity is a direct function of reliability... Reliability is thus not so much essential in its own right as it is a precondition for validity” (p. 81)
- Objectivity – “Objectivity is presumably guaranteed by methodology; If the methods are explicated, open to public scrutiny, replicable, and at least one step removed from direct investigator-subject contact, then objectivity is assured (that is, the biases of the investigator are effectively screened out)” (p. 81)

For the naturalistic paradigm, the four criteria of quality were defined as:

- Credibility – “naturalistic inquirers are most concerned with testing the credibility of their findings and interpretations with the various sources (audiences or groups) from which data were drawn” (p. 80)
- Transferability – “which is itself dependent upon the degree of similarity (fittingness) between two contexts. The naturalist does not attempt to form generalizations that will hold in all times and in all places, but to form working hypotheses that may be transferred from one context to another depending upon the degree of "fit" between the contexts” (p. 81)
- Dependability – “the concept of consistency implies not invariance (except by chance) but trackable variance-variance that can be ascribed to sources: so much for error, so much for reality shifts, so much for increased instrumental proficiency (better insights), and so on” (p. 81)

- Confirmability – “naturalists shift the burden of neutrality from the investigator to the data, requiring evidence not of the certifiability of the investigator or his or her methods but of the confirmability of the data produced” (pp. 81-82).

**The proposal of authenticity criteria for naturalism.** Lincoln (1986) and Lincoln and Guba (1986a) created two new conversations in the ongoing dialog about the quality of inquiries: (a) discussion of parallel criteria, which set the stage for future dialog on foundational versus anti- or non- foundational criteria and (b) introduction of a new set of quality criteria rooted in the naturalistic paradigm. The distinction between conventional criteria and “parallel” (Guba, 1987a, 1987b; Guba & Lincoln, 1987; Lincoln, 1986; Lincoln & Guba, 1986a) criteria drew attention to the basis of the four naturalistic criteria of quality; that is, the conventional/scientific paradigm. This was early reference to what eventually became discussed as foundational and anti- or non- foundational criteria (e.g., Guba & Lincoln, 1989; Lincoln, 1995a, 2010). The criteria of quality for scientific inquiries had been established long before naturalism itself was formally defined by Guba (1978b). Positioning of naturalistic criteria as parallel criteria highlighted that they were by design intended to satisfy those wanting an analogous set for both paradigms. However, authenticity criteria (Lincoln, 1986; Lincoln & Guba, 1986a) were presented as “new criteria rooted in naturalism rather than simply paralleling those rooted in positivism” (Lincoln & Guba, 1986a, p. 78).

Regarding authenticity criteria, Lincoln (1986) posed the following question: “Supposing that one had never heard of positivism and the conventional paradigm of inquiry, but worked only and directly from naturalist assumptions, what would be the nature of the criteria to emerge

from that paradigm?” (p. 4). Lincoln (see also Lincoln & Guba [1986a]) answered the question by proposing five authenticity criteria:

1. Fairness
2. Ontological authenticity
3. Educative authenticity
4. Catalytic authenticity
5. Tactical authenticity

The five authenticity criteria were defined as follows:

1. Fairness: Given the reality, value, and belief interactions of the naturalist axioms...

What can a researcher do to assure that these several (or multiple) constructions are presented and honored in a balanced, even-handed way, a way in which the several belief system parties or groups would agree is balanced and even-handed? How can—or should—the inquirer go about his or her tasks in ways which, while not guaranteeing balance (since nothing can provide such certainty), can at least enhance the probability that balance will emerge? If every inquiry serves to social or political agenda (as it must if inquiry is value-mediated), how can a person conduct the inquiry to avoid (at least probabilistically), the possibility that certain values will be diminished, and their holders exploited, while other values will be enhanced, and their holders advantaged? (pp. 5-6).

2. Ontological authenticity:

If each person's reality is constructed and reconstructed as that person gains experience, interacts with others, and deals with the consequences of various personal actions and beliefs (the relativist ontology), an appropriate criterion to apply is that of improvement in the conscious experiencing of the world. What have sometimes been termed “false consciousness” (by the Marxists) and “divided consciousness” (by the feminists) are part of this concept... A given inquiry (whether it is research, evaluation, or policy analysis) ought to have as one of its objectives consciousness-raising or the “uniting of divided consciousness.” (p. 6).

By *improvement* Lincoln distinguished the implication of improving an individual's life and improving an individual construction such that it "will be both richer and broader" (p. 7).

### 3. Educative authenticity:

It is not enough that the individual actors (or groups) in some inquiry situation achieve, individually, more sophisticated constructions of their world. It is also essential that they come to appreciate (acknowledge, recognize, credit), although not necessarily like or agree with, the constructions which are created by others, and to understand how those constructions are rooted in the differing values systems of those others. By this, it is meant that individuals (or groups) come to understand and appreciate the particular value and belief systems of others, and how those value systems give rise to particular social strategies for ameliorating problems (or for failing to ameliorate them). (p. 7).

4. Catalytic authenticity: "Reaching new constructions and achieving increased understandings is still not enough. Inquiry—whether research, evaluation or policy analyses—must also make possible a different form of action than before. Inquiry must also facilitate and stimulate action" (p. 8).

### 5. Tactical authenticity:

Stimulating to action via catalytic authenticity is in itself no assurance that the action taken will be effective. The inquiry will need other attributes to serve this latter goal. Chief among them is the matter of whether the inquiry is empowering. The first step toward empowering is taken by providing all persons at risk (or with something at stake) in the inquiry with the opportunity to control it as well (collaborative, or joint, inquiry), and provides practice of that power through the negotiation of constructions (joint emic/etic elaborations). (p. 9)

Guba and Lincoln (1987) proposed five new criteria specific to fourth-generation evaluation (a naturalist form of evaluation); however, the five criteria closely align with the five authenticity criteria of naturalism. These five were openness, relevance, fairness, ethicality, and increased understanding. Openness was defined as a type of transparency in collecting and displaying all stakeholder opinions (similar to member checking). Relevance was defined as

focusing on and collecting information that is responsive to the voice of the stakeholders. Fairness was defined as presentation of stakeholder perspectives in a balanced manner. Ethicality was defined as subjecting stakeholders to a little risk as possible through participation and making every effort to protect their right to confidentiality. Increased understanding was defined to include improved understanding individually by each stakeholder, but also improved understanding for the perspectives held by other stakeholders involved (Guba & Lincoln, 1987). Although not an exact one-to-one match with the authenticity criteria of naturalism, it is clear that the fourth-generation evaluation criteria were equally rooted in a value system inherent to naturalism and incommensurable with conventional perspectives.

**Distinct criteria for process and product.** Significant to the development and presentation of quality criteria was the conceptual organization of the criteria in 1988 into two groups distinguishing quality criteria for process (i.e., methodological criteria) from quality criteria for product (i.e., outcome criteria) (Lincoln & Guba, 1988). Lincoln and Guba commented that the criteria of quality discussed to date spoke more to quality of process for arriving at conclusions than did the criteria for what makes for good conclusions (i.e., criteria for the “form and content”) (p. 4) of inquiry outcomes. In the context of naturalistic inquiries and the associated case study reporting mode, the authors noted,

Judging the process, while critical in understanding the premises under which the research was carried out and in understanding why the case study takes on the form it does... is a very different activity from judging the quality of the product of an inquiry, prototypically a case study in this type of research. Process judgments tell the reader something about the trustworthiness and authenticity of a given study, but they say little about the quality of the narrative which is presented. Since the ability of a given case study to evoke a vicarious response is directly related to its quality as a narrative, criteria for judging the goodness of the product (case study) are coequally critical with criteria for judging the goodness of process. (p. 9)

In response to the identified lack of quality criteria for the products of inquiry, Lincoln and Guba (1988) proposed four classes of criteria for addressing the goodness of products of naturalistic inquiries: (a) axiomatic criteria, (b) rhetorical criteria, (c) action criteria, and (d) application or transferability criteria.

Axiomatic criteria were defined as “the criteria that demonstrate the resonance between the [reporting mode] and the axioms that characterize the basic belief system” (Lincoln & Guba, 1988, p. 10) of the paradigm. The belief system with which resonance of the reporting mode should be shown was defined as a twofold grouping of (a) the stance toward reality, the outcomes of inquiry, and the dynamics of action and (b) the stance toward the relationship of the knower to the known and the role of values in inquiry. Six axiomatic positions for naturalistic inquiries were described. Given naturalistic axioms, the case study reporting mode must:

[1] reflect the multiple realities constructed by the respondents to such research; [2] demonstrate in what ways it has taken account of the mutual shaping of phenomenal elements on the site, relying on pattern theories rather than on conventional formulations of cause and effect; [3] reject generalizability and the drawing of nomothetic conclusions and avoid making recommendations which look like or which can be interpreted as generalizations; [4] must display and openly take account of the value influences that impinge on the research, including the values which dictated that choice of a problem, the values which impelled the choice of theoretical formulation or framework (if any), the values dictating the choice of paradigm, and the values inherent in the research site (including those of all stakeholder groups), and those of the investigator himself or herself; [5] and finally, must reflect the investigator’s involvement in such a way as to make clear that objectivity, being unachievable in any event, is not the aim of inquiry... [6] With respect to the latter five, a portion of the case study probably ought to be given over to considerations of conscious reflexivity. That is, some portion of the methodological treatment ought to comprise reflections on the investigator’s own personal experience of the fieldwork. (pp. 10-11)

Rhetorical criteria were defined as criteria “relating to the form and structure, or the presentational characteristics, of the case study” (Lincoln & Guba, 1988, p. 11). Furthermore, four sub-criteria are referenced: (a) the criterion of unity, (b) overall organization, (c) simplicity



or clarity, and (d) craftsmanship. The criterion of unity suggests that the report should exhibit structural coherence and logical corroboration: “In short, there ought not to be loose ends, stories left dangling, or characters from the cast who disappear” (p. 12). Overall organization suggests that the report ought to flow and fit together like the overall structure of a novel and its plot. Simplicity and clarity suggest that the report exhibit “accessibility to many persons who could not comprehend a typical scientific report” (p. 12) through the use of natural language or the language, terms, and meanings of respondents/stakeholders/audience. Craftsmanship holds that the report demonstrate carefully written, elegant, creative, courageous, egalitarian writing: “writing, rewriting, and writing again and again are probably the only techniques for advancing the art of craftsmanship. But it is evident when we see it” (p. 13).

Action criteria were defined simply as “the ability of the case study to evoke and facilitate action on the part of readers... The actionability criterion might also be thought of as the empowerment criterion” (Lincoln & Guba, 1988, p. 17).

Application or transferability criteria mandated thick description and was defined as

the extent to which the case study facilitates the drawing of inferences by the reader that may have applicability in his or her own context or situation... transference can take place between contexts A and B if B is sufficiently like A on those elements or factors or circumstances that the A inquiry found to be significant (and those salience factors will vary from inquiry to inquiry). (p. 18)

**The quality criteria boom of the 1990s.** The transition into the 1990s was marked by a big year regarding the development of criteria for quality. Guba (1990c) continued the discussion about parallel methodological criteria in detail; however, new to the conversation was further positioning of authenticity criteria distinct from methodological trustworthiness criteria and a further contextualization of the larger quality criteria dialog within Chisholm’s (1973) *problem*

*of the criterion*. Also new this year was the presentation of 20 common criteria of quality (Guba, 1990c), new nonconventional criteria for judging the goodness of inquiries (Guba, 1990b), categorical and a practical imperative as ethical principles for inquiry (Lincoln, 1990b), and revision of the quality criteria of inquiry products (Lincoln & Guba, 1990).

Prior to 1990, the authenticity criteria of naturalism had been made distinct from the parallel trustworthiness criteria by the grounding of authenticity criteria in naturalism and the grounding of trustworthiness criteria in response to the four quality criteria of the conventional paradigm (i.e., internal validity, external validity, reliability, and objectivity). However, Guba (1990c) further positioned authenticity criteria as “states of being” (p. 70) unique to the stakeholders of naturalistic inquiries. The authenticity criteria, or states of being, were intended to be

particularly for respondents, participants, and stakeholders, which were not expected (or warranted) in conventional inquiry, and one additional criterion, which recognized and attended to the need for such inquiries to express multiple, socially constructed, and often conflicting realities... They related both to (a) levels of understanding and sophistication and to (b) the enhanced ability of participants and stakeholders to take action during and after an inquiry and to negotiate on behalf of themselves and their own interests in the political arena. (pp. 71-72)

Also highlighted in 1990 was the larger philosophical context surrounding the need for criteria of quality process and product for inquiries. Guba (1990c) framed the discussion of quality within Chisholm’s (1973) circular criterion:

To know whether things really are as they seem to be, we must have a procedure for distinguishing appearances that are true from appearances that are false. But to know whether our procedure is a good procedure, we have to know whether it really succeeds in distinguishing appearances that are true from appearances that are false. And we cannot know whether it does really succeed unless we already know which appearances are true and which ones are false. And so we are caught in a circle. (p. 168)

As a consequence of the circular criterion, Guba pointed out the questions inquirers are left to ask: “What can we do so that our research will yield an accurate (objective) as opposed to a distorted (biased) depiction of reality? What criteria can we apply to distinguish valid from invalid research?” (p. 168). Thus, we have the need for criteria against which we can judge quality process and quality process for our inquiries.

Guba (1990c) drew further contrast with what made for valid inquiries between conventional and naturalistic paradigms and emphasized that “the conventional inquirer’s assertion that ‘the data speak for themselves’ was erroneous. In conventional inquiry, actually, the methods attest to the strength of the conclusions. And in parallel fashion, in constructivist fashion, the data are what speak for themselves.” (p. 72). Consequently, an important distinction was made regarding judgments of quality process versus quality product; that is,

could the methodological strategy be good, could the inquirer be an honest and faithful servant to the inquiry question and still turn out a product that fell short of the mark? The answer, of course, was yes. We needed criteria by which we might judge products.” (p. 73)

Therefore, if the quality of our methodology can only speak to the extent of upholding an honest and faithful alignment with the underlying belief system in the conduct of inquiry, and not unilaterally to the extent of the production of a quality product, then we need unique criteria with which to make distinct judgments about the quality of our inquiry outputs.

Looking beyond the differences in quality across qualitative approaches to inquiry, Guba (1990c) noted that if we instead focused on similarities in quality inquiry “that we would agree on common criteria (although different paradigms would weight each criterion differently)” (p. 192). To this end, Guba proposed 20 common criteria of quality. These included (pp. 192–195):

1. The method is explicated in detail with rationale for all design choices
2. Assumptions are stated explicitly
3. The research guards against value judgments and value laden researcher language
4. Evidence is clearly presented that connects inquiry findings to real world knowledge claims
5. The research questions are stated and connected to findings and further questions
6. The current study is explicitly connected to previous studies and findings; the current phenomenon explored is explicitly defined and connected to previously identified phenomena
7. The study is reported in a timely manner and format accessible to researchers, practitioners, and policymakers
8. Evidence is presented demonstrating negative case analysis, alternative explanations, and triangulation of findings
9. The report acknowledges the limitations of generalizability while assisting the readers in seeing the transferability of findings
10. The inquiry problem was generated from, or connected to, a real-world experience rather than mere connection of new data to old theories and or theory-only problems
11. Observations span multiple time points and daily contexts
12. Raw data are available for inspection
13. Methods of member checking are utilized
14. All analysis is documented
15. Meaning is derived from multiple constructions/perspectives
16. Ethical standards are maintained

17. Benefit to participants/co-researchers/stakeholders is demonstrated
18. The researcher demonstrates sophistication and efficacy in selection of methodological strategies
19. The individual study connects back to the big picture
20. Historical context is explored

Guba (1990b) also spoke to rejection of the criteria for quality that stem from conventional, positivist methodologies. Further emphasis was given to the criteria of judging the quality of the products of new paradigm inquiries with his proposal of seven criteria grounded in the new paradigm methodology. These seven were:

1. The report must resonate with the subjects' actual lived experiences.
2. The report must enable the subjects to comprehend their experiences of subordination.
3. The report must lessen the "structural divide" between academics and actors.
4. The report must not be pretentious or condescending-interpretations and concepts must be generally accessible.
5. Subjects must find the report demystifying and clarifying.
6. The researcher's prior theoretical understandings must also be modified.
7. The inquirer must take ethical and political issues seriously-no intellectual tourism is allowed. (p. 84)

In 1990, ethical principles and concerns were also part of the conversation about criteria for quality in inquiries, with the shifting of discussion to the ethical criteria driving inquiry decisions. Lincoln (1990b) proposed a categorical imperative and a practical imperative as ethical principles for inquiry. Lincoln defined the categorical imperative as a *do unto others* rule of inquiry. More specifically:

The categorical imperative is often deemed the "golden rule" of philosophical systems, since its sense is very like the dictum to do unto others as one would have them do unto oneself. The ethical criterion here, again in simplistic form, is judged by whether one would wish the principle guiding his or her own actions to become law that would guide

the actions of others toward him or her. Is what you are doing now something you would wish done to yourself? Your spouse? Your minor children? Your aging parents? Your best friend? If it is not, then it is probably something you ought not to be doing; it is a principle that you cannot, ethically, support. (p. 291)

Lincoln defined the practical imperative as an ethical treatment of participants in such a way that involving them in the research provides them with some benefit. The inquiry should not only benefit the inquirer.

The practical imperative is a corollary to the categorical imperative. Briefly stated, it is, “Treat every man as an end in himself, and never as a means only. In other words, never use another as an instrument” (Reese, 1980, p. 279; emphasis in original). Were we to legislate the practical imperative today, clearly half or more of the social science projects currently underway would fail the standard and lose their funding. Since ethical principles are inevitably human principles, all systems are “flawed” in some sense; they are social constructions that allow given societies to retain some sense of public and private civility while ensuring that rights rest with individuals the society deems responsible enough to handle them. (p. 292)

The last significant event for the criteria of quality in 1990s was a revision of the criteria of quality products. As originally proposed, these criteria included axiomatic criteria, rhetorical criteria, action criteria, and application or transferability criteria. However, Lincoln and Guba (1990) revised and expanded the original four criteria into:

1. Resonance criteria
2. Rhetorical criteria
  - i. Unity
  - ii. Overall organization
  - iii. Simplicity or clarity
  - iv. Craftsmanship
3. Empowerment criteria
4. Applicability criteria

- i. Transference
- ii. Vicarious experience
- iii. Metaphor
- iv. Reexamination of constructions

The resonance criteria was the new label given to the previously labeled axiomatic criteria; however, the definition remained similar. Resonance criteria were defined as “criteria that assess the degree of fit, overlap, or reinforcement between the case study report as written and the basic belief system undergirding that alternative paradigm [or other paradigm?] which the inquirer has chosen to follow” (p. 54).

Rhetorical criteria (i.e., “those relevant to assessing the form, structure, and presentational characteristics of the case study”; Lincoln & Guba, 1990, p. 54) were expanded upon by defining four specific sub-criteria: (a) unity, (b) overall organization, (c) simplicity or clarity, and (d) craftsmanship. These were defined as:

- The rhetorical criteria of unity: “the idea of unity goes beyond organization and the advancement of some central ideas. It encompasses structural characteristics such as coherence and corroboration... In short, there ought not be loose ends, stories left dangling, or characters who disappear from the cast.” (pp. 54-55)
- The rhetorical criteria of overall organization: Similar to judging the structure of a novel, “Is there rising action, climax, falling action? From whose point of view is the story being told, first person, second person, or third person? Who is the narrator, and what are his or her roles? (p. 55)

- The rhetorical criteria of simplicity or clarity: The report is written with natural language so it is accessible to people who could not comprehend a traditional scientific technical report (Lincoln & Guba, 1990).
- The rhetorical criteria of craftsmanship: “Writing, rewriting, and writing again and again are probably the only techniques for advancing the art of craftsmanship. But it is evident when we see it.” (p. 55).

The empowerment criteria was the new label given to the previously labeled action criteria. The definition remained similar, defined here as “the ability of the case study to evoke and facilitate action on the part of readers... At the least, empowerment implies consciousness-raising.” (Lincoln & Guba, 1990, p. 57).

Applicability criteria (i.e., “those which assess the extent to which the case study facilitates the drawing of inferences by the reader that may have applicability in his or her own context or situation” [p. 57]) were also expanded upon by defining four specific sub-criteria: (a) transference, (b) vicarious experience, (c) metaphor, and (d) reexamination of constructions. These four sub-criteria of applicability were defined as:

- Transference: “transference can take place between contexts A and B if B is sufficiently like A on those elements or factors or circumstances that the A inquiry found to be significant” (Lincoln & Guba, 1990, p. 57).
- The applicability criteria of vicarious experience: “whether or not vicarious experience [e.g., *déjà vu*] is enabled” (p. 57).
- The applicability criteria of metaphor: The use of another term or concept to help illuminate meaning of the subject or topic term.



- The applicability criteria of reexamination: New information may be leveraged for “re-examining and reconstructing one's own construction of a given phenomenon. The case may provide new (or better) information. It may raise the reader's level of sophistication. Or it may provide the interpretation critical to erasing false or divided consciousness” (p. 57).

By the mid 1990s, quality criteria for critical inquiries began to catch up with the expanding paradigm constructions for positivist, postpositivist, critical, and constructivist inquiries. Shortly following the introduction of the critical paradigm into their paradigm framework, Guba and Lincoln (1994) proposed quality criteria for critical inquiries distinct from those for conventional and constructivist inquiries. Initially three criteria for critical inquiries were proposed: the criterion of persuasiveness, the criterion of internal validity and authenticity, and the criterion of resonance (Lincoln, 1993). However, by 1994 the three criteria were revised to include three new critical criteria of quality:

[1] the historical situatedness of the inquiry..., [2] the extent to which the inquiry acts to erode ignorance and misapprehensions, and [3] the extent to which it provides a stimulus to action, that is, to the transformation of the existing structure” (Guba & Lincoln, 1994, p. 114).

These three criteria remained the foundation of the goodness criteria for critical inquiries through to the fourth edition of *The Sage Handbook of Qualitative Research* (Denzin & Lincoln, 2011; see Guba & Lincoln, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011), despite a brief deconstruction into criteria specific to feminist positions, ethnic positions, Marxist positions, and cultural studies positions (Denzin & Lincoln, 1994).

The mid 1990s also represented the explicit introduction of the conversation about representation and legitimation, and although not quality criteria per se, the criteria addressed the issues of “how best to describe and interpret the experiences of other peoples and cultures” (Lincoln & Denzin, 1994, p. 577)”. Representation and legitimation addressed the issues of the experiences of “the other” in different ways. The issue of representation asks “Who is the Other? Can we ever hope to speak authentically of the experience of the Other, or an Other? And if not, how do we create a social science that includes the Other?” (p. 577). The issue of legitimation addresses the authority given to knowledge claims made in the text produced by an inquiry. That is,

the claim any text makes to being accurate, true, and complete. Is a text, that is, faithful to the context and the individuals it is supposed to represent? Does the text have the right to assert that it is a report to the larger world that addresses not only the researcher's interests, but also the interests of those studied? (p. 577)

In 1995, Lincoln (1995a) built upon the dialog on methodological criteria (e.g., Guba, 1990c), wherein Lincoln centered the conversation on the basic question of quality for those seeking to do, understand, and use research; that is, “how do we separate good research from poor research across disciplines and traditions? That question still engages many scholars, both those seeking to do such research and those seeking to understand and to use it” (p. 276). Lincoln drew attention to the distinction between the conventional paradigm’s methodological reliance on method (i.e., internal validity, external validity, reliability, and objectivity) and the constructivist paradigm’s methodological reliance extrinsically on data (i.e., the trustworthiness criteria of credibility, transferability, dependability, and confirmability) and intrinsically on an ethical system inherent to the paradigm, i.e., authenticity criteria. This distinction made by Lincoln was of critical importance for thinking about quality of inquiries, given the

methodological emphasis on procedure to ensure rigor in conventional inquiries and the methodological emphasis on data and ethics in constructivist/naturalist inquiries.

Lincoln (1995a) also initiated a discussion on emerging criteria of quality for interpretive research. Altogether, 10 emerging criteria of quality for interpretive inquiry were discussed (see also Lincoln, 1997b, 1998b). These criteria included:

1. Standards for judging quality in the inquiry community (Lincoln, 1995a, 1997b)
2. Positionality, or standpoint judgments (Lincoln, 1995a, 1997b, 1998b)
3. Community as arbiter of quality (Lincoln, 1995a, 1997b, 1998b)
4. Voice (Lincoln, 1995a, 1997b)
5. Critical subjectivity (Lincoln, 1995a, 1997b)
6. Reciprocity (Lincoln, 1995a, 1997b, 1998b)
7. Sacredness (Lincoln, 1995a, 1997b)
8. Sharing the prerequisites of privilege (Lincoln, 1995a, 1997b, 1998b)
9. Caring (Lincoln, 1997b, 1998b)
10. Yearning (Lincoln, 1997b)

**A return to issues of validity and rigor.** By the late 1990s, validity was being given increased attention as a common concept for quality of inquiries and by the turn of the millennium, numerous conceptions of validity were introduced and discussed in detail (Guba & Lincoln, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011). To frame the conversations around validity, the authors generically defined validity and referenced verisimilitude as an indicator of validity.

At its heart, validity questions the congruence between some representation of an object, context, situation, event, or person and the object that is “signified” by the verbal representation. Validity’s logic and justification reside in verisimilitude or isomorphism, the extent to which some signifier’s referent can be recognized in a physical or social world. Validity is critical to researchers and research consumers because another question is important to us: What is the “truth” of these findings [where truth is a construct of the inquiry paradigm], and thus, how far can we trust the reported findings to guide action? The purported verisimilitude is what permits “trustworthiness”, or the judgments that findings from a given study are worthy of our confidence in their close relationship to some reality on which we have received an account. (Lincoln, 1997a, p. 161)

In other words, the authors suggested that the construct of validity was the answer to the question: “Are these findings sufficiently authentic (isomorphic to some reality, trustworthy, related to the way others construct their social worlds) that I may trust myself in acting on their implications?” (Lincoln & Guba, 2000, p. 178). Following suit to the expansion of their paradigm framework to include axiomatic systems for positivist, postpositivist, critical, constructivist, and participatory paradigms, the authors also expanded their discussion to include a number of extended considerations of validity. These extended considerations for the alternative paradigms included validity as authenticity, crystalline validity, transgressive validities, and validity as an ethical relationship.

Validity as authenticity referenced the antifoundational quality criteria “rooted in the axioms and assumptions of the constructivist paradigm” (Lincoln & Guba, 2000, p. 180). These criteria were considered the hallmarks of authentic constructivist inquiry and included the criteria of fairness, ontological authenticity, educative authenticity, catalytic authenticity, and tactical authenticity.

Crystalline validity referenced the multifaceted nature of constructed meaning, also given under the labels of *validity as resistance* and *validity as poststructural transgression*. Crystalline validity was defined as:

The metaphoric “solid object” (crystal/text), which can be turned many ways, which reflects and refracts light (light/multiple layers of meaning), through which we can see both “wave” (light wave/human currents) and “particle” (light as “chunks” of energy/elements of truth, feeling, connection, processes of the research that “flow” together) is an attractive metaphor for validity. The properties of the crystal-as-metaphor help writers and readers alike see the interweaving of processes in the research: discovery, seeing, telling, storying, re-presentation. (Lincoln & Guba, 2000, pp. 1821-182)

Transgressive forms of validity related strongly to critical conceptions of *truth*, where validity was viewed as “disruptive of the status quo... these form a way of interrupting, disrupting, and transforming "pure" presence into a disturbing, fluid, partial, and problematic presence” (Lincoln & Guba, 2000, p. 182).

Validity as an ethical relationship positioned the referent reality isomorphism as one tied to the “ways in which the ethical intersected both the interpersonal and the epistemological (as a form of authentic or valid knowing)” (Lincoln & Guba, 2000, p. 182). The 10 criteria for validity as an ethical relationship were captured in the 10 emerging criteria of quality for interpretive inquiry (Lincoln, 1995a, 1997b, 1998b) previously discussed.

In addition to the emphasis on validity and the different forms of validity, an important discussion about rigor began to emerge—of rigor in method versus rigor in interpretation, and how the two differed in importance across paradigms of inquiry. The millennium (Lincoln & Guba, 2000) saw the first discussion within the authors’ quality criteria writings that explicitly proposed a *rigor unique to the process* of conducting inquiry and a separate *rigor unique to the interpretation* of inquiry outputs. Furthermore, the differentiated conceptions of rigor were tied back to differences in process and product of quality inquiry within different paradigms of inquiry. The authors described rigor in the application of method and rigor in the interpretation of data in the following excerpt:

One of the issues around validity is the contamination between method and interpretation. The postmodern turn suggests that no method can deliver on ultimate truth, and in fact “suspects all methods,” the more so the larger their claims to delivering on truth (Richardson, 1994). Thus, although one might argue that some methods are more suited than others for conducting research on human construction of social realities (Lincoln & Guba, 1985), no one would argue that a single method-or collection of methods-is the royal road to ultimate knowledge. In new-paradigm inquiry, however, it is not merely method that promises to deliver on some set of local or context-grounded truths, it is also the processes of interpretation. Thus we have two arguments proceeding simultaneously. The first borrowed from positivism, argues for a kind of rigor in the application of method, whereas the second argues for both a community consent and a form of rigor-defensible reasoning, plausible alongside some other reality that is known to author and reader-in ascribing salience to one interpretation over another and for framing and bounding an interpretive study itself. Prior to our understanding that there were, indeed, two forms of rigor, we assembled a set of methodological criteria, largely borrowed from an earlier generation of thoughtful anthropological and sociological methodological theorists. Those methodological criteria are still useful for a variety of reasons, not the least of which is that they ensure that such issues as prolonged engagement and persistent observation are attended to with some seriousness. It is the second kind of rigor, however, that has received the most attention in recent writings. Are we interpretively rigorous? Can our cocreated constructions be trusted to provide some purchase on some important phenomenon? (pp. 178-179)

**A shift to the quality criteria for theory.** Toward the close of the first decade of the new millennium, the conversation about quality criteria shifted with the conversation about paradigm-specific forms of knowledge in relation to the theories guiding the inquiry of the respective paradigms (Lincoln & Lynham, 2007, 2011). The predominant emphasis, although not exclusive emphasis (e.g., Lincoln & Guba, 1990), in the discussion on quality criteria had been on the quality criteria for inquiry process; however, with the new focus on paradigm-specific forms of theory came increased attention to quality criteria of theory, and therefore the quality criteria of the outputs of inquiry.

Using Patterson’s (1986) eight criteria of good theory as a starting point, Lincoln and Lynham (2007) initially began contrasting criteria of quality for conventional and interpretive theories. Lincoln and Lynham (2011) introduced a set of quality criteria for critical theories and

presented a more fully developed set of quality criteria for interpretive theories than originally presented by Lincoln & Lynham (2007). These three sets of quality criteria are shown in Table 22 (adapted from Lincoln & Lynham [2011] and Lincoln & Lynham [2007]).

Table 22

*Criteria of Quality for Positivist, Postpositivist, Critical, and Interpretive Theories*

Paradigm of theory	Quality criteria of theories
Criteria of quality for applied conventional (positivist/post-positivist) theories (Lincoln & Lynham, 2011, pp. 12-14)	Importance
	Precision and clarity
	Parsimony and simplicity
	Comprehensiveness
	Operationality
	Empirical validation or verification
	Fruitfulness
	Practicality
Criteria of quality for applied interpretive theories (Lincoln & Lynham, 2011, pp. 16-17)	Meaningfulness and understandability
	Thick description and insightfulness
	Narrative elegance
	Transferability
	Mutuality of concepts and descriptive logic
	Empirical verifiability
	Fruitfulness and provocativeness
	Usefulness and applicability
	Compellingness
	Saturation
	Prompt to action
	Fittingness
	Transferability and transportability
Criteria of quality for applied critical theories (Lincoln & Lynham, 2011, p. 11)	The Epistemological category of quality for critical theories
	Discreteness
	Empirical grounding
	Researchability
	Comprehensiveness
	The Communicative category of quality for critical theories
	Communicative clarity
	Invitational tone
	Connectedness
	Prescriptive policing
	The Critically analytic category of quality for critical theories
	Assumptive awareness
	Ethical attention
	Contextual sensitivity

### Data Synthesis

Analysis across coded sources revealed a number of pertinent milestones in the self-cited history of the authors of paradigm theory. Each milestone was judged pertinent to the extent that it captured a landmark in the evolution of the authors' paradigm thinking. The milestones can be summarized in the chunks of time shown in Table 23 and further visually represented in Figure 3. In the following sections, each milestone time period is discussed in detail. However, before covering the nine milestone time periods, the coded literature on disciplined inquiry was synthesized upfront as contextual backdrop for the discussion of milestones in the development of the authors' paradigm theory.

Table 23

#### *Milestones in the Authors' Paradigm Theory Development*

<b>Milestone in conceptualization</b>	<b>Date range</b>	<b>Relevant publications</b>
Two approaches emerge	1975 - 1979	Guba, 1975; Guba, 1978b; Guba, 1979
The early 1980s – Axiomatic theory enters the picture, the paradigm meta-framework was introduced as sets of axiom systems	1981 -1982	Guba, 1981a; Guba & Lincoln, 1981; Guba & Lincoln, 1982a
The mid 1980s – Basic belief systems were refined	1985 - 1986	Guba, 1985; Lincoln, 1985e; Lincoln & Guba, 1985b; Lincoln, 1986; Lincoln & Guba, 1986a
The late 1980s – Distinction of process from products	1987 - 1989	Guba, 1987a/b; Lincoln & Guba, 1988; Guba & Lincoln, 1988; Guba & Lincoln, 1989
The turn of the decade 1989-1990 – Four axiom systems emerge, the theory and its operationalization is further refined	1989 - 1990	Guba & Lincoln, 1989; Guba, 1990b; Guba, 1990c; Lincoln, 1990b; Lincoln & Guba, 1990
The mid 1990s – The table of metaphysical assumptions and their practical consequences takes center stage	1993 - 1995	Lincoln, 1993; Denzin & Lincoln, 1994; Guba & Lincoln, 1994; Lincoln, 1995a
The late 1990s – The conversation around extended validity considerations is foreshadowed	1995 - 1998	Lincoln, 1995a; Lincoln, 1997a; Lincoln, 1997b; Lincoln, 1998b



The millennium period – The participatory paradigm was introduced and the meta-framework continues to evolve and be refined	2000 - 2005	Lincoln & Denzin, 2000; Lincoln & Guba, 2000; Guba & Lincoln, 2005; see also Reason & Rowan, 1981; Reason, 1994a; Reason, 1994b; Reason & Heron, 1995; Heron, 1996; Heron & Reason, 1997
2011 – The most recent paradigm meta-framework evolution	2007 - 2011	Lincoln & Lynham, 2007; Lincoln et al., 2011; Lincoln & Lynham, 2011

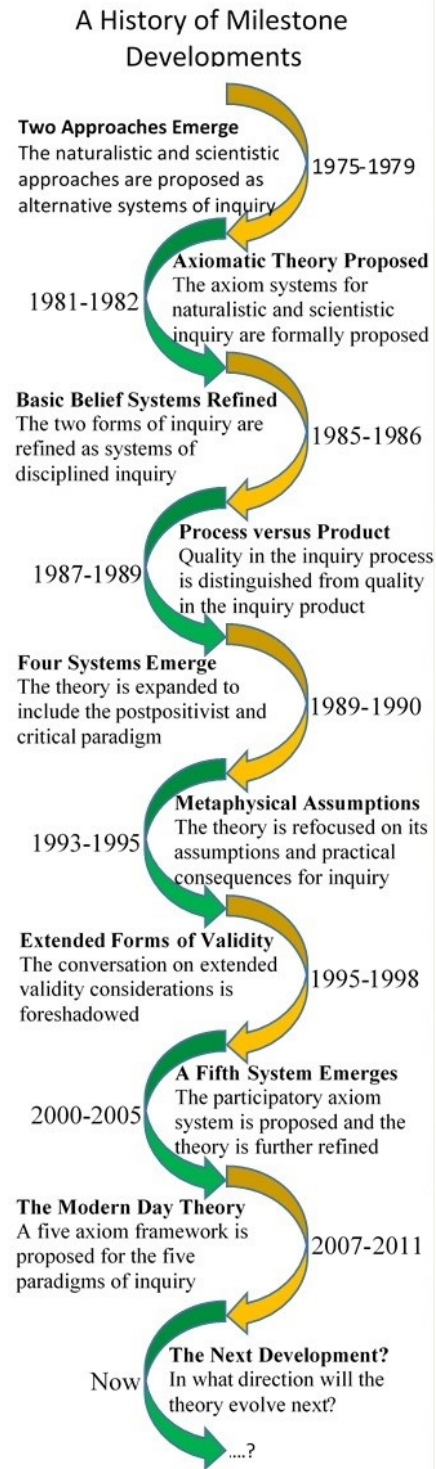


Figure 3. Diagram of Significant Milestones in the Development of Paradigm Theory

## **Disciplined Inquiry Revisited**

One of the important framing ideas that emerged from analysis of the authors' work was the explicit positioning of disciplined inquiry in connection with fully articulated, foundational belief systems aimed at guiding disciplined inquiry (Guba, 1990c; Guba & Lincoln, 1982a). Different forms of inquiry were distinguished (e.g., those of the "everyday garden variety or action taken in connection with a disciplined inquiry"; Guba, 1990c, p. 17). Disciplined inquiries are "concerned with how we explore the world, how it is we come to systematize or order knowledge about the world, and what methods might be most appropriate for accomplishing that end" (Lincoln, 1985b, p. 31); that is, they are concerned with the "disciplined acquisition of knowledge" (Guba, 1992, p. 18).

The production of disciplined knowledge requires judgments of the veracity of the claims of knowledge made as a consequence or output of the disciplined inquiries. These judgments must be done in connection with a belief system that guides what might be considered knowledge and how that knowledge might be acquired; in other words, judgment must be performed in connection with an understanding of quality inquiry process and quality inquiry product. The feature of disciplined inquiries that make them distinct from other forms of inquiry, (i.e., garden variety inquiries) is that disciplined inquiries must be "conducted (the process) and reported (the product) in such a way that all of its aspects can be examined publicly... the twin criteria of inspectable and verifiable process and product" (Lincoln & Guba, 1985b, pp. 49–50).

That is, to qualify as disciplined, the report of an inquiry must inform the reader, in ways that are publicly confirmable, what the nature of the "raw" data is, the sources of those data, and the context in which they were collected (for example, a laboratory, the respondents' work places, and the like). At the same time, the processes for transforming the data into information—interpretations, conclusions, extrapolations,

recommendations—must also be apparent to the reader; they too must be publicly confirmable so that their logic and coherence can be tested. (Lincoln & Guba, 1986b, p. 547)

The authors identify three questions that every inquirer should be able to answer about their inquiries if they are to be considered disciplined: “[1] Are the raw materials clearly displayed? [2] Do I understand the logic by which the data were reorganized into the argument? [3] Does the argument exhibit logic and coherence?” (pp. 547–548). These three questions guide the design, execution, and presentation of disciplined inquiries and effectively define what was done against the quality judgments of process and product. Methodologically, the emphasis on quality is on process, while paradigmatically the emphasis is on product, but the two remain important co-components of the overall judgment of an inquiry’s quality.

Judging the quality of process, while critical in understanding the premises under which an inquiry was undertaken and why the case report takes the form that it does, as Smith (1987) suggests, is very different from judging the quality of the product of an inquiry. Process judgments can tell the reader something about the trustworthiness and authenticity of a given study, but they say little about the quality of the narrative presented. (Lincoln & Guba, 1990, p. 53).

As a brief point of departure, it may be a useful contrast to extend discussion beyond definition of what disciplined inquiry is and attempt to define what disciplined is may not be. For the initial departure, the review turns back to Kaplan’s (2009) writing on the four uses of the term *methodology*: techniques, methods, honorifics, and epistemology. As described by Kaplan, techniques, methods, and honorifics have no explicit acknowledgment for the underlying belief system that encapsulates the knowledge to be produced, nor do they acknowledge the criteria and observable indicators of quality process and product that guide “the ways of doing the work of that science which are regarded, for more or less compelling reasons, as being acceptable” (p. 19).

Kaplan (1990) emphasized that appropriate application of a technique or method does not make an inquiry disciplined. For example, the use of random selection and assignment in experimental inquiries is desirable. Appropriate random selection and assignment can be taught or practiced without any epistemological acknowledgment of why they might be a desirable feature of quality experimentation; rather, it can simply be understood as the agreed-upon right way to do the work of experimentation. Similarly, detailed articulation of specific experimental procedures can be practiced because it is the agreed-upon format for publication without further epistemological acknowledgment. In the former, there is no mapping of randomization to external validity, and external validity to objective epistemology, and objective epistemology to a form of realist ontology. In the latter, there is no mapping of detailed procedures to replicability, replicability to consistency and reliability, and consistency and reliability to generalizable knowledge claims.

In the current working example, randomization and detailed procedures are forms of what Kaplan (2009) called *honorifics*, or ritualistic descriptions of a type of research to position the work in a particular area. However, neither honorifics nor appropriate application of technique or method warrants the inquiries disciplined. Disciplined inquiries connect “consideration of systematic, thorough, conscious choice of method, and overall design strategy” (Lincoln, 1997b, p. 56) to explicit assumptions and criteria of quality associated with an articulated belief system. Disciplined inquiries explicitly link “thoughtful decisions about design strategies, including methods” (Lincoln, 1995a, pp. 276–277) to “the most basic questions that can be raised concerning the pursuit of truth” (Kaplan, 2009, p. 20). Examples of these connections in operation can be found in Guba’s (1981a) framework of design decisions, actions, and desired outcomes, explicitly mapped to quality threats in inquiry for both the conventional and

naturalistic paradigms. In Guba's framework, the threats to quality are explicitly linked to the knowledge outcomes of the forms of inquiry, thus enabling the inquirer to make thoughtful decisions about action in direct relation to the basic questions concerned with knowing.

A great deal of the literature related to disciplined inquiry addressed how disciplined inquiry can be defined. Less prevalent in this sample of literature were discussions addressing why and how disciplined inquiry can be different from what scientists and practitioners already do. An extended section of text in *The Paradigm Dialog* (Guba, 1990c, pp. 51–52) captured the essence of these latter two issues. According to Guba, some practice of research has the tendency to ignore epistemological, social, and historical issues that have formally guided the formation of the procedures, rules, and customs adhered to in the conduct of inquiry. For example, Guba pointed to training programs whose methodological emphasis focused principally on methods and techniques of data collection and data analysis; however, the technical training alone did a disservice to the foundational conceptual issues at play that legitimize the methods and techniques as viable means to interacting with data. So why do disciplined inquiry (i.e., inquiry that makes explicit its underlying system of assumptions and its relation to both the process of conducting inquiry and the types of knowledge products taken as the ends of inquiry)? Because method practices do not stand alone; they stand in dependent relation with foundational questions regarding the knowledge inquiries seek to produce. In other words, according to Guba, methods are not simply independent right or wrong means to producing knowledge; rather, methods are the consequences of the forms of knowledge sought. Method is not prior to knowing but determined a priori by what one seeks to know: “What seems logical about inquiry is made so because of systems of meanings and relations that make things’ [i.e., methods, techniques, and procedures] seem reasonable and plausible” (p. 52). Systematic application of methods according

to given procedures may warrant judgments of rigor, but need not qualify the inquiries as disciplined.

## **Two Approaches Emerge**

The late 1970s was a seminal time period in writings on paradigms of inquiry (Guba, 1975, 1978b, 1979). One of the more significant works of the self-cited sample of literature was Guba's (1978b) monograph on naturalistic evaluation, in which naturalistic inquiry was formally proposed and contrasted with experimental inquiry, given eight conceptual distinctions, six operational distinctions, and distinctions among four general criteria of scientific adequacy. Although 11 criteria of good evaluation had been proposed in (Guba, 1975), Guba's (1978b) monograph was the first time he had distinguished quality criteria for the naturalistic and conventional inquiry approaches.

Naturalistic and experimental inquiries were conceptualized along two dimensions of control: (a) high-to-low control over antecedent conditions and (b) high-to-low control over noted outcomes or responses of interest. Experimental inquiry was fit into the high-high space in which both antecedent conditions and potential outputs were highly controlled. Naturalistic inquiry was fit into the low-low space, in which neither the dependent nor independent variables were controlled by the inquirer (Guba, 1978b).

Guba (1979) further refined and extended the operational and conceptual distinctions of naturalistic and experimental inquiries. However, of greater significance was the presentation of the *basic assumptions* for the two approaches. These are shown in Table 24 (adapted from Guba [1979]).

Table 24

*Basic Assumptions of Naturalistic and Experimental Inquiries*

<b>The scientific model of inquiry</b>	<b>The naturalist model of inquiry</b>
<p>The assumption of singular reality.</p> <ul style="list-style-type: none"> <li>E.g., phenomena are real, inquiry can converge on their discovery, and that reality is “fragmentable into subsystems, which, at the extreme, may be conceptualized as variables” (Guba, 1979, p. 269)</li> </ul>	<p>The assumption of multiple realities</p> <ul style="list-style-type: none"> <li>E.g., “inquiry diverges onto many realities, no one of which is any more “true” than any other ... [; phenomena] cannot be described or understood in terms of separate variables” (Guba, 1979, pp. 269-270).</li> </ul>
<p>The assumption of subject-object duality.</p> <ul style="list-style-type: none"> <li>E.g., “the inquirer will have no effect on the phenomena being studied” (Guba, 1979, p. 269).</li> </ul>	<p>The assumption of subject-object inter-relatedness.</p> <ul style="list-style-type: none"> <li>E.g., “inquirers and the objects or entities they investigate are inter-related” (Guba, 1979, p. 270).</li> </ul>
<p>The assumption of generalizability.</p> <ul style="list-style-type: none"> <li>E.g., inquiries can produce nomothetic statements or “enduring truth statements that are essentially unchanged from context to context” (Guba, 1979, p. 269).</li> </ul>	<p>The assumption of contextuality.</p> <ul style="list-style-type: none"> <li>E.g., inquiry produces idiographic understandings or “working hypotheses in a context and thick description of that context to be able to appreciate the way in which it impacts inquiry” (Guba, 1979, p. 270).</li> </ul>

The formal articulation of the inquiry systems for both naturalistic and scientific inquiries in the late 1970s set the stage for the paradigm conversation over the ensuing 40-plus years of literature. What had essentially been accomplished was an initial positioning of naturalistic inquiry as its own form of inquiry, as opposed to some lesser or, at best, modified form of conventional scientific inquiry. Conceptually and practically, Guba (1978b, 1979) had set the foundations of the conversation around underlying assumptions, methodological issues, and issues of interpretation and outcome for completely independent frameworks of inquiry.

**Axiomatic Theory Enters the Picture**

The early 1980s was the dawn of axiomatic theory, and thus the dawn of opposing paradigms of inquiry. The axiomatic connection of Guba and Lincoln’s (e.g., 1982a) work with that of Habermas (1971) was made explicit. Similarities in the language used by Habermas, such as “value-freedom (or ethical neutrality)” (p. 303), “disinterested contemplation” (p. 306), and



the *apprehension* of reality (p. 309) was also carried over in ideas to demonstrate in a few instances.

Of additional significance during the period of emerging axiomatic theory was conceptualization of the framework of inquiry systems embedded in the axiomatic theoretical form. The framework of frameworks was achieved through a subject-position axiom structure. Prior to the axiomatic theory, inquiry approaches were contrasted by the different sets of assumptions comprising the inquiry systems (e.g., Guba, 1978b). However, the advent of the axiom theory offered conceptualization of independent inquiry systems through the holistic set of differing positions on common category-like subjects of fundamental assumptions about reality and the process of coming to know it (Guba, 1981a; Guba & Lincoln, 1981, 1982a). The five axiom subjects and specific positions of the rationalistic and naturalistic paradigms proposed in this time period are shown in Table 25 (adapted from Guba & Lincoln, [1982a]).

Table 25

*Subject-Position Axiom Theory*

Axiom subject	Rationalistic position	Naturalistic position
Axiom #1: The nature of reality	Single and tangible	Multiple and intangible
Axiom #2: The inquirer-object relationship	"The inquirer is able to maintain a discrete and inviolable distance between himself/herself and the object of inquiry" (Guba & Lincoln, 1982a, p. 238).	"The inquirer and the object interact to influence one another; especially is this mutual interaction present when the object of inquiry is another human being (respondent)" (Guba & Lincoln, 1982a, p. 238).
Axiom #3: The nature of truth statements	Nomothetic body of knowledge, e.g., context-free truth statements	Idiographic body of knowledge, e.g., time and context-bound working hypotheses about an individual case but does not rule out transferability
Axiom #4: Attribution/explanation of action	"Every action can be explained as the result (effect) of a real cause or causes that precede the effect temporally (or are at	"An action may be explainable in terms of multiple interacting factors, events, and processes that shape it and are part of it; inquirers can, at best, establish plausible

	least simultaneous with it)” (Guba & Lincoln, 1982a, p. 238)	inferences about the patterns and webs of such shaping in any given case” (Guba & Lincoln, 1982a, p. 238)
Axiom #5: The role of values in inquiry	“Inquiry is value-free and can be guaranteed to be so by virtue of the objective methodology employed. These methods guarantee inquirer neutrality and inquiry rigor and produce data that ‘speak for themselves’” (Guba & Lincoln, 1982a, p. 238)	Inquiry is always value-bound in at least four ways: a) by inquirer values, b) by the paradigm selected to investigate the problem, c) “by the choice of substantive theory and methods used to guide the collection and analysis of data relevant to the problem selected and in the interpretation of findings” (Guba & Lincoln, 1982a, p. 238), d) by the values inherent in the context. The “...problem, paradigm, method(s), and context must exhibit internal coherence, value fit, and congruence (value resonance) for the inquiry to be deemed appropriate and fitting and to produce meaningful findings” (Guba & Lincoln, 1982a, p. 243).

In addition to significant conceptual organization of the fundamental assumptions guiding inquiry that was accomplished through the subject-position axiom structure, operational clarity and organization were enhanced through the application of the same subject-position hierarchy to derivative postures (i.e., axiom extensions into the process of inquiry) and quality criteria. Table 26 (adapted from Guba [1981a]; Guba & Lincoln [1981, 1982a]) shows the derivative postures, and Table 27 (adapted from Guba [1981a]; Guba & Lincoln [1981, 1982a]) the quality criteria.

Table 26

*Subject-Position Hierarchy of Postures Taken by Practitioners*

<b>Posture subject</b>	<b>Rationalistic position</b>	<b>Naturalistic position</b>
Preferred techniques	Preference for quantitative methods	Preference for qualitative methods
Quality criterion	Almost exclusively on the criteria of rigor: internal validity, external validity, reliability, and objectivity	Emphasis, although not exclusively, on relevance: credibility, transferability, dependability, and confirmability
Source of theory	A priori theory derived from deductive reasoning; emphasis placed on verification of hypotheses generated from the a priori theory.	A posteriori, grounded, theory derived inductively from real world data, but not exclusively.

Questions of causality	"Scientific inquirers typically pose the question in the form, Can x cause y?, and demonstrate in the laboratory that y can indeed be caused by x." (Guba & Lincoln, 1981, p. 68)	"Naturalistic inquirers are less interested in what can be made to happen in a contrived situation than in what does happen in a natural setting" (Guba & Lincoln, 1981, p. 68)
Knowledge types used	Propositional only	Tacit and propositional
Stance	Reductionist stance	Expansionist stance
The purpose of inquiry	Verification of a priori hypotheses	"...the discovery of elements or insights not yet included in existing theories." (Guba & Lincoln, 1981, p. 71)
Instrument	Objective neutral instruments	Use of the self as instrument, i.e., the "human being as an instrument" (Guba & Lincoln, 1981, p. 72)
Timing of the specification of data collection and analysis rules	All rules for data collection and analysis specified in advance.	Flexible process that emerges with and throughout data collection, e.g. "data accrue in the "rawest" possible fashion and must be unitized and categorized after the fact" (Guba & Lincoln, 1981, p. 73)
Design	Preordinate design	Emergent design
Style	Intervention, emphasis on rigor: "independent and dependent variables are isolated and the context is arranged so that these variables and only these variables can account for whatever findings emerge" (Guba & Lincoln, 1981, p. 74).	Selection, balance of rigor and relevance: study of "naturally occurring events... in which nature has arranged the experiment without benefit of man's intervention" (Guba & Lincoln, 1981, p. 74)
Setting	Context-free, laboratory-like environments for managing interventions.	Context-rich, natural environments reflecting the phenomenon's natural and complex environment.
Treatment	The controlled manipulation of a variable.	Not inherent to naturalistic inquiry, yet does not prevent consideration of "some naturally occurring phenomenon as a "treatment," that is, as a likely cause for some [situation specific] observable effect" (Guba & Lincoln, 1981, p. 75)
Analytic units	"The variable, and all relationships are expressed as between variables (or systems of variables)." (Guba & Lincoln, 1981, p. 75)	Emphasis on "the complex patternings that are observed in nature... While it is useful to analyze variables, too little attention has been paid to the more complex interrelationships that can only be described as patterns. And it is dubious whether conventional modes for analyzing data can catch these often kaleidoscopic patterns." (Guba & Lincoln, 1981, p. 75)
Contextual elements	Control all extraneous elements that might confound the effects of the central phenomenon of interest.	Invited interference includes all real world complexity; "the concept of "invited interference" is of great importance to the evaluator, who generally does not wish to know how the entity being evaluated works in the best of all possible worlds, but in the worst" (Guba & Lincoln, 1981, p. 76).

Table 27

*Subject-Position Hierarchy for Criteria of Quality*

<b>Subject</b>	<b>Rationalistic position</b>	<b>Naturalistic position</b>
Truth value	Internal validity	Credibility
Applicability	External validity or generalizability	Transferability*
Consistency	Reliability	Dependability**
Neutrality	Objectivity	Confirmability

\* termed “fittingness” in Guba & Lincoln, 1981

\*\* termed “auditability” in Guba & Lincoln, 1981

**Basic Beliefs Systems Refined**

The mid 1980s was a period of refined discussion about the paradigms defined by the axiom theory proposed at the beginning of the decade Guba, 1985; Lincoln, 1985e, 1986; Lincoln & Guba, 1985b, 1986a); however, the emphasis was clearly on further articulating the naturalistic paradigm (e.g., Lincoln, 1985e; Lincoln & Guba, 1985b). During this time period, the conversation also shifted subtly to a focus on the basic belief system of a paradigm, rather than an exclusive (theoretical) reference to its underlying axioms. The shift in focus to a paradigm’s basic belief system facilitated extended discussion of the holistic and systematic nature of the collective set of assumptions defining a paradigm, as well as the synergism of the postures logically extended from the basic belief system. The postures, or operational characteristics in the work of Lincoln and Guba (1985b) represented the most detailed exposition to date of operationalized theoretical propositions (i.e., theorems) derived from their fundamental axioms.

The refined discussion of this time period not only included further detailed attention to the basic assumptions of the conventional/positivist and naturalistic paradigms, but it also included presentation of a new set of derivative postures, including several new posture subjects and specific positions for the naturalistic paradigm (Lincoln, 1985e; Lincoln & Guba, 1985b), as well as expansion of the quality criteria of naturalism to include a set of non-foundational authenticity criteria (Lincoln, 1986; Lincoln & Guba, 1986a). The new set of derivative postures included 14 subjects (Lincoln, 1985e; Lincoln & Guba, 1985b):

1. Setting
2. Instruments
3. Knowledge types used
4. Preferred methods
5. Sampling strategy
6. Logic of analysis
7. Source of theory
8. Design
9. Research results
10. Reporting mode
11. The nature of interpretation
12. Application of findings
13. Determining inquiry boundaries
14. Criteria of quality

Seven of these 14 postures were novel presentations. The positions on each were defined for naturalism but not positivism. These naturalistic positions were (Lincoln, 1985e; Lincoln & Guba, 1985b):

- Logic of analysis – inductive data analysis
- Sampling strategy – purposive sampling
- Determining inquiry boundaries – problem-determined boundaries
- Application of findings – tentative application
- Reporting mode – case study reporting mode
- Criteria of quality – special criteria for trustworthiness (i.e., credibility, transferability, dependability, and confirmability)
- Research results – negotiated results

The presentation of authenticity criteria was a further assertion of the independence of the naturalistic paradigm from the shadow of positivism. The parallel authenticity criteria were grounded in the naturalistic paradigm itself, rather than representing a set of criteria developed to parallel those quality criteria of positivism. That is, authenticity criteria fit into a parallel subject-position framework within which the subjects (i.e., truth value, applicability, consistency, and neutrality) were conceptualized in relation to the positions of positivism (i.e., internal validity, external validity, reliability, and objectivity; Lincoln, 1985e; Lincoln & Guba, 1985b). These new authenticity criteria included:

- Fairness
- Ontological authenticity
- Educative authenticity

- Catalytic authenticity
- Tactical authenticity

### **Distinction of Process From Product**

By late the 1980s, writings on paradigms of inquiry began to focus more heavily on methodological process differences between the conventional and naturalistic paradigms. Guba (1987a, 1987b; and later Guba & Lincoln, [1989]) wrote the first introduction to methodology as an axiom subject in the theory. Methodology was retained as a fundamental assumption through to the current day theory (e.g., Lincoln & Lynham, 2011; Lincoln et al., 2011). Full models of the methodologies for the conventional and naturalistic paradigms were proposed in 1988; furthermore, the paradigms' methodological processes were distinguished from their respective qualitative and quantitative tools and techniques (i.e., the methods of their methodologies) (Guba & Lincoln, 1988, pp. 100-110).

In addition to the added methodological emphasis of the late 1980s, the paradigm discourse more closely aligned with the definition of disciplined inquiry through explicit distinction of the process of inquiry from the product of inquiry. The alignment of the paradigm development with disciplined inquiry had two significant implications. First, the alignment influenced positioning of the axiom extensions (e.g., the 14 formal theorems of conventional and constructivist paradigms) (Guba, 1987a, 1987b; Guba & Lincoln, 1989). Second, the alignment resulted in a reconceptualization of quality criteria into two groups distinguishing the quality criteria for process (i.e., rigor/trustworthiness criteria and authenticity criteria as methodological criteria, although later authenticity criteria were repositioned as states of being by Guba [1990c]) from quality criteria for product (i.e., outcome criteria [Lincoln & Guba, 1988; Guba & Lincoln,

1988]). New to this reconceptualization of quality criteria for process and product was proposal of four classes of criteria for addressing the goodness of products of naturalistic inquiries (Lincoln & Guba, 1988):

1. Axiomatic criteria
2. Rhetorical criteria
3. Action criteria
4. Application or transferability criteria

### **Four Axiom Systems Emerge**

At the turn of the decade (i.e., 1989–1990), the constructivist label was introduced for the naturalistic paradigm, and four complete axiomatic systems of inquiry were proposed that detailed specific axiom positions on the ontological, epistemological, and methodological subjects for the positivist, postpositivist, constructivist, and critical paradigms (Table 28). At this point in time, the primary focus shifted from axioms to metaphysical assumptions of paradigms; ontology, epistemology, and methodology were defined as the three basic questions of an inquirer's (metaphysical) belief system. The critical realist ontological position also received greater attention, given the explicit place in the frameworks for postpositivist and critical paradigms (Guba, 1990b, 1990c; Guba & Lincoln, 1989).



Table 28

*Table of Four Axiom Systems Emerging in 1989–1990*

Subject	Positivist position	Postpositivist position	Critical position	Constructivist position
Ontology	Realist	Critical realist	Critical realist	Relativist
Epistemology	Dualist / objectivist	Modified objectivist	Subjectivist	Subjectivist
Methodology	Experimental / manipulative	Modified experimental / Manipulative	Dialogic, transformative	Hermeneutic, dialectic

In addition to expansion of the paradigm meta-framework, two other notable milestones marked the transition from the 1980s to the 1990s: a significant modification and extension of the quality criteria, and the beginning of an extensive discussion on knowledge accumulation across paradigms (Guba, 1990b, 1990c; Lincoln, 1990b; Lincoln & Guba, 1990). The progression of the quality criteria can be characterized by several key developments.

First, further contextualization of the concepts of quality criteria for process and product was provided within the larger quality criteria philosophical dialog of Chisholm's (1973) problem of the criterion (Guba, 1990c). The problem of the criterion argues that the credibility of knowledge claims can be evaluated by the process used to arrive at them. However, to know which processes have merit in producing credible results, one must also know what credible results are. Thus, circularity is present in the evaluation of credible knowledge claims. Therefore, separate criteria are needed to judge the quality of the inquiry process and of the inquiry product.

Another key development was the distinction of authenticity criteria from methodological trustworthiness criteria (i.e., credibility, transferability, dependability, and confirmability). Authenticity criteria were repositioned as "states of being" (Guba, 1990c, p. 70) unique to the stakeholders of naturalistic inquiries. The repositioning more closely aligned the authenticity

criteria as something unique to and rooted in, naturalism, rather than more simply paralleling the explicit methodological (process) criteria of positivism (i.e., internal and external validity, reliability, and objectivity).

New nonconventional criteria for judging the goodness of naturalistic reports were proposed (Guba, 1990b), along with 20 general criteria of quality for naturalistic inquiries (Guba, 1990c). Although not formal criteria in the sense of an axiomatic structure, the criteria filled an important gap in practice by contextualizing the more esoteric components of quality for naturalistic inquiries. For example, rather than discussing resonance criteria, Guba (1990b) more directly asked whether the report resonates with the participants' actual lived experiences from the perspective of participant.

Building upon the contextualized conversation of quality criteria in the practice of naturalistic inquiries, Lincoln (e.g., 1990b) began discussing how ethics should be incorporated into the many decision points in research design. Here, *ethics* was not discussed in the conventional sense of the ethical treatment of human subjects that may be part of an internal review board (IRB) proposal to work with human subjects, but rather, the ethical and moral considerations of doing research with co-participants and working to co-construct and re-present understandings of their experiences. Given the humanistic nature of naturalistic inquiry, a robust discussion emerged about the ethics of doing research on, with, and about humans. To this end, the categorical and practical imperatives were introduced as ethical principles for inquiry (Lincoln, 1990b). Although not criteria of quality per se, they were presented in close relation to quality criteria as ethical principles guiding the conduct of naturalistic inquiry, and emphasizing

that participants should both be treated as one would want to be treated and as a benefactor of inquiry rather than mere means for inquiries.

Another key development in the conversation on quality criteria was the revision of the criteria specific to addressing the goodness of products of naturalistic inquiries (Lincoln & Guba, 1990). The axiomatic criteria (Guba, 1990c; Lincoln & Guba, 1988) was relabeled with the category of resonance criteria (Lincoln & Guba, 1990), and the action criteria (Guba, 1990c; Lincoln & Guba, 1988) was relabeled as the category of empowerment criteria (Lincoln & Guba, 1990). In addition, the full set of criteria categories was more fully unpacked into the following hierarchy (Lincoln & Guba, 1990):

1. Resonance criteria
  - i. Unity
  - ii. Overall organization
  - iii. Simplicity or clarity
  - iv. Craftsmanship
3. Empowerment criteria
4. Applicability criteria
  - i. Transference
  - ii. Vicarious experience
  - iii. Metaphor
  - iv. Reexamination of constructions

*The Paradigm Dialog* (Guba, 1990c) was one of the most comprehensive syntheses of the work on paradigm theory to date. Among its many contributions to the development of the paradigm framework, as well as to the development of five specific paradigm frameworks, was its foundational dialog on knowledge accumulation across different paradigms of inquiry. In addition to opening the conversation to acknowledge that different types of knowledge can accumulate differently (e.g., not all are building blocks in the wall of knowledge), the conversation on knowledge accumulation also set the stage for the conceptualization of theories as ways knowledge can accumulate, a concept that continued for the next two decades.

### **Metaphysical Assumptions and Their Practical Consequences Take Center Stage**

A milestone of the mid 1990s was publication of the first edition of the *Handbook of Qualitative Research* (Denzin & Lincoln, 1994). Even though the handbook emphasized qualitative inquiry, the text was a comprehensive presentation of philosophy to practice for different styles and approaches of qualitative inquiry. The table of three metaphysical assumptions (i.e., ontology, epistemology, and methodology) undergirding paradigms played a central role in the inquiry discussion; here again, the specific metaphysical positions for positivism, postpositivism, critical theory, and constructivism were presented (Guba & Lincoln, 1994). The axiom extensions were rethought, built upon, and now termed “consequences for the practical conduct of inquiry, as well as for the interpretation of findings and policy choices” (p. 112). Five new consequences were introduced:

- Ethics
- Voice
- Training

- Hegemony
- Accommodation

In addition to discussion of the axiom subjects, positions, and extensions into practice for positivism, postpositivism, critical theory, and constructivism, the text opened the door for discussion of the issues of representation and legitimation (i.e., the presentation of others' voices/experiences and the authority given to texts, respectively) and continued to advance the sophistication of the conversation around quality criteria for inquiries. Quality criteria for critical inquiries were presented distinct from those for conventional and constructivist inquiries (Guba & Lincoln, 1994; Lincoln, 1993). Paradigm-specific emphasis/importance was distinguished among the set of axiom extensions (Guba & Lincoln, 1994). The distinction was made for thinking about the quality of inquiries, given the extrinsic methodological emphasis on procedure to ensure rigor in conventional inquiries and the intrinsic methodological emphasis on data and ethics to ensure rigor in constructivist/naturalist inquiries (Lincoln, 1995a).

### **The Conversation About Extended Validity Considerations Is Foreshadowed**

In the late 1990s, 10 emerging criteria of quality for interpretive inquiry were presented (Lincoln, 1995a, 1997b, 1998b): (a) standards for judging quality in the inquiry community, (b) positionality, or standpoint judgments, (c) community as arbiter of quality, (d) voice, (e) critical subjectivity, (f) reciprocity, (g) sacredness, (h) sharing the prerequisites of privilege, (i) caring, and (j) yearning. Later, these 10 emerging criteria became the specific criteria for validity as a form of ethical criteria when extended validity considerations were presented by Lincoln and Guba (2000).

The emerging criteria represented an early swell in the spotlight being put on the concept of validity and how judgments of verisimilitude were being made about inquiry products (e.g., judgments of “the congruence between some representation of an object, context, situation, event, or person and the object that is “signified” by the verbal representation”; Lincoln, 1997a, p. 161). The singularity of objective isomorphism as the only validity criterion was being challenged, given the ethical and moral considerations of doing research with co-participants for their own betterment in addition to improved understanding (e.g., issues of representation and legitimation).

### **The Participatory Paradigm Is Introduced**

During the early millennium time period, both the second and third editions of the *Sage Handbook of Qualitative Inquiry* (2000 and 2005, respectively) were published. The most significant new addition to the second edition was the introduction of the participatory paradigm within the paradigm meta-framework as an independent system of inquiry alongside the positivist, postpositivist, critical, and constructivist systems of inquiry (Guba & Lincoln, 2005; Lincoln & Denzin, 2000; Lincoln & Guba, 2000). The authors built upon prior writings of Heron and Reason (e.g., 1997) to fully articulate the newly introduced participatory paradigm within their meta-framework of axiom subjects, positions, and axiom extensions into practice.

Throughout the second and third editions (2000 and 2005, respectively) of the handbook, the authors continued to evolve the axiom extensions and refine the discussion around validity and rigor (Guba & Lincoln, 2005; Lincoln & Guba, 2000). The second and third editions took another look at the working set of axiom extensions. Here, axiom consequences (Guba & Lincoln, 1994) were re-presented as positions on practical issues, and furthermore, a set of

critical issues of the time was highlighted. Eleven positions on practical issues of inquiry and seven critical issues of the time were discussed for the five paradigms (i.e., positivism, postpositivism, critical, constructivism, and participatory) (Guba & Lincoln, 2005; Lincoln & Guba, 2000).

Validity was given increased attention as a common theoretical construct for the quality of inquiries. Discussion of validity as relevant to all paradigms was achieved by demonstrating that the validity construct could be operationalized drastically different depending upon the assumption of reality with which verisimilitude, i.e., isomorphism, was the ideal. A number of operationalized validity concepts were discussed for alternative paradigms (i.e., extended validity considerations). The extended validity considerations included validity as authenticity, crystalline validity, transgressive validities, and validity as an ethical relationship (Guba & Lincoln, 2005; Lincoln & Guba, 2000).

A bold stance on rigor on rigor was also taken during this early millennium time period; however, it was a stance that aligned with the writings on disciplined inquiry. Traditionally, rigor had been a construct of conventional positivist or postpositivist inquiries, within which the rigor ideal implied attention to the method of inquiry in order to ensure objective findings. Up to this point in time, the tendency in the paradigm literature was to discuss the rigor of conventional methodology, the trustworthiness of naturalistic methodology, and the authenticity of naturalistic results. However, the dialog further opened during the early millennium time period to the idea of rigor in method versus rigor in interpretation; that is, the questions of whether inquirers are being disciplined in the process of inquiry, as well as disciplined in the interpretation of the information produced (Guba & Lincoln, 2005; Lincoln & Guba, 2000).

## The Most Recent Paradigm Framework Evolution

At the end of the first decade of the new millennium, three significant publications converged on the latest evolution of the authors' paradigm meta-framework (Lincoln & Lynham, 2007, 2011; Lincoln et al., 2011). This most recent paradigm evolution (i.e., 2007–2011) included the addition of axiology and teleology as two metaphysical subjects, more explicit paradigmatic focus on the form of theories produced from paradigmatically different inquiries, and presentation of a set of quality criteria for the different paradigms' theories.

The addition of axiology and teleology to the meta-framework as two metaphysical subjects at the end of the first decade of the millennium represented a formal reintroduction of the two assumptions into the meta-framework. Note that the conceptual basis of axiology was initially presented by Guba (1978b) as *the value structure* of an inquiry approach, and then explicitly introduced as an axiom by Guba and Lincoln (1982a). There was a gap, however, in representation of axiology as an explicit metaphysical subject from about the time that methodology was introduced (circa 1989–1990) as part of the three basics questions of an inquirer's belief system. Throughout the second, third, and fourth editions of the handbook (Lincoln & Guba, 2000; Guba & Lincoln, 2005; Lincoln et al., 2011; respectively), the authors noted that "axiology should be grouped with basic beliefs" (e.g., Lincoln & Guba, 2000, p. 169), yet it failed to formally enter the meta-framework as a metaphysical assumption until Lincoln and Lynham (2011) added it.

Teleology, although never explicitly included in any framework prior to 2011, was conceptually included early (e.g., *the purpose of inquiry*, according to Guba [1978b]), and *the aim of inquiry*, according to Guba and Lincoln [1981]). Lincoln and Lynham (2011) made the



first explicit presentation of teleology as a metaphysical assumption. Given the introduction of the two additional metaphysical subjects, the meta-framework received yet another expansion as the five axiom meta-framework was fully articulated with axiom positions for the positivist, postpositivist, critical, and interpretive paradigms (note that neither the constructivist nor participatory paradigm was individually included).

Of significance to the writing on inquiry outputs (e.g., knowledge claims and accumulation of knowledge) was the emphasis on different paradigmatic forms of theory and their respective criteria of quality (Lincoln & Lynham, 2007, 2011). Within the most recent paradigm evolution, the conversation about the theoretical outputs of paradigmatically based inquiries came full circle from its earlier roots in the 1990s (i.e., Guba, 1990c). Lincoln and Lynham (2011) described both the nature and purpose of theory generated from positivist, postpositivist, critical, and interpretive paradigms. Twenty years earlier, Guba (1990c) had described the nature of knowledge and knowledge accumulation produced from positivist, postpositivist, critical, and constructivist paradigms. Since then (i.e., approximately 1990 to 2011), Lynham (2000a, 2000b) and others also furthered the conversation in the literature on the nature of theory and theory building.

Given the framing of theory as a type of knowledge container within an ongoing cycle of continuous refinement and development (Lynham, 2002b), the description of the nature and purpose of paradigmatically oriented theories (Lincoln & Lynham, 2007, 2011) offered a strong connection to and advancement of the underlying idea of knowledge accumulation in the authors' writing on paradigms. The writing on the nature of knowledge, accumulation, and theory is synthesized in Table 29 (adapted from Guba [1990c]; Lincoln and Lynham [2011]).

Table 29

*Summary of the Nature of Knowledge, Accumulation, and Theory*

	<b>Paradigm</b>			
	<b>Positivist</b>	<b>Postpositivist</b>	<b>Critical</b>	<b>Constructivist / interpretivist</b>
<i>The purpose of theory</i>	Development of grand to middle range explanations and predictions		Development of critical local to middle range descriptions of social structures towards critically informed praxis	Development of descriptive local to middle range understanding of meaning towards improved praxis
<i>The nature theoretical knowledge accumulation</i>	Verified theoretical propositions existing prior to experience		Historically situated descriptions of experiences explained by descriptions of power structures	Stories grounded in experience that convey meaning of lived experience and result in vicarious experience
<i>Quality criteria of theoretical knowledge</i>	Pattern's eight criteria of quality theory		Epistemological, Communicative, and Critically analytic categories of quality critical theory	Lincoln and Lynham's 13 criteria of quality interpretive theory

**Conclusion of Historical Analysis of the Paradigm Theory**

Although at its core an axiomatic theory, paradigm theory defined the phenomenon primarily through the set of meta-characteristics articulated as the basic beliefs or metaphysical assumptions of a paradigm (i.e., axioms) (Table 13, modified from Guba & Lincoln [1994, 2005]; Lincoln & Guba [2000]; Lincoln & Lynham [2011]; Lincoln et al. [2011]). The meta-framework was further elaborated through the positions on practical issues and several additional relevant critical issues of the time (i.e., axiom extensions). All paradigms were presented in a subject-position structure, within which the framework of subjects defined the universal premises

upon which all defined paradigms must have positions, and the specific positions detailed the defining set of assumptions that characterized each individual paradigm.

Table 30

*Metaphysical Assumptions of the Positivist, Postpositivist, Critical, Constructivist, and Participatory Paradigms*

Metaphysical assumption about...	Paradigm position				
	Positivist position	Postpositivist position	Critical position	Constructivist position	Participatory position
<i>Ontology</i>	Naïve realism	Critical realism	Historical realism	Relativism	Participative reality
<i>Epistemology</i>	Dualist/objectivist	Modified dualist/objectivist	Transactional/subjectivist	Transactional/subjectivist	Critical subjectivity
<i>Methodology</i>	Experimental/manipulative	Modified experimental/manipulative	Dialogic/dialectical	Hermeneutical/dialectical	Collaborative action inquiry
<i>Axiology</i>	Maintain inquirer distance so inquiry produces law-like propositional knowing	Leverage triangulation in inquiry to produce propositional knowing that approximates truth as close as possible.	Advocate for change in existing social and political structures.	Emphasize “propositional, transactional knowing... as a means to social emancipation” (Guba & Lincoln, 2005, p. 198).	“Practical knowing about how to flourish with a balance of autonomy, cooperation, and hierarchy in a culture is an end in itself” (Guba & Lincoln, 2005, p. 198).
<i>Teleology</i>	The aim of inquiry is to explain in order to predict		The aim of inquiry is to critique, illuminate, and transform in order to emancipate	The aim of inquiry is to describe, make sense of, and interpret the meaning joint constructions in order to improve practice	Not yet defined

At least two significant contributions to the paradigm of inquiry construct emerged through organization into the framework represented in Table 13. First, individual philosophical paradigms of inquiry could be better understood from within each paradigm, based on the

underlying set of axiom positions and theorems that were expressed as a specific combination of positions on metaphysical assumptions and their logical extensions into practice. Each paradigm was organized into a specific framework of ideals, and the specific lens, or world view, of each paradigm was made more explicit through each paradigm's specific framework of ideals.

The second significant contribution that emerged through the meta-framework organization was the connectivity of different paradigms of inquiry at a meta level, which facilitated understanding between paradigms. Previously, attempts to understand one paradigm from the perspective of another were still burdened by issues of commensurability and accommodation, somewhat akin to a form of ethnocentric philosophy science (e.g., Guba & Lincoln, 1994; Lincoln & Guba, 2000). The authors offered a framework of inquiry frameworks. Given the meta-framework organization, cross-paradigm comparisons were achieved with the set of axiomatic subjects systematized into a framework of each paradigm's basic beliefs. Even though similarly achieved previously by Habermas (1971), it had not been achieved with the added sophistication of Lincoln et al., nor had it been achieved for the breadth of paradigm frameworks and depth of operational characteristics articulated within the sophisticated subject-position formulation of basic assumptions, postures, and quality criteria.

With its unifying organization, the paradigm of inquiry meta-framework (Lincoln et al., 2011) defined the general structure, or meta-structure, of a paradigm of inquiry outside the context of any particular paradigm of inquiry. That is, all paradigms of inquiry could be understood within the paradigm meta-framework of axiomatic subjects, even though understanding any particular paradigm of inquiry was accomplished by first substituting a specific axiomatic position for each axiomatic subject, and then understanding all the axiomatic

position pieces within their unified gestalt context. As articulated by Guba (1990c) regarding ontology, epistemology, and methodology, “all these past paradigms, as well as emergent contenders, can be characterized by the way their proponents respond to three basic questions” (p. 18); however, it is the set of basic assumption subjects themselves, not the specific positions, that can be used to more generally understand the general structure of any paradigm of inquiry.

### **Next Steps**

The historical analysis provided improved understanding of the paradigm theory within its historical and developmental context. Given the larger goal of using the understanding of the theory as an exemplar against which to conceptualize an analogous model for methodology for its complementary juxtaposition with the paradigm theory in the process of disciplined inquiry, the axiomatic form of paradigm theory should be further understood as a theoretical product and theoretical process. Even though the current historical analysis presented a contextualized understanding of the exemplar theory’s development, it did not provide detailed understanding of paradigm through the lens of a theory.

Reverse engineering, although typically associated with physical systems in the discipline of engineering, provides a meaningful framework for examining the axiomatic theory from a process/product perspective. The reverse engineering process facilitates deconstruction of the theory into its formative process. The outcome of reverse engineering is the production of a reproducible surrogate process and product of the subject system. Consequently, a reverse engineering analysis, as described in the following chapter, should be considered as means to gaining the needed methodological understanding of developing the theoretical exemplar.

## CHAPTER 5: METHOD FOR REVERSE ENGINEERING THE PARADIGM THEORY

### Chapter 5 Preface

Chapter 5 describes the method of reverse engineering analysis used to advance the historical understanding of the paradigm phenomenon developed in the fourth chapter towards understanding the phenomenon as both a form of theory and part of an ongoing theory-building process. The method of reverse engineering analysis describes how the inquiry into the paradigm phenomenon was conducted that led to characterization of the key theoretical features of the subject system, systematic process, and initial conditions. Even though the process of reverse engineering analysis specifically targeted understanding and characterizing the theory-building process associated with the development of paradigm theory, within the larger research agenda the reverse engineering analysis represented the next significant step towards understanding the theoretical exemplar and distilling the actionable theoretical knowledge necessary to define a starting point in the theory-building work on the phenomenon of methodology.

The process described in chapter 5 follows the integrative literature review research design framework of Appendix A. First, the method chapter specifically positions the reverse engineering analysis in the context of its purpose, conceptual frame, research problem, need, and research questions. Next, the method chapter includes details on the process of sampling, collecting, and analyzing data in support of the four foci of a reverse engineering analysis: (a) consideration of indirect influences, (b) analysis of subject system, (c) analysis of systematic process, and (d) analysis of initial conditions. The novelty of the methodological approach described in chapter 5 should be considered. Few example exist in which a reverse engineering

analysis coupled with a theoretical coding scheme (Appendices B and C) has been used to theoretically analyze a phenomenon.

### **Background Information**

Reverse engineering can be defined as “the practice of deciphering designs from finished products” (Chikofsky & Cross, 1990, p. 13), performed “by someone other than the original designers” (Rekoff, 1985, p. 244). That is, reverse engineering takes as its starting point a finished product, and then systematically and deductively analyzes the “subject system to identify the system’s components and their interrelationships and create representations of the system in another form or at a higher level of abstraction” (Chikofsky & Cross, 1990, p. 15). The purpose of reverse engineering is to identify and document an actionable set of specifications that can be used to reproduce the process and/or product of interest (Rekoff, 1985). Thus, the purpose of applying the reverse engineering practice to paradigm theory was to identify and document the theoretical characteristics of the theory (e.g., theory building processes and theoretical form) for use in the reproduction of the theoretical process for the phenomenon of methodology.

The reproduced process and product of reverse engineering can both be re-envisioned as a clone of the original or a surrogate of the original. A cloned process would be an exact replicate of the original design process, and a cloned product would be an exact replicate of the original design output, whereby both must exhibit “the same form, fit, function, and mechanism-of-operation as does the original item” (Rekoff, 1985, p. 244). A surrogate functions similarly to the original subject system and has a similar physical or conceptual structure, but is not an exact duplicate. That is, surrogates in the reverse engineering process accommodate differences,

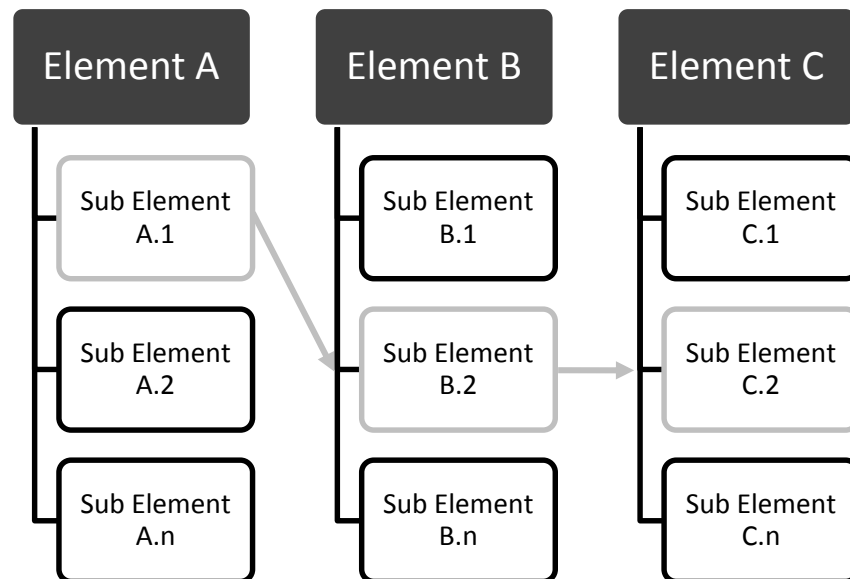
improvements, and modifications to either the process or product, whereas clones are intended to be exact copies of the original process and the original product of the original designers (Chikofsky & Cross, 1990; Rekoff, 1985).

As a style of thinking, “it should be recognized that the business of reverse engineering is not really greatly different from that of detective work in a criminal investigation or of conducting military intelligence operations” (Rekoff, 1985, p. 245). As a first step in the detective work of reverse engineering, it is important to build up a background understanding of both the subject system and the indirect influences of the original designers. Indirect influences might include the designer’s technical culture, disciplinary background training, intended users and uses, methodological conventions, and other influences intuitively known by the designers. “The designer’s mind set comes about from his/her basic method of education and prior experience... Standard practices used in the designer’s environment (in its largest sense) provide distinctive ‘finger prints’” (p. 246).

Three main assumptions about the original design and designers undergird the detective-like thought process of reverse engineering: (a) the presence of a subject system, (b) the existence of a life-cycle model, and (c) the identification of abstraction levels. The first assumption simply implies that to reverse engineer an existing product, one must have access to the subject system. The second assumption implies that the subject system was produced through some sort of systematic design and development process. This second assumption is necessary so that one is not re-envisioning an orderly process out of an originally chaotic process. The last assumption implies that the design process can be specified in high-level, abstract design stages as well as in low-level stage details (Chikofsky & Cross, 1990).



One of the tools leveraged during reverse engineering is representation of the deconstructed subject system abstractly in a configuration document. A configuration document generally maps out all the identified system elements, sub-elements, various ways elements are interconnected, and various system states of the subject system. The configuration document both reveals all the components normally unexposed and reveals how those components fit together hierarchically and functionally (Rekoff, 1985). An example of a configuration document modeled in the general axiomatic form (i.e., axiomatic subject and axiomatic position) is shown in Figure 4.



*Figure 4.* Example configuration document.

The goal of the current reverse engineering was to conceptually re-envision a surrogate research design similar to that of the axiomatic method of Lincoln et al. (e.g., Guba, 1987, 1990c, Guba & Lincoln, 1982a, 1988, 1989; Guba & Lincoln, 1994, 2005; Lincoln & Guba, 1985b, 2000; Lincoln & Lynham, 2011; Lincoln et al., 2011), the surrogate flow of ideas through that research design, and the inputs that would result in a similarly structured output of the

original research design. To accomplish the conceptual recreation, a representative set of research design decisions must be deduced from the existing system. The current reverse engineering process took the paradigm theory of Lincoln et al. (2011) as its subject system for analysis. Leveraging insights from the historical analysis, first the indirect influences of the original design and the designers were factored into the analysis. Second, the theoretical product serving as subject system was deconstructed and represented in a configuration document. Next, because a systematic design process led to the axiomatic output of the subject system, the elements identified in the configuration document were further abstracted into sub-products of representative research design phases. Lastly, initial conditions and premises for the re-envisioned research design were considered.

### **Positioning**

The purpose of the proposed reverse engineering analysis of the exemplar paradigm theory of Lincoln et al. (2011) was to better understand the theory-building process(es) that the authors may have gone through (both formally and informally) in the development of the theory. To do so is to see the subject system as a theoretical form, conceptually re-envision a surrogate research design, the flow of ideas through that research design, and premises that would result in a similarly structured output of the original research design. As noted before, paradigm theory is a mature topic existing in a single body of literature. The most comprehensive documentation of the theory's development exists in the authors' published journal articles, conference papers, and text books from approximately 1980 to present day. Consequently, a process-oriented (i.e., theory-building research) integrative literature review, leveraging additional literature on theory-building research for its coding paradigm (Appendix B and Appendix C), was selected as an appropriate approach to the research.

Using Cooper's (1988; Randolph, 2009) taxonomy, the following typological positioning of the reverse engineering analysis was suggested:

- Focus: Research methods (surrogate process for developing paradigmatic theory)
- Goal: Criticism and identification of central issues (influence and process)
- Perspective: Neutral (no espoused position, neutral)
- Coverage: Purposive central or pivotal (select key pieces that illuminate process)
- Organization: Methodological (Influences, outcome, process, inputs)
- Audience: Specialized scholars and practitioners

### **Conceptual Frame**

The current reverse engineering analysis took the paradigm theory of Lincoln et al. (2011) as the subject system for analysis. Framing the analyses were two analytical perspectives. The first perspective used a structural lens modified from the concepts of reverse engineering analysis (Chikofsky & Cross, 1990; Rekoff, 1985) that focused examination of the phenomenon on (a) the indirect influences of the original design and designers, (b) the structural configuration of the subject system, (c) the potential design phases contributing to the subject system, and (d) the initial conditions and premises that may have led to the subject system. The second perspective used a coding paradigm developed from key concepts of theoretical products and theoretical processes (Appendix B and Appendix C, respectively) that focused examination of the phenomenon on its theoretical basis.

Analysis of indirect influences specifically targeted emic and etic concepts in the history of the development of paradigm theory. Analyses of the theoretical product (i.e., subject system);

theory-building process (i.e., systematic process); and requirements of theory (i.e., initial conditions) specifically examined the process of paradigm theory through a theoretical lens.

Table 31 displays the key concepts leveraged from Appendix B and Appendix C for the reverse engineering analysis.

Table 31

*Key Concepts of the Reverse Engineering Analysis*

	Phase of reverse engineering analysis		
	Subject system	Systematic process	Initial condition
<b>Literature examined</b>	Review of Theoretical Products (Appendix B)	Review of theoretical processes (Appendix C)	Review of the requirement of theory building (Appendix C)
<b>Key concepts</b>	Theoretical components, range, roles in inquiry, and specific forms.	The theory-building research process, theorizing versus application, research strategies, phases of theory-building research, specific theory-building processes and methods.	Requirements of the theory-building process and requirements of the theorist engaged in theory-building research

**Research Problem and Proposed Solution**

Given that the subject system, i.e., the paradigm theory of Lincoln et al. (2011), served as an exemplar theoretical formulation, it stands to reason that an analogous process for theoretically formulating a framework for the phenomenon of methodology would benefit from a deep understanding of the subject system's theoretical process. Even though a number of products of the authors' thinking are available in nearly 40 years of publications, little work has been done in an attempt to systematically identify, document, and theoretically analyze the theoretical process of the authors' thinking juxtaposed with their theoretical products. As a consequence, the lack of process understanding remains an obstacle to any claims toward reproduction of analogous, or surrogate, process applied to different topical content.

Reverse engineering provided a systematic process for conceptually re-envisioning an actionable set of specifications that can be used to reproduce the process and/or product of an existing system (Rekoff, 1985). Taking the paradigm theory of Lincoln et al. (2011) as a subject system, reverse engineering offered a suitable methodological shell for generating the prerequisite understanding necessary for developing an analogous process for theoretically formulating a framework for the phenomenon of methodology.

### **Need**

Given the widespread reference of the *Sage Handbook of Qualitative Research* ([Denzin & Lincoln, 1994, 2000, 2005, 2011] a far reaching text that, over four editions, presented the authors' cutting edge thinking on paradigm theory), it can be argued that the current state of paradigm theory is not only widely accessible, but widely accessed. However, despite the accessibility of paradigm theory, the heavy emphasis on the metaphysical assumptions and implications on inquiry falls short of adequately representing to readers the theoretical basis of the information presented in the handbook. That is, the writings on paradigm theory are not the proselytizing final words on what all inquiry is and should be. Instead, the writings present a sophisticated explanation of systems of inquiry (i.e., a theory) as well as a presentation of what five such systems of inquiry (i.e., system states) look like within the boundaries of their axiomatic theory.

Because the work of paradigm theory has not been emphasized as a theory-building process and axiomatic theoretical product, knowledge about the phenomenon as a theory remains inadequate. Thus, the need addressed by the reverse engineering analysis served the actionable practical and conceptual knowledge necessary to reproduce similar theoretical outputs by

analogous theoretical processes. Consequently, it was important for the current specific research agenda, as well as for more generally improving upon understanding of the body of paradigm work, to deconstruct the exemplar into its formative theoretical processes.

### **Research Questions**

The general research question guiding the reverse engineering analysis was *What surrogate theoretical research process can be inferred about the development of the exemplar subject system?* In addition, the following more specific research questions guided the reverse engineering analysis of the paradigm theory of Lincoln et al. (2011):

1. What indirect influences on the authors' can be identified relevant to development of the subject system?
2. What features are characteristic of the subject system as a theoretical output?
3. What features are characteristic of the subject system as a theoretical process?
4. What features are characteristic of the initial theoretical conditions that led to the development of the subject system?

### **Sampling and Data Collection**

Sampling and data collection were an interactive process involving review of the historical analysis, further critical case sampling where warranted, and organization of the information reviewed for its foci specific analysis. The sampling and data collection techniques used in support of the analysis of indirect influences and analyses of subject system, systematic process, and initial conditions varied considerably. Consequently, techniques are described separately for the former and three latter foci of analysis.

Despite differences, the sampling and data collection techniques for all four foci of the reverse engineering analysis (i.e., consideration of indirect influences on the subject system, analysis of the subject system, analysis of systematic process, and analysis of initial conditions) shared some common overarching features. In general, sampling and retrieval of sources involved less retrieval of new information than might be typical for a review; this was due to the piggybacking of the reverse engineering analysis on the historical analysis of the subject system. Instead, sampling more heavily involved review of the historical analysis for insights informing the reverse engineering analysis.

Review of the historical analysis for insights involved a purposive sampling strategy. Specifically, *critical case sampling* was used to select sources from the synthesized writing that described the context of development; the developmental process; and/or the events, circumstances, and influences that served as inputs to the authors' thinking. In this context, critical case sampling was a form of purposive sampling that permitted maximum application of information to other cases, under the assumption that if the information was valid for critical cases, it was also likely to be true of all other cases (Miles & Huberman, 1994; Patton, 1980, 1990, 2002).

Each source identified from the critical case sampling had to meet two broad conditions for inclusion in the reverse engineering analysis. These inclusion criteria were:

- The source must have discussed or described one of the following:
  1. The contextual backdrop during the development of paradigm theory,
  2. The characteristics of the subject system,
  3. The method, process, or rationale of theoretical development, or

4. The events, circumstances, and influences that served as inputs to the theoretical process.
- The sampled source must have been reasonably accessible by means of electronic databases, university libraries, or internet searches.

### **Sample and Data Collection for Consideration of Indirect Influences**

For consideration of indirect influences, critical case sampling and information organization involved an emergent process of developing categories from the literature and purposively sampling additional literature to further inform the emerging categories. Sampling primarily relied on prior synthesis and samples from the historical analysis, but further focused data collection on events that may have had indirect (or direct when explicitly called out) influences on the authors' development of paradigm theory.

Although the consideration of indirect influences sampled from the same sources included in the ancestry sample of the historical analysis, new data were collected from the sources examined. In addition to leveraging the literature synthesis in the historical analysis of paradigm theory, literature related to the moments in the history of qualitative inquiry was reviewed. One particular thread within the sample of the literature reviewed discussed the history of qualitative inquiry as nine moments (Denzin & Lincoln, 1994, 2000, 2005, 2011; Guba & Lincoln, 1987, 1989; Lincoln, 1995b). The nine moments presented a review of the history of qualitative inquiry from the authors' perspectives. These nine moments in qualitative history included:

- First moment: The traditional period (1900-1950)



- Second moment: The modernist phase or golden age (1950-1970)
- Third moment: The moment of blurred genres (1970-1986)
- Fourth moment: The crisis of representation (1986-1990)
- Fifth moment: The postmodern modern period (1990-1995)
- Sixth moment: The period of postexperimental inquiry (1995-2000)
- Seventh moment: The methodologically contested moment(2000-2010)
- Eighth moment: The methodologically contested moment within qualitative research (2005-2010)
- Ninth moment: The fractured future (2010- )

Although the nine moments did inform the analysis of indirect influences, the literature on historical moments only represented an external account of potential influences. To complement the external perspective, an addition insider account of the work was also needed. For the insider perspective, several narrative works, prefaces, forewords, and epilogues of pivotal works were reviewed to sample and collect information from the authors' own words on their work. The sources reviewed for an insider perspective included:

- The preface of *Naturalistic Inquiry* (Lincoln & Guba, 1985b)
- The foreword of *Fourth Generation Evaluation* (Guba & Lincoln, 1989)
- The foreword of *The Paradigm Dialog* (Guba, 1990c)
- Lincoln's chapter on the making of a constructivist in *The Paradigm Dialog* (Guba, 1990c)
- The prefaces and epilogues of all four editions of *The Sage Handbook of Qualitative Research* (Denzin & Lincoln, 1994, 2000, 2005, 2011)

- Guba, E. G. (1996). What happened to me on the road to Damascus? In L. Heshusius & K. Ballard (Eds.), *From positivism to interpretivism and beyond: Tales of transformation in education and social research* (pp. 43-49). New York, NY: Teachers College Press.
- Lincoln, Y. S. (2010). What a long, strange trip it's been: Twenty-five years of qualitative and new paradigm research. *Qualitative Inquiry*, 16(1), 3-9.

Each included source was reviewed in its entirety. Next, sources were summarized with citation information and a brief synopsis of any information relevant to indirect influences.

### **Sample and Data Collection for Analyses of the Subject System, Systematic Process, and Initial Conditions**

For the analyses of the subject system, systematic process, and initial conditions, sampling and data collection leveraged a theoretical coding paradigm developed a priori from two supplemental reviews of theory-building literature (Appendix B and Appendix C). The review of the historical analysis and further purposive samples then deductively followed to retrieve information specific to populating the categories of the coding paradigm. Although only relying upon three sources (i.e., historical analysis [chapter 4], supplemental review of theoretical products [Appendix B], and supplemental review of theoretical processes [Appendix C]), the three sources were assembled explicitly for the current body of inquiry and altogether reviewed and synthesized the work of nearly 100 different sources. A summary of the a priori theoretical coding paradigm is shown in Table 32. Table 32 expands upon the key theoretical concepts shown in Table 31. The theoretical coding paradigm served as the analytical lens for the current analyses.

Table 32

*Theoretical Coding Paradigm Used for Analysis of Subject System, Systematic Process, and Initial Conditions*

Phase of reverse engineering analysis	Theory-building concept of coding paradigm	Specific theoretical characteristics considered
Analysis of subject system	Theoretical products of theory building research	Theory as answers to questions of why
		Theoretical anatomy
		Theoretical range
		The roles of theory in inquiry
		Specific forms of theory
Analysis of systematic process	Theoretical processes of theory building research	Justification of the research as a theory-building process
		Accumulation of interim and full-blown theoretical products
		The theorizing half and the practice half of the theory-building process
		The theory-then-research and research-then-theory theory-building research strategies
		The phases of theory-building research
		The processes of theory-building research
		The methods of theory-building research
Analysis of initial conditions	Requirements of theory building research	The theoretical need
		The entry point into the theory build cycle
		The theoretical solution to the problem
		The logic of analysis
		Operationalization of theory
		Ongoing theoretical needs
		Practical knowledge of theory-building research methods
		Practical knowledge of theory
		Practical knowledge of the phenomenon and topic of theory
		Conceptual knowledge of theory-building research methods
		Conceptual knowledge of the elements and structures of theory
		Conceptual knowledge of the phenomenon and topic of theory

Recoding and reanalysis of the historical synthesis with the theoretical coding paradigm allowed the content and history of the paradigm phenomenon to be viewed and understood as a theory-building process. Sampling and data collection performed through the analytical lens of the theoretical coding paradigm brought together two distinct bodies of literature to fill the

identified knowledge gap in theoretical understanding of paradigm theory. One body of literature represented the historical content of the development of paradigm theory. The other body of literature represented methodological knowledge of the processes and products of theory building. The two bodies of literature provided the information necessary to understand the development of the subject system as a specific form of theory. Applied together through the analytical framework of reverse engineering analysis, the two bodies of literature were able to yield an actionable understanding of the process of the phenomena as a theory that can be used to reproduce a surrogate theoretical process and theoretical product.

### **Data Analysis Strategies**

Data analysis was a process of examining the information sampled and collected for each of the four foci of the reverse engineering analysis. Data analyses were conducted separately for each of the four foci of the reverse engineering analysis: (a) consideration of indirect influences, (b) analysis of subject system, (c) analysis of systematic process, and (d) analysis of initial conditions. Each analysis is described individually in the following sections.

#### **Consideration of Indirect Influences on the Subject System**

For analysis of indirect influences, two types of literature were reviewed: literature providing an emic insider perspective and literature providing an etic outsider perspective. Forewords, prefaces, and epilogues were reviewed for the emic perspective; literature on the nine moments in the history of qualitative inquiry were reviewed for the etic perspective. The emic and etic literature was reviewed and analyzed for recurring and/or salient ideas and events describing the indirect influences on the authors' theoretical work. The historical analysis of

chapter 4 was iteratively and interactively reviewed alongside the emic and etic literature. Interaction with the historical analysis was necessary to contextualize emergent influences within the timeline and states of historical development. From the analysis across literature with the authors' own words, literature on moments in the history of qualitative inquiry, and the historical analysis of chapter 4, several potential categories of influence on the development of paradigm theory were identified, including (a) an embedded historical context, (b) a time of change, (c) a rejection of traditional perspectives, (d) acting in an advocacy role, and (e) wrestling with commensurability.

### **Analysis of Subject System**

The first step in the analysis of the subject system was mapping out paradigm theory in a configuration document (Figure 4). Next, the subject system was reviewed against numerous characteristics of theoretical products. Review of the literature on the purpose, structure, and form of theory (see Appendix B for a review of theoretical products) revealed several pertinent theoretical categories of information important to understanding the subject system. These categories included:

- Contextualization of paradigm theory as specific answers to questions of why
- Understanding the theoretical anatomy
- Considering the theoretical range
- Understanding the role of paradigm theory in inquiry
- Understanding the paradigm theory as an axiomatic form of theory
- Understanding the paradigm theory as a typological form of theory

Analysis of the subject system was deductively guided with each of these characteristics of theoretical products. Both the literature informing the historical analysis and the synthesis of the historical analysis were reviewed for information relevant to each theoretical characteristic.

**Hierarchical abstraction of the subject system.** Rekoff (1985) described the configuration document as a tool of reverse engineering used to reveal the components normally unexposed and how those components fit together hierarchically and functionally. Hierarchical abstraction of paradigm theory used the concept of the configuration document (Figure 4) to facilitate understanding of the subject system. Leveraging the historical analysis of paradigm theory in chapter 4, hierarchical abstraction focused on identification and graphical representation of:

- System elements
- Sub-elements
- Interrelationships of elements
- System states

**Understanding paradigm theory to answer questions of why.** Sutton and Staw (1995) and Whetten (2002) suggested that theories are the answers to questions of why. Kaplan (2009) likened theory to conjectures about the rules of the game that can explain why certain empirical patterns might be observed. Therefore, key to understanding any theory is explicating both the *why questions* asked and *the answers to those why questions*, which the theory explains. Consequently, an understanding of paradigm theory as a means to answer questions of why focused on positioning and contextualizing the theory according the specific questions of why asked by the theory and the specific answers explained by the theory.

**Understanding the theoretical anatomy of the theory.** Understanding the theoretical anatomy of paradigm theory was accomplished by considering several components of a theory. Specifically, these components were (a) the theoretical units, or basic building blocks; (b) the laws of interaction, or relationships among units; (c) the boundaries or scope of the theory, and (d) the system states, or various conditions of the whole theory when all elements and structures are active together; (e) the propositions; (f) the empirical indicators; and (g) the hypotheses.

Analysis of the paradigm theory's theoretical units involved identifying seven properties of the theoretical units:

1. Concept versus construct
2. Unit versus event
3. Attribute versus variable
4. Real versus nominal
5. Primitive versus sophisticated
6. Collective versus member
7. Type of theoretical unit

Analysis of the laws of interaction identified which of three categories of theoretical laws captured the relationships between theoretical units:

1. Categorical
2. Sequential
3. Determinant

Analysis of the theoretical boundary of paradigm theory involved identifying the portion of the world that was intended to be explained by the theory and distinguishing it from those portions it did not intend to explain. Furthermore, a number of additional properties of the theoretical boundary were identified, including:

- Reach: bound in time versus unbound in time
- Reach: bound in space versus unbound in space
- Type of boundary: open versus closed
- Theoretical origins of boundary: internal versus external

Analysis of the system states of paradigm theory involved description and identification of all system states of the paradigm theory. The system states of the paradigm theory were then presented using the general format for presentation and statement of a theory's system states, based on the type of theoretical law of interaction (Dubin, 1978; see Appendix B).

Analysis of the paradigm theory's propositions involved classification into one of three mutually exclusive and exhaustive types of propositional statements (Dubin, 1978; see Appendix B). These three classes included:

1. Statements about the value of a unit, given its relation to the values of other units in the theory and the defined nature of their interactions
2. Statements about the continuity of a system state of the theory and the values of the cohesive set of units for the system state
3. Statements about changes in the theoretical system across its various system states and the values of the cohesive set of units for each system state



Analysis of the empirical indicators and hypotheses of the paradigm theory involved identifying the means to measurement (i.e., instrumentation); the act of measurement; and resulting value of measurement for the theory in operation. Further identification of the hypothesis of the paradigm theory involved identifying the statement(s) of values for units of the theory, given the operation associated with the identified empirical indicators.

**Considering the theoretical range of the theory.** Consideration of the theoretical range of paradigm theory involved identifying a number of characteristics of paradigm theory pertinent to understanding its theoretical range (Appendix B). These characteristics included:

- The size of the explanatory shell or theoretical boundary
- The implied level of analysis
- The extent of the direct connection of theory with the empirical world
- The accuracy versus generalizability of the theory (i.e., the possibility of being general, accurate, and simple simultaneously)
- The level of abstraction or contextualization
- The time-boundedness of the theory
- The forms of knowledge that the theory represents
- Driven theoretically versus driven empirically

**Understanding the role of paradigm theory in inquiry.** Numerous roles of theory in inquiry were reviewed (see Appendix B). Six general roles of theory were pulled forward in summary:

- Theory as means to organizing what is known and what is not known

- Theory as means to identifying/prioritizing research issues
- Theory as means to identifying research problems
- Theory as means to prescribing and evaluating solutions to research problems
- Theory as means to framing data for interpretation
- Theory as means to generate and shape method

Table 45 in Appendix B further details each of the six roles of theory in inquiry, with specific examples taken from the literature on theoretical products. To analyze the roles of the paradigm theory of Lincoln et al. (2011) in inquiry, each of the six roles of theory summarized in Table 45 of Appendix B were examined for the relationship between paradigm theory and inquiry. Where applicable, the examples taken from the literature on theoretical products for each role of theory were further highlighted as specific examples of the role of paradigm theory in inquiry.

**Understanding the paradigm theory as an axiomatic form of theory.** The axiomatic form of theory was reviewed (see Appendix B). Seven key features of the axiomatic form of theory were pulled forward in summary:

- The theory includes:
  - Theoretical concepts or constructs
  - Scope conditions
  - Axiom statements
  - Propositions derived from axiom combinations
  - A logical system within which to relate the theoretical concepts and derive propositions

- The theory is capable of being evaluated with:
  - Value judgments of justification
  - Value judgments of fit with reality

To analyze the paradigm theory of Lincoln et al. (2011) as a form of axiomatic theory, each of the seven key features of axiom theories summarized in Appendix B was examined for the paradigm theory.

**Understanding the paradigm theory as a typological form of theory.** The typological form of theory was reviewed (see Appendix B). Eleven key features of the typological form of theory were pulled forward in summary:

- Taxonomic characteristics:
  - Division of elements into semantically heterogeneous categories
  - Inclusion of within category attributes
  - Simplification of all unique elements in an aggregate classification scheme
  - Decision rules for classification
- Typological characteristics:
  - First-order constructs
  - Ideal types comprising first-order constructs
  - Holistic organization of category attributes into ideal types and ideal types into typologies
- Minimum criteria as typological theory:
  - First-order constructs (not redundantly discussed given availability as a typological characteristic)

- Ideal types comprising first-order constructs (not redundantly discussed given availability as a typological characteristic)
- Unique Gestalt-like pattern for each ideal type
- Complex hierarchical organization of grand theory and several middle-range theories
- Judgments regarding ideal type internal consistency
- Judgment regarding the degree of empirical fit or normative influence on practice

To analyze the paradigm theory of Lincoln et al. (2011) as a form of typological theory, each of the 11 key features of typological theories summarized in Appendix B was examined for the paradigm theory.

### **Analysis of Systematic Process**

The theoretical processes of theory-building research was reviewed (see Appendix C). Several key considerations of theory-building research were pulled forward:

- Justification of the research as a theory-building process (e.g., why can the systematic process be considered a theory-building process?)
- Review and understanding of the theoretical products produced and evidence of becoming full-blown theory
- Positioning of the research in at least half of the theory-building process (i.e., the theorizing half or the practice half) (Chermack, 2006; Lynham, 2002a, 2000b; Reynolds, 1971; Torraco, 1994, 1997)

- Mapping of the inquiry process to a theory-building research strategy (i.e., positioning the general method within two common theory-building research strategies, theorizing to practice and practice to theorizing; Lynham, 2002b; Reynolds, 1971)
- Mapping of the theory-building research to phases of theory-building process
- Mapping of the theory-building research to specific theoretical processes
- Mapping of the theory-building research to specific theoretical methods

To analyze the systematic process leading to development of the paradigm theory of Lincoln et al. (2011) as a theory-building process, each of the key considerations of theory-building research summarized in Appendix C was examined for the paradigm theory.

### **Analysis of Initial Conditions**

The theoretical requirements of theory-building research were reviewed (see Appendix C). Numerous key requirements of theory-building research were pulled forward, six for the theory-building process and six for the theorist to be engaged in the theory building.

The requirements of the theory-building process outlined in Appendix C included:

- Clear demonstration of a theoretical gap in knowledge in the form of (a) a theoretical need and (b) the entry point into the theory-building cycle
- Explicit linkage of theoretical problem to theoretical solution through description of (c) the theoretical solution and (d) the theoretical logic

- Extension of the theoretical framework into empirical practice through (e) operationalization of the theoretical framework and (f) definition of further theoretical research to be done

The requirements of the theorist to be engaged in the theory-building process outlined in Appendix C included:

- Practical knowledge of (a) theory-building research methods from experience attempting to build theory, (b) theory from experience attempting to apply theory in practice, and (c) the phenomenon and topic of theory from experience with the phenomenon in practice
- Conceptual knowledge of (d) theory-building research methods from intensive study of theory-building processes, (e) the elements and structures of theory from intensive study of theory itself, and (f) the phenomenon and topic of theory from intensive study of the phenomenon itself

Analysis of the initial conditions leading to the theory development work of the paradigm theory of Lincoln et al. (2011) was performed against the requirements for theory building synthesized in Appendix C.

### **Data Synthesis Strategy**

The process of data synthesis sequentially stepped through each phase of reverse engineering analysis, beginning with consideration of indirect influences and then moving through analyses of the subject system, systematic process, and initial conditions. For synthesis of the literature on indirect influences, the emergent framework of potential categories of

influence on the development of paradigm theory was used to organize the narrative. For syntheses of the literature on the subject system, systematic process, and initial conditions, the a priori coding paradigm on theory building was used to organize the narratives. The synthesis was concluded by revisiting understanding of the paradigm phenomenon as a form of theory and as part of a theory-building process, and then focusing on the next inquiry steps, given the learning from the current analysis.

The overall process of the reverse engineering analysis can be situated as an incremental piece of work within a larger, ongoing research agenda on disciplined inquiry. The intended output of the synthesis strategy was a theoretical understanding of the paradigm phenomenon as an exemplar form of theory. The intended outcome of the research was actionable theoretical knowledge that could be used to define a starting point in theory-building work on the phenomenon of methodology as part of the overall conceptualization of disciplined inquiry.

## CHAPTER 6: SYNTHESIS OF REVERSE ENGINEERING ANALYSIS

### Chapter 6 Preface

Chapter 6 presents the outputs of the reverse engineering analysis of paradigm theory. Four data syntheses are described: (a) consideration of indirect influences, (b) analysis of subject system, (c) analysis of systematic process, and (d) analysis of initial conditions. Synthesis of the consideration of indirect influences identified five factors potentially influencing the development of paradigm theory. Synthesis of theoretical coding of the subject system identified paradigm theory as a form of axiom theory and further characterized the theoretical components in operation in the theory. Synthesis of theoretical coding of the systematic process identified the relevant theory building phases and research strategy involved in theory-building work of paradigm theory. Synthesis of theoretical coding of initial conditions revealed how an initial need for theory development was established and in response the axiomatic form was identified as a potential theoretical solution.

The output of the reverse engineering analysis was a characterization of the key theoretical features of the theory product, theory-building process, and requirements for theory-building associated with the development of paradigm theory. Within the larger research agenda, the outcome of the reverse engineering analysis was the actionable theoretical knowledge necessary to begin theorizing about the phenomenon of methodology. New contributions made to knowledge about paradigms of inquiry include an understanding the paradigm phenomenon as both a form of theory and part of an ongoing theory-building process that was not previously available in the literature on paradigms.



### **Data Synthesis: Consideration of Indirect Influences on the Subject System**

Numerous forewords and prefaces provided by the authors of paradigm theory, in addition to review of the nine historical moments in qualitative inquiry, offered some insights into the indirect influences that may have guided the authors' work on the subject system. The commentaries and writings embedded in the authors' published works offered a narrative, espoused position and insider view of the development of their work. The nine moments in the history of qualitative inquiry provided an external perspective on the influences that may have come to bear on the authors' work. Across both internal (the authors' own words) and external (writings on the moments of qualitative inquiry) sources, several potential influences on the development of paradigm theory were identified: (a) an embedded historical context, (b) a time of change, (c) a rejection of traditional perspectives, (d) acting in an advocacy role, and (e) wrestling with commensurability.

### **Historically Situated Context**

In addition to positioning the work narratively in the writing on the subject system, Lincoln (1990) provided a biographical sketch of the paradigm-building process for the constructivist paradigm that she framed as *The Early Years*, *The Middle Years*, and *Rites of Passage*. Lincoln described the personal context of her work on the subject system as "not only intellectual but also personal, social, and possibly political transformation" (p. 69). Within her biographical sketch, in addition to positioning the work within a formative time period of a couple decades, Lincoln also positioned the evolution of ideas more broadly within a larger history of science literature. In contrasting the two historical contexts, local and broad, Lincoln

captured the lack of consistency to traditional positivist views and the fit of her personal journey within the positivist gaps.

### **A Time of Change**

A change theme was consistent throughout Guba and Lincoln's work on the subject system. In example, Guba (1990c) explicitly placed their work in a Kuhnian context. The positioning implied a time of change in which current paradigms can no longer be applied to solve the problems of a community of inquirers, and as a result, new paradigms are sought (Kuhn, 1996). The change theme as a backdrop to their work was also prevalent in the language used throughout the decade to establish a time of unrest and revolution in how inquirers were thinking about paradigms of inquiry. For example, the following language was used in conjunction with the paradigm term:

- "Competing paradigm" (Guba & Lincoln, 1982a, p. 234)
- "Alternative paradigms" (Lincoln & Guba, 1985b, p. 7)
- "Paradigm revolution" (Guba & Lincoln, 1989, p. 16)
- "Paradigm wars" (Guba, 1990c, p. 370)
- "Emergent paradigms" (p. 9)
- "New paradigm" (p. 27)

## **Rejection of the Traditional Perspective**

Both Guba and Lincoln (1989) positioned themselves as constructivists during the development of the subject system. Their positioning implied a constructed reality rather than an external reality.

Outcomes are not descriptions of the “way things really are” or “really work” or of some “true” state of affairs, but instead represent meaningful constructions that individual actors or groups of actors form to “make sense” of the situations in which they find themselves. (p. 8)

It seems important to recognize their inquiry perspective (i.e., belief system) during the development of the paradigm meta-framework. Their work not only occurred during a time period of changing or expanding paradigm perspectives, but also occurred as a result of their “rejection of convention assumptions” (Lincoln, 1990, p. 69). They talked not only about the “heresy” (Lincoln & Guba, 1985b, p. 9) of positivism, but also about the failure of conventional inquiry to influence practice (Guba & Lincoln, 1982a). Their work was heavily oriented toward practice, something evident in their proposed authenticity criteria for naturalist inquiry (e.g., Lincoln, 1986; Lincoln & Guba, 1986a).

## **Serving in an Advocacy Role**

Given the historical position in a time of questioning of positivism, exploration of alternative paradigms, and rejection of positivist impact on practice, it should be noted that the work of Lincoln and Guba was less against positivism and more in favor of a naturalist (or constructivist) perspective. That is, the role that emerged for them was not one of the voice to speak out against positivist ways; rather, their voice was very much one of advocate and influencer for a new paradigm, an alternative to positivism. As stated in *Naturalistic Inquiry*,

“challenges are being mounted from the perspective of alternative paradigms that suggest new and different answers. This book is about such a challenge” (Lincoln & Guba, 1985b, p. 7). It is important to note that as advocates (even though they did have their own personal stances), they supported the legitimacy of the naturalist perspective without trying to pit it against, and defeat, the positivist perspective. Rather, their advocacy was “about options for inquiry: options among the paradigms” (Guba, 1990c, p. 9).

### **Wrestling with Commensurability**

The last indirect influence identified from the literature was the authors’ ongoing struggle with issues of commensurability between the axiomatic systems defined with their paradigm theory. The commensurability question asks, “Is it possible to blend elements of one paradigm into another, so that one is engaging in research that represents the best of both worldviews?” (Lincoln & Guba, 2000, p. 174). The issue at hand for commensurability resides at the philosophical level, whether or not two paradigms are commensurable across the axiom positions. The authors’ position was when axioms are not similar enough to resonate, paradigms are not commensurable, and therefore blending elements of the two paradigms should not be possible. However, if similar enough, then blending can cautiously be done (Lincoln et al., 2011). “Commensurability is an issue only when researchers want to “pick and choose” among the axioms of [different paradigms]... because the axioms are contradictory and mutually exclusive” (Lincoln & Guba, 2000, p. 174).

Contention about commensurability can be traced from the earliest proposal of scientific and naturalistic paradigms, circa 1978 (Guba, 1996), to reflections on the paradigmatic work that remains unresolved for the future (e.g., Lincoln, 2010). The tension was most notably evident in

discussions of mixed-methods approaches to inquiry; specifically, mixing methods versus mixing methodologies. The authors reflected that unfortunately the issue of commensurability had been ignored, misrepresented, or simply confused at the methods level (i.e., quantitative or qualitative methods and data). Commensurability takes no position on whether quantitative or qualitative methods of data collection, analysis, or data can be used within the same inquiry approach. However, commensurability does take a position on combining the methodological approaches of incommensurable paradigms, whereby incommensurability can be isolated to incompatibilities in the basic underlying philosophical assumptions (i.e., axioms) (Lincoln et al., 2011).

Lincoln (2010) noted that some modern-day mixed-method proponents have been explicit that they are not confusing the level at which they are mixing (i.e., methodologies of paradigms versus specific method techniques); rather, those proponents are simply choosing to ignore the issue. Ignoring the commensurability issue when mixing the methodologies of incommensurable paradigms takes the position that “there is no necessary connection between knowing and how we know” (pp. 6-7). Despite their best efforts, the authors’ acknowledged the debate goes on; however, particular to disciplined inquiry, mixing matters and remains a topic to be addressed. “Paradigms and metaphysics do matter... They tell us something about what the researcher thinks counts as knowledge, and who can deliver the most valuable slice of this knowledge” (p. 7).

### **Data Synthesis: Analysis of Subject System as a Theory Product**

Data synthesis for the subject system initially focused on representation of paradigm theory in a configuration diagram. In addition to representing paradigm theory in a configuration

diagram, given the frame of reference for theory in Appendix B, the subject system was analyzed for a number of theoretical characteristics. The following synthesis sections also explore the paradigm meta-framework of Lincoln et al. (2011) as a theory with a relationship to reality, specific theoretical components, a theoretical range, and alignment with each of the axiomatic and typological forms of theory.

### **Hierarchical Abstraction of the Paradigm Theory**

Leveraging the historical analysis in chapter 4, the following elements (Figure 5) of the paradigm theory of Lincoln et al. (2011) were considered for abstraction of the theory into a configuration document:

- Axiom subjects: The axiomatic subjects of the paradigm meta-framework consist of the meta-physical categories of ontology, epistemology, methodology, axiology, and teleology.
- Ontological axiom positions: The ontology category consists of the following axiom positions: naïve realism, critical realism, historical realism, relativism, and participative reality.
- Epistemological axiom positions: The epistemology category consists of the following axiom positions: objectivist, modified objectivist, transactional subjectivist, and critical subjectivist.
- Methodological axiom positions: The methodology category consists of the following axiom positions: experimental, modified experimental, dialogic/dialectic, hermeneutic/dialectic, and collaborative action inquiry.

- Axiological axiom positions: The axiology category consists of the following axiom positions: law-like propositional knowledge, approximations of reality, advocate for social change, transactional knowledge to improved praxis, and practical knowing about how to flourish.
- Teleological axiom positions: The teleology category consists of the following axiom positions: technical, critically informed praxis, and improved praxis.
- The six axiom systems (i.e., paradigms) defined under paradigm theory:
  - The positivist axiomatic system consists of a naïve realist ontological position, objectivist epistemological position, experimental methodological position, propositional axiological position, and technical teleological position.
  - The postpositivist axiomatic system consists of a critical realist ontological position, modified objectivist epistemological position, modified experimental methodological position, an approximate propositional axiological position, and technical teleological position.
  - The critical axiomatic system consists of a historical realist ontological position, transactional subjectivist epistemological position, dialogic/dialectic methodological position, an advocate for social change axiological position, and critically informed praxis teleological position.
  - The constructivist axiomatic system consists of a relativist ontological position, transactional subjectivist epistemological position, hermeneutic/dialectic methodological position, transactional knowledge to improved praxis axiological position, and improved praxis teleological position.

- The participatory axiomatic system consists of a participative reality ontological position, critical subjectivist epistemological position, collaborative action inquiry methodological position, practical knowing about how to flourish axiological position, and improved praxis teleological position.

Figure 5 maps all identified system elements, sub-elements, interrelationships of elements, and the six system states of the subject system. The first-level headings represent axiom subjects; the second-level headings represent axiom positions; and the interconnected arrows represent system states (i.e., paradigms of disciplined inquiry).

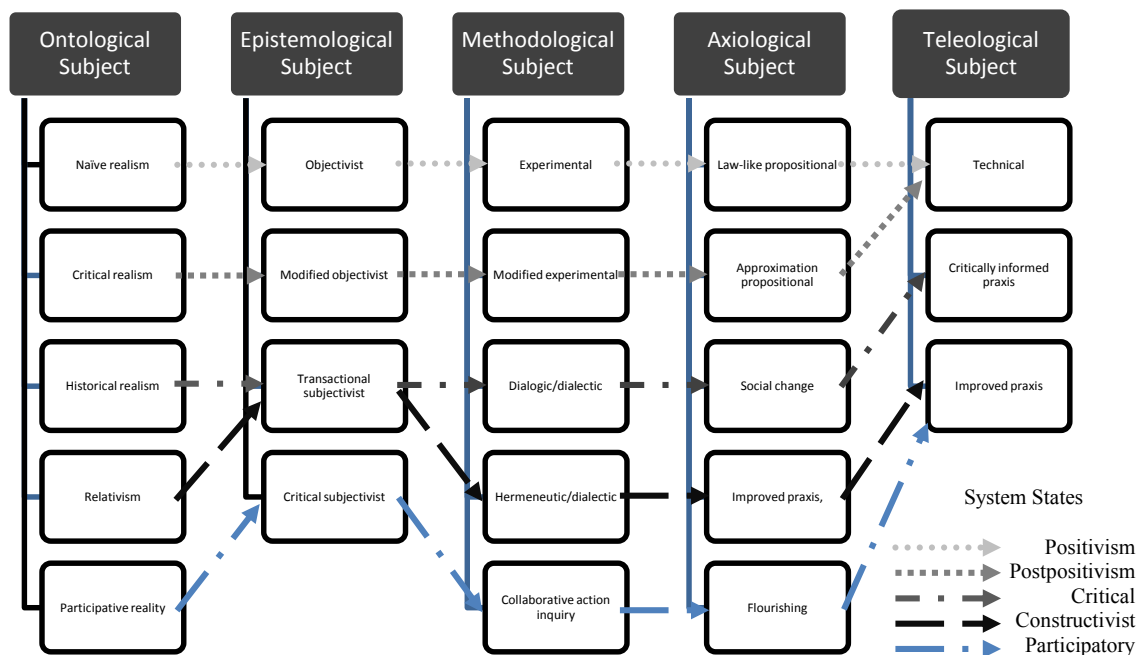


Figure 5. Hierarchical abstraction of paradigm theory in a configuration diagram.



## **Positioning as a Theory**

In the present case, what questions of why does the paradigm theory of Lincoln et al. (2011) address? In the *game of inquiry* (Kaplan, 2009), observable empirical patterns can be described with data and conjectures about the rules of the game that explain why certain empirical patterns of inquiry might be observed; that is, the story that makes the observable inquiry patterns intelligible.

Lincoln et al. (2011) described the empirical processes and products specifically associated with disciplined inquiry and knowledge claims. They explained why those inquiry patterns can be observed in two ways: fundamentally through a set of metaphysical assumptions that define the underlying belief system of any paradigm of inquiry, and holistically through a set of metaphysical positions that taken together synergistically pattern in such a way as to extend into the practice of inquiries as postures inquirers would take toward relevant issues in the conduct of disciplined inquiries. That is, the framework of metaphysical assumptions (or axiom subjects) explains what the basic belief system of a paradigm is and answers the question of why different paradigms of inquiry exist. The framework is essentially a theory of paradigms of inquiry. The specific set of internally consistent metaphysical positions (or axiom positions) of any specific paradigm explain why inquiry looks like it does within the given paradigm; each paradigm is an individual theory of inquiry.

## **The Anatomy of Paradigm Theory**

Seven components of the paradigm theory of Lincoln et al. (2011) were examined in analysis of its theoretical anatomy. These seven components were (a) the theoretical units, or

basic building blocks; (b) the laws of interaction, or relationships among units; (c) the boundaries or scope of the theory; (d) the system states or various conditions of the whole theory when all elements and structures are active together; (e) the propositions; (f) the empirical indicators; and (g) the hypotheses. Only the first four components are necessary for consideration as a complete theory (Lynham, 2002b).

**Theoretical units.** The theoretical units of the paradigm theory of Lincoln et al. (2011) included the major axiomatic subjects, or metaphysical assumptions, upon which inquirers can take positions. The theoretical units can be further defined relative to status as concepts or constructs (Kerlinger & Lee, 2000); five distinguishing characteristics of theoretical units (Dubin, 1978); and the type of theoretical unit (Dubin, 1978). Classification of the theoretical units of the paradigm theory of Lincoln et al. are shown in Table 33.

Table 33

*Classification of the Theoretical Units of the Paradigm Theory of Lincoln et al. (2011)*

<b>Classified property of theoretical unit</b>	<b>Classification</b>	<b>Explanation</b>
Concept versus construct	Construct	Axioms are abstractions invented for the purpose of relating to other axioms in the paradigm theory; not formed as generalizations from particulars (Kerlinger & Lee, 2000)
Unit versus event	Unit	Axioms are properties of belief system whenever they exist and under all circumstances of their existence (Dubin, 1978)
Attribute versus variable	Attribute	The axioms have the properties of their specific positions or they do not; the properties associated with the axiom positions do not exist in degree (Dubin, 1978)
Real versus nominal	Nominal	No empirical indicator exists for the axiom subjects (Dubin, 1978)
Primitive versus sophisticated	Sophisticated	The axiom subjects are well defined units with a name, definition, and some properties associated with the theory (Dubin, 1978)
Collective versus member	Collective	The high level, abstract axioms are not part of a classification of units, rather they define the classes of units at lower levels, i.e., the sets of axiom positions within an axiom subject (Dubin, 1978)

Type of theoretical unit	Enumerative	There exist no conditions under which any axiom may take on a null value or one in which the property does not exist, e.g., all paradigms hold some ontological position on reality; the reality axiom cannot take on a null value (Dubin, 1978)
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**Laws of interaction.** With regard to the relationships that exist between axioms of the paradigm theory of Lincoln et al. (2011), the theoretical laws of interaction can be considered categoric. The relationships among axioms fit the categoric category of relationship because no intended order or sequence exists between the units, and no implied or explicit directional quality exists in the relation between axioms. The specific axiomatic positions taken on each axiom subject within a specific paradigm of inquiry are only associated with regard to the collective presence or absence of position values; one axiom position neither causally nor serially determines the other. Rather, the set of axiom positions represents a symbiotic, congruent, and cohesive whole instead of any serial or determinant relation (Dubin, 1978; Lynham, 2002a).

**Theoretical boundaries.** The theoretical boundary of the paradigm theory of Lincoln et al. (2011) defined the portion of the empirical world of inquiry intended to be explained by the theory (Chermack, 2004; Dubin, 1978; Lynham, 2002a). The world of inquiry (Crotty, 2007) included in the paradigm theory encapsulates those worlds of disciplined inquiry that can be characterized by a commitment of the inquirer to a system of inquiry defined by:

- assumptions about reality,
- what can be known about that reality,
- how one comes to know something about that reality,
- the role of values in coming to know, and
- the purpose(s) that that knowledge is sought through inquiry.

Furthermore, the paradigm theory of Lincoln et al. (2011) can be positioned according to a number of additional properties of the theoretical boundary shown in Table 34. These properties of the theoretical boundary include its reach in time and space, the type of boundary, and the origins of the boundary.

Table 34

*Classification of the Theoretical Boundary of the Paradigm Theory of Lincoln et al. (2011)*

<b>Classified property of theoretical boundary</b>	<b>Classification</b>	<b>Explanation</b>
Reach: bound in time versus unbound in time	Unbound in time	The theory is not limited to forms of disciplined inquiry historically tied to any point in time (Bacharach, 1989; Freese, 1980).
Reach: bound in space versus unbound in space	Bound in space	The paradigm theory may arguably be extended to all forms of inquiry; however, the current analysis considers the theoretical boundary to include only those forms of disciplined inquiry that may be characterized by a commitment to the five basic assumptions of the theories axioms. Any form of inquiry that may take a null position on an axiom, perhaps some forms of formal pragmatism, are beyond the explanatory reach of the theory (Bacharach, 1989; Freese, 1980).
Type of boundary: open versus closed	Closed system	The theoretical boundary is closed such that it is an idealization of the world of inquiry, informed by, yet independent of context and environment. That is, the units and laws of interaction drive the world of experience rather than serve as generalizations of the empirical world (Dubin, 1978; Freese, 1980).
Theoretical origins of boundary: internal versus external	Internal	The boundary of the theory is determined by the cohesive whole inherent in the axiomatic system resulting from five axiom positions. The net result is an empirical world of inquiry, although still only hypothetical, determined by the units and the relationships; nothing external to the theory imposes its boundaries (Dubin, 1978).

**System states.** As highlighted by Torracco (1997), the system states of a theory can be considered the “conditions under which the theory is operative” (p. 129). In the paradigm theory of Lincoln et al. (2011), each constellation of axiomatic positions on the five axiomatic subjects can be considered a system state of the theory in operation. In other words, each inquiry paradigm is a system state of the paradigm theory. Within a paradigm of disciplined inquiry all

five enumerative theoretical units (i.e., axiom subjects) are active in a manner such that the defined type of unit is active; each unit has one of the attribute values (i.e., axiom positions); and all units are interacting in the collective gestalt manner that the categoric laws of interaction define. A paradigm of disciplined inquiry is, therefore, a state of the theory as a whole defined by the unique combination of cohesive axiom positions (Dubin, 1978).

While a specific paradigm of disciplined inquiry (comprising the whole product of five interacting positions on axiom subjects) can be considered a system state of the paradigm theory of Lincoln et al. (2011), the theoretical outcomes of the paradigm theory point to something less complete. A theoretical outcome was defined as either a single or subset of theoretical unit values that provide distinctive character to the theory (Dubin, 1978). Two candidates emerged as likely state coordinates for each paradigm of disciplined inquiry: the ontological and epistemological positions or the methodological position. Both potential state coordinates of a paradigm typify the paradigmatic system state in different ways. The former state coordinates (i.e., ontological and epistemological positions) typify the knowledge possible for the paradigm. The latter state coordinate (i.e., methodological position) typifies the means to which the knowledge assumed to be possible might be gained.

Based on the types of theoretical laws of interaction that were defined for the units of a theory, Dubin (1978) defined three general formats for presentation and statement of a theory's system states, based on the types of theoretical laws of interaction that were defined for the units. The general format for presenting a "a system state characterized by a categoric law of interaction typically has the following format: If ..., then... under conditions of" (p. 152).

Therefore, for the paradigm theory of Lincoln et al. (2011), the following general structure can be assumed for presenting each paradigm of disciplined inquiry.

If the ontological position is..., the epistemological position is..., the methodological position is..., the axiological position is..., and the teleological position is..., then the paradigm of disciplined inquiry is..., under conditions of disciplined inquiry explicitly aligned with an underlying belief system. For example, if the ontological position is critical realist, the epistemological position is modified dualist/objectivist, the methodological position is modified experimental/manipulative, the axiological position is to leverage triangulation in inquiry to produce propositional knowing that approximates truth as close as possible, and the teleological position is to explain in order to predict, then the paradigm of disciplined inquiry defined under the paradigm theory of Lincoln et al. (2011) is postpositivist, under conditions of disciplined inquiry explicitly aligned with the underlying belief system defined by those five axiom positions (Lincoln & Lynham, 2011).

**Propositions.** The paradigm theory's units, laws of interaction, boundaries, and system states define a theoretical framework from which propositions can be derived (Lynham, 2002a, 2002b). The theorems or operational characteristics (i.e., axiom extensions into practice) for each system state (i.e., inquiry paradigm) can be considered the theoretical propositions of the paradigm theory (e.g., Guba, 1987a, 1987b; Guba & Lincoln, 1989; Lincoln et al., 2011). As covered in Appendix B, the content of a theoretical proposition is a truth statement about the values taken by theoretical units within the overall theoretical system of units, interactions, boundaries, and states; that is, theoretical propositions are *truth statements* about the theoretical framework in operation (Dubin, 1978; Lynham, 2002a; Torraco, 1997). Therefore, the

propositional truth of the axiom extensions represents an internal truth value only true to the extent that derivation from the theoretical framework is correct and the theoretical framework of the paradigm theory is cohesive and logically not false.

Dubin (1978) identified three mutually exclusive and exhaustive types of propositional statements. For the paradigm theory of Lincoln et al. (2011), the axiom extensions can be considered propositional statements about “the continuity of a system state that in turn involves a prediction about the conjoined values of all units in the system” (Dubin, 1978, p. 166). In other words, the cohesive conjoined set of axiom positions of an inquiry paradigm (i.e., a system state of the paradigm theory) suggests logical implications on ways of acting for the inquirer engaged in disciplined inquiry. Although the theoretical framework of the paradigm theory of Lincoln et al. is made complete by specification of the axiom extensions into inquiry, the theory remains only conceptual without specification (or consideration) of empirical indicators and hypotheses (Torraco, 1994, 1997, 2005a). To assess the fit of the paradigm with reality, the axiom theory’s propositions had to be operationalized, or extended into the world of the practice of disciplined inquiry, with empirical indicators and hypotheses.

**Empirical indicators and hypotheses.** As an operation, empirical indicators have been defined to include means to measurement (i.e., instrumentation), the act of measurement, and resulting value of measurement (Dubin 1978; Lynham, 2002a). In the case of the paradigm theory of Lincoln et al. (2011), the analog to empirical indicators as complete operation of means, act, and result would be the research design as means; the strategies of inquiry as acts (e.g. the activities and techniques aimed at achieving quality criteria, see Lincoln & Guba, 1985b, pp. 301-331 for detailed discussion of activities aimed at achieving trustworthiness in

naturalistic inquiries); and knowledge claims as inquiry results (e.g., see Denzin & Lincoln, 2005 for discussion of research design and embedded research strategies). The means, act, and result are all assembled in accordance with the quality criteria for process and product appropriate to the paradigm (e.g., Guba, 1990c).

A hypothesis was defined as a statement of values for units of a theory, given the operation associated with the identified empirical indicators (Cohen, 1989; Dubin 1978; Torraco, 1997). Given the axiom extensions (e.g., derived theorems), of disciplined inquiry, hypotheses associated with the paradigm theory of Lincoln et al. (2011) can predict that if an inquirer leverages a particular form of research design and engages in specific activities aimed at achieving quality criteria, then a commensurate form of knowledge will result. The hypotheses of paradigm theory make predictions about quality process and product, given empirical indicators and propositions. This same formulation of proposition, empirical indicator, and hypothesis reflects the frameworks outlined for how rationalists and naturalists handle issues of trustworthiness presented by Guba (1981a).

For example, the table for rationalists has five columns with the following headings (Guba, 1981a, p. 83):

1. Inquiry can be affected by...,
2. Which produce effects of...,
3. To guard against which we...,
4. In hope this action will lead to...,



5. And produce findings that are... (Guba, 1981a, p. 83).

Likewise, the table for naturalists has five columns with the following headings (p. 88):

1. Inquiry can be affected by...,
2. Which produce effects of...,
- 3a/b. To guard against which we... during/after the study,
4. In hope these actions will lead to...,
5. And produce findings that are...

The third heading in both tables highlights the activities and strategies in which inquirers can engage. These activities and strategies are a direct operationalization of the paradigm's theorems, which are derived from the collective set of axioms active in the theory. The fourth heading highlights the regulative nature of quality criteria in the process of disciplined inquiry under the paradigm theory. The fifth heading highlights the regulative nature of quality criteria in the products of disciplined inquiry under the paradigm theory.

### **The Theoretical Range of Paradigm Theory**

The paradigm theory of Lincoln et al. (2011) is a theory that explains paradigms of disciplined inquiry. Each specific paradigm of disciplined inquiry further explains the inquiry of the paradigm. Therefore, the paradigm theory can be considered a meta-theory, with each system state (i.e., paradigm of disciplined inquiry) as a grand theory of inquiry. Table 35 further positions the paradigm theory according to numerous dimensions of theoretical range.

Table 35

*Characteristics of the Theoretical Range of the Paradigm Theory of Lincoln et al. (2011)*

<b>Characteristics of theoretical range</b>	<b>Specific position</b>	<b>Explanation</b>
The size of the explanatory shell or theoretical boundary	Large, abstract shell	Few boundary determining criteria.
The implied level of analysis	Possibility of experience	The implied level of analysis is much larger than an organization; rather, it applies to the entire possibility of experience and the entire collective of inquirers that commit to a reality within which to inquiry and generate knowledge.
The extent of the direct connection of theory with the empirical world	Indirect connection	The meta theory is the most distant from the empirical world, the specific paradigms next, then research designs and strategies of inquiry, with the specific techniques having the strongest direct connection to the empirical world. Each layer is informed and made legitimate by its prior more abstract layer.
The accuracy versus generalizability of the theory, i.e., the possibility of being general, accurate, and simple simultaneously	General and simple	Generalizable to all forms of disciplined inquiry. The basic belief system and theoretical framework is theoretically elegant. However, the theory may not directly align with inquiry as experienced by the inquirer.
The level of abstraction or contextualization	Abstract with limited context	The meta level theory is abstract in its application to philosophical issues of experience.
The time-boundedness of the theory	Unbound in time	Not tied to any single inquiry event. There are no periods of time that are inapplicable.
The forms of knowledge that the theory represents	Meta knowledge of process and product	Each grand theory defined by the meta theory positions the specific paradigmatic knowledge.
Driven theoretically versus Driven empirically	Theoretically driven	Top down theory of inquiry that normatively shapes experience and behavior.

**The Role of Paradigm Theory in Inquiry**

The numerous roles of theory in inquiry summarized in Appendix B were examined for the relationship of the paradigm theory of Lincoln et al. (2011) with inquiry. Analysis suggested

that each of the six roles of the theory in inquiry captured a portion of the relationship of paradigm theory with inquiry. Table 36 summarizes the relationships examined for paradigm theory with inquiry.

Table 36

*Table of Roles of Paradigm Theory in Inquiry*

Role of paradigm theory in inquiry	Examples of theoretical role
Paradigm theory as means to organizing what is known and what is not known	“A theory organizes ideas and, in so doing, may uncover hidden assumptions” (Cohen, 1989, p. 189)
	<i>Paradigm theory make explicit the philosophical assumptions of inquirers engaging in paradigmatically different forms of inquiry by organizing the specific axiom positions on more general axiom subjects that are typically, at best, an implicit part of the inquiry process. The theory organizes what is known and what is not known from an ontological and epistemological perspective rather than from a knowledge accumulation perspective.</i>
	“A theory may display the complexities of a problem” (Cohen, 1989, p. 189)
	<i>Paradigm theory underscores the complexity of making and evaluating knowledge claims. What counts as being both methodologically and interpretively rigorous greatly depends upon the specific paradigm of inquiry from which the inquiry was conducted.</i>
Paradigm theory as means to identifying/prioritizing research issues	“A theory may relate what on the surface are different problems” (Cohen, 1989, p. 189)
	<i>Different inquiry paradigms are different theory problems on the surface that are connected and made uniform at the meta-theoretical level of the common axiom subjects that define the basic questions of each paradigm’s belief system. Paradigm theory relates otherwise disparate paradigms of inquiry.</i>
	“Theories tell us that certain facts among the accumulated knowledge are important, and others are not” (Campbell, 1990, p. 65; also cited in Lynham, 2000, 2002b; Torraco, 1994, 1997, 2002), e.g., theories help prioritize important research issues.
	<i>Teleologically and axiologically, paradigm theory helps inquirers see the “facts” that are important as means and ends in their inquiries (e.g., the aggregate commonalities that allow for generalizations, vs the contextualized thick descriptions that help us understand lived experience, vs the compelling evidence that allows us to see the other perspective, and so forth).</i>
	“Theory provides members of a professional discipline with a common language and a frame of reference for defining boundaries of

	<p>their profession” (Torraco, 1997, p. 119; similar notion also referenced in Cohen, 1989; Lynham, 2000b, 2002b)</p> <p><i>Through the paradigm-specific axiom positions on the paradigm neutral axiom subject, the idea of appropriate knowledge (e.g., subjective vs objective (see 2x2 table in Guba, 1978b, p. 74)), the language of research design (samples as exhaustive, representative, critical cases, or saturated), the idea of methods (instruments as the Archimedean lever vs the human), or analysis as an a priori procedure versus an in process hermeneutic decision or interpretation. Without these sorts of common terms and frame of reference for them, scholars cannot have critical discourse from the same point of understanding.</i></p>
Paradigm theory as means to identifying research problems	<p>“Theories identify important new issues and prescribe the most critical research questions that need to be answered to maximize understanding of the issue” (Campbell, 1990, p. 65; also cited in Lynham, 2000, 2002b; Torraco, 1994, 1997, 2004; similar notion referenced in Van de Ven, 1989), e.g., theories highlight gaps in our knowledge.</p> <p><i>Knowledge gaps drive research problems and paradigms interact with what counts as an important type of problem (e.g., Clark and Guba’s problem syllogism; Guba, 1978b; Guba &amp; Lincoln, 1981; Lincoln &amp; Guba, 1985b). Understanding what truly represents a gap in knowledge depends heavily upon what counts for knowledge; thus, paradigm theory provides the theoretical means to identifying what is a warranted problem to work on through inquiry.</i></p> <p>“Theories provide a means for identifying and defining applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002), e.g., issues in practice can be highlighted by the explanatory power of theories, or conversely, issues in practice can highlight the need for theory.</p> <p><i>Pure applied empiricism without any explanation is simply a process of describing what was observed; however, theory is needed to explain why those data were observed (Sutton &amp; Staw, 1995). Paradigm theory extends descriptions of inquiry processes and procedures by further explaining why those inquiry behaviors are important, i.e., what we are about when we engage in inquiry; “as we think, so do we act” (Lincoln, 1985b, p. 36).</i></p>
Paradigm theory as means to prescribing and evaluating solutions to research problems	<p>“Theories provide a means for prescribing or evaluating solutions to applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000, 2002b; Torraco, 1994, 1997, 2002), e.g., because theories can help highlight the research problem, they can also help researchers define appropriate solutions both a priori (prescription) and a posteriori (evaluation).</p> <p><i>Paradigm theory provides both the language and concept of quality methodological process, and, the language and concept of quality interpretive process. Paradigm theory further articulates the types of knowledge produced from inquiries within each paradigm, how that knowledge accumulates, and what the nature of the theoretical products for the paradigm are. Altogether, the language concepts, and knowledge descriptions provided by paradigm theory help prescribe what types of solutions a paradigm may produce a priori</i></p>

	<p><i>and how well an inquiry product measures up to the ideal of a paradigm's outputs after the fact.</i></p>
Paradigm theory as means to framing data for interpretation	<p>“Theories can give old data new interpretations and new meaning” (Campbell, 1990, p. 65; also cited in Lynham, 2002b; Torraco, 1994, 1997, 2002), e.g., old data can be reinterpreted within new explanatory frameworks.</p> <p><i>Paradigm theory frames what is important to know from data analysis; and therefore, what questions are important to ask of the data from the lens of the paradigm inquiry. For example, how reliable are these data in postpositivism, or, how fair are these data with regard to empowering all perspectives and representing all ideologies in constructivism?</i></p>
	<p>Theory may generate and shape method through “its level of analysis” (Van Maanen, et al, 2007, p. 1147) by defining the size of the system of relations of interest: individual, group, organization, etc.</p> <p><i>The level of analysis prescribed by theory is related to the theoretical range of the theory. The paradigms of inquiry defined under paradigm theory accommodate different theoretical ranges. The theoretical range accommodated by a paradigm, in part, shapes the unit of analysis and level (or not) of aggregation targeted with method.</i></p>
Paradigm theory as means to generate and shape method	<p>Theory may generate and shape method through “its stage of articulation” (Van Maanen, et al, 2007, p. 1147) depending upon the maturity of the theory-building development cycle.</p> <p><i>The paradigms defined under paradigm theory prescriptively, descriptively, and evaluatively shape the methods of each paradigm. As the paradigm theory evolved and was further articulated with additional axioms, extensions of the axioms into inquiry, operationalized statements of inquiry activities associated with achieving quality criteria, and even with the addition of new paradigms (i.e., participatory paradigm in 2000), method of each paradigm was further and further generated and shaped through the stages of articulation of paradigm theory.</i></p> <p>Theory may generate and shape method through “the types of constructs it proposes” (Van Maanen, et al, 2007, p. 1147); as described in Appendix B on the nature of the theoretical units.</p> <p><i>The constructs of paradigm theory, i.e., the theoretical units defined by each axiom subject, as well as the specific values taken on within each system state, i.e., the axiom positions of each paradigm, not only serve to generate and shape method of the paradigm, but also shape the assumed nature of reality and world being inquired into by the inquirer.</i></p> <p>Theory may generate and shape method through “its descriptive or prescriptive nature” (Van Maanen, et al, 2007, p. 1147) given an emphasis on describing the way things are versus the way things should be, could be, or ought to be given some criteria.</p> <p><i>The paradigms defined under paradigm theory result in the regulative ideals for inquiry under each paradigm. That is, through the defined</i></p>

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*assumptions and criteria of quality, the paradigms drive inquiry conceptions of what inquiry ought to be like given the assumption of what knowledge under the paradigm ought to be like.*

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Theory can inform “research design” (Van Maanen, et al, 2007, p. 1147) choices given a set of “state coordinates” (Dubin, 1978, p. 151) serving as independent variables.

*The methodological state coordinate of paradigm theory informs research design decisions through typifying the means to which the knowledge assumed to be possible under the paradigm might be gained through systematic, disciplined inquiry.*

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Theory can inform “choice of measures” (Van Maanen, et al, 2007, p. 1147) given empirical indicators.

*The paradigm theory analogs to empirical indicators, understood to include means to measurement, the act of measurement, and resulting value of measurement were given as the research design as means, the strategies of inquiry as acts, and knowledge claims as inquiry results. In this sense of empirical indicators, the measures appropriate under paradigm theory are as much logical consequence as they are “choice” of inquirer; that is, paradigm theory guides what is even worthy of empirical measure in inquiries.*

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Theory can inform selection of “samples” (Van Maanen, et al, 2007, p. 1147) given theoretical boundaries.

*Methods of sampling address issues such as: who and what counts as valid data, or, what counts as enough data. Paradigms guide what to attend to and what not to attend to in inquiries given process and product criteria of quality guiding knowledge claims; and therefore, inform appropriate methods of sampling.*

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## **Paradigm Theory as a Form of Axiomatic Theory**

The key features of the axiomatic form of theory summarized in Appendix B were examined for the paradigm theory of Lincoln et al. (2011). Given the authors’ explicit positioning of their paradigm theory as a form of axiomatic theory (e.g., Guba & Lincoln, 1982a), it should not be surprising that analysis suggested strong alignment of paradigm theory with the seven key features of the axiomatic form. Table 37 shows the mapping of axiom features to paradigm theory.

Table 37

*Mapping of Key Features of the Axiomatic Form of Theory to the Paradigm Theory of Lincoln et al. (2011)*

Key features of axiomatic theories	Axiom features mapped to paradigm theory
Theoretical concepts or constructs	The metaphysical assumptions (i.e., axiomatic subjects or basic questions) of ontology, epistemology, methodology, axiology, and teleology may be considered the theoretical constructs.
Scope conditions	The scope conditions are limited to the world of inquiry within which the inquirer engages; this need not be, but is not excluded from, the everyday world the inquirer experiences (Crotty, 2007).
Axiom statements	The specific metaphysical positions, or answers to each of the basic questions may be considered the axiom statements (Guba & Lincoln, 1982a).
Propositions derived from axiom combinations	The postures inquirers take towards inquiry (i.e., axiom extensions or operational characteristics) may be considered the derived propositions or theorems (Lincoln & Guba, 1985b).
A logical system within which to relate the theoretical concepts and derive propositions	The meta-framework of axiom subjects, or theoretical constructs, defines the <u>set</u> of basic questions that inquirers must answer to engage in a disciplined inquiry. All questions must be addressed and the answers form the bounding system of what can be known and how an inquirer might go about attaining some of that knowledge. It is that bounding system helps define the types of propositions that would meaningfully, and logically, be derived about what the inquiry may look like for each paradigm, or system state, in practice.
Value judgments of justification	The theorems, or axiom extensions, of each paradigm defined under paradigm theory are judged as justified given the paradigm's axioms and its logical bounding system. That is, justification of a set of axiom extensions is a judgment based on demonstration of logical dependence upon the axiom system and the extent that the set of axiom extensions further exhibit synergistic coherence and interdependence. There is; however, no requirement that the axiom extensions fit any portion of reality for judgment of their justification under the axiomatic form of theory (Lincoln & Guba, 1985b; Reynolds, 1971).
Value judgments of fit with reality	Judgment of the fit of a paradigm's set of axiom extensions is an evaluation of their utility for not only informing and guiding inquiries in practice (i.e., serving as a regulative ideal), but for successfully governing a process of inquiry that yields knowledge claims valued as ends in a world of practice (Guba, 1987a/b).

### Consideration of Paradigm Theory as a Form of Typological Theory

The key features of the typological form of theory summarized in Appendix B were examined for the paradigm theory of Lincoln et al. (2011). Although never explicitly discussed as a form of typological theory, analysis suggested strong alignment of paradigm theory with the

seven key features of the typological form. The alignment of paradigm theory under both the axiomatic and typological forms is justifiable given the strong structural similarities between the two forms of theory. Table 38 shows the mapping of typological features to paradigm theory.

Table 38

*Mapping of Key Features of the Typological Form of Theory to the Paradigm Theory of Lincoln et al. (2011)*

<b>Key features of typological theories</b>	<b>Typological features mapped to paradigm theory</b>
<b>Taxonomic characteristics:</b>	
Division of elements into semantically heterogeneous categories	Each axiom subject serves as semantically different category of basic assumption.
Inclusion of within category attributes	Each axiom position under an axiom subject serves as within category attribute.
Simplification of all unique elements in an aggregate classification scheme	The full five axiom subject meta-framework organizes a large number of assumptions about the possibility of experience into a set of basic questions undergirding an inquirer's belief system.
Decision rules for classification	The basic questions articulated for each axiom subject, e.g., "what is there that can be known" (Guba & Lincoln, 1989, p. 83) for the ontological axiom subject, along with the definitions provided for each axiom position, e.g., "virtual reality shaped by social , political, cultural, economic, ethnic, and gender values; crystallized over time" (Guba & Lincoln, 2005, p. 195) for the historical realist axiom position under the ontological subject, together form decision rules for classification. For example, if the inquirer believes X about the nature of what can be known, then the ontological position is $X_n$ .
<b>Typological characteristics:</b>	
First-order constructs	The first-order constructs are analogous to the axiom positions defined under each axiom subject in the meta-framework.
Ideal types comprising first-order constructs	Each paradigm of inquiry, or system state of the overarching theory, is analogous to an ideal type; each paradigm (or ideal type) is comprising the holistic set of axiom positions on each of the five axiom subjects.
Holistic organization of category attributes into ideal types and ideal types into typologies	A unique, synergistic, and coherent organization of axiom positions are defined for each ideal type / paradigm of inquiry. Further, each ideal type is organized into a typology of paradigms of inquiry (positivist, postpositivist, critical, constructivist, participatory). For example, the vertical typologies of axiom positions under an ideal type and horizontal ordering of axiom positions under axiom subjects in Table 6.5 in pages 102 through 115 in Lincoln et al. (2011).
<b>Minimum criteria as typological theory*:</b>	
Unique Gestalt-like pattern for each ideal type	Each paradigm, i.e., each ideal type defined under the paradigm theory, is much more than the sum of its first-order constructs. At



	the level of paradigm definition, this <i>greater than the sum of its parts</i> effect may not be apparent as a set of five belief statements. However, as a belief <u>system</u> from which axiom extensions are derived, the Gestalt pattern of the belief system becomes more apparent as its manifest inquiry behaviors, e.g., the set of fourteen theorems (Guba & Lincoln, 1989) or the eighteen positions on practical issues of inquiry (Lincoln et al., 2011).
Complex hierarchical organization of grand theory and several middle range theories	The meta-framework of interacting axiom subjects form what can be mapped to a grand theory within which the axiom subjects themselves are the theoretical units. At a lower level of abstraction, each paradigm / ideal type of the grand theory also serves as more specific middle range theory within which the specific interacting axiom positions, i.e., first-order constructs, are the theoretical units. However, due to the high level of its abstraction, the meta-framework and lower level ideal types of paradigm theory likely better fit the range of meta-theory and grand theory, respectively, given the range descriptions summarized in Figure 9 of Appendix B.
Judgments regarding ideal type internal consistency	Judgment regarding the internal consistency of an ideal type is similar to the value judgment of justification of an axiomatic theory; however, the internal consistency of typological theory is examined not at the analogous theorem level of the typological form, but at the first-order constructs (analogous to axiom positions). The group of five first-order constructs within an ideal type, one from each of the five categories of construct, are not simple combinations of constructs (simple in the sense of mere exhaustive permutations of five sets of five unique positions taken five at a time, one from each set). Rather, the set of five first-order constructs are a smaller subset that must hang together in a synergistic and holistic manner.
Judgment regarding the degree of empirical fit or normative influence on practice	Here again, judgment of the empirical fit of an ideal type is similar in concept to the judgment of the fit of the theorems of the axiom form with the empirical world. However, the typological form of theory also makes explicit the regulative influence ideal types may have on practice. That is, instead of assuming and judging fit with reality, the typological form may be understood to represent a more perfect, ideal form of experience. As a consequence, rather than descriptively fit the practice of inquiry, the ideal type may exert normative force on the practice of inquiry as a regulative ideal.

*Note.* Minimum criteria as typological theory does not include mapping for first-order constructs or ideal types because they were covered as typological characteristics.

### **Data Synthesis: Analysis of Systematic Process as Theory Building**

Analysis of the systematic process leading to development of the paradigm theory of Lincoln et al. (2011) was conducted by examining several of the key considerations of theory-building research summarized in Appendix C. Table 39 shows the results of analysis of the

theoretical work of paradigm theory using the key considerations of theory-building research to frame the analysis. The following sections discuss each consideration of theory-building research in further detail.

Table 39

*Analysis of the Systematic Process Leading to Development of the Paradigm Theory of Lincoln et al. (2011)*

<b>Key considerations of theory-building research</b>	<b>Examination of the systematic process of paradigm theory</b>
Justification of the research as a theory-building process	The inquiry represented an ongoing and iterative process of describing, explaining, and representing the possibility of experience.
Understanding of the theoretical products	Numerous components of theory (i.e., seven anatomical components of theory) were identified both prior to, and in the decades that followed, emergence as complete theory.
Theoretical positioning	The theorizing half of the overall theory-building process best positions the nonlinear, generative process of sensemaking engaged in by the authors across the four decades of theory development.
Theory-building research strategy	The research strategy associated with the development of paradigm theory may be best associated with the Theory to practice research strategy of theory building.
Phase(s) of the theory-building process	The theorizing primary occupied the conceptual development, operationalization, and continuous refinement and development phases of the theory-building research process.
Theoretical processes	The authors not only developed a framework for conceptualizing the possibility of experience but also defined an entire vocabulary with which to talk the phenomenon into existence.
Theoretical methods	The authors present the theoretical product of paradigm theory in the axiomatic form, thus, the axiomatic form of theory building is justified as best fitting theoretical method.

### **Justification of the Research as a Theory-building Process**

Analysis of the subject system provided evidence of the “descriptions, explanations, and representations” (Lynham, 2000, p. 161) provided for the possibility of experience from paradigm theory. The “ongoing process of producing, confirming, applying, and adapting” (Lynham, 2002b, p. 222) evident in the history of the theory’s development suggests justification as a theory-building process. Beginning in the late 1970s (e.g., Guba, 1978b), initial assumptions

and constructs were posited for independent systems of inquiry; these outputs represented interim theoretical products of theorizing about different realities that may be inquired into (Weick, 1995).

The initial theoretical framework for paradigm theory was presented in early 1980 (Guba & Lincoln, 1981, 1982a) and continued to be refined and operationalized throughout the 1980s (e.g., Guba, 1987a, 1987b; Guba & Lincoln, 1989; Lincoln & Guba, 1985b). Over the next decade, the theory was further refined and expanded upon with new system states (e.g., Guba, 1990c; Lincoln & Guba, 2000). The following decade produced still more refinements, further operationalization of the theory, expansion of the theoretical units of each system state, and new articulation of the outcomes of each system state (e.g., Lincoln & Lynham, 2011; Lincoln et al., 2011). Although paradigm theory can be argued to have achieved status as full-blown theory by the mid 1980s, its ongoing adaptation and development over the subsequent 25 years justifies positioning of the developmental process as a form of dynamic theory-building research that was subject to revision and refinement over time (Weick, 2005).

### **Understanding of Theoretical Products**

A portion of the analysis of the subject system focused on understanding the anatomy paradigm theory. The seven basic anatomical components of theory examined for paradigm theory were (a) the theoretical units, or basic building blocks; (b) the laws of interaction, or relationships among units; (c) the boundaries or scope of the theory; (d) the system states or various conditions of the whole theory when all elements and structures are active together; (e) the propositions; (f) the empirical indicators; and (g) the hypotheses. All seven of these components of paradigm theory can individually be considered products of the theory-building

research process. Some interim products were prior to initial status as full-blown theory, some were necessary to be considered full-blown theory, and some were theoretical refinements or revisions to the working theoretical framework over time.

Although unorganized into an overarching theoretical framework prior to the early 1980s, the basic assumptions, operational distinctions, and general criteria of scientific adequacy presented in the 1970s represented significant early interim theoretical products of the theorizing process before the full theoretical framework for paradigm theory had come to fruition (Guba, 1975, 1978b, 1979). The basic assumptions of naturalistic and scientific inquiry were early theoretical ruminations that later became the values taken by the theoretical units of paradigm theory when it transitioned from one system state to another. The naturalistic and scientific approaches defined were early statements of the two system states of the emerging paradigm theory. The operational distinctions were early formulations of the theory in practice and later became the theorems or propositions of paradigm theory. The criteria of scientific adequacy served as pre-theory formulations of the empirical indicators of quality process within each system state.

Given the criteria assumed for full-blown theory (i.e., full theoretical framework [Lynham, 2002b] or fully operationalized theoretical framework [Torraco, 2005a]), the initial axiom theory developed throughout the first 5 years of the 1980s was arguably the point in the ongoing theory-building process that the first necessary pieces to be considered full-blown theory were proposed for paradigm theory. Although a complete framework of assumptions, positions, and postures was presented in 1981 (Guba & Lincoln, 1981), it was not until 1982 that the complete framework was formally expressed in axiomatic form (Guba & Lincoln, 1982a).

This fully operationalized theoretical framework included five axiom subjects (i.e., theoretical units); axiom positions for rationalistic and naturalistic inquiry (i.e., values of the theoretical units under each system state); derivative postures taken by practitioners (i.e., theorems or theoretical propositions); trustworthiness criteria; and even methods for achieving trustworthiness criteria (i.e., operationalized propositions). The subsequent theory-building work that continued throughout the next three decades built upon and refined this foundational framework, but its early conceptualization remained at the core of paradigm theory through to current thinking.

Further examples of theoretical products generated from the continuous refinement and development of paradigm theory over the next 30 years were detailed in the analyses of the coded categories for paradigms, axiom subjects and positions, axiom extensions, and basic questions and positions on inquiry quality over time. The new paradigms added to the overarching theory were proposals of new system states, ideal types of inquiry, and middle-range theories (see chapter 4). The new axiom subjects and positions were definitions of new theoretical units and possible unit values (see chapter 4). The new axiom extensions were formulations of new theoretical propositions for each system state, ideal types of inquiry, and middle-range theory encompassed by paradigm theory (see chapter 4). The basic questions of quality and different paradigmatically oriented positions on quality were further operationalizations of the theoretical framework with refined empirical indicators (see chapter 4).

### **Theoretical Positioning**

The theoretical work contributing to the development of paradigm theory was a nonlinear, generative process. That is, the theoretical process engaged in by the authors

continuously generated and/or refined various theoretical components of paradigm theory. Although the theoretical outputs were intentionally aligned with the axiomatic form of theory, rather than definition of products within a stepwise linear process, the theoretical outputs were incrementally talked into existence in a nonlinear creative process of idealization and sensemaking of the possibility of experience as it related to disciplined inquiries.

As described by Weick (1989), theorizing can be thought of as the set of mental activities intentionally engaged in for the purpose of imagining coherent descriptions of constructs, their interrelationships, and the circumstances they provide for explanation or representation. The practice of theorizing aligns with the type of nonlinear theoretical thinking (Mintzberg, 2005) that must occur within the process of generating theoretical ideas, whereby “the process of theorizing consists of [ongoing] activities like abstracting, generalizing, relating, selecting, explaining, synthesizing, and idealizing” (Weick, 1995, p. 389). Given that the literature reviewed on paradigm theory exemplified a process of theory development rather than theoretical application and operation, the systematic process can be positioned primarily within the theorizing half (e.g., the theorizing half versus the practice half) of the whole theory-building research process.

### **Theory-building Research Strategy**

Lynham (2002b) positioned the general method of applied theory building within two common theory-building research strategies: theorizing to practice and practice to theorizing (see also Reynolds, 1971). Even though the theoretical process of paradigm theory was iterative over multiple phases of the theory-building process, the theorizing process represented a recurrent conjecturing about and operationalization of the concepts that explain experience. Given the

emphasis on first generating a theoretical framework and theoretical propositions, the research strategy associated with the development of paradigm theory may be best associated with the “theory-then-research strategy” (Reynolds, 1971, p. 96) of theory building.

### **Phase(s) of the Theory-Building Process**

Thus far, the systematic process of paradigm theory has been positioned in the theorizing half of the theory-building research process. The systematic process was also aligned within the theory-then-practice theory-building strategy. It can be further argued that much of the theoretical process of paradigm theory iteratively, and perhaps even simultaneously, occupied the conceptual development, operationalization, and continuous refinement and development phases of theory-building research (Lynham, 2002b).

Within the theorizing half of theory building and the theory-then-research strategy, intense emphasis was placed on the development and operationalization of a theoretical framework. Lynham (2002b) proposed the conceptual development and operationalization phases of theory-building research as the two theory-building research phases that “dominate the theorizing component of theory-building research” (p. 232). The conceptual development phase produces the theoretical framework as its theoretical output, and operationalization translates the theoretical framework into concrete language with the theoretical propositions, empirical indicators, and hypotheses. These two phases of theory-building research can occur serially or parallel, linearly or nonlinearly. However, due of the iterative nature of theorizing, the conceptual development and operationalization phases often are accompanied by the continuous refinement and development phase (Dubin, 1978; Lynham, 2000a, 2002b; Torraco, 1997).

## **Theoretical Processes**

Six heuristics of the process of theorizing are summarized in Appendix C: (a) talk and write the phenomenon into existence; (b) understand where you are coming from; (c) be explicit about and own your own style of thinking; (d) write (i.e., tell the story); (e) be your own toughest critic; and (f) iterate until you have a theory. The first (i.e., talk and write the phenomenon into existence) bears notably on the theoretical process of paradigm theory.

One of the more significant processes that the authors engaged in during conceptual development of the paradigm theory was the writing of the phenomenon into existence. More specifically, the evolving theoretical framework of paradigm theory effectively created an entire language with which to characterize and describe the possibility of experience. Much of the language of the positivist and critical paradigms had existed long before paradigm theory emerged (e.g., Habermas, 1971). However, the language of those two paradigms existed as largely unrelated systems outside the context of the overarching meta-framework (and language) of paradigm theory (e.g., axiom subjects). Prior to the work of the paradigm, the naturalistic paradigm did not exist conversationally, theoretically, or in practice, except for maybe in reference to hermeneutic science. Much of the language of the naturalistic (or constructivist) paradigm was explicitly formed as part of the development of the paradigm theory. The authors wrote the naturalistic paradigm into existence by both defining its system of axiom positions and extending those axioms into practice with operationalized theoretical propositions.



## **Theoretical Methods**

Given the explicit presentation of paradigm theory in axiomatic form (e.g., Guba & Lincoln, 1982a), the axiomatic form of theory building is clearly implied. Furthermore, Reynolds (1971) recommended the axiomatic form of theory as most efficient for a “theory-then-research strategy” p. 96). Details of the axiomatic theoretical product are provided in Appendix B, details of axiom theories as a theoretical process are provided in Appendix C, and review of paradigm theory as an axiomatic form of theory was performed in this chapter.

### **Data Synthesis: Analysis of Initial Conditions**

Analysis of the initial conditions for theoretical work leading to development of the paradigm theory of Lincoln et al. (2011) was conducted by examining the requirements of the theory-building process and the requirements for the theorist(s) to be engaged in the theory-building process. Six requirements of the theory-building process and six requirements of the theorist framed analysis of initial conditions were outlined in Appendix C. Table 40 summarizes the results of analysis of the requirements of the theory-building process for the theoretical work leading to development of the paradigm theory of Lincoln et al. and Table 41 summarizes the results of analysis of the requirements of the theorists.

Table 40

*Analysis of the Paradigm Theory of Lincoln et al. (2011) for the Requirements of the Theory-building Process*

<b>Requirements of the theory-building process</b>	<b>Examination of requirements for paradigm theory</b>
Clear demonstration of a theoretical gap in knowledge in the form of:	(1) a theoretical need The failure of conventional modes of inquiry to respond to, and produce, contextualized knowledge was thoroughly argued by the authors.
	(2) the entry point into the theory-building cycle In response to the need for a new model of inquiry, the authors entered the theory-building process in the conceptual development phase of theory building.
Explicit linkage of theoretical problem to theoretical solution through description of:	(3) the theoretical solution The axiomatic form of theory was proposed as theoretical solution to the need for a new model of inquiry.
	(4) the theoretical logic The theoretical logic relied upon the derivative truth based logic analogous to that used in the axiomatic system of Euclidean geometry.
Extension of the theoretical framework into empirical practice through:	(5) operationalization of the theoretical framework Operationalization of the axiomatic framework was achieved through extension of the axioms into practice with operationalized theoretical propositions.
	(6) definition of further theoretical research to be done Definition of further theoretical research needed was continually redefined through the addition of new paradigms of inquiry to the meta-framework and ongoing extension of the work into theoretical accumulation within each paradigm.

Table 41

*Analysis of the Paradigm Theory of Lincoln et al. (2011) for the Requirements of the Theorist Engaged in Theory Building*

<b>Requirements of the theorist engaged in theory building</b>	<b>Examination of requirements for paradigm theory</b>
Practical knowledge of:	(1) theory-building research methods from experience attempting to build theory The more than four decades of theory development on paradigm theory represented in the body on literature reviewed is testament to the authors' practical experience with the axiomatic theory-building research method.
	(2) theory from experience attempting to apply theory in practice Same as 1
	(3) the phenomenon and topic of theory from experience with the phenomenon in practice Early publications in the sample of literature reviewed provide evidence of the authors' practical experience with the paradigm topic in practice.

Conceptual knowledge of:	(4) theory-building research methods from intensive study of theory-building processes	Knowledge of the axiomatic form found in the analogies to axiom process of Euclidean Geometry.
	(5) the elements and structures of theory from intensive study of theory itself	Knowledge of theoretical axiom structures evident in the tensions highlighted between the use of theorems in paradigm theory and the form of theorems in the analog of Euclidean Geometry.
	(6) the phenomenon and topic of theory from intensive study of the phenomenon itself	Numerous pivotal works of the authors focused primarily on analysis of the paradigm topic itself.

### **Demonstration of a Theoretical Gap in Knowledge**

The theoretical need for definition of alternative paradigms of inquiry to inform practice was argued by the authors over multiple decades. Arguments of need included, for example, the failure of convention inquiry to effectively evaluate programs when focused on significance (Guba, 1969); the failure of the dualist objectivist/subjectivist lens (Guba, 1978b); the need to focus on intrinsic context dependent value characteristics in addition to extrinsic context-free characteristics of programs (Lincoln & Guba, 1980); the numerous roles values play in needs assessment (Guba & Lincoln, 1982b); the interactive nature of ethics, research design, and the underlying belief system (Lincoln & Guba, 1987; Lincoln & Guba, 1989); and the categorical and practical imperatives for interacting with research participants (Lincoln, 1988a). Early in the theory-building process, Guba (1978b) explicitly offered eight reasons a model for naturalistic inquiry was needed. The need for an alternative model to convention inquiry had been well establishing in the theoretical work of paradigm theory.

A conceptualization (e.g., model) and methodology was needed not to just accommodate contextualize knowledge, but to produce it. Guba (1978b) proposed naturalism as a new, alternative model of inquiry analogous to the accepted model of conventional inquiry. Guba's seminal monograph responded to the initially defined need by proposing a preliminary

conceptualization of the parallel assumptions of the naturalistic model of inquiry as means to the production of contextualized knowledge. Given the conceptualization (and later operationalization), the entry point in the theoretical work of paradigm theory can justifiably be assumed as the conceptual development and operationalization phases of theory-building research.

### **Explicit Linkage of Theoretical Problem to Theoretical Solution**

Guba initially responded to the defined theoretical need (i.e., an alternative model of inquiry for the production of contextualized knowledge) by proposing the naturalist model in analogous form to the conventional model (1978b). A few years later, the authors explicitly linked the theoretical need for an alternative model with the axiomatic form of theory as a theoretical solution to the theoretical need (e.g., Guba & Lincoln, 1982a; Lincoln & Guba, 1985b). The axiomatic form was proposed for both naturalistic and conventional approaches to inquiry as sets of different positions on a common set of axiomatic subjects. This proposed axiomatic solution included a complete theoretical framework in addition to numerous theorems offered as derivative postures and implications of the axiomatic systems on the practice of inquiry (“implied by accepting the axioms” [Guba, 1990c, p. 69]).

The theoretical logic used to identify axiom positions and then derive the associated postures practitioners would take toward inquiry was likened to that used in the formulation of Euclidean geometry (e.g., Guba & Lincoln, 1981, 1982a, 1989; Lincoln, 1985b; Lincoln & Guba, 1985b). The axiomatic logic included identifying basic untestable truths specific to the phenomenon upon which conjecture is based, then from the system comprising those basic truth statements, a logically consistent and coherent set of theorems is derived as statements of the

axiomatic system in operation. The derived operational system is considered true, given its relational nature to a set of fundamental untested basic truths. In other words, the theoretical logic was based on the rationale:

Truth is whatever can be demonstrated to be consistent with the basic axioms and definitions of the system, as a geometry theorem is “proved” by showing it to follow logically from other proved theorems and, ultimately, from the basic axioms and definitions. (Guba & Lincoln, 1981, p. 53)

### **Extension of the Theoretical Framework Into Empirical Practice**

Operationalizing a theoretical framework requires developing truth statements about the theory in operation across its system states (i.e., propositions), and contextualization of those theoretical propositions with empirical indicators and hypotheses. With regard to operationalization of the theoretical framework of paradigm theory, the historical analysis of paradigm theory in chapter 4 extensively documented the numerous axiom extensions (e.g., theorems, propositions, postures, implications) of the axiomatic theoretical framework. Furthermore, the current chapter details the nature of the axiom extensions as forms of operationalized theoretical propositions.

The present chapter also describes the various theoretical products produced throughout the theoretical work on paradigm theory. The theoretical products included early ruminations about assumptions of different inquiry approaches, a full-blown theoretical framework, and ongoing refinements and additions to the theoretical framework over time. The historical analysis of the paradigm theory of Lincoln et al. (2011) in chapter 4 described the continuous addition and revision of those theoretical products from the present back to the earliest available publications on the topic. The current chapter positions those theoretical products within a

taxonomy of theoretical components. Each time a new paradigm was proposed, or a new set of axiomatic subjects was presented, or a revised set of implications on practice was offered, or a novel set of quality criteria was suggested, further theoretical research was demanded for all system states of paradigm theory. For example, defining a new set of axiom subject demanded further theoretical work defining the axiom positions on each subject for each paradigm, and defining a new system of axiom subjects demanded revisiting the theorems derived from the new axiomatic system. Each addition of a theoretical product to paradigm theory both defined and demanded the systemic revision of the entire operationalized theoretical framework as further research needed in response.

### **The Theorists' Practical and Conceptual Knowledge**

The sample of literature reviewed shed little light on the practical experiences the authors may have had prior to entering into the theory-building process for paradigm theory. However, the body of work reviewed was itself a testament to the practical experiences of the authors with continuously building, presumably applying, and refining paradigm theory for more than four decades of inquiry (requirements #1 and #2). In addition, the literature reviewed implied experience with the paradigm topic in practice as educational evaluators (e.g., Guba, 1967, 1969, 1975, 1977; Lincoln, 1978; Lincoln & Guba, 1978 [requirement #3]).

The authors' conceptual understanding of axiomatic theory and axiomatic processes was evident through the analogies to Euclidean geometry (e.g., Guba & Lincoln, 1981, 1982a; Lincoln, 1985b; Guba & Lincoln, 1989; Lincoln & Guba, 1985b [requirement #4]). The authors demonstrated further depth of understanding of the elements and structures of axiomatic theory in recognition of the tensions between logically derived axioms of mathematical theories and the

theorems of paradigm theory (requirement #5). Early proposals of the axiomatic theory cautioned against interpretation of the postures as logical derivatives in the same sense as the logically derived theorems of mathematics (e.g. Guba & Lincoln, 1982a). Instead, the authors suggested that the theorem-like postures should be understood as stances practitioners take toward the practice of inquiry that are in agreement with the underlying axiom system. They later argued that the postures could be shown as logical derivatives (Guba, 1987), but seemed to finally concede and later explain the postures as implications on the practice of inquiry from acceptance of the underlying axiomatic system (e.g., Guba, 1990c; Guba & Lincoln, 1994).

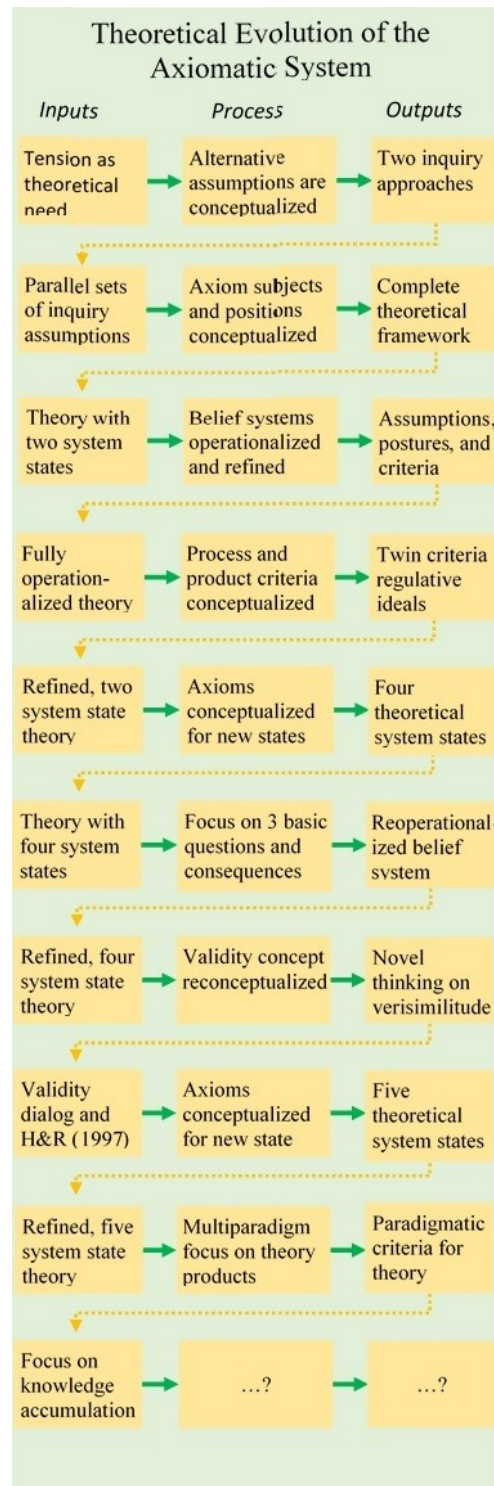
The literature review contained a multitude of publications focusing primarily on the analysis of the paradigm topic itself. Numerous pivotal works served as examples of the authors' conceptual knowledge of the paradigm phenomenon from intensive study of paradigms (requirement #6). For example, *Effective Evaluation* (Guba & Lincoln, 1981); *Naturalistic Inquiry* (Lincoln & Guba, 1985b); *Fourth Generation Evaluation* (Guba & Lincoln, 1989); *The Paradigm Dialog* (Guba, 1990c); and all four revisions of their chapter on paradigms in *The Sage Handbook of Qualitative Research* (Guba & Lincoln, 1994, 2005; Lincoln & Guba, 2000; Lincoln et al., 2011).

### **Conclusions of Reverse Engineering Analysis**

As an entry point into the theoretical work of paradigm theory, the authors established the need for a model and methodology to accommodate and produce contextualized knowledge. In response to the need, the authors linked the axiomatic form of theory as a theoretical solution to the theoretical need for an alternative model (e.g., Guba & Lincoln, 1982a; Lincoln & Guba, 1985b). The axiomatic form was proposed for both naturalistic and conventional approaches to

inquiry as sets of different positions on a common set of axiomatic subjects. The proposed solution was likened by analogy to the theoretical form of Euclidean geometry and provided a similar operationalization of paradigm theory through theorem-like extensions of the theory's assumptions into practice. The theoretical flow of inputs, process, and outputs is represented in Figure 6.





*Figure 6.* Theoretical evolution of the axiomatic system of paradigm theory shown through iterations of inputs, process, and outputs.

The theory-building process engaged in by the authors was understood as a continuous process of refinement of the initially developed theoretical framework and its operationalization into the practice of inquiry. More specifically, the theory building engaged in was a process of ongoing theorizing through the conceptual development, operationalization, and continuous refinement and development phases of theory-building research, with a theory-then-research theorizing strategy. Through the axiomatic method of building theory, the authors essentially wrote the paradigm phenomenon into existence. Even more significantly, the authors effectively created an entire language with which to have cross-disciplinary conversations about the possibility of experience through the development of paradigm theory.

As a form of theoretical output, the authors developed an axiomatic form of theory that provided explanation of what makes for good disciplined knowledge. The axiomatic theory was analyzed for its theoretical units, laws of interaction, boundaries, system states, propositions, empirical indicators, and hypotheses. The theoretical range of paradigm theory was further explored and the theory's roles in inquiry were defined.

As a backdrop to the landscape of the authors' work, a number of indirect influences were identified. One influence on the theoretical work was an embedded historical context of intellectual, personal, social, and political transformation. Other influences included theory building during a time of change in the landscape of accepted forms of inquiry, a personal rejection of traditional scientific perspectives for understanding the human condition, acting in an advocacy role for the merit and utility of paradigm theory, and ongoing wrestling with issues of commensurability regarding the methodologies and methods of different paradigms used by practitioners in single studies.

A somewhat antagonistic statement was made in definition of the need for the reverse engineering analysis; that was, paradigm theory is not the proselytizing final word on what all inquiry is and should be. The term *proselytizing* was quite intentionally used due to its history in Becker's (1970) writing on who owns the responsibility of methodology—the idealist-methodologist preaching to the practitioner, or the practitioner who is methodologist as well in his or her own right. A proselytizing tension was evident within the writings of the authors between their advocacy and the positivists and their advocacy and the mixed-methods camps. The reverse engineering analysis offered a resolution to the proselytizing tension by changing the conversation about the authors' writing on paradigms of inquiry.

The theoretical understanding of paradigm theory gained from reverse engineering analysis underscores one obvious characteristic of paradigm theory: it is no more or less than a theory. The authors were clear to emphasize that the paradigms they proposed were their own constructions; however, the conversations that existed in the proselytizing tensions failed to emphasize strongly enough the nature of their writing as theory and the nature of their advocacy as one of arguing utility and fit with the world of inquiry, as opposed to arguing the trueness of their constructions. At their core, valid theories must be internally true with regard to the statements made by the theoretical propositions and the applicable scope of the theory, and the consistency of the propositional statements with the defined units, relationships, and system states of the theory. No external truth requirement comes to bear on theories.

The notion and requirements of a theory's truth are highlighted by a number of authors in Appendix B (e.g., Dubin, 1978; Kaplan, 2009; Mintzberg, 2005; Patterson, 1986). As pulled

forward for emphasis in Appendix B, Mintzberg's words are pulled forward here as well in emphasis of the same truth bearing point:

It is important to realize, at the outset, that all theories are false. They are, after all, just words and symbols on pieces of paper, about the reality they purport to describe; they are not that reality. So they simplify it. This means we must choose our theories according to how useful they are [for making the moves of nature more intelligible], not how true they are. (p. 356)

Paradigm theory is not different. It is an axiomatic form of theory. Paradigm theory is words on paper about systems of reality that inform disciplined inquiries. It is not the entirety of reality, rather a simplification of reality. Paradigm theory need not be externally true, but only internally consistent. Paradigm theory should not be extended beyond its theoretical boundaries or explanatory shell. Paradigm theory should only cautiously be used as an instrument of sensemaking when discussed with respect to any systems of inquiry not assumed under one of the five systems states of the theory (i.e., the positivist, postpositivist, critical, constructivist, and participatory paradigms). Outside its five system states, no axiomatic system currently has articulated how the theory may operate, and therefore be congruent (or not) with other forms/systems of inquiry. Paradigm theory attempts to explain the possibility of experience within disciplined inquiries; however, the explanations only extend to the inquiry circumstances within which its assumptions hold. Consequently, engaging in disciplined inquiries requires a commitment of the inquirer to the assumptions of paradigm theory in operation.

Changing the conversation about paradigm theory to one centered on its theoretical applicability may help resolve the (interpreted) proselytizing tensions. Tensions with positivists become conversations about paradigm theory in operation under different system states. Tensions with mixed-method practitioners become conversations about the utility of paradigm

theory for informing mixed practices aimed at the specific knowledge ends predicted by paradigm theory. If mixed-method practitioners choose to view their world of practice through the lens of paradigm theory, then issues of commensurability with what is mixed, within the limits of paradigm theory, are highlighted for conversation. If mixed-method practitioners choose not to view the world through the lens of paradigm theory, then the conversation between its advocates is no more productive than one critiquing the practices of one system state from the perspective of the other.

In addition to the conceptual theoretical understanding of the paradigm phenomenon and actionable understanding of theory building that were gained through the reverse engineering analysis, reflection upon the requirements of theory building revealed an unanticipated outcome of the analyses. That is, a couple of requirements of the theorist engaged in theory building were initially satisfied through both the reverse engineering analysis and the historical analysis. The initially satisfied requirements are shown in Table 42.

Table 42

*Reflection Upon the Requirements of the Theorist Satisfied From the Present Research*

Requirements of the theorist engaged in theory building		Examination of the requirements of the theorist initially satisfied
Practical knowledge of:	(1) theory-building research methods from experience attempting to build theory	
	(2) theory from experience attempting to apply theory in practice	
	(3) the phenomenon and topic of theory from experience with the phenomenon in practice	
Conceptual knowledge of:	(4) theory-building research methods from	Adequate conceptual knowledge of theory-building research methods gained from conducting the

intensive study of theory-building processes	supplemental review of theoretical processes in Appendix B, the historical analysis, and the reverse engineering analysis.
(5) the elements and structures of theory from intensive study of theory itself	Adequate conceptual knowledge of theory-building research methods gained from conducting the supplemental review of theoretical products in Appendix C, the historical analysis, and the reverse engineering analysis.
(6) the phenomenon and topic of theory from intensive study of the phenomenon itself	Preliminary conceptual knowledge the methodology phenomenon gained from review of the literature on methodology from chapter 2 and historical analysis. Further knowledge would be gained through future analysis of literature on methodological concepts as part of the theory-building process.

### Next Steps

The reverse engineering analysis provided improved understanding of paradigm theory within its theory-building context. Given the larger goal of using the understanding of paradigm theory as an exemplar against which to conceptualize an analogous model for methodology, the axiomatic method of theory should next be applied to explaining the phenomenon of methodology. At a minimum, the theory building should begin by stating the questions of why intended to be answered by theorizing: explicitly articulating (a) the theoretical need, (b) how an axiomatic form of methodology could fill that knowledge gap, and (c) what incremental theoretical products serve as the intended outcomes of each iteration of the theory. The conceptualization phase would be the appropriate entry point into the theorizing half of the overall theory-building process, and a theory-then-research theorizing strategy should be followed.

Regarding development of the theoretical framework for an axiomatic theory of phenomenon of methodology, a number of key parallels between the seven general anatomical characteristics of theory and the specific structural characteristics of axiom theories should be kept in mind:

- Understanding axiom subjects as a type of theoretical unit
- Understanding axiom positions as specific theoretical values of each axiom subject
- Understanding the system of relations between axioms as the laws of interaction
- Distinguishing the explained from the irrelevant unexplained as determination of the theoretical boundary
- Understanding the holistic configuration of axiom positions (i.e., ideal types) as system states of the axiom theory, potentially aligning development of systems states as different approaches/strategies of inquiry
- Understanding the theorems or axiom extensions into practice as the theoretical propositions of the axiom theory

Lastly, although the exemplar laid the foundations for axiomatic theory, a number of similarities between the axiomatic form of paradigm theory and the typological form of theory were drawn. As theorizing on methodology progresses, explicit caution should be taken not to force fit evolving theoretical ideas into the axiomatic form. Theorizing should avoid being closed to typological theory if the alternative form turns out to be better suited when the theoretical framework begins to become more concrete.

## CHAPTER 7: CONCLUSIONS AND NEXT STEPS

### **The Research Problem and Proposed Solution**

The research problem presented in chapter 1 and developed from the literature in chapter 2 called attention to a gap in knowledge on disciplined inquiry. Specifically, when conceptualized with the phenomena of methodology and inquiry paradigms, the latter was shown to exist in the literature as a well-developed sophisticated theory, while the former to exist more primitively (and often inconsistently) as a broad range of possible ideas, principles, and processes. The argued consequence of the underdeveloped half of the conceptualization of disciplined inquiry was both a knowledge gap in conceptual understanding of disciplined inquiry, as well as an applied cost in the ability to methodically practice disciplined inquiry.

To better understand the process of disciplined inquiry conceptually as well as inform the improved practice of disciplined inquiry, the proposed solution for closing the gap in knowledge in disciplined inquiry was development of an underlying theoretical framework for the phenomenon of methodology to complement the fully articulated theoretical framework for the phenomenon of inquiry paradigms. In response, incremental work was undertaken in attempt to advance conceptual understanding of the phenomenon of methodology from its primitive state to a more sophisticated state, and therefore advance knowledge of disciplined inquiry by more fully articulating the phenomena and interrelationships that define its conceptualization.

### **Closing the Problem-Solution Gap**

As a starting point in the larger research agenda required to close the problem-solution gap, two studies were initially conducted. The first was a historical analysis of paradigm theory;



the second was a reverse engineering analysis of paradigm theory. The historical analysis was judged an appropriate entry point because the desired methodological framework was both conceptualized as a complement to paradigm theory and intended to be modeled after the sophisticated fully articulated paradigm theory. The historical analysis was aimed at better understanding the foundations of the exemplar theory by tracing and reconstructing the inquiry paradigm's theoretical evolution over time as it was represented in the authors' published body of work. The reverse engineering analysis followed the historical reconstruction as a means to examine the theoretical form of paradigm theory. The aim of the reverse engineering analysis was to better understand the theory-building processes the authors engaged in throughout the development of paradigm theory.

### **The Incremental Learning of the Historical Analysis**

The historical analysis uncovered the evolution in the authors' thinking about paradigms of inquiry from early proposals of an alternative approach (e.g., Guba, 1978b) to the current evolutionary state defining five independent systems of inquiry based on positions to five metaphysical subjects (e.g., Lincoln & Guba, 2011; Lincoln et al., 2011). The middle work on paradigm theory, bookended by initial proposals and the current representation, demonstrated considerable new thinking and rethinking of the constructs that define paradigms of disciplined inquiry. The historical analysis was able to track over time the authors' progression of thinking about what a paradigm of inquiry might be, the development of axiom subjects and positions, axiom extensions into inquiry, and basic questions about quality.

Two significant contributions of paradigm theory to disciplined inquiries were highlighted. The set of metaphysical positions and implications on practice provided an

improved understanding of what inquiry should look like within any one of the five paradigms of inquiry defined by the theory. In addition, the theory facilitated understanding of paradigms by providing a common ground between otherwise incommensurable systems of inquiry through its overarching axiom subject, or metaphysical subject, structure. That is, between-paradigm comparisons could move from contrasts in method practices to contrasts in positions on the common categories of basic assumptions that guided the method practices of each paradigm of inquiry.

### **The Incremental Learning of the Reverse Engineering Analysis**

The reverse engineering analysis revealed paradigm theory in its axiomatic form and as a process of ongoing theory development. The theoretical coding paradigm applied to the milestones of the historical analysis allowed disaggregation of paradigm theory into its theoretical components and further facilitated understanding of the theory's development through a specific theorizing process that continuously moved between the conceptual development and operationalization phases of theory-building research.

Viewing the paradigm phenomenon as a theory, specifically as an axiomatic theory, provided greater understanding of its underlying structure and operation, as well as greater understanding of paradigm theory's explanatory reach as a bounded theoretical model. As an axiomatic theory, paradigm theory was analyzed for its theoretical constructs, scope conditions, axiom statements, derived propositions, and logical systems of theoretical operation. The quality of the axiomatic theory was further understood as judgments of justification regarding the synergistic coherence of the derived theorems and their logical dependence upon the axioms of each paradigm. The validity of the axiomatic theory was understood as judgments of fit with

reality, wherein fit was qualified as the utility of the theorems for informing and guiding inquiries in practice and for successfully governing a process of inquiry that yields knowledge claims valued as ends in a world of practice.

### **The Research Questions Addressed**

In chapter 1 three guiding questions were outlined for the developing research agenda on disciplined inquiry:

1. How did the exemplar paradigm theory of Lincoln et al. (2011) evolve into its current theoretical state, and what features are characteristic of the paradigm theory?
2. What surrogate theoretical research process can be inferred about the development of the exemplar subject system?
3. Can understanding of disciplined inquiry be advanced given a more complete understanding of the phenomena of methodology and inquiry paradigms?

The historical and reverse engineering analyses appropriately addressed the first two guiding research questions by unpacking the evolution in the authors' thinking about paradigms of inquiry and revealing the full theoretical nature of paradigm theory in its axiomatic form and as a process of ongoing theory development. The symbiotic outputs of the two analyses are shown together in Figure 7.

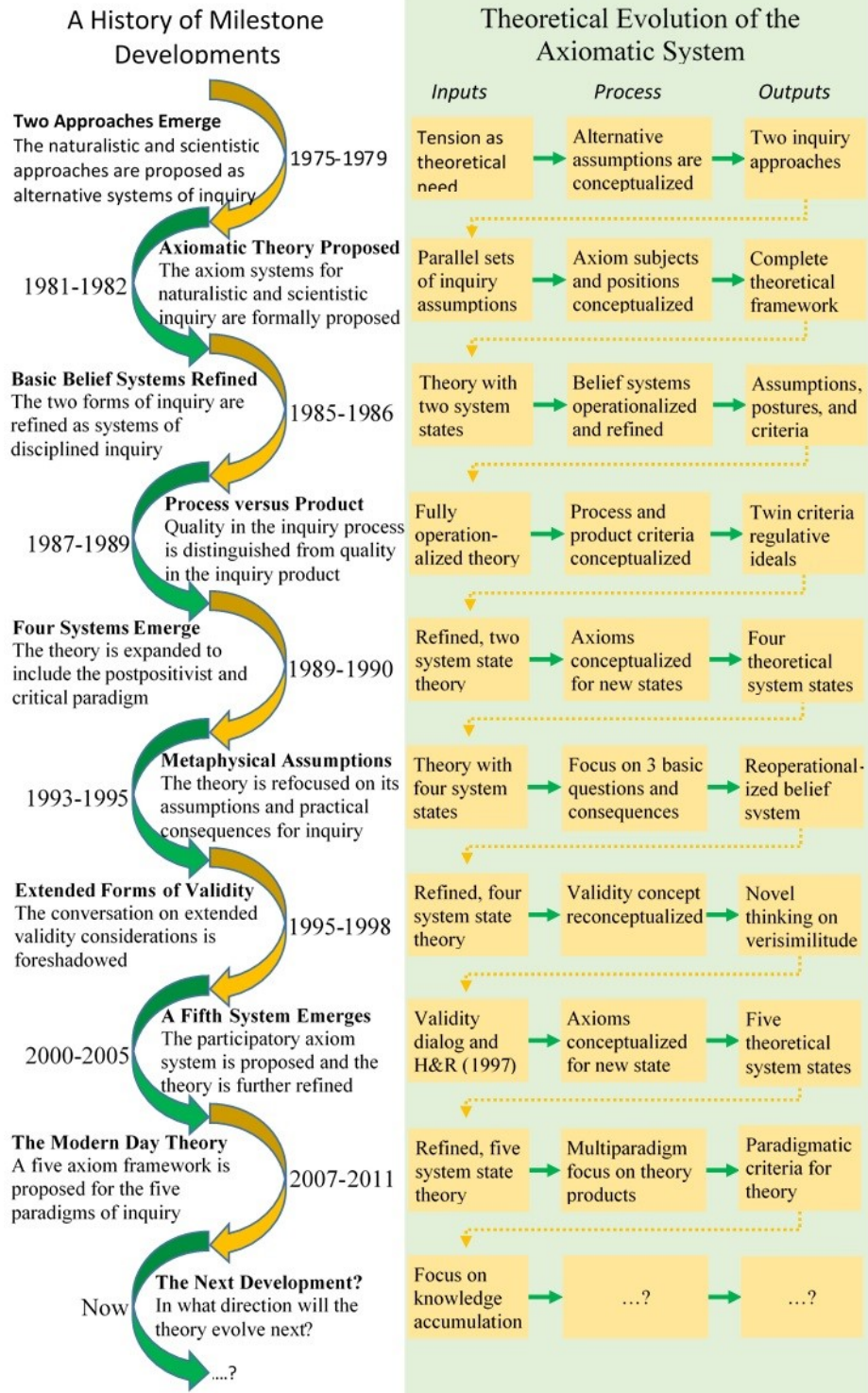


Figure 7. Side by side graphic of the outputs of the historical and reverse engineering analyses showing milestones developments next to the associated theoretical iterations.

Whether or not understanding of disciplined inquiry can be advanced given a more complete understanding of the phenomena of methodology and paradigms of inquiry remains to be determined (I'm certainly hopeful). However, the problem space defined by Kant's (2007) conception of how we interrogate the concepts of experience in order to form understanding remains underdeveloped. Fortunately, the knowledge of how to theoretically approach that problem space has been developed through the historical and reverse engineering analyses.

The next step is to apply it. The literature on methodology needs to be further explored. The assumption that the regulative ideal concerning the process of combining the concepts of experience should be characterized with the methodological phenomenon should be critically reexamined. Is the regulative ideal for the process of combining the concepts of experience more, less, or perhaps entirely different than methodology? It is this point of departure in the current work that future inquiry about disciplined inquiry will begin.

### **Revisiting the Conceptualization of Disciplined Inquiry**

Chapter 2 proposed an initial conceptualization of disciplined inquiry to guide the inquiry about its constructs. The conceptualization situated disciplined inquiry at the intersecting space between the phenomena of methodology and paradigms of inquiry, such that the paradigm of inquiry phenomenon embodied Kant's (2007) regulative ideal defining the possibility of experience and methodological phenomenon embodied in Kant's principles of action for the application of rules, manifest in method, to the possibility of experience. Furthermore, skill with the process of disciplined inquiry in operation was positioned as Kant's power of judgment (i.e., the special talent for applying the two regulative ideals in the real world practice of disciplined inquiry).

In the same spirit of the authors' (e.g., Lincoln et al., 2011) comment regarding their position on axiology as a basic assumption (i.e., "We reserved for ourselves the right to either get smarter or just change our minds. We did both" [Lincoln & Guba, 2000, p. 169]), immersion in the present theoretical, methodological, and philosophical literature has left the initial conception of disciplined inquiry seeming somewhat more incomplete than initially anticipated. Specifically, the initial conceptualization seemed lacking with regard to how and where in the process Best-JB might be produced, how warranted assertions accumulate as knowledge, and how accumulated knowledge can inform future disciplined inquiries. New thinking about disciplined inquiry and a re-envisioned model are discussed next.

### **New Thinking About Disciplined Inquiry**

Table 4 in chapter 2 captured the nature of the twin criteria of disciplined inquiries as the justifiers embedded in a disciplined inquiry necessary to meet the standards for the ex ante and ex post justification that come to bear on judgments of Best-JB. Unfortunately, the justifiers never found an explicit place in the initial conception of disciplined inquiry, and as a consequence, how and where in the process Best-JB might be produced were unclear. It seemed that the power of judgment needed a more prominent place in the developing model of disciplined inquiry so the relationship between the special talent for the practice of disciplined inquiry and the production of Best-JB could be directly represented within the model.

After a knowledge claim achieves its status as Best-JB, the initial conceptualization of disciplined inquiry failed to recognize any mechanism for the accumulation of warranted assertions as knowledge. The significant efforts that went into the supplemental reviews of theoretical products and processes provided some grist for thinking about how knowledge

accumulation might occur within a model of the practice of disciplined inquiry. However, the thinking about the inadequate accumulation mechanism was catalyzed by the writings on accumulation within each paradigm by Guba (1990c) and Lincoln and Lynham (2011). Theory was a logical mechanism for how Best-JB might be received and accumulated as knowledge, particularly given the efforts of Guba, Lincoln, and Lynham in defining the nature of theory across different paradigms of inquiry.

Lastly, the initial conceptualization of disciplined inquiry failed to address the two apparent roles of accumulated knowledge in the practice of disciplined inquiries. That is, the initial model needed representation of how accumulated knowledge serves as both the intended output of disciplined inquiries and as the input to disciplined inquiries. Definition of a problem warranting inquiry demands the juxtaposition of what is known against what is not known, and making a knowledge claim demands the juxtaposition of new knowledge against a previous less-informed state. Disciplined inquiries should start and end with an understanding of accumulated knowledge.

### **Re-thinking the Conceptualization of Disciplined Inquiry**

Figure 8 presents a re-envisioned conceptualization of disciplined inquiry. In addition to the inclusion of the power of judgment, theoretical accumulation of knowledge claims, and the connection of theoretically accumulated knowledge to the entry and exit points in disciplined inquiries described, Figure 8 also includes a relabeling of what was originally shown as the phenomena of methodology and paradigms to represent language more aligned with the Kantian roots in regulative ideals.

The process labeled *theoretical accumulation of knowledge* in the disciplined inquiry process represented in Figure 8 serves as both entry and exit points in the inquiry cycle. Presumably, to begin any disciplined inquiry, the inquirer must first identify the knowledge known relative that knowledge believed to be unknown. The contrast of known with unknown guides the selection of a problem to work on, and assumptions about the possibility of what can come to be known about the problem's solution. Understanding the tension between the known and unknown is informed by theoretically accumulated knowledge about the topics or phenomena of interest. Available theoretically accumulated knowledge then informs choices about both what concepts can be considered to define the possibility of experience about the phenomena and what processes are most appropriate for combining those concepts of experience so that knowledge, in the form of a solution to the problem, can be gained.

Guided by commitments to the two regulative ideals (i.e., the concepts of the possibility of experience, and the processes for combining the concepts of experience) and the ex ante justifiers of process and product, the inquirer engages in the power of judgment by enacting elements of the commitments as means to the solution state. The resulting information interpreted by the inquirer is subject to scrutiny by those with appropriate hegemony, and judgments of Best-JB are made. If the interpreted information is judged to fall short of either process or product justifiers, then the cycle corrects and recurs in adapted fashion. If the interpreted information is judged as Best-JB, then the warranted assertion(s) theoretically accumulate as knowledge about the inquired into phenomenon or phenomena. Of note here is the assumption that theoretical knowledge takes on many forms with regard to type of theory; paradigm within which knowledge about the phenomenon exists; and maturity of theoretical



knowledge as interim theoretical product, full-blown theory, or refinement/extension of existing full-blown theory. The disciplined inquiry cycle repeats, ending and starting at the same place.

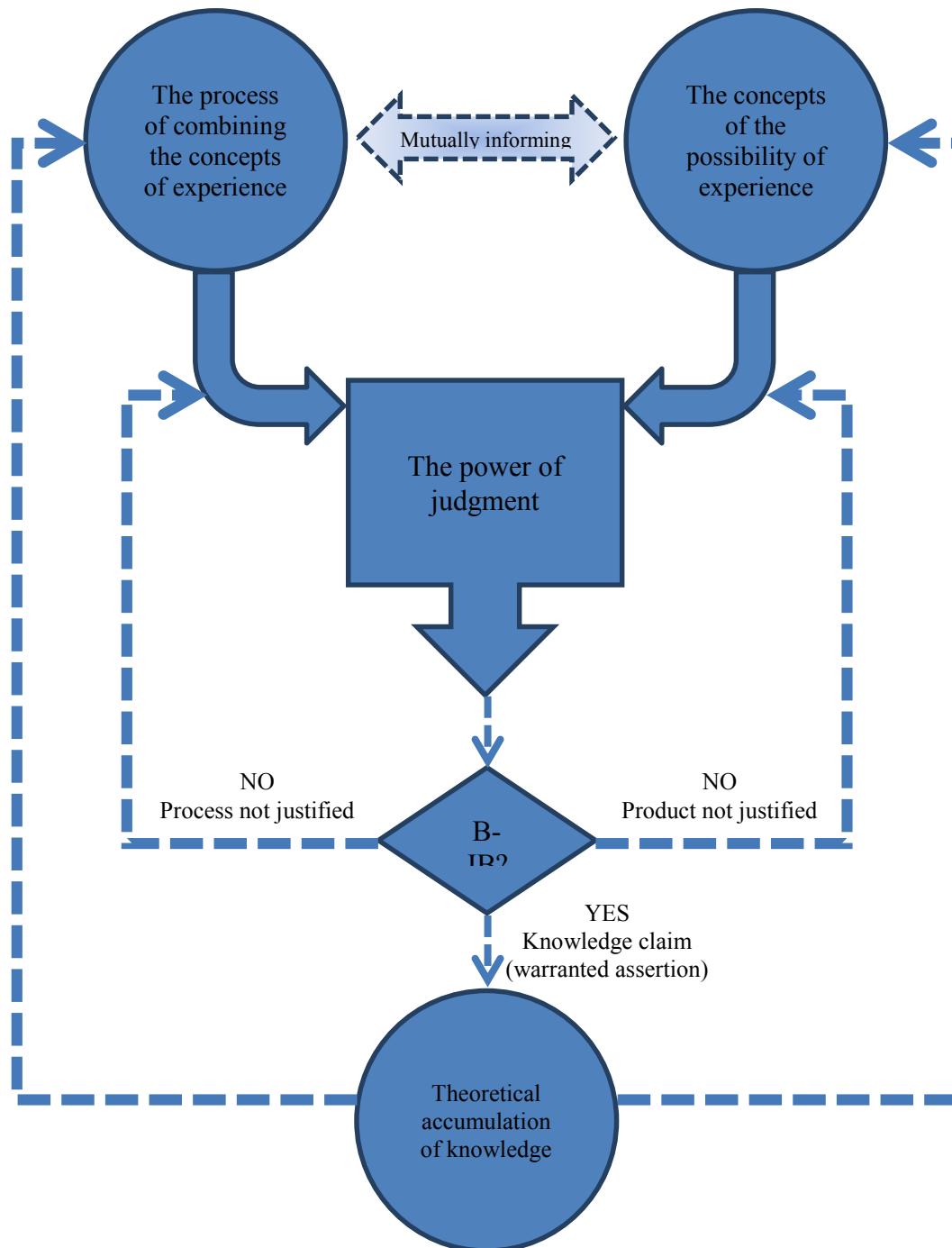


Figure 8. Re-envisioned conceptualization of disciplined inquiry.

## **Implications on Practice**

As a result of the research problem defined and developed in chapters 1 and 2, a consequence and cost were identified from the conceptual and action problems, respectively. The consequence was a gap in conceptual understanding of disciplined inquiry and the cost was a gap in knowing how to practice disciplined inquiry. For the practitioner, the cost in terms of the practice of disciplined inquiry is most important and extends well beyond limitations in knowing how to form justified beliefs through the practice of disciplined inquiry; the cost also includes the ability to recognize and acquire skill in its practice.

The process of disciplined inquiry in practice was mapped to the third of Kant's (1781/2007) mental powers of logic: the power of judgment. The power of judgment was positioned as skill in the practice of inquiry. The power of judgment is informed regulatively by the understanding and reason as the "special talent" (Kant, 1781/2007, p. 173) for applying the two regulative ideals in the real world practice of disciplined inquiry. However, as a skill of practice, it represents the rules in action rather than merely declarative know-how. As rules in action, not simply know-how, knowledge of disciplined inquiry may be mastered conceptually and even explained with precision, yet the inquirer may still exhibit shortcoming in the practice of disciplined inquiry.

Skill in the practice of disciplined inquiry (or lack thereof) is the greatest potential cost of the gaps in knowledge in terms of practice. Carrying the ideals of disciplined inquiry into practice requires that the power of judgement be sufficiently trained and reinforced with practical experience. However, the practical experience must first come from a place of understanding disciplined inquiry abstractly so that the inquirer may then make informed judgements about the

degree of alignment between a concrete case in practice and the ideals against which it is to be compared.

One element of skill in practice is being able to communicate to other inquirers key information about concrete cases. Inquirers must put their assumptions on the table if that conversation is to happen with any sense of productivity. Conversations about examples of inquiry in practice involve questioning what makes the inquiry (regarding process and product) appropriate, credible, and valuable. To answer those questions, there needs to be shared and explicit understanding of what things are important for inquiry. The things that are important are precisely what is defined by the assumptions and belief system. If the assumptions and belief system are not made explicit upfront, there exists considerable risk of wasted effort producing and/or consuming knowledge. Those truly skilled in the practice of disciplined inquiry are able to both navigate degrees of fit between the concrete and the abstract, and, possess the flexibility to change the nature of the practical dialog when the nature of the belief system changes.

### **Methodological Contributions to Theoretical Analysis**

In addition to the focused learning on the historical milestones and theoretical structure of paradigm theory, the two integrative literature reviews also resulted in an emerging approach to theoretical analysis. The use of the literature review approach for theoretical analysis was not novel (e.g., Cooper, 1988; Randolph, 2009), nor was the use of Dubin's (1978) eight-step theory-building approach novel for theoretical analysis of a phenomenon (e.g., Chermack, 2004). The theoretical coding paradigm applied to milestones in the history of theory did present a novel approach to disaggregation of a theory into its theoretical components and understanding the theory's development over time. Because the novel approach to theoretical analysis leveraged a

theory-building process (i.e., theory as a process) lens from which to code the theoretical elements and processes of a phenomenon, the approach to theoretical analysis also resulted in a situating of the analyzed phenomenon within the theory-building process, and therefore facilitated an agenda of ongoing theory-building research.

More specifically, the coding paradigm expanded upon the use of Dubin's (1978) theory-building method (i.e., the anatomy of a theory) to include analysis of the theoretical positioning, theoretical range, theoretical roles in inquiry, and theoretical form. However, beyond simple expansion of elements outside the eight steps articulated by Dubin, the coding paradigm also included means for analysis of theoretical process with coding for features such as theoretical products (both interim and full blown), where in the theory-building process the work can be positioned, the research strategy used, the phases of theory building involved, and the theoretical processes and methods used. The coding paradigm further accommodated analysis of initial conditions leading to the theory's development. Lastly, when applied to a historical analysis of the theory's development, a more complete picture emerged from the coding paradigm with regard to what and when the components of the theory were conceptualized, in conjunction with what other theoretical elements or research, and how all the pieces incrementally fit together and evolved against a larger contextual backdrop over time.

### **The Way Forward**

Much of the initial agenda holds the same (i.e., improved understanding of disciplined inquiry through development of a theoretical framework that explains the phenomenon of methodology); however, the conceptualization of disciplined inquiry has been further developed into a (more) complete model (or diagram, in the parlance of Weick [1995]). What was initially

conceived as two intersecting constructs has been expanded to include additional constructs and assumptions “about sequence, about more and less determinate relationships, and about pathways of influence” (p. 389). Next steps include theorizing about methodology, theorizing about a model for theory and theoretical accumulation, and revisiting the model of disciplined inquiry.

With further reference to Weick’s (1995) commentary on what should not be considered theory but incremental products of theorizing, the lists of variables that define the phenomena of methodology and theoretical knowledge need to be developed. Ironically, the work conducted for the supplemental reviews in Appendices B and C likely put the research closer to accomplishing the latter. From those lists of potential variables, additional theorizing is needed to imagine the possible values each variable can take on, the relationships among the variables, and system states of each phenomenon that come to life with specific combinations of values and relationships.

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## APPENDIX A: METHODOLOGICAL REVIEW OF LITERATURE REVIEW RESEARCH METHODS

### **Purpose and Organization**

Appendix A served as a *methodological* background literature review for the current research. Accordingly, the methodological literature on literature review research methods was reviewed. A general research design for the integrative literature review research method was synthesized from this literature and used to guide the works of the current dissertation.

Appendix A was organized into two main sections. The first section provides an overview of the available literature on literature review research methods with a more specific emphasis on the integrative literature review research method. The second section presents a synthesized research design for integrative literature review research.

### **Overview of Literature Review Research Methods**

The literature review may be defined as “a written argument that promotes a thesis position by building a case from credible evidence based on previous research” (Machi & McEvoy, 2009, p. 4). The literature review attempts “to integrate what others have done and said, to criticize previous scholarly works, to build bridges between related topic areas, to identify the central issues in a field” (Cooper, 1998, p. 2). Furthermore, critical to definition of the literature review is understanding that the systematic and rigorous forms of these reviews are research (Cooper, 1988, 1998). The systematic and rigorous form of literature-based research will be reviewed next.



## General Characteristics of Literature Review Research

Cooper (1988) and Randolph (2009) present a view of the literature review that captures nuances in the research method from a taxonomy of six primary review categories and a number of sub characteristics for each primary category (Table 43). The six primary review categories were focus, goal, perspective, coverage, organization, and audience; where,

- Focus was defined as the particular type of information targeted in the review.
- Goal was defined as what the researcher intends to achieve with the research.
- Perspective was defined as the researcher's point of view, e.g., inquirer posture (Lincoln et al., 2011).
- Coverage was defined as the manner of search and inclusion of literature.
- Organization was defined as the scheme used structure and present findings.
- Audience was defined as the intended consumers of the literature research.

Table 43

### *Cooper's Taxonomy of Literature Reviews*

Categories	Characteristic
Focus	Research outcomes
	Research methods
	Theories
	Practices or applications
Goal	Integration
	(a) Generalization
	(b) Conflict resolution
	(c) Linguistic bridge-building
	Criticism
Perspective	Identification of central issues
	Neutral representation
Coverage	Espousal of position
	Exhaustive
	Exhaustive with selective citation

	Representative Central or pivotal
Organization	Historical Conceptual Methodological
Audience	Specialized scholars General scholars Practitioners or policymakers General public

Source: From Cooper, H.M. (1988). Organizing Knowledge Synthesis: A Taxonomy of Literature Reviews. *Knowledge in Society*, 1(1), p. 109.

In Hart's (1998) book on *Doing a Literature Review*, he defined 8 minimum requirements of doctoral dissertation research. These requirements were:

1. Specialization in scholarship;
2. Making a new contribution to an area of knowledge;
3. Demonstrating a high level of scholarship;
4. Demonstrating originality;
5. The ability to write a coherent volume of intellectually demanding work of significant length;
6. The ability to develop the capacity and personal character to intellectually manage the research, including the writing of the thesis;
7. Showing in-depth understanding of the topic area and work related to the research;
8. Defending orally what was produced in terms of the reason for doing the research and choices over the way it was done.

Literature review research, if executed in a scholarly, systematic and methodical manner, may be shown to meet at least the first 7 of those requirements. For example, one of the more widely accepted literature review research methods, in postpositivistic circles, is the systematic review and meta-analysis (e.g., Borenstein, Hedges, Higgins, & Rothstein, 2009; Higgins &

Green, 2011 or <http://www.campbellcollaboration.org/>). Systematic reviews have an advantage over the qualitative realm of literature review research given the emphasis on quantitative synthesis of primary study evidence and perceived precision of quantitative analysis; however, the systematic review's strength lies in its clearly specified and rigorously adhered to research protocol, not its quantitative subject. Although not exclusively oriented towards quantitative synthesis, integrative literature reviews also define, and adhere to, systematic and methodical research protocols. The integrative literature review was chosen as the most appropriate form literature review research for the current dissertation research and is detailed next.

### **The Integrative Literature Review Research Method**

Although literature review research may be conceptually organized within the taxonomy of literature reviews provided by Cooper (1988) and Randolph (2009), a specific instance of literature review research method is the integrative literature review research method.

Examination of the literature review *methods* literature revealed a number of relevant sources for the integrative review: Callahan (2010), Cooper (1982), Jackson (1980), Torraco (2005b), and Yorks (2008).

Integrative literature reviews are “a form of research that reviews, critiques, and synthesizes representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated” (Torraco, 2005b, p. 356). They may also be considered seminal work audits or systematic reviews (Callahan, 2010). Integrative reviews may pull together disparate bodies of literature or explore one topical area in depth; however, critical to the integrative literature review is the presence of a methodology. It is because of the

systematic methodology that integrative literature reviews may be considered sophisticated forms of research (Callahan, 2010; Torraco, 2005b; Yorks, 2008).

**The purpose of an integrative literature review.** Integrative reviews bring together and synthesize bodies of knowledge in the literature in new ways and result in new knowledge and understanding; however, they also serve to generate new research questions and direct future research (Callahan, 2010; Cooper 1982; Jackson, 1980; Torraco, 2005b). While the outcome of integrative reviews may be new understanding and new research questions, Torraco (2005b) identified four common types of output of the integrative literature review: (1) a research agenda, (2) a new conceptual organization, e.g., taxonomy, (3) a theoretical model or conceptual framework, and (4) meta-theory; the two most commonly paired being a new conceptual model and a research agenda. However, in all cases, a required output of an integrative literature review is something new as a product of the research synthesis; simple summaries fall short of new knowledge (Callahan, 2010).

**The content of an integrative literature review.** Three sources on conducting integrative literature reviews stood out as complete process descriptions of integrative literature review research, both in the publications on conducting integrative literature reviews and in the methodological citations of integrative literature review dissertations; these were, Cooper (1982), Jackson (1980), and Torraco (2005b). In fact, Cooper (1982), Jackson (1980), and Torraco (2005b) were the most frequently cited methodological references for dissertations with “integrative literature review” in the title published in proquest dissertations and theses in the time spanning 2000 through 2012. As complete process descriptions of the integrative literature review research method, the works contribute to two important methodological areas of

integrative literature review research: the content of the research method and issues of methodological quality. The former, the multi-stage process of the literature review method, is summarized in Table 44 for Cooper (1982), Jackson (1980), and Torraco (2005); however, “if one thing must be realized about conducting and reporting a literature review it is that the stages for conducting and reporting a literature review parallel the process for conducting primary research” (Randolph, 2009, p. 4).

Table 44

*Table of Methodological Content for the Integrative Literature Review Research Method*

Cooper (1982)	Jackson (1980)	Torraco (2005)
(1) Problem formulation	(1) Select the Questions or Hypotheses	(1) Identify an appropriate topic or issue
(2) Data collection	(2) Sample the literature	(2) Establish the need for the review
(3) Evaluation of data points	(3) Represent the Characteristics of the Primary Studies	(3) Conceptually frame the review
(4) Data analysis and interpretation	(4) Analyze the Primary Studies	(4) Describe the methods used: collection, analysis, synthesis
(5) Presentation of results	(5) Interpret the Results	(5) Critically analyze the literature
	(6) Report the Review	(6) Critique the literature
		(7) Synthesize New Knowledge on the Topic

*Source:* Cooper, 1982; Jackson, 1980; Torraco, 2005b.

While not complete process descriptions, Callahan (2010) and Yorks (2008) further articulate and emphasize the significance of an explicit sampling process that defines the intended population of literature sampled from, the sampling strategy, criteria for inclusion in the review, where and when the sampling was conducted, and the outcome of each sampling procedure. Across all five of these sources, i.e., Callahan (2010), Cooper (1982), Jackson (1980),

Torraco (2005b), and Yorks (2008), a five component structure of methodological content for the integrative literature review surfaces.

1. Begin with a clearly articulated research problem, from which research questions are generated, and for which the solution's importance is established as a value-added contribution to understanding or practice.
2. In addition to establishing the need for the review, the articulated problem must further justify why a review of the literature is an appropriate approach to generating a solution to the problem. That is, the researcher should conceptually frame the problem and proposed approach in the literature.
3. The method should make explicit a data collection plan that includes (a) the sampling strategy, (b) the approach to evaluation of sources, and (c) the process for codifying the included literature.
4. The method should further clearly articulate the process and logic for analyzing and interpreting the codified literature.
5. Lastly, the integrative literature review method should propose the process, logic, and organization for synthesis and presentation of new ideas from the literature.

The second important contribution of the complete process descriptions for the integrative literature review addressed issues of methodological quality of the research.

Altogether, the integrative research review should address three high level, but basic, points (Yorks, 2008). First, what was understood that was not understood before? Second, why is it important to close the defined gap in understanding? Lastly, what makes the new understanding generated from the review credible? Further, a number of key quality indicators can be gleaned

from works of Callahan (2010), Cooper (1982), Jackson (1980), Torraco (2005b), and Yorks (2008). These key indicators of quality include:

- The importance and need of the research should be explicitly justified by the researcher.
- The review's purpose and conceptual framing should be presented upfront as an advanced organizer of the manuscript.
- The researcher should present and make explicit the logic used to both filter information and draw conclusions.
- Data collection should define both what literature was relevant to the research and what criteria were met for sources to be included in the research.
- The overall emphasis in the integrative review is on synthesis not summary; the goal is generation of new understanding through either reframing existing ideas or creating new ones.
- The new understanding generated from the review should serve as catalyst for further action through research or practice.
- The integrative review should generate provocative research questions for future inquiry.
- The integrative review should be presented and written in a coherent and clear writing style.

As a heuristic guide for researchers engaging in integrative literature reviews, Torraco (2005) offered a nine step checklist for the literature review method organized around three

phases of the research process: (1) before writing the review, (2) organizing the review, and (3) writing the review. Torraco's full nine step checklist is outlined below:

*Before writing the integrative review:*

1. Determine the maturity of the topic in the literature (i.e., new topic versus a mature topic) and justify why literature review research is an appropriate way to address the research problem.
2. Define and justify the need for the research review as a value-added contribution to the audience.

*Organizing the integrative review:*

3. Structure the review manuscript around the conceptual framework defined for the topic.
4. Explicitly and sufficiently describe the review method including: how/where literature was sampled, the criteria for evaluating sources, and the process for coding, critiquing, and synthesizing ideas.

*Writing the integrative review:*

5. Analyze and critique the existing literature.
6. Synthesize new knowledge on the topic.
7. Explicate the type of outcome (i.e., research agenda, conceptual classification, new theory or conceptual framework, or meta-theory) and relate to future research needs.



8. Describe the logic and conceptual reasoning used to deconstruct and reconstruct the literature.
9. Pose provocative questions to stimulate further research.

### **A Research Design for Integrative Literature Review Research**

Given the prior review of Cooper's (1988; Randolph, 2009) taxonomy of literature reviews, and, the methodological content of integrative literature review research by Callahan (2010), Cooper (1982), Jackson (1980), Torraco (2005b), and Yorks (2008), a twofold methodological framework for conducting integrative literature review research emerged as general framework for the current dissertation. The first part of the general framework for conducting integrative literature review research involves positioning the review descriptively as a set of literature review characteristics using the taxonomy discussed by Cooper (1988) and Randolph (2009). The second prescribes a methodological content and structure to the review report. It should be noted that no two reviews are identical in perspective, goal, etc.

Consequently, the general framework attempts to capture most of the relevant ideas discussed in the literature on review research methods, but the framework should neither be consider 100% inclusive of *all* integrative review components nor prescriptive of exactly what an integrative literature review must include. The general framework is heuristic in quality.

### **Integrative Literature Review Typological Positioning**

Upfront, the purpose of the research shall be made explicit, and given the purpose, justification shall be provided for why the integrative literature review is an appropriate research approach, e.g., position the topic in the literature. Once the integrative literature review research

approach has been justified, the review shall be positioned as a set of review characteristics based on the taxonomy provided and discussed by Cooper (1988) and Randolph (2009). The six categories of review characteristics are: focus, goal, perspective, coverage, organization, and audience (Table 43).

### **Integrative Literature Review Methodological Structure**

Given that the presence of a systematic methodology is one of the critical and distinctive features of integrative literature reviews that allows the type of review to be considered a sophisticated form of research (Callahan, 2010; Torraco, 2005b; Yorks, 2008), it is important to specify both the methodological content and structure of the proposed integrative literature review research method. This second piece of the general methodological framework proposes the following methodological content for the integrative literature review research method.

#### *Introduction:*

- Background information
  - Generally includes background information on the phenomena of interest in relation to the research problem.
- Positioning
  - Place the topic in the literature, thus justifying the literature review as appropriate method, and future position with Cooper (1988) and Randolph's (2009) taxonomy of literature reviews.
- Conceptually framing the concepts and philosophical perspective

- Provides a frame within which to relate the topics, phenomena, concepts of the problem.
- The research problem
  - Establishes a state of not being able to explain or understand something from which research questions are generated and for which the proposed solution's importance is established as a contribution to understanding or practice.
- The need/importance
  - Establishes to whom resolution of the research problem is important.
- Research questions
  - The specific questions that will focus the review and whose answers are explicitly aimed at closing the problem-solution gap.

*Method:*

- Sample description
  - Generally includes (a) the sampling strategy, i.e., where/how, (b) the approach to evaluation of sources, i.e., inclusion criteria, and (c) sampling results, e.g., how many sources were considered (and from where), how many sources were included, and relevant descriptive information on the final set of literature used in the review.
- Data collection description
  - Generally includes (a) the process for codifying the included literature, e.g., the coding scheme and logic/reason, (b) the logic and conceptual reasoning used to deconstruct each source, and (c) the coding results, e.g., descriptive statistics for

any coding schemes or tables of coded data that meaningfully organized the coded sources.

- Data analysis description
  - Generally includes (a) a description of how the collected data was organized to facilitate the analysis, (b) a description of any analytical strategies used to examine the data, e.g., the logic or reasoning used to reconstruct ideas from the deconstructed literature sources, and (c) the analysis results, e.g., tables or graphs of integrated/analyzed data or any summary information that serves as important transition to synthesis.
- Data synthesis strategy
  - Should include a description of intended forms of review outcome and how those outcomes were organized for presentation.

*Synthesis:*

- Narrative on new understanding
  - Should be tied to the outcome form(s) identified (Torraco, 2005b) and the review goal specified in the typological positioning of the review (i.e., Integration, Linguistic bridge-building, Criticism, Identification of central issues [Cooper, 1988; Randolph, 2009]).

*Conclusions:*

- Review new understanding gained as solution state to problem state
- Speculate on next steps

- Pose future research questions to answer given new understanding as a new problem state

## APPENDIX B. REVIEW OF THEORY PRODUCTS

### Theories

A theory helps inquirers make sense of the explicit empirical world through conjecture about its implicit meaning (Dubin, 1978; Kaplan, 2009). Theory is the answer to questions of why (Sutton & Staw, 1995; Whetten, 2002). A theory is “more than a synopsis of the moves that have been played in the game of nature [i.e., the explicit empirical part]; it also sets forth some idea of the rules of the game [i.e., the implicit part], by which the moves become intelligible” (Kaplan, 2009, p. 302). That is, “data describe *which* empirical patterns were observed and theory explains *why* empirical patterns were observed or are expected to be observed” (Sutton & Staw, 1995, pp. 373-374). However, because inquirers are conjecturing about the underlying rules that make the observable moves intelligible, the conjectured meaning has a special, and important, quality. This quality is something that Kaplan further describes as “a symbolic construction” (Kaplan, 2009, p. 296). That is, theories are entirely conceived by man; theories “do not exist by themselves somewhere waiting to be discovered” (Patterson, 1986, p. xix). In fact, when wrestling with what a theory is ...

It is important to realize, at the outset, that all theories are false. They are, after all, just words and symbols on pieces of paper, about the reality they purport to describe; they are not that reality. So they simplify it. This means we must choose our theories according to how useful they are [for making the moves of nature more intelligible], not how true they are. (Mintzberg, 2005, p. 356)

Mintzberg (2005) makes an important point: theories are sets of imagined concepts and with presumed connectedness (Kaplan, 2009) that are used to describe and simplify a portion of reality, but they are not that reality. If theories were the reality they described, then the focused attention and conceptual traction provided by the theoretical containment would cease to exist in

(Dubin, 1978) and the theoretical phenomenon examined would just be the entirety of human experience. Theories provide an awareness “focused so that the object of attention comes to the foreground and other experiences become the background” (Dubin, 1978, p. 6). Theories cannot be true due to this divide between reality and theory. Arguments about a theory’s accuracy (e.g., Weick, 1995, 2005) and attempts to falsify a theory’s propositions (e.g., Popper, 2010) target the degree of agreement between the way a phenomenon has been contained by theory and the reality represented by theory; they do not however address whether or not a theory is true. Rather, theories are useful to varying degrees and ultimately “it is in the application of a theory that practice gets to judge and inform the usefulness and relevance of the theory for improved action and problem solving” (Lynham, 2002b, p. 233).

To complicate the theoretical definition further, theories are intertwined with forms of knowledge. That is, a theory “encapsulates and ‘contains’ the explanation of the phenomenon, issue, or problem that is the focus of the theory” (Lynham, 2002b, p. 229); in other words, theories may be thought of as phenomenon-specific knowledge containers serving accumulation of phenomenon-specific knowing. Therefore, changing the nature of the knowing must change the nature of that which is contained by theory. In this regard, what it actually means to be a theory in terms of phenomenon-specific knowledge containment is the relational product of what it means to know and the nature of “knowledge accumulation” for that particular form (Guba, 1990c, pp. 251-255), because neither knowing nor accumulation of that knowing are constant properties but rather are both always relationally present when contained in a theory.

As a consequence of the relational quality of theory, most definitions of theory exist in tension as paradigm-specific definitions. Core characteristics of theory definition may range

from “explanations and predictions” (Patterson, 1986, p. xix) to “deep and widely accessible understanding... the ability to achieve a vicarious experience” (Lincoln & Lynham, 2011, p. 9). Others, such as Mintzberg, side step the labeling activity all together, “I am interested in explanation, and don’t much care what it’s called, theory or otherwise” (Mintzberg, 2005, p.360). As highlighted by Torraco (2002), the theory-theorist relationship is a reflection of the metaphysical assumptions (i.e., ontology, epistemology, axiology, etc) underlying the theorist’s paradigmatic perspective. Beliefs systems will factor into any representation of reality; reality itself manifests in a belief system dependency. Grappling with the diversity of what theory is or might be, as well as the exclusion of what it is not (Sutton & Staw, 1995; Weick, 1995; and DiMaggio, 1995) are important preludes to a definition of theory.

However, much more generally (than paradigmatically specific) theories may be thought of as

...informed knowledge frameworks about how to act on things in our world... put into practice or use precisely because they help us to understand, explain, anticipate, know, and act in the world in better and more informed ways, and to better ends and outcomes. (Lynham, 2002b, p. 222).

As simply as it can be stated, a theory may be generally defined as “any coherent description, explanation, and representation of observed or experienced phenomena” (Gioia & Pitre, 1990, p. 587); a theory “simply explains what a phenomenon is and how it works” (Torraco, 1997, p. 115).

### **The Anatomy of a Theory**

Understanding the anatomy of “full blown theory” (Weick, 1995, p. 385) becomes a particularly relevant concept for transitioning into Appendix C focused understanding the theory-



building process; that is, *when* the various elements and structures manifest themselves within the systematic theory development process (e.g., Weick, 1995, 2005) and then *how* those elements and structures influence ongoing inquiry (Lynham, 2000, 2002a, 2002b). Even though the specific form and composition of theoretical output that is considered complete theory is, in part, dependent upon the specific sort of theory-building method used, more general descriptions of the anatomy of a theory may be considered (e.g., Chermack, 2006; DiMaggio, 1995; Dubin, 1976, 1978; Lynham, 2002a, 2002b; Reynolds, 1971; Shoemaker, Tankard, & Lasorsa, 2004; Sutton & Staw, 1995; Weick, 1995).

The *anatomy* of a theory is a reference to the elements and structures that comprise a full-blown theory, similar to how a description of the anatomy of the heart might discuss where the heart is located within a larger human anatomical system, what other organs the heart connects to, the surface layers of the heart, the inner chambers and valves of the heart, and how all the elements and structures function together to circulate blood. However, defining the elements and structures of a theory must be understood as a somewhat less precise description than that of human organs given the abstract nature of a theory, which itself is a simplification of reality, e.g., theory presents some idea of the implicit rules of the game by which the explicit observable moves of the game are more intelligible (Kaplan, 2009). As a consequence of the conjectural nature of speculating on implicit rules of nature, a full-blown theory must at a minimum “include the development of the key elements of the theory, an initial explanation of their interdependence, and the general limitations and conditions under which the theoretical framework can be expected to operate” (Lynham, 2002b, p. 232). However, others suggest that further operationalization of the theoretical framework is also a requirement of full-blown theory in some instances, e.g., “the statement of research propositions, questions, or hypotheses is

necessary, not optional, for any theory that has not been tested or for theoretical research on topics that have not been studied exhaustively” (Torraco, 2005a, p. 370)

Lynham’s (2002b) and Torraco’s (2005a) statements regarding the requirements of a theory lead in two directions for understanding the anatomy of a theory. First, Lynham’s (2002b) minimum requirements of a theory lead to an examination of the deeper theoretical *anatomy* that is prerequisite to the theoretical propositions, questions, and hypotheses. Second, Torraco’s (2005a) statement leads to an examination of definition and purpose of the propositions, questions, and hypotheses used in the theoretical context. Examination of both (i.e., deeper theoretical anatomy, as well as propositions and hypotheses) follows from the perspective of Dubin’s theory descriptions (1976, 1978).

The deeper theoretical anatomy of a theory may be generally characterized with four fundamental components. These fundamental components are: (1) the *theoretical units*, or basic building blocks, (2) the *laws of interaction*, or relationships among units, (3) the *boundaries of the theory*, or scope of the theory, and (4) the *system states of the theory*, or various conditions of the whole theory when all elements and structures are active together. Together, these four elements and structures interact to form the internal workings, external borders, and activated states of a theory (Cohen, 1989; Dubin, 1978; Lynham, 2002a; Torraco, 1994, 1997).

**Theoretical units.** A *unit* is the term used to “designate the things out of which theories are built” (Dubin, 1978, p. 38); however, as building blocks units are only construction material for theory and not what the theory itself is about. Theories are built “about the properties of the things rather than about the things themselves” (Dubin, 1978, p. 40). There are two potential ways to think about theoretical units, as concepts or as constructs. A construct is a more

specific type of concept. A *concept* “expresses an abstraction formed by generalization from particulars” (Kerlinger & Lee, 2000, p. 40). Concepts are typically abstractions of observable things, such as human behavior, so they have their start in observable reality. Concepts are, or typically can be, defined operationally such that properties of the concepts could be empirically observed. That is, concepts represent abstractions that are intended to be assigned operational definitions, where an operational definition is way of:

...specifying the activities or ‘operations’ necessary to measure it and evaluate the measurement..., a sort of manual of instructions to the researcher. It says, in effect, ‘Do such-and-such in so-and-so a manner’. In short, it defines or gives meaning to a [concept] by spelling out what the investigator must do to measure it and evaluate that measurement. (Kerlinger & Lee, 2000, p. 42)

Critical to a construct’s distinction from a concept is its explicit use abstractly in theory. That is, constructs are not intended to be observed, rather they are, or typically should be, defined with other constructs. In contrast to a concept, a *construct* can be defined as a concept that has been:

...deliberately and consciously invented or adopted for a special scientific purpose... that scientists consciously and systematically use in two ways: (1) it enters into theoretical schemes and is related to in various ways to other constructs... and (2) is so defined and specified that it can be observed and measured. (Kerlinger & Lee, 2000, p. 40)

Constructs are abstractions invented for the purpose of relating to other constructs in theories, where theories might be considered imposed order on experience in which “the idea of order, and the tools utilized to create the sense of order, are in the mind of the theorist... the locus of theory is the human mind” (Dubin, 1978, p. 5). Where the utility of concepts is in their capacity for empirical extension, observation, and measurement, the utility of constructs is in their capacity for theoretical extension and use in relating to other constructs of a theoretical framework (Kerlinger & Lee, 2000).

In addition to thinking about theoretical units according to the high level distinction of concept versus construct, Dubin (1978) proposed five important lower level distinctions relevant to understanding and classifying theoretical units. These distinctions were: (1) unit versus event, (2) attribute versus variable, (3) real versus nominal, (4) primitive versus sophisticated, and (5) collective versus member (Dubin, 1978; Lynham, 2002a).

***Unit versus event.*** A unit can be counted by two or more occurrences whenever it exists and under all circumstances of its existence. An event only happens once in time and consequently has a population of exactly one. Recall that units are about the properties of things. The properties of things should be considered independent of events. Consequently, when modeling events, even though the events described, their antecedent causes, and manner both are sequenced together may be an accurate reconstruction, the model “can only explain that one event, no more” (Dubin, 1978, p. 42). Conversely, because units represent properties of things with a population of more than one, when modeling units, the units defined and their manner of interaction are in reference to explaining “whenever these systems exist and under all conditions of their existence” (Dubin, 1978, p. 43).

***Attribute versus variable.*** A theoretical unit may be a property of a thing that possesses the quality of being either attribute or variable. “The thing always has this quality if the attribute is a property of the thing... the property is either present or not” (Dubin, 1978, p. 44). Attribute properties focus attention on whether or not the thing is part of the set with the property or part of the set without the property. In contrast, if the variable is a property of the thing, then the thing has the quality present to some degree. With variable properties “attention becomes focused

upon the amount or degree to which this property is present in the thing. In other words, a variable varies in how much of the property is present at any given time” (Dubin, 1978, p. 44).

***Real versus nominal.*** A real unit is a theoretical unit for which an empirical indicator already exists or is capable of being invented. A nominal unit is a theoretical unit for which no empirical indicator exists. “The distinction between a real and a nominal unit rests solely upon the probability of finding an empirical indicator for the unit” (Dubin, 1978, p. 44). However, there is somewhat an issue of intention of the inquirer that the distinction is made upon. If the inquirer intends to invent or discover an empirical indicator for a defined unit, then it may be considered real. Yet, if for the same unit the inquirer has no intention of seeking the empirical indicator, then the unit may be considered nominal.

***Primitive versus sophisticated.*** The primitive versus sophisticated distinction is one of definition. A sophisticated unit is a defined theoretical unit. It has a name, definition, and some properties associated with the theory. A primitive unit is an undefined theoretical unit. These often represent the something that is related to an observation that that scientist strives to discover, define, and explicitly incorporate into theory. A primitive unit guides theoretical discovery. By first noting that something undefined might be related to something else that is defined, a primitive unit is being defined in relationship to a sophisticated unit. Inquiry can be guided to define this primitive unit and perhaps introduce it as a nominal unit, and then, with further guided inquiry next introduce it as a real unit measureable as an attribute or variable (Dubin, 1978).

***Collective versus member.*** Here, the levels of relationship are critical. There is an analytical hierarchy somewhat analogous to the level of analysis of interest, e.g., society-group-

person-organ-cell-atom. The question is one of relationship between both adjacent levels and levels separated by one or more level in the hierarchy. A society level unit will relate to society level explanations, but not person level explanations. A collective theoretical unit is the larger class, set, or collective. For member theoretical units the focus is much more granular, with attention shifted to the individual members of the class, or the elements composing the set (Dubin, 1978).

Dubin further proposed a mutually exclusive classification system for defining the type of theoretical unit (1978). This classification system serves as means to classifying the *properties* of the defined units. Classifying the properties of theoretical units is a quality only of sophisticated units; and therefore, is a key characteristic of any sophisticated unit, a distinguishing feature between primitive and sophisticated units, as well as means to transforming primitive to sophisticated (Dubin, 1978). The five mutually exclusive classes are: (1) enumerative, (2) associative, (3) relational, (4) statistical, and (5) summative units (Chermack, 2004; Dubin, 1978; Lynham, 2002a).

***Enumerative units.*** An enumerative unit is “a property characteristic of a thing in all its conditions. That is, regardless of the condition of the thing that can be observed or imagined, it will always have that property” (Dubin, 1978 p. 58) regardless of whether the enumerative unit is attribute or variable. When the property characteristic is also an attribute, then the enumerative unit is always present in the thing. When the property characteristic is also a variable, then the frequency of occurrence of the property determines the degree, or how much, of the enumerative unit the thing possesses. However, in either case, attribute or variable enumerative unit, there

cannot exist a condition in which the unit takes on a *not-A* or zero frequency value. If the null condition is the case, then the unit is associative rather than enumerative (Dubin, 1978).

***Associative units.*** An associative unit is identical to an enumerative unit in all manners except that it is “a property characteristic of a thing in only some of its conditions” (Dubin, 1978 p. 60). That is, for an associative unit, the condition in which the unit takes on a *not-A* or zero frequency value can exist. This subtle difference is quite important though. It not opens the door for absence of the property in the thing, but negative values of the property as well (Dubin, 1978).

***Relational units.*** A relational unit is “a property characteristic of a thing that can be determined only by the relation among properties” (Dubin, 1978 p. 62). The relational unit’s existence in the theory depends upon other units in the theory relating together in some manner to produce a new property; that is, a relational unit “is not itself a property of a thing but a property of two or more properties of things” (Dubin, 1978 p. 63). Two types of relations were defined, that based on interaction between two or more unit properties and that based on the combination of two or more unit properties. In the former, at least two unit properties interact to produce another relational property, e.g., “a subordinate and a superior, when they interact, have as an outcome one property called *subordination*” (Dubin, 1978 p. 62). In the latter, at least two unit properties combine such that when taken together produce the property of a relationship, e.g., “the property ‘male,’ and the property ‘female’ (when they combine, *not* interact!) produce the property ‘sex ratio’” (Dubin, 1978 p. 62).

***Statistical units.*** A statistical unit is “a property of a thing that summarizes the distribution of that property in that thing” (Dubin, 1978 p. 64). The mean or mode of a

distribution, a heterogeneously dispersed distribution, and the upper quartile of a distribution are examples of statistical units. These three examples, respectively, represent “three classes of statistical units: (1) units summarizing a *central tendency* in the distribution of a property; (2) units summarizing the *dispersion* of a property; and (3) units locating things by their *relative position* in a distribution of a property” (Dubin, 1978 p. 64).

***Summative units.*** A summative unit is “a global unit that stands for an entire complex thing” (Dubin, 1978 p. 66), within which there are often numerous ill-defined units and relationships all summed together in one large composite unit. As a consequence, summative units typically represent a great deal of properties of things, the details of which mostly remain unspecified. Due to the lack of defined properties, summative units are the least valuable theoretical unit for building theory (Dubin, 1978).

Although described *here* as mutually exclusive unit types, “it is possible that a unit employed in a theory may satisfy the definition of two or more classes of units at the same time” (Dubin, 1978, p. 68); however, non-mutually exclusively satisfying multiple definitions is very different from mutually exclusive classification. Depending on the type of unit classification in the theory, when the unit is *activated*, in the manner with which the property of thing can be activated, it will interact with other units in a finite set of ways. As a consequence, in the fully developed theory each unit must take on the specific quality of only one type of unit, regardless of whether the unit may satisfy multiple classification definitions, depending upon the way that theorist conjectures that units will relate to each other in the representation of the phenomenon. The relationships specified between theoretical units are called their laws of interaction (Dubin, 1978).



**Laws of interaction.** The laws of interaction for a theory may be simply defined as “the linkages among units of a [theory]” (Dubin, 1978, p. 90). Laws of interaction are explicit formulations of the specific relationships that exist between two or more units in a theory. Here, causality is not implied by the specification of relationship between theoretical units. “The problem of interaction among units is one of accounting for variance in one unit by specifying a systematic linkage of this unit with at least one other” (Dubin, 1978, p. 92); however, the linkage is not defined as causal mechanism.

Although defining as *law* may imply a sense of absoluteness to the relationship, Dubin highlighted that the presumed linkages among the units of a theory are nothing more than products of the mind that are far removed from being absolute and only “limited by the capacity of the human mind to invent ways of denoting relationships” (Dubin, 1978, p. 97). Even though qualified as tractable rather than unconditional, Dubin defined three high level categories of theoretical laws for all forms of unit relationships; these are, categoric, sequential, and determinant (Dubin, 1978; Lynham, 2002a).

Categoric laws of interaction were defined as the category of relation between theoretical units “that states that values of a unit are associated with values of another unit. The association is in the form of the presence or absence of the respective values for the two units” (Dubin, 1978, p. 98). Important for understanding categoric laws are their symmetry; that is, there is no intended order or sequence between the units such that one is the antecedent and the other is the result. There is no directional quality to the relation between units. Rather, the units are merely determined to be associated with regard to presence or absence of unit values, but in no way causally or serially linked (Dubin, 1978; Lynham, 2002a).

Sequential laws of interaction were defined as the category of relation between theoretical units that “is one always employing a time dimension [where] the time dimension is used to order the relationship among two or more units” (Dubin, 1978, p. 101). Thus, a sequential law of interaction intentionally imposes a temporal quality to the association between theoretical units by ordering the units sequentially or serially in time. However, even though the temporal ordering of units in their relation does imply a singular directional relationship in time, i.e., precedes or follows, the temporal ordering of units in a sequential law does not imply a causal relationship (Dubin, 1978; Lynham, 2002a).

Determinant laws of interaction were defined as the category of relation between theoretical units that “associates determinate values of one unit with determine values of another unit” (Dubin, 1978, p. 106). Consequently, determinant laws of interaction impose a predictive relation between theoretical units, where, “if we know the value of one of the units, we can know the value of another” (Chermack 2004, p. 310). A regression line is an example representation of a determinant relationship in which

...the distribution of values for one unit may be said to be related to a distribution of values for another unit. The essential feature is that these values are paired, with each value for the first unit having a mating value on the second unit (or units), and that these associated values on the units are invariantly linked. (Dubin, 1978, p. 107)

**Theoretical boundaries.** As discussed previously, a theory is an attempt to simplify and explain or describe some portion of reality. As a consequence of this limited focus on a portion of reality, the extent of that modeled reality must be defined so that the limits to empirical reality that the theory may extend to are known (Dubin, 1978; Lynham, 2002a). “The boundaries of a theory therefore establish the real-world limits of the theory and in so doing distinguish the theoretical domain of the theory from those aspects of the real world not addressed or explained

by the theory” (Lynham, 2002a, p. 253). In other words, if one was to think about or apply a theory, then one must also have a clear understanding of the empirical areas that the theory was intended, by design, to simplify and explain or describe. The theoretical boundaries separate those areas within which the theory should hold up from those that are of no intended consequence for the theory. As a result, determining theoretical boundaries “...requires that the theorist identify the domain or multiple domains in which the theory is expected to operate [in the empirical world] (Dubin, 1978). The boundaries locate the theoretical model in the environment that it concerns” (Chermack, 2004, p. 311).

To an extent, the boundaries of a theory represent the assumptions of the theorist (Bacharach, 1989), but more than assumptions, the boundaries represent specific characteristics of the theory and congruence between its units, laws, and reach. With regard to the *reach* of the theory in application, the boundaries may, in part, be thought of as the time and space context of the theory.

...some theories may be unbounded in time, but bounded in space. That is, these theories are only applicable to specific types of organizations, but can be applied over different historical periods. Other theories are unbounded in space (that is, they may be applicable to many types of organizations), but very much bounded in a specific temporal context. Finally, theories may be relatively unbounded in both space and time. Such theories have a higher level of generalizability than those bounded in either or both space and time. (Bacharach, 1989, p. 500)

With regard to congruence of units, laws, and reach, Dubin (1978) defined two types of theoretical boundaries (i.e., open and closed) and two origins of the theoretical boundaries (i.e., internal and external). The distinction on type of theoretical boundary is one of interaction or exchange of something relevant to the theoretical process (e.g., inputs, feedback, etc) from within the theoretical system or from outside the theoretical system. Defining a theoretical

boundary as open or closed “...depends on *exchange over the boundary* of the system between itself and its environment” (Dubin, 1978, p. 126). However, as somewhat differently defined by Freese (1980), an open versus closed system may also apply to its level of idealization; where, an open system even when “of nonlimited spatio-temporal scope” (Freese, 1980, p. 191) is meant to apply to empirical data and a closed system is meant to apply only to abstract regularities. In this sense of a closed system, theories are...

...not meant to be generalizations about the world of everyday experience. The regularities they describe exist in a theoretically possible world but not in the actual world. Theories and laws... describe what is true in a hypothetical world whose antecedent conditions are not satisfied in our ordinary world. (Freese, 1980, p. 191)

Even though somewhat differently defined as information exchange on one hand and level of idealization on the other, both describe contained systems, contained (or not) from the environment in the former and contained (or not) from context in the latter.

Dubin's (1978) distinction on origins of the theoretical boundaries also follows in the logical consistency of the theory's characteristics. Depending on what types of units and laws were defined, as well as what type of boundary was determined appropriate, the formation of the theoretical boundaries may logically be driven by either internal conditions or external conditions. “Interior criteria are those derived from the characteristics of the units and laws employed in the model. Exterior criteria are those imposed from outside the model” (Dubin, 1978, pp. 128-129). In other words, the extent of the reach of a theory into the empirical world may be determined by either forces internal to the theory or external to the theory, but in either case, the theory must have some scope stipulations for which empirical circumstances it is intended to be meaningful.

**System states.** The system states of a theory may be considered the “conditions under which the theory is operative” (Torraco, 1997, p. 129). More specifically, Dubin (1978) defined three features of theoretical system states:

1) all units of the system have characteristic values, 2) the characteristic values of all units are determinant, and 3) this constellation of unit values persists through time. The essential notion of a system state is that the system *as a whole* has distinctive features when it is in a state of the system. (Dubin, 1978, p. 144)

Thus, the system states of a theory are the situations within which all of the defined theoretical units are active in a manner that the defined type of unit would be active, each having a value also appropriate to the type of value that the defined type of unit would have, and all units are interacting in the manners that the set of units would be interacting given the defined laws of interaction. In analogy, if each theoretical unit was a type of electrical switch and each law of interaction was a pathway between switches, then 1 of N complete combinations of all switch positions and pathways for the entire circuit would represent one of the systems states. Similarly, for a theory, all of the theoretical units and laws of interaction are presumed to combine in a number of specific ways; each combination of all units is a system state of the theory (Dubin, 1978).

Critical to the definition of a theoretical system state is that all of the theory’s units have determinate values; it is a gestalt condition of the theory. “A system state is a state of the system as a whole. It is defined by the unique combination of values of *all* units composing a system. This combination gives to the system as a whole a distinctive condition” (Dubin, 1978, p. 146). Drawing attention to the difference between theoretical system states and theoretical outcomes, Dubin (1978) contrasted conditions of theory in which *all units* have special values versus

conditions in which the focus is on *only one or a subset of all units* that have special values. A theoretical outcome may be defined as:

...a region of values (or a single critical value as well) for one (or some) unit of a model that gives to that unit (or units) a distinctive analytical character. An outcome, then, is a special condition of one or more units, but not of all units. (Dubin, 1978, p. 145)

Therefore, the line separating outcome conditions for subsets of theoretical units and system states of a theory as a whole is drawn between the focus on a region of values for a subset of units in the former and all units simultaneously in the latter.

Certain system states of a theory are of more interest to researchers applying a theory, often due to a particularly salient or valuable set of theoretical outcomes. The subset of theoretical units of interest in these particular system states can typify the system state of the theory. As a consequence, the specific system state may usefully be named after the theoretical units “that exemplify the characteristics of the system state” (Dubin, 1978, p. 151). The theoretical units that exemplify the specific system state are called the *state coordinates* of the system. Not only are the state coordinates used as the descriptive terms for the particular system state, but

Those units of a system that are given the characterization of state coordinates are the ones that name the particular state of the system. In a more exact sense, these are the units often used as the so-called independent units (or variables) in an analytical statement. (Dubin, 1978, p. 151)

It is because of the independent variable – state coordinate relationship that certain system states are of more interest to researchers during the application of the theory.

Based on the types of theoretical laws of interaction that have been defined for the units of a theory, Dubin (1978) defined three general formats for presentation and statement of a

theory's system states. The general format for presenting a "a system state characterized by a categic law of interaction typically has the following format: If ..., then... under conditions of ... " (Dubin, 1978, p. 152). The general format for presenting a system state characterized by a determinant law is "a change in value of  $A$  (in a given direction; by a given amount; in and by both) is accompanied by a change in values of  $B$  (in a given direction; by a given amount; in and by both) under conditions... " (Dubin, 1978, p. 153). The general format for presenting a system state characterized by a sequential law of interaction is "A change in the value of  $A$  (in a given direction; by a given amount; in and by both) is followed in time by a change in the value of  $B$  (in a given direction; by a given amount; in and by both)" under conditions... (Dubin, 1978, p. 153).

**Propositions.** Once a theory's units, laws of interaction, boundaries, and system states have been defined, an initial theoretical framework is in place (Lynham, 2002a, 2002b). "This theoretical framework is essentially the core explanatory container of any theory" (Lynham, 2002b, p. 232). The theoretical framework is made more complete by specification of theoretical propositions, but the theory remains conceptual and unready for testing or application in the real world until empirical indicators and hypotheses are also specified (Torraco, 1994, 1997, 2005a). Theoretical propositions, empirical indicators, and hypotheses help extend the theory into the empirical world of practice (Dubin, 1978; Lynham, 2002a, 2002b; Torraco, 1997). This preparation of theory for extension into empirical research and practice is called operationalization of the theoretical framework (Lynham, 2002a, 2002b). "Once the theoretical framework has been operationalized, the researcher-theorist can begin the conduct of related research to test and confirm, or indeed disconfirm, the theoretical framework in practice, or action" (Lynham, 2002a, p. 261).

Theoretical propositions are *truth statements* about the theoretical framework in operation (Dubin, 1978; Lynham, 2002a; Torraco, 1997); also referred to as *theoretical statements* (Cohen, 1989; Reynolds, 1971). That is, “a proposition, then, is a truth statement about a model when the model is fully specified in its units, laws of interaction, boundary, and system states” (Dubin, 1978, p. 160). Given this definition, two important clarifications should be made about theoretical propositions. The first is clarification on the distinction between the correspondence of theoretical propositions and its theoretical framework versus theoretical propositions and empirical reality. The second is clarification on the content of theoretical propositions with regard to the predictions the propositions make.

Theoretical propositions are “logical deductions about the theory in operation” (Torraco, 1997, p. 129). As a consequence, propositions have a special relationship to the theoretical framework from which they were derived; specifically, it is that they were *derived*. Propositions are not mere statements of truth about the world or what should be experienced within it. Propositions are truth statements specifically about conditions of the theoretical framework from which they were deduced. As a consequence, propositions do not stand on their own merit. Any theoretical proposition that may be considered true is only true to the extent that it may be demonstrated as a logical derivative from a fully specified theoretical framework (Chermack, 2004; Dubin, 1978; Lynham, 2002a; Torraco, 1997). Therefore, on the distinction of *truth statements*, it is important to note the difference in “the correspondence between the predictions of the model and the empirical domain it purports to represent” (Dubin, 1978, p. 160). With theoretical propositions, it is only the former predictions that need necessarily to be true. In fact, “the sole test of the accuracy of a proposition is whether or not it follows logically from the



model to which it applies. Thus, all propositions of a model satisfy logical rules and not empirical rules to establish their truth” (Dubin, 1978, p. 164).

Dubin (1978) further articulated the distinction of correspondence that theoretical propositions have with the theoretical framework in his analysis of the term *truth statement*. There, he makes the distinction between truth in a metaphysical sense and truth in a bounded theory-propositions logical sense.

The term *truth* should not cause any trouble if it is kept clear of its metaphysical connotations. We could just as well employ the term *logical consequence* in place of *truth statement* in the definition of proposition. Care has been taken to state that any system of logic may be employed to establish a truth statement about a theoretical model. This relativity with respect to the system of logic employed makes clear that *the* truth statements about a model may be changed if the system for defining truth is changed. The only criterion of consistency that propositions of a model need to meet is the criterion that their truth be established by reference to only one system of logic for all propositions set forth about the model. (Dubin, 1978, p. 160)

The content of a theoretical proposition is a truth statement about the values taken by theoretical units within the overall theoretical system of units, interactions, boundaries, and states (Lynham, 2002a; Dubin, 1978). These propositional truth statements about system values are *predictions* about “what must be true about the model in operation if we know the components, units, laws of interaction, boundaries, and system states that characterize the model” (Dubin, 1978, p. 163). That is, using the theoretical framework to generate truth statements about the theory in operation is using the theoretical framework to make predictions about the values taken on by the theoretical units under different system states; “the problem of prediction is a problem of establishing unit values” (Dubin, 1978, p. 164) under specific conditions of the theory. In specification of the theoretical model, the various states of activation of the units have already been defined; the laws of interaction have already established “what the relationship is” (Dubin,

1978, p. 170) between theoretical elements; and for the whole, the system's limitations in scope have been defined. However, the prediction of a theoretical proposition extends established relationships and states to predictions about specific values of theoretical units under the relevant theoretical conditions of the theoretical framework (Dubin, 1978).

When developing theoretical propositions, or making predictions about the values of theoretical units in a theoretical model, there are only three types of predictive statements that can be made. Dubin (1978) identified these as follows.

1) Propositions may be made about the values of a single unit of the model, the value of that unit being revealed in relation to the value of other units connected to the unit in question by a law of interaction; 2) Propositions may be predictions about the continuity of a system state that in turn involves a prediction about the conjoined values of all units in the system; or 3) Propositions may be predictions about the oscillation of the system from one state to another that again involves predictions about the values of all units of the system as they pass over the boundary of one system state into another. (Dubin, 1978, p. 166)

The set of three general classes of theoretical propositions are mutually exclusive and exhaustive. There exist no additional classes and all theoretical propositions derived from its underlying theoretical framework must conform to one of these three classes (Dubin, 1978).

**Empirical indicators and hypotheses.** As defined, “an empirical indicator is an operation employed by the researcher to secure measurements of values on a unit” (Dubin 1978, p. 182). Key to the definition of empirical indicator is the term *operation*. An empirical indicator is not just a thing; rather, it is both the process of measurement on a theoretical unit and the measured value resulting from the process of measurement (Dubin 1978; Lynham, 2002a). As an operation, empirical indicators include means to measurement (i.e., instrumentation), the act of measurement, and resulting value of measurement. In other words, “an indicator is a set of

empirical procedures (operations) which generates an instance of a concept” (Cohen, 1989, p. 153). Empirical indicators are “empirical measures used to make the propositions testable” (Torraco, 1997, p. 129). Prior to defining empirical indicators, theoretical units remain abstract and disconnected with the empirical world; the theoretical units remain only the properties of the things that the theory is about (Dubin, 1978). It is through the operation of empirical indicators that the abstract properties of things in the theory are given in empirical example. Empirical indicators serve as the critical link between theory and the empirical world; that is, an empirical indicator “emphasizes the relationship between ideas and observations” (Cohen, 1989, p. 155).

Given that empirical indicators provide the operation for linking the theoretical framework to the empirical world, hypotheses allow the researcher to make specific “statements about the predicted values and relationships among the units” (Torraco, 1997, p. 129). “An hypothesis may be defined as the predictions about values of units of a theory in which empirical indicators are employed for the named units in each proposition” (Dubin 1978, p. 206). More structurally, an hypothesis is “(1) a singular statement that (2) predicts a relationship between two or more indicators and (3) can be true or false” (Cohen, 1989, p. 241). Just as there is link between theoretical framework and theoretical propositions, there is also link between theoretical framework, theoretical propositions, and hypotheses. A theoretically-driven hypothesis “is not an *ad hoc* question to be answered by research but is rather a prediction of values on units that in turn are derivable from a proposition about a theoretical model” (Dubin 1978, p. 206). Of all the elements of a theory, the hypotheses are “the closest to the ‘things observable’ that the theory is trying to model” (Dubin 1978, p. 205). The “linkage between the theoretical framework and the real world is made possible by translating some of the propositions of the theory to testable

hypotheses, a process further informed by the empirical indicators identified for the units of the theory” (Lynham, 2002a, p. 267).

It should be clear at this point, that there is a strong interdependency among all the components of a theory, and as a consequence, a dependency among the ways with which the theory can ultimately be paired with the empirical world. Not only do the types of theoretical units and the types of theoretical laws relating the units begin to define the nature of the propositions that can be formed, but, there are further relations among the theoretical units, propositions, empirical indicators, and hypotheses. As a general rule, “every time the name of a unit appears in a proposition, there must be substituted for it an empirical indicator that measures values on this unit” (Dubin 1978, p. 206). More than one empirical indicator can be used to measure each theoretical unit. Furthermore, “every proposition has the potential of being converted to a large number of hypotheses... a new hypothesis is established each time a different empirical indicator is employed for any one of the units designated in a proposition” (Dubin 1978, pp. 208-209).

The formulation of hypotheses represents the final element of a fully operationalized theoretical framework. Operationalization “is achieved by first specifying propositions derived from the framework, then identifying corresponding empirical indicators informed by the propositions, and finally constructing hypotheses based on the propositions and informed by the empirical indicators” (Lynham, 2002a, p. 261). Interestingly, a fully operationalized theoretical framework should emphasize the number of areas that may be susceptible to flawed translation of the theoretical framework into the empirical world. There is a multiplicative relationship between the number of propositions, empirical indicators, and hypotheses. A failure of one such

combination to demonstrate congruence with the empirical world does not directly indicate an internal flaw in the theoretical framework.

In the next section on theoretical range, the bias of the positioning of the current anatomical representation of theory towards theories of the middle range should begin to emerge. However, the bias in anatomical description is not as much intentional as much as it just happens to be most clearly represented in the literature at the middle range level. What is currently not clear though is the degree to which the defined elements of a middle-range theory persist, or cease to do so, when examining theory opposite middle-range theory at either end of the continuum, i.e., narrow-range theories and grand theories. Or interestingly, perhaps range may not only impact persistence of elements, but also impact the presumed order in which the elements form in connection with the data-explanation relationship. Differences in theoretical range do not appear to be simple divergences in the *degree* of application of the theoretical explanation. Differences in theoretical range speak to fundamental differences not only in the theory itself, but issues of theoretical range also suggest the possibility of fundamental differences in the inquiry paradigms and inquiry methodologies involved in the theory's formulations. Many of the issues involved in considering theoretical range are addressed, if not at least unearthed next.

### **Considering Theoretical Range**

Issues of theoretical range may be dismissed as less complex and less dimensional than they truly are. The language around *range* was popularized by Merton (1968) regarding the type of social science theory, i.e., “theories of the middle range... [or] middle-range theory” (Merton, 1968, p. 39), that should be central to the work of social scientists, particularly sociologists.

Merton advanced middle-range theory as means to guide empirical research, to consolidate empirical findings, and as stepping stone towards grand theory (Merton, 1968; Pinder & Moore, 1980; Poole, 1985). The type of theory aptly got its name from being positioned somewhere in between, or *in the middle of*, the day-to-day *working hypothesis* temporally and contextually tied to data, and, the all-embracing, temporally and contextually untethered *grand theory* of social systems (Bourgeois, 1979; Merton, 1968; Pinder & Moore, 1980; Poole, 1985).

Given the *between* positioning of middle-range theory, over time, it has become customary to organize theory along a continuum of abstraction ranging from Meta-theory → Grand theory → Middle range theory → Narrow range theory (Brink, 2006; Merton, 1968; Pinder & Moore, 1980; Poole, 1985). Other distinctions include macro to micro theory and molar to molecular theory (Kaplan, 2009). However, when considering issues of theoretical range, it becomes apparent that the simplified continuum may actually be much more multidimensional than the singular continuum implies (Kaplan, 2009). Due to the extensive attention that Merton's concept of middle-range theory has received over the years, Merton's proposal has been interpreted and articulated by a number of authors. For that reason, discussion of Merton's theories of the middle range serves as an appropriate entry point into the conversation on theoretical range as means to providing context for further exploration of the potential dimensionality of the range concept.

**Merton's middle range theory.** Specifically, Merton defined *his conception* of middle-range theory as those “theories that lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and the all-inclusive systematic efforts to develop a unified theory that will explain all the observed uniformities of social behavior, social

organization, and social change” (Merton, 1968, p. 39). The emphasis being made here is on Merton’s conception of middle-range theory and not necessarily any broader conception held collectively today. A number of scholars have interpreted Merton’s 1968 chapter on *social theories of the middle range* (e.g., Bourgeois, 1979; Layder, 1993; Pinder & Moore, 1980; Poole, 1985); those as well as Merton’s original writing are used here to position and describe his work. A number of key features have been used to define Merton’s middle-range theory over the years. Poole (1985) summarized seven of these features of Merton’s middle-range theory as:

(a) it could be used to guide further empirical research; (b) it was intermediate to general theories which were too distant from particular phenomena to provide an accurate account or explanation of what was being observed, and to detailed orderly descriptions of particulars that are not generalized at all; (c) it made use of abstractions which were still sufficiently similar to observed data to be used in propositions which could be tested empirically (thus we know it contains propositions); (d) it dealt with delimited aspects of data; (e) it was not logically derived from a single universal theory; (f) it consolidated empirical findings; and (g) it could only be developed effectively after a great mass of basic observations had been accumulated. (Poole, 1985, pp. 84-85)

In Merton’s conception, middle-range theories are smaller than “comprehensive theories... whose construction is a function of the state of knowledge in a field” (Bourgeois, 1979, p. 443). Comprehensive theories are “too remote from particular classes of social behavior... to account for what is observed” (Merton, 1968, p. 39). However, middle-range theories are larger than narrow-range theory “that deals with one person in one situation at one point in time” (Brink, 2006, p. 21). Narrow-range theories are embedded in temporally and contextual bound data and “those detailed orderly descriptions of particulars that are not generalized at all” (Merton, 1968, p. 39). Middle-range theories have a strong connectedness to the empirical world (Layder, 1993; Poole, 1985); that is, they are generated from data, rather than derived from grand or comprehensive theory (Pinder & Moore, 1980; Poole, 1985). There is a constant and iterative link between empirical data and abstraction in middle-range theory. Not

only are the abstractions formed from empirical data, but the abstractions serve hypothesis generating functions (Bourgeois, 1979; Merton, 1968; Pinder & Moore, 1980; Poole, 1985) that are in turn verified through empirical research (Bourgeois, 1979; Layder, 1993; Merton, 1968; Pinder & Moore, 1980). Because middle-range theories are connected to the empirical world both in generation and testing, the primary purpose of middle-range theory is to guide empirical inquiry (Bourgeois, 1979; Merton, 1968; Poole, 1985). However, given the smaller-than-comprehensive theory nature of middle-range theories, they do not deal with all social data and all social phenomena; rather, only a delimited set of both (Merton, 1968; Pinder & Moore, 1980; Poole, 1985).

Of particular importance to the concept of middle-range theories is the concern with “the *recurrent* [emphasis added] aspects of social life rather than those that are unique and fleeting since these are not general enough to count as properly social characteristics” (Layder, 1993, p. 21). Recurrence is demanded in order to make prediction, and making prediction is an essential feature of middle-range theory’s testability. In order for middle-range theory to guide inquiry, in the particular way it guides inquiry, the relationship between abstraction and empirically measurable variables is emphasized; thus, “the theoretical significance of an empirical regularity allows... for the cumulative and systematic development of theory since it is given a firmer grounding by continually testing it against empirical evidence” (Layder, 1993, p. 22)

**A broader look at issues of theoretical range.** In consideration of the broader meaning of theoretical range outside of Merton’s middle-range conception, review of the literature reveals a number of terms used to describe range that do little to provide further conceptual traction



towards understanding the meaning of theoretical range, but if anything, begin to elucidate the potential dimensionality of the idea of theoretical range. Some of these terms include:

- *Purpose*, where purpose is generally defined as guiding empirical inquiry, .e.g., through generation of predictions, delimiting data of interest, formation of hypotheses (Brink, 2006; Bourgeois, 1979; Layder, 1993; Merton, 1968; Poole, 1985).
- *Scope*, where scope is generally defined as the number of problems explained by the theory, e.g., one behavior or a number of them (Brink, 2006; Kaplan, 2009; Merton, 1968; Pinder & Moore, 1980).
- *Level of abstraction*, where abstractedness is defined as the degree of empirical context or length of the reduction chain connecting the theoretical constructs with observable ones (Brink, 2006; Kaplan, 2009).
- *Range*, itself, where range is defined as the things to which the theory applies from broad to limited, e.g., human behavior versus animal behavior or individual behavior versus organizational behavior (Kaplan, 2009).

Further review of the literature on theory with an emphasis on explanations of the meaning of range reveal a number of concepts that start to shed some light not only on the dimensionality of the meaning of theoretical range, but many of the specific dimensions as well. Three general types of explanations of theoretical range seem to give range its full character. These three can be described as those capturing the boundedness defined by range, those that explain what's inside the boundedness of the range, and those differentiating the specific features that comprise the range of a theory.

To a limited extent, the boundedness of a theory relates to the bigness or smallness of the theory in terms of the boundary of the theory, e.g., postpositivist “small theory” (Guba, 1990c, p. 251). The boundedness that determines the size of a theory may be understood in a couple of ways. First, there is the “theoretical boundary” (Dubin, 1978, p. 125) as described by Dubin. Recall that a theoretical boundary has been defined as the demarcation between that limited portion of reality modeled by the theory from everything else. In defining how big or small that boundary is, Dubin further noted that “there is an inverse relationship between the number of the boundary-determining criteria employed in a model and size of the domain covered by the model” (Dubin 1978, 134); thus, the boundary-determining criteria imposed on a theory stipulate the limited empirical circumstances to which the theory is intended to be meaningful. As a consequence, the more stipulations on relevant empirical circumstances of the theory, the smaller the theoretical boundary or the greater the boundedness of the theory.

In addition to Dubin’s (1978) theoretical boundary, the boundedness of a theory may also be understood in terms of the theory’s “explanatory shell” (Kaplan, 2009, p. 299) as described by Kaplan. Here, the shell may be considered “a sphere containing whatever is referred to in the theory... The contents of the shell constitute what is, from the standpoint of the theory, an effectively isolated system” (Kaplan, 2009, p. 299). In other words, if a theory is intended to represent properties and relationships of *things*, then the explanatory shell defines all the things that theory may be considered in reference to in reality and distinguishes them as a subset from all other things. Kaplan draws the contrast in the nature of the explanatory shell as the length of the radius of that shell, thus a longer radius would imply that more things are being referred to by the theory; but defines it as distinct from the extensiveness of the sorts of problems that the theory explains (Kaplan, 2009).

Given that the boundedness of a theory may be described as the explanatory shell discriminating the limited portion of reality modeled by the theory, attention may now be put on further understanding what is within the bounded shell of a theory. Dubin defined the region inside the theoretical boundary as “the territory over which we can make truth statements about the model and, therefore, about the values of the units composing the model” (Dubin 1978, pp. 134-135). Dubin emphasized the relation between the building blocks of the theory and theory’s propositions; that is, the connectedness of the theoretical units as referents in the truth statements that can be generated from the theory. This idea that the territory within the boundedness of the theory is both the source and limitation of the theoretical propositions was something that was also reflected in the writings of Whetten (1989) and Merton (1968). Whetten further described this territory as the Who, Where, and When of the theory (Lincoln & Lynham, 2011; Whetten, 1989). Specifically, the Who, Where, and When of the theory are the “temporal and contextual factors [that] set the boundaries of generalizability, and as such constitute the range of the theory” (Whetten, 1989, p. 492). What’s inside the boundedness of the theory directly relates to, as well as limits, the propositions that can be formulated about the theoretical framework in operation (Dubin, 1978; Lynham, 2002a; Torraco, 1997); therefore, the theoretical range relates to both the boundary condition of the theory and the content of the truth statements that can be made about the theory.

Numerous features of theoretical range can be distilled from the literature on theory. Figure 9 graphically presents a number of features relevant to understanding theoretical range. Even though the specific features that comprise theoretical range add further detail to the broader conversation on what range is, they also begin to delineate more specifically the types of features

that make theoretical range a multi-dimensional concept. A number of the features considered dimensions of the character of theoretical range are listed below.

Theoretical range involves (among other issues):

- The size of the explanatory shell or theoretical boundary that includes everything that is referred to by the theory (Brink, 2006; Dubin, 1978; Kaplan, 2009; Merton, 1968; Pinder & Moore, 1980)
- The implied level of analysis of the theory, i.e., behavior, whole person, group, organization, etc (Kaplan, 2009).
- The extent of the direct connection of theory with the empirical world, and therefore its guiding influence on research and/or practice (Bourgeois, 1979; Layder, 1993; Merton, 1968; Poole, 1985).
- The accuracy versus generalizability of the theory, i.e., the possibility of being general, accurate, and simple simultaneously (Weick, 1980, pp. 398-400, in Pinder & Moore, 1980).
- The level of abstraction or contextualization of the theory, i.e., nomothetic vs idiographic (Bacharach, 1989; Brink, 2006; Kaplan, 2009; Lincoln & Lynham, 2011; Whetten, 1989).
- The time-boundedness of the theory, i.e., “event” Dubin, 1978, i.e., nomothetic vs idiographic (Bacharach, 1989; Dubin, 1978; Lincoln & Lynham, 2011; Whetten, 1989).
- The forms of knowledge that the theory represents, as well as the implied paradigm (and consequently philosophical methodology) to which the theory belongs; “for

postpositivists, reality is what works, what can be warranted or verified; knowledge is *small theory*” (Guba, 1990c, p. 251).

- The theoretical strategy: research-then-theory vs theory-then-research, e.g., middle range theories are not derived from axioms, but driven by contact with data (Layder, 1993; Reynolds, 1971).

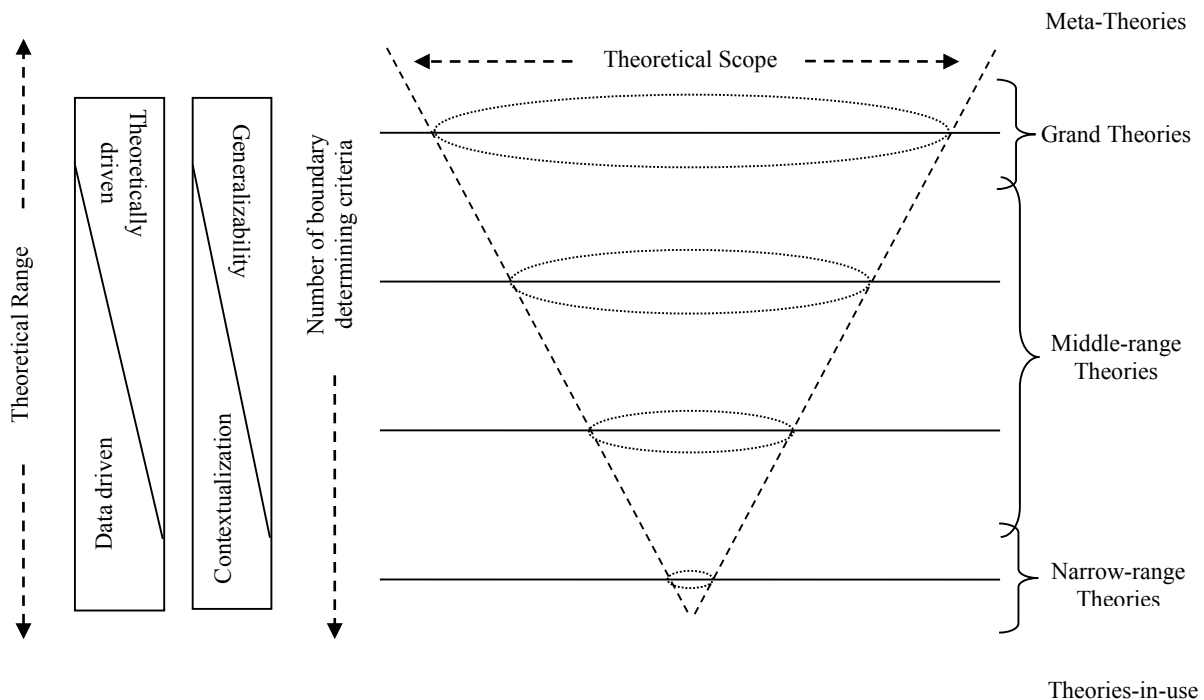


Figure 9. Graphical representation of some of the concepts of theoretical range.

## The Roles of Theory in Inquiry

Theory scholars have suggested a number of roles that theory plays in inquiry (e.g., Campbell, 1990; Cohen, 1989; Lynham, 2002b; Lynham, 2000b; Torraco, 1994; Torraco, 1997; Torraco, 2002; Van de Ven, 1989; Van Maanen, Sorenson, & Mitchell, 2007). These roles include (but are not limited to) theory as means to identifying research problems, framing data

for interpretation, and prescribing and evaluating solutions to research problems. However, as a whole, the role of theory in disciplined inquiry is one of symbiotic guidance. In disciplined inquiry, within which the goal is the formation of knowledge, theories serve a number of essential functions in the development and evaluation of that knowledge (Cohen, 1989). This chapter later explores in detail the range of roles that theory plays in inquiry.

For the current exploration of the range of the roles of theory in inquiry, a small number of sources were sampled from across the disciplines of Industrial/Organizational Psychology, Sociology, HRD, and Management. Each source explicitly discussed the role(s) of theory in the activities of inquiry. All of the discussed roles of theory in inquiry were individually recorded, categorically sorted, and then a list of roles that theory may play in inquiry was compiled. While the small sample is clearly not representative of all disciplines, the compiled list may be at least considered generalizable of theoretical roles in inquiry because, as noted by Torraco (1997), “the roles that theory serves in HRD are essentially the same those served by theory in other disciplines. Indeed, theory’s potential value for guiding scientific understanding, explanation, and prediction cuts across all professional disciplines” (p. 116).

A number of roles of theory in inquiry suggested by Campbell (1990) have been reiterated over the years by other theory scholars (Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002). These roles of theory in inquiry include:

- “Theories tell us that certain facts among the accumulated knowledge are important, and others are not” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002), e.g., theories help prioritize important research issues.

- “Theories can give old data new interpretations and new meaning” (Campbell, 1990, p. 65; also cited in Lynham, 2002b; Torraco, 1994, 1997, 2002), e.g., old data can be reinterpreted within new explanatory frameworks.
- “Theories identify important new issues and prescribe the most critical research questions that need to be answered to maximize understanding of the issue” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002; similar notion referenced in Van de Ven, 1989), e.g., theories highlight gaps in our knowledge.
- “Theories provide a means by which new research data can be interpreted and coded for use” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002), e.g., theories provide the explanatory framework for organizing and understanding new data.
- “Theories provide a means for identifying and defining applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002), e.g., issues in practice can be highlighted by the explanatory power of theories, or conversely, issues in practice can highlight the need for theory.
- “Theories provide a means for prescribing or evaluating solutions to applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2002), e.g., because theories can help highlight the research problem, they can also help researchers define appropriate solutions both a priori (prescription) and a posteriori (evaluation).
- “Theories provide a means for responding to new problems that have no previously identified solution strategy” (Campbell, 1990, p. 65; also cited in Lynham, 2000b,

2002b; Torraco, 1994, 1997, 2002), e.g., Kaplan's knowledge growth by extension (2009).

However, in addition to the roles of theory prescribed by Campbell (1990), a number of additional roles of theory in inquiry have been suggested by theory scholars. These include:

- “Theory provides members of a professional discipline with a common language and a frame of reference for defining boundaries of their profession” (Torraco, 1997, p. 119; similar notion also referenced in Cohen, 1989; Lynham, 2000b, 2002b)
- “Theory allows us to avoid recreating the wheel in our research” (Torraco, 2002, p. 174)
- “Theory can open up new intellectual perspectives to catalyze research” (Torraco, 2002, p. 174)
- “A theory organizes ideas and, in so doing, may uncover hidden assumptions” (Cohen, 1989, p. 189)
- “A theory generates new ideas” (Cohen, 1989, p. 189)
- “A theory may display the complexities of a problem” (Cohen, 1989, p. 189)
- “A theory may relate what on the surface are different problems” (Cohen, 1989, p. 189)

One of the more significant roles of theory in inquiry, and of particular importance to the current work, is the methodological role that theory plays in inquiry. It has already been highlighted that theory can both illuminate problems and prescribe solutions (i.e., entry and exit conditions of the inquiry process); theory can focus our attention on certain data and provide a way to interpret and see meaning in the data; and theory can even reveal unanswered research



questions and important gaps in our understanding. However, with regard to “how the empirical regress is to be carried out” (Kant, 2007, p. 449), theory also informs and guides methodological choices of the researcher; that is, “theory can generate and shape method” (Van Maanen, Sorenson, & Mitchell, 2007, p. 1146). Van Maanen, et al (2007, p. 1147) suggest a few ways that theory can shape method in inquiry:

- Theory may generate and shape method through “its level of analysis” (Van Maanen, et al, 2007, p. 1147) by defining the size of the system of relations of interest: individual, group, organization, etc.
- Theory may generate and shape method through “its stage of articulation” (Van Maanen, et al, 2007, p. 1147) depending upon the maturity of the theory-building development cycle.
- Theory may generate and shape method through “the types of constructs it proposes” (Van Maanen, et al, 2007, p. 1147); as described previously with the nature of the theoretical units.
- Theory may generate and shape method through “its descriptive or prescriptive nature” (Van Maanen, et al, 2007, p. 1147) given an emphasis on describing the way things are versus the way things should be, could be, or ought to be given some criteria.
- Theory can inform “research design” (Van Maanen, et al, 2007, p. 1147) choices given a set of “state coordinates” (Dubin, 1978, p. 151) serving as independent variables.
- Theory can inform “choice of measures” (Van Maanen, et al, 2007, p. 1147) given empirical indicators.

- Theory can inform selection of “samples” (Van Maanen, et al, 2007, p. 1147) given theoretical boundaries.

While this list is not intended to be exhaustive of all possible roles that theory can play in inquiry, it does underscore the importance of theory for inquiry. Nearly every facet of inquiry *can be* guided and informed by theory (Cohen, 1989; Lynham, 2000b, 2002b; Torraco, 1997), so that “we do not have to approach new research opportunities blindly” (Torraco, 2002, p. 174). The list of methodological implications of theory in inquiry stresses the relationships between theory and ways of understanding as well as theory and ways of engaging in the inquiry process. As pointed out by Van Maanen, et al (2007, p. 1146), “methods without theoretical substance can be sterile, representing technical sophistication in isolation” or the generation of “data primarily for the purpose of applying rigorous statistical techniques” (Bourgeois, 1979, p. 443). Theory can provide both context and justification for methodological choices.

In summary, the six key roles of theory in inquiry may be pulled forward as a reorganization of the numerous roles of theory identified in the literature; each of the six roles of theory in inquiry are further detailed in Table 45. These six roles are:

- Theory as means to organizing what is known and what is not known
- Theory as means to identifying/prioritizing research issues
- Theory as means to identifying research problems
- Theory as means to prescribing and evaluating solutions to research problems
- Theory as means to framing data for interpretation
- Theory as means to generate and shape method

Table 45

*Table of Roles of Theory in Inquiry*

<b>Role of Theory in Inquiry</b>	<b>Examples of Theoretical Role</b>
Theory as means to organizing what is known and what is not known	“Theory allows us to avoid recreating the wheel in our research” (Torraco, 2004, p. 174)
	“Theory can open up new intellectual perspectives to catalyze research” (Torraco, 2004, p. 174)
	“A theory organizes ideas and, in so doing, may uncover hidden assumptions” (Cohen, 1989, p. 189)
	“A theory generates new ideas” (Cohen, 1989, p. 189)
	“A theory may display the complexities of a problem” (Cohen, 1989, p. 189)
Theory as means to identifying/prioritizing research issues	“A theory may relate what on the surface are different problems” (Cohen, 1989, p. 189)
	“Theories tell us that certain facts among the accumulated knowledge are important, and others are not” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2004), e.g., theories help prioritize important research issues.
Theory as means to identifying research problems	“Theory provides members of a professional discipline with a common language and a frame of reference for defining boundaries of their profession” (Torraco, 1997, p. 119; similar notion also referenced in Cohen, 1989; Lynham, 2000, 2002b)
	“Theories identify important new issues and prescribe the most critical research questions that need to be answered to maximize understanding of the issue” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2004; similar notion referenced in Van de Ven, 1989), e.g., theories highlight gaps in our knowledge.
Theory as means to prescribing and evaluating solutions to research problems	“Theories provide a means for identifying and defining applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000, 2002b; Torraco, 1994, 1997, 2004), e.g., issues in practice can be highlighted by the explanatory power of theories, or conversely, issues in practice can highlight the need for theory.
	“Theories provide a means for prescribing or evaluating solutions to applied problems” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2004), e.g., because theories can help highlight the research problem, they can also help researchers define appropriate solutions both a priori (prescription) and a posteriori (evaluation).
Theory as means to framing data for interpretation	“Theories provide a means for responding to new problems that have no previously identified solution strategy” (Campbell, 1990, p. 65; also cited in Lynham, 2000, 2002b; Torraco, 1994, 1997, 2004), e.g., Kaplan’s knowledge growth by extension (2009).
	“Theories can give old data new interpretations and new meaning” (Campbell, 1990, p. 65; also cited in Lynham, 2002b; Torraco, 1994, 1997, 2004), e.g., old data can be reinterpreted within new explanatory frameworks.
	“Theories provide a means by which new research data can be interpreted and coded for use” (Campbell, 1990, p. 65; also cited in Lynham, 2000b, 2002b; Torraco, 1994, 1997, 2004), e.g., theories

	provide the explanatory framework for organizing and understanding new data.
	Theory may generate and shape method through “its level of analysis” (Van Maanen, et al, 2007, p. 1147) by defining the size of the system of relations of interest: individual, group, organization, etc.
	Theory may generate and shape method through “its stage of articulation” (Van Maanen, et al, 2007, p. 1147) depending upon the maturity of the theory-building development cycle.
	Theory may generate and shape method through “the types of constructs it proposes” (Van Maanen, et al, 2007, p. 1147); as described previously with the nature of the theoretical units.
Theory as means to generate and shape method	Theory may generate and shape method through “its descriptive or prescriptive nature” (Van Maanen, et al, 2007, p. 1147) given an emphasis on describing the way things are versus the way things should be, could be, or ought to be given some criteria.
	Theory can inform “research design” (Van Maanen, et al, 2007, p. 1147) choices given a set of “state coordinates” (Dubin, 1978, p. 151) serving as independent variables.
	Theory can inform “choice of measures” (Van Maanen, et al, 2007, p. 1147) given empirical indicators.
	Theory can inform selection of “samples” (Van Maanen, et al, 2007, p. 1147) given theoretical boundaries.

### **The Axiomatic Form of Theory**

According to Reynolds axiomatic theory “is typically defined as an interrelated set of definitions and statements” (Reynolds, 1971, p. 92) that includes: (a) theoretical concepts or constructs, (b) scope conditions, (c) axiom statements, (d) propositions derived from axiom combinations, and (e) a logical system within which to relate the theoretical concepts and derive propositions. As further defined by Reynolds (1971), the axiomatic form of theory should include a consistent and parsimonious set of axioms that result in an easy to understand theory rather than complicated and cumbersome set of relationships.

As described in further detail by Lincoln and Guba (Guba & Lincoln, 1982a; Lincoln & Guba, 1985b; Guba & Lincoln, 1989), axioms are “basic beliefs” or “self-evident truths” (Lincoln & Guba, 1985b, p. 33) from which accepted practices, rules of thumb, or “theorems” (Lincoln & Guba, 1985b, p. 34) can be deduced. Therefore axioms are “the set of undemonstrated (and undemonstrable) propositions accepted by convention (even if only

intuitively) or established by practice as the basic building blocks of some conceptual or theoretical structure or system” (Guba & Lincoln, 1982a, p. 236). Whereas axioms represent basic truth statements, or here basic beliefs, theorems represent derived statements of the axiomatic theory in operation, or in the case of the paradigm theory, operational characteristics of the postures typically assumed by practitioners following the orientation of a paradigm’s set of axioms (Lincoln & Guba, 1985b).

The axiom-theorem relationship is one where the theorem, as a common practice or statement of practice, can be proven, or shown to be truth, based on logical derivation from the axiom or self-evident truth. Thus, unproven self-evident statements are axioms and proven logical deductions of the axioms are theorems. However, the truth of the derived theorems depends upon the truth of the unproven, yet undemonstrable truth of the axiom. Even if accepted only as analogs to derived theorems, the conceptually derived postures demonstrate the strongest alignment with *enacted* elements of the process of inquiry in action, and most readily lend themselves to observation within actual inquiries and thus *tests of fit* (Lincoln & Guba, 1985b). As operationalized propositions, they truly represent action statements for engaging in inquiry.

The appropriateness of an axiomatic system and its theorems or derived operational characteristics of inquiry are judged by two standards: justification and fit with reality. A justified set of axioms are coherent and synergistic (Reynolds, 1971). A justified set of theorems are synergistic and stand in deductive logical relation with their underlying axioms; however, a justified set of theorems need not fit empirical reality, and in fact, is not a requirement of the justified set (Lincoln & Guba, 1985b; Reynolds, 1971). Yet, where justification meets standards of logical analysis, tests of fit need only meet judgments of utility. As emphasized by Guba

(1987), the test of an axiomatic system for inquiry is whether or not its theorems turn out to be useful for and congruent with the inquiry experienced.

Value judgments concerning the justification of an axiomatic system's theorems are made by evaluating two factors: (a) the logical dependence of the set of theorems upon the axioms that undergird the paradigm, and (b) the coherence and interdependence among set of derived theorems (Lincoln & Guba, 1985b). That is, justified theorems must arguably be logical derivatives of the underlying axiomatic system (Guba, 1987a/b), and, hang together in such a way that they "display a synergism such that, once one is selected, the others more or less follow" (Lincoln & Guba, 1985b, p. 39). There is no requirement in the value judgment of justification that the set of theorems fit the empirical world (Guba, 1987a/b). However, a test of fit depends first upon deducing a set of theorems and second upon applying the theorems and evaluating weaknesses.

I shall take the tack that in geometry one can test the utility of one's axioms by deriving whatever theorems it yields and applying those theorems; problems in the belief system will become evident quickly enough. Similarly, I will argue, one can derive theorems from the paradigmatic axioms and attempt to apply them; again, the test for us will be to see which set turns out to be more useful for... [inquiry], more congruent with the world of... [inquiry] experience as we typically confront it. (Guba, 1987, p. 33)

Value judgments concerning the empirical fit of an axiomatic system's theorems is one of utility. Even though a justified set of theorems may demonstrate synergy and deductive logical relation with underlying axioms, they may still present no utility for understanding the empirical world if there is a large enough gap between the logical theory and the world of experience, i.e., usefulness and congruence. It is important to highlight that justification is a different animal than testing fit. That is, fit tests a paradigm's "utility for performing in the arena in which one wishes to apply it" (Guba, 1987).

It is also important to further emphasize that the axioms themselves are not directly testable (even though they may rationally *fit*); rather, the theorems derived from the axioms serve as operationalized statements of observable characteristics (here, characteristics of inquiry) that may actually be empirically observed and compared for test of fit. The operational nature of theorems allows direct comparison with actual inquiry for judgments of fit with, or utility for, human inquiry. Therefore, operationalizing inquiry characteristics in specific features of the “research process” (Denzin & Lincoln, 2005, p. 21) is essential, or in the very least helpful, for the direct comparisons with inquiry experiences necessary for utility judgments regarding the axiomatic system.

In summary, the following key features of axiomatic theories may be pulled forward. The axiomatic form of theory includes five basic components:

- Theoretical concepts or constructs
- Scope conditions
- Axiom statements
- Propositions derived from axiom combinations
- A logical system within which to relate the theoretical concepts and derive propositions

Furthermore, the axiomatic form of theory is capable of being evaluated with two types of value judgments:

- Value judgments of justification
- Value judgments of fit with reality

## **Typologies and Taxonomies**

Broadly speaking, taxonomies are classification systems that describe sets of semantically different categories, and attributes of the categories, that constructs, concepts, or phenomena may be organized into. Taxonomies further provide the decision rules by which semantically heterogeneous constructs, concepts, or phenomena can be grouped through assignment of category membership (Bobko & Russell, 1991; Doty & Glick, 1994). Typologies on the other hand are exhaustive systems of ideal types, where each ideal type is similar to a theoretical system state in which the ideal type represents a unique combination of attributes that together take on a unique system characteristic (Doty & Glick, 1994; Dubin, 1978). Furthermore, due to the theoretical properties of typologies, when correctly developed, typologies may also be considered a form of theory. Taxonomies, typologies, and the typological form of theory are each discussed in further next.

### **Taxonomies**

“Taxonomies are, quite simply, attempts at classification” (Bobko & Russell, 1991, p. 293). As a classification system, the categories of a taxonomy distinguish heterogeneity among the elements being classified, while simultaneously identifying the elements with sufficient homogeneity to fit together within any single category. Within category attributes may be defined to further account for additional heterogeneity among grouped elements resulting in even greater homogeneity among elements than accomplished with the high level category alone. The efficiency of the taxonomy exists in the tension of between-category heterogeneity and within-category homogeneity. The opposite extremes of the tension are one category for all elements versus one unique category for all elements. Thus, a taxonomy should, in practice, simplify the



full complexity of all unique elements to some degree by meaningfully aggregating them into fewer categories than elements, i.e., at least  $n-1$  categories; thus, the process of classification (Bobko & Russell, 1991; Doty & Glick, 1994; Guba, 1978b; Guba & Lincoln, 1981).

## **Typologies**

Typologies share similar components with taxonomies, but impose greater integration and specification among the elements than the mere classification rules of taxonomies.

Typologies have two types of constructs, first-order constructs and ideal types. First-order constructs are the “building blocks” (Doty & Glick, 1994, p. 234) of an ideal type. In typologies, the category and attribute structure of taxonomies are leveraged as the first-order constructs; however, unique holistic configurations of sets of first-order constructs are further used to define a complex, synergistic pattern greater than the sum of the first-order constructs, i.e., an ideal type. The typology defines numerous ideal types among the taxonomic-like set of first-order constructs. In this sense, there is both hierarchical and holistic organization to typologies; the organizing framework of ideal types and the specific, unique patterning of holistic ideal type. The dual organization of information is one made analogous to a grand theory with multiple nested middle range theories (Doty & Glick, 1994; Pinder & Moore, 1980).

## **The Typological Form of Theory**

Typological theories are explicit theoretical formulations of fully specified typologies. The typological approach to theory building is a unique method of generating theoretical frameworks by developing a classification scheme of concepts (i.e., a taxonomy), and then, both specifying the relationships among concepts and identifying system states as sets of ideal types

(Doty & Glick, 1994). As theories, typological theories must meet certain minimum criteria to be considered theory. The suggested minimum criteria to be considered theory are as follows (Doty & Glick, 1994; Bobko & Russell, 1991; Pinder & Moore, 1980):

- Inclusion of first-order constructs,
- inclusion of holistic ideal type constructs comprising the first-order constructs,
- specific relationships between first-order constructs that together define a unique Gestalt-like pattern for each ideal type
- complex hierarchical organization that includes a grand theory –like structure that generalizes to all forms of the phenomenon explained and several middle range –like theories (i.e., ideal types) that explain specific instances of the phenomenon, and
- it must be testable in the sense that the internal consistency of ideal types can be judged and it is extensible to some empirical world so that some assessment of its degree of fit may be had.

The last requirement is more ambiguous than the others. One of the advantages of typological theories are the capability to extend beyond a purely empirical world (Doty & Glick, 1994; Mintzberg, 2005). That is, because typological theories specify ideal types, typological theories allow specification of instances of a phenomenon that may extend beyond anything empirically observed. Rather, ideal types are notions about something potentially more perfect, or orderly, or idyllic than exists. As a consequence, while rich in description, the ideal types of a typological theory may have less descriptive power than prescriptive, normatively reinforcing influence; “thus, typologies may not only allow theoretical advances, but they may also allow theorists to make better normative prescriptions” (Doty & Glick, 1994, p. 245).

In summary, three general characteristics of typological theories may be pulled forward. The theory must exhibit certain taxonomic characteristics, exhibit certain typological characteristics, and further must meet certain minimum criteria to be considered typological theory. The taxonomic characteristics of a typological theory include: division of elements into semantically heterogeneous categories, inclusion of within category attributes to further account for additional heterogeneity among grouped elements, decision rules for classification, and a resulting simplification of all unique elements in an aggregate classification scheme within which the number of categories is at least  $n-1$  elements. The typological characteristics include: first-order constructs, ideal types comprising first-order constructs, and a resulting holistic organization of category attributes into ideal types and ideal types into typologies.

The minimum criteria that must be met to be judged as typological theory include:

- First-order constructs
- Ideal types comprising first-order constructs
- A unique Gestalt-like pattern for each ideal type defined by its first-order constructs and the relationships between first-order constructs
- Complex hierarchical organization that includes:
  - a grand theory –like structure generalizing to all forms of the phenomenon explained and
  - several middle range –like theories (i.e., ideal types) that explain specific instances of the phenomenon
- The internal consistency of idea types can be judged.
- The degree of empirical fit or normative influence on practice may be judged.

## APPENDIX C. REVIEW OF THEORY PROCESS

### **The Theory-building Process**

A theory may be generally defined as “any coherent description, explanation, and representation of observed or experienced phenomena” (Gioia & Pitre, 1990, p. 587).

Accommodating the influence of one’s worldview, Lynham (2000, p. 161) offers a sufficiently broad, i.e., paradigmatically neutral, definition of theory building that builds on Gioia and Pitre’s (1990) theory definition:

Theory building is the process of building a theory, a process that is informed and influenced by one’s view or definition of theory ...the process or recurring cycle by which coherent descriptions, explanations, and representations of observed or experienced phenomena are generated, verified, and refined. (Lynham, 2000b, p. 161)

In other words, given that “descriptions, explanations, and representations of observed or experienced phenomena” (Lynham, 2000b, p. 161) rest at the core of theory, theory building is the “ongoing process of producing, confirming, applying, and adapting” (Lynham, 2002b, p. 222) those descriptions, explanations, and representations of the world around us.

### **Theorizing Versus Theory Building**

Although there are many different process representations of theory building, each with differing phases and/or steps, a common conception is the two part high level distinction of a theorizing half, i.e., “the theory development side” (Lynham, 2000b, p. 243), and a practice half, i.e., “research operation side” (Lynham, 2000b, p. 244), of the theory-building process (Chermack, 2006, Lynham, 2000b, 2002b; Reynolds, 1971; Torraco, 1994, 1997). The theorizing of the *theory development side* should not be confused with the *whole* of theory building; there is

a hierarchical relationship. Theorizing is one part of the overall process of theory building; “theorizing is how we think about the relationships among the elements in the world that occupy our research attention” (Van Maanen, Sorenson, & Mitchell, 2007, p. 1147).

In the simplified two component view, theorizing is one of two components that the overall process of theory building may be deconstructed into. *Conceptual development* is “one of two phases that dominate the theorizing component of theory-building research” (Lynham, 2002b, p. 232). The output of this phase is the theoretical framework. The second phase included in the theorizing part of theory building is *operationalization* in which the theoretical framework is “translated, or converted, to observable, confirmable components/elements” (Lynham, 2002b, p. 232). Operationalization is achieved with the theoretical propositions, empirical indicators, and hypotheses (Dubin, 1978; Lynham, 2002b, 2002b; Torraco, 1997). However, this bifurcation of the theory-building process need not imply completely mutually exclusive activities, as is the case with Lynham’s explicit *Ongoing Refinement and Development* (2002b) phase of the overall theory-building process that encompasses the continuous improvement of theory (and theoretical products) through the “ongoing study adaptation, development, and improvement of the theory in action” (Lynham, 2002b, p. 234).

Consider the following similarities and differences between the theorizing part of theory building and the whole of theory building. At a high level, theorizing and theory building are both explicitly used in relation to the process of generating theory and both produce interim products of the theory process (Weick, 1995). With regard to differences, theory building is a more complete recurring cycle (Weick, 2005) that also includes aspects of verification, application, and refinement in addition to the “mental gymnastics” (Gay & Weaver, 2011, p. 30)

and products associated with theorizing (Lynham, 2000b; Lynham, 2002b; Weick, 1989). Thus, theorizing aligns with the type of nonlinear theoretical thinking (Mintzberg, 2005) that must occur *within* the process of generating theoretical ideas, i.e., “the experience of sensemaking” (Weick, 2005, p. 394), where “the process of theorizing consists of [ongoing] activities like abstracting, generalizing, relating, selecting, explaining, synthesizing, and idealizing” (Weick, 1995, p. 389).

Theorizing may be thought of as the set of mental activities intentionally engaged in for the purpose imagining (Weick, 1989) coherent descriptions of constructs, their interrelationships, and the circumstances for they provide explanation or representation. “Hence, the point of theorizing, when viewed as a cognitive process, is not simply to produce validated knowledge but, rather, to suggest plausible connections and relationships that have not yet been glimpsed” (Van Maanen, Sorenson, & Mitchell, 2007, p. 1148). By contrast, theory building aligns with the type of full recurring process by which theory is generated, articulated, tested, taken to application, and continuously refined (Lynham, 2002b).

Weick points out that most of what are passed off as theories are actually approximations to theory (Weick, 1995, 2005); the byproducts of working through theorizing phases of the theory-building process over time. He further adds that for theorists engaged early in the theorizing process lesser substitutes (in the form of references, data, variable lists, diagrams, hypotheses, etc) may still “represent interim struggles in which people intentionally inch toward stronger theories” (Weick, 1995, p. 385). Here, Weick positions the act of theorizing in a theoretical trajectory that takes a great deal of time, but along the way produces incremental products that are far from full-blown theory yet still theoretical contributions. Weick’s writings

(e.g., 1974, 1989, 1995, 1999a, 1999b, 2005) emphasize that theorizing and the products of theorizing are both highly theoretical and often what is actually passed off as full-blown theory. His writings additionally emphasize that what does count as full-blown theory, even though a more complete (and often vetted) operationalize theoretical framework, still remains a dynamic “direction that is subject to revision” (Weick, 2005, p. 398).

### **Theory-building Research Methods**

Theory-building research methods saw considerable growth and attention from the 1970’s through to the first decade of the 2000’s. As a result, multitudes of theory-building research methods are available to theorists that span both paradigmatic boundaries as well as boundaries between phases of the various theory-building processes (e.g., *Advances in Developing Human Resources*, volume 4, issue 3). Further, a number of reviews and analyses of theory-building research methods were conducted in a five year span from 2002 to 2007 (i.e., Lynham, 2002b; Storberg-Walker, 2003, 2006, 2007; Storberg-Walker & Chermack, 2007; Torraco, 2002, 2005a; Torraco & Holton, 2002). Two of those reviews stand out in particular as means to framing the landscape of literature on theory-building research methods: Torraco (2002) and Storberg-Walker (2006).

Both Torraco (2002) implicitly and Storberg-Walker (2006) explicitly used Lynham’s (2002b) General Method of Theory Building in Applied Disciplines as a way to organize theory-building research methods by the phases of the theory-building process covered by the methods. In addition to using the General Method (Lynham, 2002b) as a universal template for understanding the whole of theory building, Storberg-Walker (2006) further organized theory-

building research method exemplars into four categories. They were as follows (Storberg-Walker, 2006, 2007):

- Type I – Extensive descriptions of a complete theory-building research process.
- Type II – Process descriptions of segments of a complete theory-building research process.
- Type III – Mono-paradigm descriptions of specific theory-building research methods.
- Type IV – Multi-paradigm theory-building process and strategy descriptions.

The current review of theory-building research methods borrows from Torraco (2002) and Storberg-Walker (2006, 2007) by framing theory-building research methods according to (a) the phase(s) of theory-building research that the methods cover and (b) the *type* of theory-building method description, using Storberg-Walker's (2006, 2007) categories and Lynham's (2002b) General Method, respectively (see Table 46 in example). The purposes of reviewing theory-building research methods against the *phase* and *type* criteria were to: (1) identify a way to position the current theoretical thinking within a specific phase of theory-building research, (2) identify theoretical processes relevant to the identified phase, and (3) narrow down the appropriate method approaches to review specific to the identified phase of theory building.

Table 46

*Example Table of Criteria for Framing Theory-building Methods*

Theory-building Method	Method Type	Phase of Theory-building Process				
		Conceptual Development	Operationalization	Confirmation or Disconfirmation	Application	Continuous refinement and development
Example Method A	Type II	x	x	x		



Example Method B	Type I	x	x	x	x	x
Example Method C	Type III	x	x			

*Source:* Adapted from Torraco (2002) and Storberg-Walker (2006, 2007).

Storberg-Walker (2006) chose the General Method of Applied Theory Building (Lynham, 2002b) as universal template for understanding the whole of theory-building research processes, because it “illuminates a basic framework that can be found in most, if not all, theory-building attempts regardless of the purpose of the theory” (Storberg-Walker, 2006, p. 251), i.e., Type I exemplar. Given that the Lynham’s general method is being used as frame for understanding the theory-building research methods reviewed, an overview of the general method is warranted prior to discussion of the theory-building methods that met the three goals of the review of literature on theory building.

The General Method is all-inclusive way to think about the process of theory building. It provides “a contextual overview and reconstruction of the general logic-in-use embedded in the nature and challenges of the journey of theory building” (Lynham, 2002b, p. 224) and presents a basic framework within which any specific theory-building research method can be situated. In other words, the General Method is not a theory-building research method, but rather, a description of the overall process of applied theory building; a process common to all specific theory-building endeavors. The General Method accommodates multiple paradigms of inquiry and multiple forms of logical inference, but does not provide step-by-step sequences on how to build theory. Instead, the General Method presents phases of theory-building research that encompass and position all specific theory-building research methods. The choice of which particular theory-building method(s) to use, which phase(s) should serve as entry point into the

process, and which metaphysical assumptions serve as underlying framework of beliefs are all decisions left up to the theorists given the theory-building need (Lynham, 2002b; Storberg-Walker, 2006).

Lynham (2002b) positioned the General Method within two common theory-building research strategies, theorizing to practice and practice to theorizing (Lynham, 2002b; Reynolds, 1971). However, regardless of strategy, Lynham defined five universal phases of the applied theory-building process common to any particular complete theory-building approach. These five interdependent, interacting phases are: conceptual development, operationalization, confirmation, application, and continuous refinement and development of the theory (Lynham, 2002b; Storberg-Walker, 2003; Storberg-Walker, 2006). Each of these phases is detailed below in a non-specific order, since, the five phases do not exist in any general order; rather, the specific order is prescribed the theorist and the theory-building need.

The *conceptual development phase* is the stage in theory building when the theoretical framework is generated that provides initial understanding of the phenomenon in terms of its units, laws, boundaries, and system states (Dubin, 1978; Lynham, 2002b; Storberg-Walker, 2006; Storberg-Walker, 2003). “At a minimum this process will include the development of the key elements of the theory, an initial explanation of their interdependence, and the general limitations and conditions under which the theoretical framework can be expected to operate... This theoretical framework is essentially the core explanatory container of any theory” (Lynham, 2002b, p. 232). Through the systematic conceptualization of units, laws, boundaries, and system states, the theory may begin to serve its purpose as “the answers to questions of why” (Whetten, 2002, p. 46). Even though the output of this phase is often accompanied by diagrams or figures,

it should be understood that diagrams or figures by themselves are neither theories nor theoretical frameworks. Diagrams and figures by themselves fail to answer the question of why, yet can be useful in highlighting some of the more complicated interactions or important patterns of a theory (Sutton & Staw, 1995; Whetten, 2002; Weick, 1995); yet, “regardless of their merits, diagrams and figures should be considered as stage props rather than the performance itself” (Sutton & Staw, 1995, p. 376).

The *operationalization phase* is the stage in theory building when “the theoretical framework must be translated, or converted, to observable, confirmable components/elements” (Lynham, 2002b, p. 232). The translated components are the propositions, empirical indicators, and hypotheses that together make claims about the phenomenon in practice in the empirical world (Cohen, 1989; Dubin, 1978; Lynham, 2002b; Reynolds, 1971; Storberg-Walker, 2006). The output of the operationalization phase is “an *operationalized theoretical framework*, that is, an informed theoretical framework that has been converted into components or elements that can be further inquired into and confirmed through rigorous research and relevant application” (Lynham, 2002b, p. 233). However, it is important to note that the nondirectionality of phases in the General Method (Lynham, 2002b; Storberg-Walker, 2006) can lead to operationalization in at least a couple different ways, both demonstrating the vital connection between the elements of a theory framework and the propositions, empirical indicators, and hypotheses. When progressing from the conceptualization phase to the operationalization phase, it is important to understand that the propositions, empirical indicators, and hypotheses are derivations of the elements of the theoretical framework (Cohen, 1989). When moving from an empirical phase to the operationalization phase, the propositions, empirical indicators, and hypotheses are generalizations from the data (Reynolds, 1971; Storberg-Walker, 2006).

The *confirmation or disconfirmation phase* is the stage in theory building that “involves the planning, design, implementation, and evaluation of an appropriate research agenda and studies to purposefully inform and intentionally confirm or disconfirm the theoretical framework central to the theory.” (Lynham, 2002b, p. 233). The purpose of the confirmation or disconfirmation phase is to “conduct purposive research and study that intentionally discovers whether the theory can help inform practice. In other words, the objectives of the research agenda directly connect with the operationalization of the theory” (Storberg-Walker, 2003, p. 213). Given the trustworthiness goal of this phase of theory building, one output may be a “confirmed and trustworthy theory” (Lynham, 2002b, p. 233) that is ready to inform better action and practice through application. However, a confirmed and trustworthy application ready theory need not be the only output of the confirmation or disconfirmation phase. Once completing the defined research agenda within the phase, the “theorist may develop another way of looking at the phenomenon (e.g. paradigm or hypothesis) and move back again into the conceptual development and/or operationalization phase” (Storberg-Walker, 2006, p. 254).

The *application phase* is the stage in theory building when the vetted theory is brought to practice and the theory is applied to real world problems with real world stakeholders (Lynham, 2002b; Storberg-Walker, 2006). Not only does the application of theory enable “further study, inquiry, and understanding of the theory in action... [but] ...it is in the application of a theory that practice gets to judge and inform the usefulness and relevance of the theory for improved action and problem solving” (Lynham, 2002b, p. 233). However, the application phase does not imply a terminal end to the theory-building process. The experience of the theory in practice is a source of information about the theory’s capability and acceptance (DiMaggio, 1995) for solving

real world problems, information that can be used to further refine and develop the theory (Lynham, 2002b).

The *continuous refinement and development phase* is the stage in theory building that involves ongoing reformulation, refinement and improvement of the theoretical framework. This phase is a requirement of theory building because theories are never complete (Lynham, 2002b; Storberg-Walker, 2006; Weick, 1995, 2005). Theory, by nature, is a dynamic “direction that is subject to revision” (Weick, 2005, p. 398). As a consequence,

This recursive nature of applied theory-building research requires the ongoing study, adaptation, development, and improvement of the theory in action and ensures that the relevance and rigor of the theory are continuously attended to and improved on by theorists through further inquiry and application in the real world. (Lynham, 2002b, pp. 233-234)

Continuous refinement and development of a theory keeps the theory fresh, relevant, and up to date with current knowledge and understanding of the phenomenon. However, the ongoing refinement also ensures that the theory continues to be useful for solving problems in the real world and that when it is shown not, the theory is modified accordingly (Lynham, 2002b).

Lynham highlights that “there is no one supreme method of theory building, and nor should there be” (Lynham, 2002b, p. 224). The specific theory-building research method used by the theorist “should be dictated by the nature of the theory building being engaged in, and not by the preferred inquiry methodology of the researcher-theorist or the practitioner-theorist” (Lynham, 2002b, p. 224). The General Method encompasses all such methods, theorist choices, and belief systems by representing the general process of building applied theory, the lens through which all theory-building research methods can be viewed. Through the lens of the General Method, the conceptual development phase best positions the goal of the current style of

thinking with its focus on initial generation of a theoretical framework to explain the phenomenon of interest. The focus of the theory-building method review will as a consequence be framed by (1) the theoretical processes relevant to the conceptual development phase of theory building, i.e., Type II segment specific process descriptions, and (2) method approaches specific to the conceptual development phase of theory building, i.e., Type III specific theory-building research methods.

### **Theoretical Processes of the Conceptual Development Phase**

The prior section focused on describing theory as a product and characterizing what a theory is. In this section attention turns to description of theory as a *process* in inquiry. There are two ways that theory can be perceived as process (Lynham, 2000b, 2002b). The first is the manner with which a developed theory engages inquirers in the conceptual and empirical worlds as it serves as catalyst for testing, confirmation, application, and refinement, as well as methodological framework for doing so. The majority of the ways that theory can be perceived as process in this first sense of developed theory have already been implicitly addressed in the prior section on the roles of theory in inquiry. The second way that theory can be perceived as process is the manner with which theory is initially developed through theory-building research. This second sense of theory as process by way of theory-building research is the focus of the current section; specifically, theoretical processes and methods of the conceptual development phase of theory-building research will be reviewed.

Five sources were identified as relevant process descriptions (i.e., Type II, Storberg-Walker, 2006) of the conceptual development phase of theory building. These were:

- Weick's (1989) paper on *Theory Construction as Disciplined Imagination*
- Weick's (2005) chapter on *The Experience of Theorizing: Sensemaking as Topic and Resource*
- Folger's (2005) chapter section on *Towards a Theory of Theory Building*
- Mintzberg's (2005) chapter on *Developing Theory about the Development of Theory*
- Storberg-Walker's (2007) paper on *Understanding the Conceptual Development Phase of Applied Theory Building*

Each of the five process descriptions of the conceptual development phase of theory building are individually reviewed and then the general theoretical process of conceptual development is synthesized.

**Weick (1989): Theory construction as disciplined imagination.** Weick's (1989) paper on *Theory Construction as Disciplined Imagination* describes the intellectual processes of the theorist during conceptual development of a theoretical framework. As noted by Weick, "when theorists build theory, they design, conduct, and interpret imaginary experiments" (Weick, 1989, p. 519); these imaginary experiments require disciplined thinking on the part of the theorist. Weick (1989) emphasized three general elements fundamental to good theoretical thinking: (1) well defined theoretical problem statements, (2) independent, heterogeneous thought trials, and (3) diverse selection criteria for evaluating thought trials and conjecture (Storberg-Walker & Chermack, 2007; Torraco, 1997; Weick, 1989); these "three elements form the basis of 'conceptual development' in Lynham's model" (Storberg-Walker & Chermack, 2007, p. 506).

In social inquiries, the theoretical problem statements underlying the theorizing process of conceptual development are complex (Storberg-Walker & Chermack, 2007; Weick, 1989).

Not only do they [problem statements] contain an anomaly to be explained, but they also contain a set of assumptions that can be confirmed or disconfirmed, a set of domain words that can be connected differently, details that can be generalized, a text that can be sorted into form words and substance words, an implied story whose plot may be implausible, and answers to questions not yet asked. (Weick, 1989, p. 521)

The theoretical problem statement is central to the process of conceptual development; “without clear and precise problem statements, attempts at theorizing about solutions are misguided and vague” (Storberg-Walker & Chermack, 2007, p. 507). This underscores some of the critical roles of theory in inquiry; not only can it define research problems and prescribe the most critical research questions to address, but theory can also prescribe and evaluate solutions to the theoretical problem (Campbell, 1990). That is, the problem statement defines the closed system within which the theoretical problem and solution are connected in a meaningful manner.

“When faced with a problem, the theorist generates conjectures about ways to solve it” (Weick, 1989, p. 522). Thought trials are the imaginary experiments conducted by theorists as means to solving theoretical problems, typically comprising conjectures in the form of if-then statements (Storberg-Walker & Chermack, 2007; Weick, 1989). As emphasized by Weick (1989) the greater the number of independent and heterogeneous conjectures, the better the resulting theory-building process. One suggested mechanism for producing heterogeneous thought trials was through the use of classification systems. As example of possible classification systems, Storberg-Walker and Chermack (2007) note that these could include conjectures across “varying philosophical perspectives (Does a potential solution look different to a positivist and a social constructionist?), varying demographic perspectives (Does a potential solution look different to the first year-employee of the organization and someone preparing to retire?), and so forth” (Storberg-Walker & Chermack, 2007, p. 508).



For Weick (1989), the key to evaluating thought trials was an explicit selection process and set of selection criteria. Two critical characteristics of selection criteria were noted, consistent application of selection criteria by the theorist to all thought trials and utilization of a large number of diverse selection criteria (Storberg-Walker & Chermack, 2007; Weick, 1989).

The greater the number of diverse criteria applied to a conjecture, the higher the probability that those conjectures which are selected will result in good theory. Furthermore, selection criteria must be applied consistently or theorists will be left with an assortment of conjectures that are just as fragmentary as those they started with. Every conjecture can satisfy some criterion. Thus, if criteria are altered each time a conjecture is tested, few conjectures will be rejected and little understanding will cumulate. (Weick, 1989, p. 523)

Weick's (1989) selection process involved the theorist posing questions to him/herself about each thought trial, asking whether the conjecture is "interesting, obvious, connected, believable, beautiful, or real, in the context of the problem they are trying to solve" (Weick, 1989, p. 524). The six selection criteria represent reactions of the theorist to evaluation of each thought trial (Table 47). Of particular importance in Weick's (1989) paper was the reaction of *that's interesting* to a conjecture because he substitutes interesting for validity in the experimental thought trials of theorizing. Further, the reaction *that's interesting* to a conjecture is tied to the theorist's past experience and assumptions about the phenomenon central to theorizing.

"Whenever one reacts with the feeling *that's interesting*, that reaction is a clue that current experience has been tested against past experience, and the past understanding has been found inadequate... Theorists are usually pleased when their assumptions are disconfirmed, whereas nontheorists are worried when their assumptions are disconfirmed. A disconfirmed assumption is an opportunity for a theorist to learn something new, to discover something unexpected, to generate renewed interest in an old question, to mystify something that had previously seemed settled, to heighten intellectual stimulation, to get recognition, and to alleviate boredom. (Weick, 1989, p. 525)

Table 47

*Weick's Six Selection Criteria Concerning Conjectures*

Is the conjecture...	Theorist's Reaction	Interpretation
Interesting	That is interesting (assumption of moderate strength is disconfirmed)	"The judgment <i>that's interesting</i> selects a conjecture for retention and further use... Thus, plausibility is a substitute for validity" (Weick, 1989, p. 525).
	That is absurd (strong assumption is disconfirmed)	The conjecture is dropped from further thought trials.
	That is irrelevant (no assumption is activated)	The conjecture is dropped from further thought trials.
Obvious	That is obvious (a strong assumption is confirmed)	The conjecture is dropped from further thought trials.
	That is obvious, but "for whom might this not be obvious"?	"The search for an answer to this question might help establish the boundary conditions (Dubin, 1976) inside which a conjecture will hold true but outside of which it won't" (Weick, 1989, p. 526).
Connected	This event is connected to that event	That's interesting: "Theorists often assume that events are unrelated and reactions of interest often result when unexpected connections are discovered (Davis, 1971). To discover an unexpected connection is to discover a new set of implications" (Weick, 1989, p. 527).
	These events are not connected	That's not interesting and either irrelevant or obvious.
Believable	That is believable	"To judge a conjecture believable, in the context of a story, is to assess the degree to which it makes the story one starts with into a prototypical story; 'a prototypical story identifies a protagonist, a predicament, attempts to resolve the predicament, the outcomes of such attempts, and the reactions of the protagonists to the situation' (Robinson & Hawpe, 1986, p. 112). If a conjecture strengthens one of these five elements in the story that spurs theory construction, or if it supplies an element that is missing, then the conjecture is more likely to be retained" (Weick, 1989, p. 527).
	That is not believable	"If, however, the conjecture neither strengthens nor completes, then it is likely to be rejected" (Weick, 1989, p. 527).
Beautiful	That is beautiful	"Theorists sometimes use aesthetic criteria such as beauty to select conjectures... elegant models in the social sciences have the capacity to generate the same feeling" (Weick, 1989, p. 527), and therefore, are likely to be retained.
	That is not beautiful	The conjecture lacks elegance and is likely to either be reformulated or rejected.
Real	That is real	"There are intense debates about the degree to which the concepts of science correspond to the "things" it thinks about (e.g., Gergen, 1986; Needham, 1983), but for those who favor a tighter correspondence,

	and perhaps also for those with vivid, accurate, and detailed problem statements, the criterion <i>that's real</i> is a viable selector. The criterion <i>that's real</i> invokes a combination of experience, practice, and convention to select among conjectures, whereas earlier criteria such as <i>interest</i> rely more heavily on imagined realities as selectors” (Weick, 1989, p. 528).
That is not real	May be rejected if close correspondence between theoretical concepts and empirical reality is valued.

*Source:* Weick (1989).

Weick’s (1989) article is a highly cited work on theory construction. His paper describes the creative yet simultaneously systematic thought process of the theorist during the conceptual development phase of theory building. The theorist’s thought process may be characterized as experimental thought trials in which a number of alternative criteria, including the criterion of *interesting*, is substituted for the empirical criterion of *validity* for the evaluation of each conjecture contained within a thought trial.

**Weick (2005): The experience of theorizing.** In his chapter of *Great Minds in Management*, Weick (2005) makes the comparison of the experience of theorizing to that of the experience of sensemaking; where, sensemaking is defined as “the ongoing retrospective development of plausible images that rationalize what people are doing” (Weick, 2005, p. 397), and, “consists of activities that construct reality” (Weick, 2005, p. 395). Weick describes that:

Both [i.e., theorizing and sensemaking] consist of actions that are explicative [serving to explain], evocative [serving to evoke or bring to mind], equivocality reducing [serving the reduction of ambiguity], exegetical [explanatory], transient [temporary, time-dependent, ‘passing especially quickly into and out of existence’ or ‘producing results beyond itself’], narrative [the representation of events, experiences, etc. as an account, report, or story], embedded in paradigms [not external to, or in relation to philosophical paradigms, but rather existing within them], and meaningful [intentional and oriented towards understanding *why*]... And it is respect for the correspondence that is characteristic of the actual process of theory development that will be described. (Weick, 2005, p. 394)

Ultimately, Weick makes the argument that sensemaking is central to the process of theorizing itself, and, then further couches the sensemaking context within the process of theory construction; therefore, positioning the discussion in the conceptual development phase of theory building. The following main points structure Weick's (2005) discussion of the process of theorizing and sensemaking; the process involves: 1) intentional deployment of a vocabulary to talk the phenomenon into existence, 2) constructing plausible boundaries around a phenomenon, 3) treating the process as an ongoing retrospective activity always subject to revision, and 4) knowing when one has developed a theory.

*Talking a phenomenon into existence.* As already indicated, Weick (2005) portrays the processes of theorizing and sensemaking as an activity that serves as means to constructing reality, not simply defining it. As something constructed, the question then becomes whether or not reality is created by the act of definition itself. However, to construct a reality is to generate and articulate an understanding of it, and describing that reality through definition is only one part of generating the understanding; the other part is solving the problem of how "to bring a meaning into existence" (Weick, 2005, p. 396). Here, inventing new meaning acts as a way to recognize something as itself distinct from everything that contains it or exists in parallel. Telling what the story is brings an event into existence. Further answering the question of action takes the defined event and brings it meaningfully into existence as something that organizes actors into action (Weick, 2005).

Words are how theorists bring a meaning into existence. "Naming, interpreting, and inventing meanings are actions that lie at the core of theorizing" (Weick, 2005, p. 396). It is

therefore through the intentional deployment of a vocabulary that phenomena are talked into existence.

To theorize... is partly to craft a vocabulary and grammar for... description. When that grammar is imposed on events, one's thinking tends to be channeled in directions that embody the relationships highlighted in the language of the theory. Thus, people who talk the language of... [a phenomenon], literally talk... [the phenomenon] into existence. In doing so they are thereby enabled to think for the moment as if... [the phenomenon] mattered in ways defined in the theory. (Weick, 2005, p. 400)

The deployment of language about a phenomenon, in part, defines what is a fact and what is not a fact. Facticity, as Weick called it, shares a dependency with the verbally articulated understanding of the phenomenon. "The talk enacts facts because it makes that understanding visible, explicit, and available for reflective thinking, but the talk does not create the understanding. Instead, it articulates the understanding by converting *know how* into *know that*" (Weick, 2005, p. 405).

*Constructing plausible boundaries.* According to Weick (2005), the process of defining, and then continuously redefining, the boundary condition around human or social phenomena is also a fundamental activity of theorizing. Defining plausible boundaries in addition means to making the phenomenon distinct from everything else. To construct, define, or put up boundaries is:

...to walk a thin line between trying to put plausible boundaries around a diverse set of actions that seem to cohere, while also to trying to include enough properties so that the coherence is seen as distinctive and significant but something less than the totality of the human condition. (Weick, 2005, p. 395)

Continuously redefining the plausible boundaries of around a phenomenon can occur because it turned out that the theory applied to more than originally anticipated, less than intended, or perhaps even because more became understood about properties contained by the

theory which resulted in new internal boundary determining criteria (Dubin, 1978). However, the continual redefinition of boundaries is one way that the theorist constantly struggles with creating a theory that is simultaneously accurate, general, and simple (Weick, 1980, 2005).

*An ongoing retrospective activity.* A key piece of Weick's (2005) definition of sensemaking, and therefore the process of theorizing, is emphasis of *ongoing retrospective development*. In this sense, theorizing shares a tension between definition of the past and relevance in the present. By this, Weick means that the articulated description of a phenomenon in theory is an understanding afforded by hindsight and reflection. Theorizing involves:

...continuously rejustifying what has newly been included and excluded. In theorizing, as in everyday life, meanings always seem to become clear a little too late. Accounts, cognitions, and categories all lie in the path of earlier action, which means that definitions and theories tend to be retrospective summaries of ongoing inquiring rather than definitive constraints on future inquiring. (Weick, 2005, p. 395)

The continuous balance of theorists for the tension between definition of the past and relevance in the present results not only in the seemingly persistent incompleteness of a theory but also in the persistent ongoing refinement of a theory by theorists over time. This portrayal of theory as both retrospective and always capable of further refinement is highlighted by two features. First, Weick (2005) pointed out that the process of theorizing is distinct from decision making given its amenability to revision; second the experience of theorizing is much the same as one of playing catch up.

Weick noted that theorizing should be "treated as a direction that is subject to revision, rather than as a decision that invokes selective attention in the service of justification" (Weick, 2005, p. 398). Both theorizing and sensemaking involves replacing working versions of theoretical stories with more plausible stories of what's going on given an expanded range of

observations, experiences, and reflections than originally incorporated into the stories that are replaced. It is in this sense that theorists “don’t reach single decision points so much as they shape what they will next think about, act upon, and bring into existence” (Weick, 2005, p. 398). In example, Weick offered an analogous statement about decision making versus sensemaking made by the wildland firefighter Paul Gleason:

If I make a decision it is a possession, I take pride in it, I tend to defend it and not listen to those who question it. If I make sense, then this is more dynamic and I listen and I can change it. A decision is something you polish. Sensemaking is a direction for the next period. (Personal communication, June 13, 1995 in Weick, 2005, p. 398)

For Weick, agility in theorizing occurs in much the same way when the theorist embraces the activity as one of always playing catch up with the phenomenon being described. This process of playing catch up underscores the retrospective nature of theory. Weick parallel’s the retrospective nature of theorizing to Geertz comment on the reactive, retrospective nature of consciousness. Here, Geertz describes an “after-the-fact, ex post, life-trailing nature of consciousness generally—occurrence first, formulation later on... [By extension, theorists also make] a continual effort to devise systems of discourse that can keep up, more or less, with what, perhaps, is going on” (Geertz, 1995, p. 19 in Weick, 2005, p. 402). This sort of “recursive” (Lynham, 2002b, p. 233), ex-post agility in theorizing is also characteristic of Lynham’s (2002b) *continuous refinement and development* phase of the General Method.

*Knowing when you have a theory.* Due to the retrospective, ongoing reformulation process that is characteristic of theorizing, Weick (2005) acknowledged the need for some stop rules, or general heuristics to guide the theorist towards outputting a meaningful theory. Even though the meaningful output remains direction subject to update, it does not mean that the developed theory should forever be treated as an interim struggle falling short of full-blown

theory, e.g., “sooner or later [the theorists] articulates an explanation that matters in a seriously plausible way” (Weick, 2005, p. 405). Without stop rules, the theorist risks treating the theoretical work in progress as an ongoing approximation of a theory, rather than as a full-blown theory susceptible to revision if/when the thinking about the phenomenon is changed by new information. Weick (2005) offered nine such rules for putting your work out there as theory.

Again, there are no hard and fast rules. But any of the following help:

1. Someone tells them that they have a theory.
2. The saying resembles other theories that they’ve seen.
3. The saying explains events not used in its construction.
4. The saying depicts abstract, conceptual, generalizable patterns.
5. The saying fits one of Merton’s four categories of approximations to theory<sup>1</sup>
6. The saying is a useful guide to what one can expect to see in a future event.
7. The saying serves as a higher order frame for a lower order cue to which it can be connected.
8. The author claims that it is a theory and others subject that claim to their own truth tests.
9. The author ignores the questions “is it a theory or not” and simply uses it.

This is not as haphazard as it sounds. Instead, these stop rules for theory simply recognize that theories are coherent orientations to events, sets of abstractions, consensually validated explanations and embodiments of aphoristic thinking. (Weick, 2005, pp. 405-406)

In Weick’s (2005) chapter, he underscored the centrality of the sensemaking role in the process of theorizing; a role he characterized as constructing reality through the rationalization of what’s going on and why. Weick (2005) identified a number of processes that captured the core

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<sup>1</sup> Weick identified Merton’s four categories as: (1) a general orientation in which broad frameworks specify types of variables people should take into account without any specification of relationships among these variables...; (2) an analysis of concepts in which concepts are specified but not interrelated...; (3) a post factum interpretation in which ad hoc hypotheses are derived from a single observation, with no effort to explore new observations or alternative explanations...; and (4) an empirical generalization in which an isolated proposition summarizes the relationship between two variables, but further interrelations are not attempted. (Weick, 2005, p. 406)



of his conceptual development description; these were, talking a phenomenon into existence, constructing plausible boundaries around a phenomenon, and treating the process as a retrospective activity always subject to revision. In addition, Weick further listed a number of heuristic *stop rules* associated with the end of the conceptual development phase of theory building.

**Folger (2005): Toward a theory of theory building.** In his chapter of *Great Minds in Management*, Folger (2005) discussed three pointers for building theory. However, of particular interest is his description of the “internal logic” (Folger, 2005, p. 58) of the proposed *Huh? Aha!* model of theory building. The description of internal logic is germane because it is the only theorizing description of the conceptual development phase that explicitly uses an inferential process described as reasoning/inference to the best explanation, also referred to as abduction and retroduction.

Folger characterized his *Huh? Aha!* model of theory building such that the

‘Huh?’ refers to a puzzling phenomenon; ‘Aha!’ refers to mechanisms or processes postulated as its potential explanation. Proceeding along the Huh-Aha path has an internal logic (known by philosophers as abduction or retroduction) but does not necessarily follow in the order I describe. (Folger, 2005, p. 58)

The theoretical path described by Folger (2005) included three parts: 1) think and reflect before you read, 2) start with a dependent variable or genuine phenomenon to investigate, and 3) explore a variety of antecedent conditions. Central to Folger’s theory-building process is starting with an incident or phenomenon of interest, both to the researcher and others, that can be placed as the consequence in a chain of events, and then trying to figure out a reasonable explanation of the antecedent conditions that likely led to the consequence condition.

*Think before reading.* The first part of Folger's theoretical path through his *Huh? Aha!* model of theory building involves thinking about the phenomenon of interest as a conclusion to the inquiry. The theorist should try to reflect upon the phenomenon and attempt to draw some preliminary conclusions and assumptions about it. The process of engaging in "prior introspection creates a frame of reference for a wider variety of reactions to what gets read thereafter" (Folger, 2005, p. 58). Folger describes the consequence of developing a frame of reference prior to digging into the literature as twofold. First, the prior frame of reference alters the way that literature is interpreted. Information mined in the literature is juxtaposed against the a priori assumptions and can "help preclude taking a literature's conclusions for granted or accepting them without question" (Folger, 2005, p. 58).

Second, the frame of reference potentially avoids a simple assimilation of information from the literature. Rather, the prior frame provides a baseline against which to actively question the information in the literature, facilitating a compare and contrast approach to analysis of the information discovered, e.g., is the prior frame in any way contrary to the information discovered or is it confirmed by the information discovered (Folger, 2005). If in disagreement, ask why you formed the contrary impression you did a priori and why the information source seems to be at odds with it. If in agreement, can you identify the explanatory antecedents of the phenomenon central to your prior impression, and if so, again juxtaposing against the literature, do they seem to agree or disagree with the literature's explanatory antecedents of the phenomenon?

*Start with a dependent variable.* In this context, the dependent variable is the consequence, from which, the theorist works backwards toward identifying antecedent explanations or from which the theorist reasons to the best explanation. Folger's (2005)

argument for this approach is in favor of originality and against incremental research with little new theoretical insight. Starting with existing theory builds reliance upon another's explanations first, and then leads to testing of the existing theory. Starting with an unexplained phenomenon forces a larger creative investment when the theorist has to "start from scratch" (Folger, 2005, p. 59). As an example, Folger described his theorizing process as "a variation of on Flanagan's (1954) critical incident technique...in terms of Antecedents, Behavior, and Consequences... Drawing attention to the antecedent and behavior aspects of an incident simply provides a means for disciplining one's description of events" (Folger, 2005, p. 60). By focusing attention first on the consequence, the theorist is allowed to then devote attention to understanding what led to the consequence and why. In other words, the theorizing process becomes oriented to answering and articulating the question of *why*.

*Exploring a variety of antecedent conditions.* When examining potential explanations, Folger (2005) recommended contrasting commonsense explanations against those less straightforward, i.e., "an  $A \rightarrow X$  versus  $A \rightarrow Y$  juxtaposition of alternative cause-effects" (Folger, 2005, p. 61). Here,  $A \rightarrow X$  is taken as a causal sequence predicted from commonsense reasoning involving a common event and the most reasonable explanation. On the other hand,  $A \rightarrow Y$  is taken as an anomalous or surprising event that stands in contradiction with the commonsense explanation. Collecting examples of both types of instances forces the theorist to consider richer explanatory context, because "no such anomalies will prove explainable by means of applying the same rote procedure in each instance; rather, part of the creativity of theorizing comes from finding clever ways to sort among the possibilities" (Folger, 2005, p. 62).

Folger's (2005) writing on the theorizing process provides a valuable new perspective on the inferences made by theorists during the conceptual development phase of theory building. His writing discusses the inferential process of reasoning to the best explanation, i.e., "abduction or retroduction" (Folger, 2005, p. 58). Here, Folger emphasizes not only the formulation and description of constructs to characterize a phenomenon, but also the type of reasoning engaged in by the theorist in order to explain the phenomenon.

**Mintzberg (2005): Developing theory about the development of theory.** As cited earlier in the section on what theory is not, Mintzberg (2005) presents a strong argument for conceptualizing our social theories as false by nature over true and choosing them "according to how useful they are, not how true they are" (Mintzberg, 2005, p. 356); "they are, after all, just words and symbols on pieces of paper, about the reality they purport to describe; they are not that reality" (Mintzberg, 2005, p. 356). Mintzberg's (2005) chapter emphasizes the process of creating and articulating explanation, something he represents...

...along a continuum, from lists (categories), to typologies (comprehensive lists), to impressions of relationships among factors (not necessarily 'variables': that sounds too reified for many of the factors I work with), to causations between and patterns among these relationships, to fully explanatory models (which interweave all the factors in question). (Mintzberg, 2005, p. 360)

To Mintzberg theory should be insightful, and "theory is insightful when it surprises, when it allows us to see profoundly, imaginatively, unconventionally into phenomena we thought we understood" (Mintzberg, 2005, p. 361). Similar to Weick (2005) and Folger (2005), Mintzberg (2005) emphasizes creativity in the process of theorizing. Interesting theory is created when "we let go of all this scientific correctness, or to use a famous phrase, suspend our disbeliefs, and allow our minds to roam freely and creatively—to muse like mad, albeit

immersed in an interesting, revealing context” (Mintzberg, 2005, p. 361). Mintzberg’s creative process for conceptually developing interesting theory is described as “generalizing beyond the data” (Mintzberg, 2005, p. 361). For this, he describes a nonlinear, twenty step theorizing process.

Mintzberg dedicated a great deal of text to describing the 20 step process in his chapter (i.e., “this subjective, idiosyncratic musing like mad in order to climb the scale from lists to models?”, Mintzberg, 2005, p. 361); consequently, readers are referred to his text for a detailed account (Mintzberg, 2005, pp. 361-371). However, his description of the theorizing process akin to the conceptual development phase of theory building is summarized next.

*Step one.* Do not close yourself down to possibilities and too tightly limit what you investigate by starting with elegant hypotheses rather than interesting questions. If you ask small questions, you’ll get small answers.

Ask the big questions. In my experience, the problem in doctoral theses, and subsequent research people do, is not that they bite off more than they can chew, but they nibble less than they should consume. Or to use another metaphor, I admire researchers who try to build cathedrals, not lay a few bricks. (Mintzberg, 2005, p. 362)

*Step two.* Use a body of rich inputs to stimulate theoretical thinking. Rich inputs should include thick descriptions, stories, tangible data, existing literature, and anecdotes; “anecdotal data is not incidental to theory development at all, but an essential part of it” (Mintzberg, 2005, p. 362). The theorist should keep an open mind to what is considered data. The type of data the serves as rich inputs to theorizing can include others’ conclusions, explanations, and research findings.

*Step three.* Begin creating an outline that conveys the theoretical thinking in a linear manner. Even though theoretical thinking tends to be nonlinear, the outline serves two purposes. First, it helps the theorist organize and express their own thoughts, “I must have an outline to write down my ideas, even if the object of writing down my ideas is to come up with an outline” (Mintzberg, 2005, p. 362). Second, the outline helps the theorist express the theoretical thinking to others in an understandable manner, “No matter how we *think* about our theories, ultimately we have to convey them to other people in linear order... The trouble with linear order, of course, is that the world we are trying to explain does not function in linear order” (Mintzberg, 2005, p. 362).

*Step four.* Utilize as many means as possible to help express ideas, i.e., diagrams to indicate relationships. Diagrams, and other tools, can facilitate the thinking of the theorist such that a single representation can embody a set of ideas that the theorist is trying to connect. In addition, using representations of ideas can help express the ideas outside of the head of the theorist; therefore, allowing the theorist (and others) to see what he or she was thinking (Mintzberg, 2005).

*Step five.* Ideas do not develop in a linear fashion so make lots of notes about passing thoughts to avoid forgetting them while developing current thoughts; theory development is a “messy process” (Mintzberg, 2005, p. 365). There is nonlinearity in the conception of theoretical ideas. Often while working on one point, other points are being generated both in consequence and in parallel. In this sense, the outline is nonlinear and the act of creating it is, in and of itself, generative of ideas. Here, theorists are responding to what was put in front of them and continue to build upon it (Mintzberg, 2005).

*Step six.* The theorist must be able to move back and forth between details and the big picture. That is, the theorist must:

...connect and disconnect. In other words, you have to get as close to the phenomena as possible in digging out the inputs (data, stories, and lots more), but then be able to step back to make something interesting out of them. Too connected and you risk getting co-opted by the phenomenon. (Mintzberg, 2005, p. 365)

When connected avoid immersion in unnecessary detail, when disconnected avoid being too distant to tell an interesting story. The continuous interplay between connection and disconnection is one of stimulating imagination with data, and then stepping back to let the theoretical imagination develop (Mintzberg, 2005).

*Step seven.* Avoid overemphasis on methodological elegance if it risks leading to trite conclusions; that is, do not choose methodological elegance in the theorizing process over meaningful outcomes, “elegant means often get in the way of elegant ends” (Mintzberg, 2005, p. 366). The value in methodology is in enabling justifiable ends, but the ends must still be meaningful. Use methodology as creative tool for generating elegant means, but not at the cost of conforming in process and restricting creativity.

*Step eight.* Theorizing and research are detective work. “You have to dig, dig, dig, for every scrap of information you can get. Do not forget about that ‘you never know’” (Mintzberg, 2005, p. 366). Theorizing is both about figuring out what you know and figuring out what you do not know.

*Step nine.* Re-emphasizing steps five and six, “take prolific notes” (Mintzberg, 2005, p. 366). Write down everything (Mintzberg, 2005).

*Step ten.* “At early stages, keep it messy” (Mintzberg, 2005, p. 366). Write down everything, about anything. Do not be afraid to rewrite, rephrase, and/or reframe ideas. Do not worry about getting it right the first time, just worry about getting something the first time. You can fix it later, but you cannot do anything later with what you never got the first time through.

Sometimes one is just a better way to word a particular idea I already recorded in another... there are ideas I have probably written down fifteen different times. Not because I forget the earlier versions: only because I think I have expressed it better each time. (Mintzberg, 2005, p. 366).

*Step eleven.* Keep theorizing until you can express the ideas in a manner that others can understand as well, “it is not only having the ideas that make a successful theory but also expressing them engagingly” (Mintzberg, 2005, p. 366). If the theorist cannot express the theory without jargon, it may be an indicator to the theorist that they need to understand the phenomenon and theory better. “Understanding evolves through three phases: simplistic, complex, and profoundly simple” (Mintzberg, 2005, p. 367).

*Step twelve.* Think, outline, take notes, and code notes simultaneously and iteratively. The purpose of the outline in advance of the formal paper is to both get the theoretical ideas out and get the ideas organized. Allowing the outline to evolve nonlinearly through jumping around and coding (and recoding) idea chunks allows the full thought to evolve in an organized manner as well (Mintzberg, 2005).

...how could I even come up with these notes unless I have the sense of an outline? So I need the outline to think the thoughts and get the codes. But only after I have the thoughts can I really do the outline, and so the codes. This means I have to recycle back repeatedly to redo and flesh out whatever outline I do have, in order to enhance the codes and so to recode what has been coded... All of this effort is to get everything in linear order, to get all those notes in one sequence, piles out one by one, in order, to do sub-outlines of each section and then write. (Mintzberg, 2005, p. 367)



*Step thirteen.* Embrace ideas that do not fit, do not discard them. “Cherish them [anomalies]. Repeatedly return to them. Ask why? Why? Why?” (Mintzberg, 2005, p. 367). It is not always the ideas that fall neatly into place that will result in the theoretical breakthrough. The breakthrough may finally come when the theorist understands the idea that does not fit (Mintzberg, 2005).

*Step fourteen.* Be a bulldog. “Never give up trying to figure out what they mean. If you can come to grips with the anomaly, you may have something big” (Mintzberg, 2005, p. 367).

*Steps fifteen and sixteen.* “Everything depends on the creative leap” (Mintzberg, 2005, p. 367); not necessarily on being correct. Searching for explanation often means that the theorist must be comfortable moving forward methodically and intentionally towards an unknown end, i.e., the creative leap. “What you set out to do doesn’t matter; it’s what you end up doing” (Mintzberg, 2005, p. 36). Here, Mintzberg (2005) re-emphasizes step seven. It is the elegant end that matters in theorizing. Mintzberg further points out that steps fifteen and sixteen can be scary given a mainstream of research and peer critique:

Fear is antithetical to theory development—fear of being different, fear of standing out, fear of not belonging, fear of being wrong, or subversive (if not obvious). Yet we have build fear into the whole process by which we do and assess research. (Mintzberg, 2005, p. 369).

*Step seventeen.* Theorizing is about discovery more than being right or confirming what was already known. “Theory development is really about discovering patterns... recognizing similarities in things that appear dissimilar to others, i.e., making unexpected connections. Theory is about connections, and the more, and the more interesting, the better” (Mintzberg, 2005, p. 369)

*Step eighteen.* Weave it all together. Theorizing is about linking and relating insights.

Interesting theory is not a singular novel insight; rather it is the connecting of many insights in a provocative and compelling way. Interesting theory results from:

...the weaving together of many insights, many creative leaps, most small and perhaps a few big. It's all the weaving. And that comes, for me at least, in the writing, whether of the text itself (as I hope you have been able to see here) or of the detailed outline.  
(Mintzberg, 2005, p. 370)

*Step nineteen.* Write. Use paper and notes. Clear the desk of technology. Surround yourself with your notes, papers, outlines, and rich data. Write and rewrite in ways that cannot be done with keyboard and computer. Things are less messy on screen than they really are in the outlining process of theorizing.

*Step twenty.* Do not be lazy. "Iterate, iterate, iterate... write draft after draft after draft... keep correcting, fixing, adjusting, reconceiving, changing, until it all feels right" (Mintzberg, 2005, p. 371).

The points central to Mintzberg's discussion on the theorizing process may be summarized as creativity, nonlinearity, and evolution. The conceptual development part of theorizing is about the construction of ideas and explanations. It requires a creativity to think and rethink, and openness to change and surprise throughout.

**Storberg-Walker (2007): Understanding the conceptual development phase of applied theory building.** Storberg-Walker's (2007) paper on Understanding *the Conceptual Development Phase of Theory Building* focuses on description of the process and outcome of theorizing through the conceptual development phase of theory-building research. Her work positions the conceptual development phase of theory-building research as the process of

formulating initial ideas about a phenomenon (Lynham, 2002b; Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007). Storberg-Walker's paper was motivated by the following questions: "(1) What are the critical components of conceptual development? (2) What are the relationships between the components?" (Storberg-Walker, 2007, p. 65). In response, her work identified five process components generic to the conceptual development process and the relations between them (Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007). These were:

1. Examine alternative theory research perspectives and processes
2. Resolve paradigmatic issues
3. Identify and resolve foundational theory issues
4. Resolve preliminary research design issues
5. Identify and select the appropriate modeling process

*Component #1: Examine alternative theory research perspectives and processes.* There are a large number of theory-building options available to the theorist (Lynham, 2002b; Storberg-Walker, 2003, 2006, 2007; Storberg-Walker & Chermack, 2007; Torraco, 2002, 2004, 2005; Torraco & Holton, 2002); not all options are appropriate to all theory-building endeavors. Some represent different paradigmatic perspectives, some phase-specific methods, while others variations on the problem-solution process. As a consequence, it is important that the theorist familiarize him or herself with the alternative theory-building methods available, weigh the alternatives, choose one, and justify choice in the context of the research problem and their own paradigmatic influences (Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007).

*Component #2: Resolve paradigmatic issues.* Citing Lynham (2002b) for contending that “theorists need to explicitly state their paradigmatic assumptions in order to complete the conceptual development phase” (Storberg-Walker, 2007, p. 68), Storberg-Walker emphasized the necessity for theorists to acknowledge and consider the impact of paradigms upon their theoretical development. Once the most appropriate paradigm for theory building has been identified, it is also important for the theorist to explicitly state and justify their paradigmatic choice and positioning (Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007).

*Component #3: Identify and resolve foundational theory issues.* For this third process component, Storberg-Walker puts the emphasis on identification more than resolution. Here, she notes that resolving in the *choose one over the other* sense may be less beneficial than identifying and juxtaposing different theories “expressly for the contradictions and tensions that arise” (Storberg-Walker & Chermack, 2007, p. 518). The process of identifying core/foundational theories is described as one including:

...identifying foundational literature, specifying explicit core theories from that literature, and exploring the impact of those explicit alternative core theories on the process of evidence gathering and analysis... Core theories are the foundational theories that a new theory builds on... theories somehow interact with each other to generate new understandings and theories” (Storberg-Walker, 2007, p. 76)

*Component #4: Resolve preliminary research design issues.* As suggested in Appendix B on the anatomy of theory, the choice of theoretical units, laws of interaction, theoretical boundaries, system states, propositions, empirical indicators, and hypotheses all relate to the type of empirical inquiry to come out of the specified theory. Thus, the theorist’s choices about the theoretical framework can influence research design issues, but, the same case can be made vice versa. When the theorist considers the evidence-research design-theory relationship of later

theory-building research phases, the theorist may want to make pragmatic theory development decisions on the front end of theory building informed by the types of feasible research designs available on the back end (Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007).

...the output of this component is an explicit process that leads to decisions related to research design. The value of this component is not the research design itself per se but disclosure of how the processes within conceptual development worked together with research design issues to come up with an interesting theory. (Storberg-Walker & Chermack, 2007, p. 518)

*Component #5: Identify and select the appropriate modeling process.* Because some sort of model or visual representation of the phenomenon as a theoretical framework is often the output of the conceptual development phase of theory building, it is important for theorists to understanding their modeling options as well as the timing of the modeling process (Storberg-Walker, 2007; Storberg-Walker & Chermack, 2007). Process descriptions of relevant modeling activities are available in the literature, e.g., Whetten's (2002) *Modeling-as-Theorizing*. Modeling theories helps theorists get the ideas out of their heads and onto paper (e.g., Mintzberg, 2005), but "in addition to helping theorists create a visual representation of a theory, the process of modeling can also inform and shape the theorist's intellectual processes of conceptual development" (Storberg-Walker, 2007, p. 69). Timing-wise, modeling does not need to be the last part of conceptual development; it can coincide with very early theorizing efforts. "The visual mapping process can be started at any time during the conceptual development phase... and in fact it may act as a catalyst for more inquiry if the modeling process is started at the beginning of the project" (Storberg-Walker & Chermack, 2007, pp. 518-519).

**Critique and summary of the theorizing processes of conceptual development.** In review, five sources were identified and analyzed as relevant process descriptions (i.e., Type II, Storberg-Walker, 2006) of the conceptual development phase of theory building. These were Weick (1989), Weick (2005), Folger (2005), Mintzberg (2005), and Storberg-Walker (2007). The main points of each are recapped below.

Weick (1989) described a process of disciplined imagination in which theorists engage in the conceptual development phase of theory building by designing, conducting, and interpreting imaginary experiments, i.e., thought trials, as means to developing understanding and structure of a phenomenon. Weick (1989) emphasized three general elements fundamental to good theoretical thinking: (1) well defined theoretical problem statements, (2) independent, heterogeneous thought trials, and (3) diverse selection criteria for evaluating thought trials, including the criterion of *interesting* as a substitution for the empirical criterion of *validity* for the evaluation of each conjecture contained within a thought trial. Weick's (1989) work does much in terms of capturing the qualities of disciplined intellectual thinking during theorizing, but makes only marginal gains shaping the overall notion of process during conceptual development.

In 2005, Weick describes a process of conceptual development in which sensemaking plays a central role; a role he characterized as constructing reality through the rationalization of what's going on and why. Four main activities capture the process of theorizing and sensemaking at the core of his conceptual development description: 1) intentional deployment of a vocabulary to talk the phenomenon into existence, 2) constructing plausible boundaries around a phenomenon, 3) treating the process as an ongoing retrospective activity always subject to revision, and 4) knowing when one has developed a theory. Weick's (2005) work makes a strong

contribution to the process of characterizing theoretical phenomena and pairs very complementary with his prior work on disciplined thinking (Weick, 1989).

Folger (2005) described his *Huh? Aha!* model of theory building; the three parts were: 1) think and reflect before you read, 2) start with a dependent variable or genuine phenomenon to investigate, and 3) explore a variety of antecedent conditions. However, in addition to defining a three part model of theorizing, Folger (2005) also uniquely contributed language to the process description of conceptual development with his description of the “internal logic” (Folger, 2005, p. 58) of theorizing. Here, Folger (2005) describes an inferential process of reasoning/inference to the best explanation (also referred to as abduction and retroduction). Folger’s (2005) work adds the unique idea of internal logic to the conversation of theorizing process in the literature. His further begins to suggest three potential sub phases of the conceptual development.

Mintzberg (2005) described a process for generating insightful and interesting theory through creative, nonlinear, imaginative thinking in which the theorist *suspends disbelief*. Mintzberg characterized the theorizing process of conceptual development as one of generalizing beyond one’s data. For this, he described a nonlinear, twenty step theorizing process that requires the theorist to creatively think and rethink, as well as be open to change and surprise. Mintzberg’s (2005) writing is accomplished in its presentation of the theorizing as a twenty step process simultaneously with a strong balance of nonlinear, recursive emphasis.

Storberg-Walker (2007) described the conceptual development phase of theory-building research as the process of formulating initial ideas about a phenomenon. She characterized the conceptual development phase of theory-building research with five process components. These were: 1) Examine alternative theory research perspectives and processes, 2) Resolve

paradigmatic issues, 3) Identify and resolve foundational theory issues, 4) Resolve preliminary research design issues, and 5) Identify and select the appropriate modeling process. Storberg-Walker (2007) presents a thoughtful deconstruction of conceptual development into five process components. Her emphasis on the role of research design considerations within the theorizing process particularly makes the work stand out.

Across the reviewed works of Weick (1989, 2005), Folger (2005), Mintzberg (2005), and Storberg-Walker (2007) a particular way of thinking and acting begins to emerge that is directly positioned within the conceptual development phase of theory-building research (review goal #2). In sum, the following picture of the process of conceptual development emerged that can be characterized by a number of heuristic qualities. These are: 1) Talk and write the phenomenon into existence, 2) Understand where you are coming from, 3) Be explicit about and own your own style of thinking, 4) Write, i.e., tell, the story, 5) Be your own toughest critic, and 6) Iterate until you have theory.

*Talk and write the phenomenon into existence.* Talking (and writing) a phenomenon into existence requires the deployment of a vocabulary with which to capture the phenomenon. This is fundamental to communication. A theoretical idea cannot be effectively communicated until a language exists to characterize and describe it. The purpose of theory is to answer the question *why*. Not only does answering *why* require the theorist use the language of the theory, but phenomenon itself cannot exist as theory without a specific vocabulary with which capture its theoretical nature. A number of activities illustrate this heuristic.

- Develop a clear problem statement (Weick, 1989). A clear problem statement will serve as entry point into the inquiry; an understanding of solution type defines the exit



point from the inquiry. Together, the two define the closed system within which the theoretical problem and solution are connected in a meaningful manner.

- Carefully craft into existence with language the basic elements of the theory and their interrelationships (Dubin, 1978).
- Define, and continuously redefine, the plausible boundaries of around the phenomenon of theory (Dubin, 1978; Weick, 2005). It is as important to understand the contexts that do not apply as it is to be able to define the contexts that do.
- Use a body of rich inputs to stimulate theoretical thinking (Mintzberg, 2005). Do not rely solely on neat data. Pull from literature, research findings, thick descriptions, anecdotes, etc.
- Connect and disconnect (Mintzberg, 2005). Move back and forth between immersion in the phenomenon and storytelling about the phenomenon.

*Understand where you are coming from.* However, also understand where you are going. Storber-Walker (2007) discussed the importance of choosing a modeling approach and starting with it early in the theorizing process. This requires an idea of what type of theoretical output would resolve the research problem. Knowing where you are headed with your theorizing requires and understanding grounded in paradigms, research methods, and theories. A number of activities illustrate this second heuristic.

- If you're theorizing you are not laying a few bricks, you're attempting to build a cathedral. Ask the big questions (Mintzberg, 2005). Recognizing the scope of what is being attempted is important for knowing where you're coming from.

- Position the problem tackled with theorizing paradigmatically (Storber-Walker, 2007; Weick, 2005). Paradigms define the possibility of experience (Kant, 2007); and therefore, the type of knowing contained by the theory.
- Understand issues of both theory-building research method and research design in later phases (Storber-Walker, 2007). Theory building requires that the theorist make two method choices: the choice of specific theory-building research method from among the numerous alternatives, and, theoretical choices given consideration of research design issues that will later allow the theory be properly vetted.
- Identify core or contributing theories (Storber-Walker, 2007). A number of theoretical perspectives (and theoretical ranges) provide context to theorizing. Make those theoretical influences an explicit part of the theorizing foundation.
- Think and reflect before you read (Folger, 2005). All of the above are captured in Folger's (2005) statement about creating a frame of reference prior to theorizing process. Not only is it important for readers, but it is important for the theorist to make this frame explicit to him or herself; it will influence the way the theorist thinks about, and reacts to, their own theorizing activities.

*Be explicit about, and own, your own style of thinking.* Part of making the creative leap in theorizing is acknowledging that as a theorist, you are constructing a representation of reality (Mintzberg, 2005). Coming to terms with the style of thinking required for theorizing is important for the theorist. A number of activities illustrate this third heuristic.

- Know your internal logic and make it explicit (Folger, 2005). What form of logic is guiding the theoretical thinking from defining data, to selecting data, to transforming

the data into information, and then interpreting the data in order to make knowledge claims?

- Given your internal logic, structure your thought trials accordingly (Folger, 2005; Weick, 1989).
- Embrace the premise → conclusion (or vice versa) chain of generative reasoning (Folger, 2005).
- Theorizing is a creative, nonlinear process (Weick, 2005; Folger, 2005; Mintzberg, 2005). Everything depends on the creative leap, not being correct (Mintzberg, 2005).

*Write, that is tell, the story.* Writing the story is as important as creative thinking for theorizing. The theoretical ideas are not only communicated through writing, but come to exist through writing. The story never written down is the story never told. A number of activities illustrate this fourth heuristic.

- Theorize nonlinearly and write nonlinearly, but end up with a linear story. To write down a theory is to create a linear outline of nonlinear thinking (Mintzberg, 2005).
- When writing, keep in mind that a theory should be “explicative, evocative, equivocality reducing, exegetical, transient, narrative, embedded in paradigms, and meaningful” (Weick, 2005, p. 394)
- Be open to surprise (Weick, 1989, 2005; Folger, 2005; Mintzberg, 2005). Theoretical surprises are interesting conclusions. Theorists closed down to surprises may be closed down to anything theoretical interesting.
- Utilize as many means as possible to help express ideas, i.e., diagrams to indicate relationships (Mintzberg, 2005; Storber-Walker, 2007).

- Take lots of notes. Use the outline to stimulate thinking about other ideas and write them down so that you can revisit them later (Mintzberg, 2005).
- Continue to connect and disconnect while you write (Mintzberg, 2005).
- Keep theorizing until you can express the ideas in a manner that others can understand as well. If you have not quite figured out how to express the theoretical ideas simple, take it as a sign that you may need to understand them further (Mintzberg, 2005).
- Writing the theoretical story is about weaving it all together. Theorizing is about linking and relating insights, lots of them. Interesting theory is not a singular novel insight; rather it is the connecting of many insights in a provocative and compelling way (Mintzberg, 2005).

*Be your own toughest critic.* Given the intense intellectual nature of theorizing and the disciplined imagination required, the theorist likely has to be their own devil's advocate during conceptual development. Both Weick (1989) and Mintzberg (2005) offer some insights on how to methodically be self critical in this theoretical sense. These insights illustrate the fifth heuristic.

- Being creative does not mean that you have to lack any systematic or methodical qualities, but there are not any creative procedures per se (Weick, 1989). Weick (1989) provided examples of systematic ways to generate heterogeneous thought trials, i.e., utilize classification systems.

- Evaluate your phenomenon against an explicit and diverse set of criteria (Weick, 1989). For thought trials, Weick suggested using the criteria of “interesting, obvious, connected, believable, beautiful, or real” (Weick, 1989, p. 524).
- Embrace ideas that do not fit, do not discard them (Mintzberg, 2005). Allow the lack of fit to challenge and inspire the creative process, both now and later on.
- As emphasized during the writing process, if you have not quite figured out how to express the theoretical ideas simple, take it as a sign that you may need to understand them further (Mintzberg, 2005).

*Iterate until you have theory.* It should be clear by this point that thinking about and writing about theory is a nonlinear process. Theorizing requires continuous iteration and revision. Key to both are not simply repeating the same things over again, but rather, working through the same issues again and reformulating your conclusions given additional thinking on the topic. A number of activities illustrate this last heuristic.

- The process of theorizing should be treated as an ongoing retrospective activity always subject to revision (Weick, 2005). Do not treat theory, or theorizing, as a possession to be defended; rather, as an outcropping of theoretical thought to guide future thinking about the phenomenon.
- Write, iterate, and rewrite (Mintzberg, 2005). “Write draft after draft after draft... keep correcting, fixing, adjusting, reconceiving, changing, until it all feels right” (Mintzberg, 2005, p. 371).
- Know when to stop (Weick, 2005). Weick (2005) offered nine rules-of-thumb for knowing when what you have is a theory. Even though theorizing is an ongoing

activity, e.g., Lynham's (2002b) continuous refinement and development phase of theory-building research, the conceptual development phase does not have to be a never ending phase of theorizing. At some point, the theorist needs to pause, and offer up their work as theory.

### **Specific Methods of the Conceptual Development Phase**

The review of methods of theory building continues with the focus on the perception of theory as the manner with which theory is initially developed through theory-building research. Consequently, four types of relevant theory-building method descriptions (i.e., Type III, Storberg-Walker, 2006) specific to the conceptual development phase of theory-building research were identified and are presented below. These are the axiomatic method, a modeling method, grounded theory methods, and typological / taxonomic methods. For each of the theory-building method descriptions discussed, it is important to draw attention to the close tie between the theory representation (e.g., models, axioms, taxonomies) and the theory-building approach/method (e.g., modeling-as-theorizing).

**The axiomatic method.** According to Reynolds (1971), the axiomatic form of theory has four important features.

- (1) A set of definitions, including theoretical concepts, both primitive and derived (nominal), and operational definitions (to allow the identification of some abstract theoretical concepts in concrete settings).
- (2) A set of existence statements that describe the situations in which the theory can be applied, sometimes referred to as the *scope conditions* since they describe the scope of conditions to which the theory is considered applicable. (These statements are not required in a completely imaginary theory, such as in mathematics, that is not intended to be applied to concrete or 'real' phenomena.)
- (3) A set of relational statements, divided into two groups: (a) Axioms – A set of statements from which all other statements in the theory may be derived [and,] (b)

- Propositions – All other statements in the theory, all derived from combinations of axioms, axioms and propositions, or other propositions.
- (4) A logical system used to: (a) Relate all concepts within statements, and (b) Derive propositions from axioms, combinations of axioms and propositions, or other propositions. (Reynold, 1971, p. 92)

As a method of theory-building research, Reynolds recommended the axiomatic form as most efficient for a “theory-then-research strategy” (Reynold, 1971, p. 96); an approach to theory where “theory is made explicit through the continuous, reiterative interaction between theory construction and empirical inquiry... Of an interactive inductive-deductive nature, this theory-to-research strategy is well suited to the applied nature of the behavioral and human sciences” (Lynham, 2002b, pp. 227-228). The theory-then-research strategy was described as a five step process:

1. Develop an explicit theory in axiomatic form (i.e., complete conceptual development phase).
2. Select an existence or relational statement generated axiomatic form for comparison with the results of empirical research (i.e., operationalization phase).
3. Design and execute inquiry to confirm or disconfirm the selected statements (i.e., confirmation/disconfirmation phase).
4. If any selected statements derived from the axiomatic theory are disconfirmed, adjust the theory or the research design and continue with the research (i.e., continuous refinement and development phase); and
5. For all selected statements derived from the axiomatic theory confirmed, select further statements to confirm or disconfirm in attempt to determine the limitations of the theory. (Lynham, 2002b; Reynold, 1971; Storberg-Walker, 2006)

In addition, Reynolds outlined a few criteria relevant to evaluating axiomatic forms of theory. One general criterion was defined for all axiomatic forms of theory; that is, *logical consistency* in selection of axioms: “no two axioms, or any combination of axioms, should make conflicting predictions” (Reynold, 1971, p. 95). One criterion was defined for axiomatic forms that deal with substantive matters of the real world, *ease of understanding* regardless of the number axioms: “select as axioms that set of independent statements that makes the theory easiest to understand, no matter how large...if it is found that some other set of statements is more clearly understood... the theorist should feel free to use it” (Reynold, 1971, pp. 95-96). Finally, for axiomatic forms that are completely abstract systems with no intended empirical connection, a final criterion was defined, *smallest set*: for completely abstract systems that have no intended empirical connection, there is “a preference for simplicity and elegance” (Reynold, 1971, p. 95).

**Modeling-as-theorizing.** Whetten’s (2002) description of modelling-as-theorizing is a “complete and systematic” (Whetten, 2002, p. 47) scholarly description of the conceptual development phase of theorizing; one focused on describing the theoretical process efficiently in order to express how to craft conceptual, and therefore theoretical, arguments. He presents the description as “a formal methodology for codifying theoretical assumptions and claims” (Whetten, 2002, p. 46). Whetten offers a step-by-step systematic process that builds off from Weick’s (1989) disciplined imagination process and includes heuristics for explicitly modeling the key constructs, mediating and moderating relationships, importance of modeled constructs, foundational assumptions, and theoretical boundaries (Storberg-Walker & Chermack, 2007; Whetten, 2002). Underlying the formality of the explicit methodology was a goal of improving both theory and theorizing; theorists must “make their implicit theoretical notions explicit...



systematic conceptions are more likely to arise from systematic conceptual processes” (Whetten, 2002, p. 46).

Whetten’s (2002) proposed theorizing methodology is a four step, sequential process for completing the conceptual development phase of theory-building research (Storberg-Walker & Chermack, 2007). Explicit in the methodology are a number of heuristic questions that the theorist must entertain and answer throughout the process; these are, “What, How, Why, When/Where/Who” (Whetten, 2002, p. 51). The four inclusive steps of the methodology are: (1) identify the *Whats* by generating a comprehensive list of constructs, (2) identify the *Hows* by defining the relationships between constructs, (3) establish the “sensitivity” (Whetten, 2002, p. 59) of suggested explanations by espousing foundation theory, and therefore, the *Whys* underlying the theory, and (4) determine the When/Where/Who of the contextual assumptions that drive the theory boundaries (Whetten, 2002). Each of the four steps is summarized in further detail next.

*Step one: Whats-as-constructs.* Whetten’s (2002) process begins with generating a list of the constructs relevant to explaining the phenomenon of the developing theory. Starting with identification of the core construct and continuing with all adjacent constructs, Whetten (2002) suggested writing down each construct as a noun or phrase and represent it as a box or circle in emerging diagram. In order to avoid stifling the generation of a complete set of constructs, initially “err on the side of inclusion rather than on the side of parsimony” (Whetten, 2002, p. 52). Once all potentially relevant constructs have been identified, the theorist must then evaluate the set and make decisions about the importance of their inclusion in the developing model.

Two evaluation criteria were suggested for the set of constructs, the scope and the coherence. Scope refers to “the breadth of the behavior or activity covered, the class of things to which it applies, or the totality of the objects that it identifies” (Whetten, 2002, p. 52), and, coherence refers to “the ability of the constructs to fit together to establish a meaningful story, picture, or model of the phenomenon” (Storberg-Walker & Chermack, 2007, p. 510). To evaluate scope, Whetten (2002) recommended assessing the data collection requirements necessary to test the theory, i.e., the feasibility of constructing adequate research designs. This can be accomplished by grouping “constructs according to their associated data collection requirements, for example, tally the number of different types of data..., the number of sources of data... and the number of data collection cycles” (Whetten, 2002, p. 53). Whetten further emphasized that “It is important to keep in mind that a model is a visual aid for telling a story, and that the story needs to be coherent. An argument is coherent to the extent that it ‘hangs together’” (Whetten, 2002, p. 53). Coherence can be evaluated by assessing the number of constructs and agreement in their levels of analysis. The greater the number of constructs and a lack of sharing a common level of analysis can result in unnecessarily complex, “hard-to-follow, difficult-to-understand explanations” (Whetten, 2002, p. 53).

*Step two: Hows-as-relationships.* The second step of Whetten’s (2002) theorizing methodology involves transitioning the list of constructs towards a theoretical framework through defining relationships between those constructs, e.g.,

...the specification of relationships between constructs is the key difference between a theory and a list of reasons or examples... Basically, a list is an incomplete theory – it contains ‘whats’, but no ‘hows’, which means it can not inform questions of why. (Whetten, 2002, p. 55)

Here, Whetten (2002) recommended considering categoric ‘hows’, e.g., when A, then B, or sequential ‘hows’, e.g., A precedes B. However, if sequential ‘hows’ are defined, be sure to be prepared to further articulate distinctions such as X logically follows Y, Y generally precedes X, or X emerges from Y.

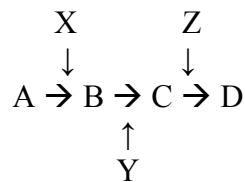
Graphically, Whetten (2002) suggested organizing the constructs and relationships along a horizontal and vertical dimension. To do so, first disambiguate explanatory constructs from explained constructs by placing the core construct in the center of the page and arrange all remaining constructs to the left if it explains the core construct or to the right if it is explained by the core construct. Everything on the left is considered a *contribution to* the core construct, while all constructs to the right are considered a *contribution of* the core construct. “Specifically, what is on the left side can be thought of as a ‘contribution to’ your explanation of the core construct, whereas what is on the right can be thought of as a ‘contribution of’ the core construct’s explanation” (Whetten, 2002, p. 56). This left/right organization can also be viewed as cause-effect ordering where the core construct is caused by the left side constructs, and, means-ends ordering where the core construct is the means to the right side constructs as ends.

The second part to graphically organizing constructs and relationships along a horizontal and vertical dimension is to map the core sequence (i.e., the horizontal dimension) and any moderating sequences (i.e., the vertical dimension). The horizontal dimension is modeled by selecting from the left/right organization the constructs that represent the core sequence of the theory. “These constructs constitute the primary elements of your theory” (Whetten, 2002, p. 57); for example,

$$A \rightarrow B \rightarrow C \rightarrow D$$

The intermediate constructs in this sequence... [B and C] are referred to as *mediators*, in the sense that they mediate the relationship between the constructs on either side. According to this model... [C] is based on... [B], not... [A]. Hence, the relationship between... [A] and... [C] is said to be mediated by... [B]. (In other words, the link between... [A] and... [C] goes *through*... [B]). (Whetten, 2002, p. 57)

The vertical dimension is modeled by arranging the remaining constructs above and below the core sequence by locating constructs near places in the core sequence that the theorist suspects further relationship. “Constructs that are located above and below the horizontal axis generally serve as *moderators*. A moderating construct is one that changes the relationship between two other constructs when it is present” (Whetten, 2002, p. 57). For example,



In the above example, X is included as a moderating construct between A and B, suggesting that in order to fully understand the relationship between A and B, X must also be taken into consideration.

The last part of step two is explicitly model the relationships between constructs. Here, arrows serve as convention, e.g., double arrows for reciprocal causality, strength of relationship with solid versus dotted lines, or the sign of the relationship to indicate effective impact of relationship. “The ability to portray specific relationship, as well as an overall pattern of relationships, is one of the strengths of graphical modeling” (Whetten, 2002, p. 57). Given the full model, it is important to assess it for problematic gaps. The modeled sequences of step two

may be evaluated by assessing its necessity and sufficiency. To test its necessity, “begin from the left side of your model and consider whether each of the antecedent constructs is necessary for what follows. If you think of your model as a story, can you tell your story without this plot element?” (Whetten, 2002, p. 62). To test its sufficiency, “begin with the constructs on the right side of your model and work backwards, asking yourself how confident you are that a given outcome can be adequately explained using the antecedent constructs” (Whetten, 2002, p. 62).

*Step three: Whys-as-conceptual assumptions.* Steps three and four of Whetten’s modeling-as-theorizing process involve the transition from construction of the model to contextualizing the assumptions of the model. “Whereas the first two steps in the methodology focused on constructing a graphical representation of a theory, these final two steps require us to specify the context, or boundary conditions, of our theory” (Whetten, 2002, p. 58). The third step of Whetten’s (2002) theorizing process establishes the legitimizing external theories and foundational assumptions upon which the developing theory is based. These conceptual assumptions explain why the theoretical explanations make sense. Whetten’s (2002) three guidelines for generating explicit conceptual assumptions:

1. “Think of this as a side bar conversation between you and your readers, something like, ‘The sensibility of this explanation is predicated up on the following assumptions about human behaviour’. For example... a theory of decision-making would likely be predicated on some form of rational choice...” (Whetten, 2002, p. 59).
2. “To stimulate your thinking, consider reviewing various typologies in our field, including those classifying epistemological assumptions held by scholars... and those

classifying cultural assumptions held by organizational members...” (Whetten, 2002, p. 59).

3. “...consider how the number and variety of your conceptual assumptions can pose a similar threat to coherence” (Whetten, 2002, p. 59), as was previously considered regarding constructs in step one.

*Step four: When/Where/Who –as-contextual assumptions.* The fourth and final step in Whetten’s (2002) theorizing methodology is the specification of contextual boundaries within which the theory, and any proposition, is expected to hold. Whetten underscores the importance of the theorist understanding and defining contextual assumptions; “failure to understand how contextual constraints temper general claims significantly undermines the utility, and hence, the credibility, of scholarly explanations” (Whetten, 2002, p. 61). That is, the theorist cannot fully understand the consequences of acting upon the theory if the theorist does not fully understand that the viability of the theory in practice is entirely dependent upon the When/Where/Who contexts that it was intended to operate (Whetten, 2002). The importance of defining, and continuing to redefine, the contextual boundaries is further emphasized in advice on utilizing major propositions or hypotheses to define where the theory is likely or unlikely to hold later on during theory testing:

“...empirical tests of a hypothesized theoretical relationship should not focus on whether the hypothesis is true or false, but rather on the conditions under which the hypothesis holds. Supporting this argument, negative research results can often be more informative than positive ones, if they suggest important limiting conditions that should be examined more closely” (Whetten, 2002, p. 60).

**Grounded theory methods.** Grounded theory has its roots in sociological study, and therefore, development of sociological theory (Glaser & Strauss, 1967). Specifically, grounded theory refers to “a product of a research process as well as to the research process itself” (Thornberg, 2012, p. 249). Generally speaking though, grounded theory is a generic way of discussing theory that is generated from data, i.e., “...systematic discovery of the theory from the data” (Glaser & Strauss, 1967, p. 7). As both a theoretical process and a theoretical concept, grounded theory can be difficult to understand due to its breadth of instantiations within and across paradigms of inquiry (e.g., Glaser, 1978, 1992; Strauss & Corbin, 1990; Charmaz, 2000, 2006). Different instances of grounded theory are distinguished based on paradigmatic grounding, the role of prior conceptions (theory, literature review, coding paradigms) and precise form of logic. The diversity of grounded theory processes can be captured at a high level by dividing the literature and practice of grounded theory into three groups: 1) a Glaserian, postpositivistic, pure inductivist group, 2) a Straussian, postpositivistic, abductivist group, and 3) a constructivist group. However, these three high level groupings are not exhaustive because other formulations can also be found in the literature on grounded theory (e.g., Clarke, 2005; Kelle, 2005; Thornberg, 2012).

The Glaserian, postpositivistic, pure inductivist form of grounded theory was advocated by one of the founders of grounded theory, Barney Glaser. In the near 40 years after initial publication of *Discovery* (1967), Glaser continued to promote a form of grounded theory that sought to identify real patterns in data by following an inductive strategy that demanded no prior literature review and no a priori theoretical frameworks or coding paradigms. This “empty head” (Kelle, 2005, p. 4) strategy elevated the importance of “total emergence” (Pettigrew, 2000, p. 257) from the data. In this form of grounded theory, true emergence was threatened by

contamination of the data with any preconceptions of the theorist. Coding was an ad hoc process, all theory emerged from the data, and literature was to be held off until the end of the research process (Allen, 2010; Glaser, 1992; Kelle, 2005; Pettigrew, 2000; Thornberg, 2012). Glaser maintained that “researchers following the ‘true path’ of Grounded Theory methodology have to approach their field without any precise research questions or research problems” (Kelle, 2005, p. 8).

For further detail on the Glaserian form of grounded theory, some relevant materials on this perspective include:

- Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine de Gruyter, Hawthorne, NY.
- Glaser, B.G. (1978). *Theoretical sensitivity*. Sociology Press, Inc., Mill Valley, CA.
- Glaser, B.G. (1992). *Basics of grounded theory analysis: Emergence verses forcing*. Sociology Press, Inc., Mill Valley, CA.
- Glaser, B.G. (1998). *Doing grounded theory: Issues and discussions*. Sociology Press, Inc., Mill Valley, CA.
- Glaser, B.G. (2001). *The grounded theory perspective I: Conceptualization contrasted with description*. Sociology Press, Inc., Mill Valley, CA.
- Glaser, B.G. (2003). *The Grounded Theory Perspective II: Description's Remodeling of Grounded Theory Methodology*. Sociology Press, Inc., Mill Valley, CA.
- Glaser, B.G. (2005). *The Grounded Theory Perspective III: Theoretical coding*. Sociology Press, Inc., Mill Valley, CA.



The Straussian, positivistic, abductivist form of grounded theory was advocated by the other founder of grounded theory, Anselm Strauss, and a collaborator Juliet Corbin (e.g., Corbin & Strauss, 2007; Strauss & Corbin, 1990). The primary differences between Glaserian and Straussian grounded theory lies in the form of logical inference, role of coding schemes, and timing of literature review. The Straussian form of grounded theory opened the door to abductive reasoning, in which inquirers go “beyond the data as well as the pre-existing theory or theories. It is an innovative process because every new insight is a result of modifying and elaborating prior knowledge or putting old ideas together in new ways” (Thornberg 2012, p. 247). There is a back and forth between data and prior explanatory hypotheses in which both are continually being compared and re-evaluated with the aim of eventually generating the best potential explanation (Lipton, 2004). Some cases suggest a process of backwards reasoning (Folger, 2005; Kelle, 2005; Thornberg 2012), but regardless of direction it maintains an iterative form of reasoning in which the theorist is always testing existing explanations against the data and then using the insights gained to form new and more feasible explanations of the data. In abduction, inferences “are neither inductive nor deductive. Instead they represent a special kind of logical reasoning whose premises are a set of empirical phenomena and whose conclusion is an explanatory hypothesis” (Kelle, 2005, p. 12).

The abductive inference of Straussian grounded theory also altered the necessary timing of the literature review and formation of a coding scheme. Here, literature review and prior sociological theoretical conceptions were leveraged before engaging in the grounded theory process to form a coding paradigm that was used “to produce concepts that seem to fit the data” (Strauss, 1987, p. 28) by offering ways to categorize and relate data. The criticism, by Glaser (1992), was on the *emergence verses forcing* of categories from data with emergence or

conversely data to categories with forcing. For further detail on the Straussian form of grounded theory, some relevant materials on this perspective include:

- Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge University Press, Cambridge, UK.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage Publications, Inc., Thousand Oaks, CA.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Sage Publications, Inc., Thousand Oaks, CA.
- Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3-20.
- Corbin, J., & Strauss, A. (2007). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage Publications, Inc., Thousand Oaks, CA.

The constructivist form of grounded theory is most prominently recognized under the advocacy of Kathy Charmaz (Charmaz, 2000, 2005, 2006, 2008, 2009). The most dramatic difference between the Glaserian and Straussian forms of grounded theory and constructivist grounded theory was the paradigm of inquiry; here, the constructivist paradigm. Consequently, constructivist grounded theory is not aimed at approximately identifying real patterns from data, but rather, generating an “interpretive portrayal of the studied world” (Charmaz, 2006, p. 10). In constructivist grounded theory, the

...concern is not with the emergence of theory, but rather with whether or not the researcher has been explicit in stating that the data and theory are a construct of both the researcher and the respondent. According to Charmaz, theory neither emerges nor is discovered, instead it is constructed. (Allen, 2010, pp. 1613-1614)

In other words, the fundamental shift across inquiry paradigms shifted the focus of grounded theory away from discovery of theory from data and assumptions of a single reality, and onto, assumptions of multiple realities and the construction of narrow range theory by inquirer and inquired into (Allen, 2010; Charmaz, 2006; Thornberg, 2012). For further detail on the constructivist form of grounded theory, some relevant materials on this perspective include:

- Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. Denzin & Y.S. Lincoln, Y. (Eds.), *The Sage Handbook of Qualitative Research* (2<sup>nd</sup> ed., pp. 509-535). Sage Publications, Inc., Thousand Oaks.
- Charmaz, K. (2005). Grounded Theory in the 21<sup>st</sup> Century: Applications for Advancing Social Justice Studies. In N. Denzin & Y.S. Lincoln, Y. (Eds.), *The Sage Handbook of Qualitative Research* (3<sup>rd</sup> ed., pp. 507-535). Sage Publications, Inc., Thousand Oaks, CA.
- Charmaz, K. (2006). Constructing grounded theory. A practical guide through qualitative analysis. London: Sage .
- Charmaz, K. (2008). Constructivism and grounded theory. In J.A. Holstein & J.F. Gubrium (Eds.), *Handbook of Constructivist Research* (pp. 397-412). The Guilford Press, New York, NY.
- Charmaz, K. (2009). Shifting the grounds: Constructivist grounded theory methods. In J. M. Morse, P. N. Stern, J. M. Corbin, B. Bowers, & A. E. Clarke, (Eds.)

*Developing grounded theory: The second generation* (pp. 127-154). University of Arizona Press, Walnut Creek, CA.

- Bryant, A. (2002). Re-grounding grounded theory. *Journal of Information Technology Theory and Application*, 4, 25-42.
- Bryant, A., & Charmaz, K. (2007). *The Sage Handbook of Grounded Theory*, Sage Publications Inc, Los Angeles, CA.
- Mills, J., Bonner, A., Francis, K. (2006a). Adopting a constructivist approach to grounded theory: Implications for research design. *International Journal of Nursing Practice*, 12, 8-13.
- Mills, J., Bonner, A., Francis, K. (2006b). The development of constructivist grounded theory. *International Journal of Qualitative Methods*, 5, 25-35.

**The typological approach to theory building.** The typological approach to theory building is a unique method of generating theoretical frameworks by developing a classification scheme of concepts (i.e., a taxonomy), and then, both specifying the relationships among concepts and identifying system states as sets of ideal types (Doty & Glick, 1994). What is often missing from typological theories are the specified relationships and set of ideal types in favor of rich descriptions of classification rules. The underspecification as “simplistic classification systems instead of theories” (Doty & Glick, 1994, p. 230) may be driven the standard to achieve parsimony in the theoretical model; however, typological theories are by nature complex organizations of grand and middle range theories. As a consequence, “it seems only reasonable that meaningful and useful subgrouping schemes incorporate commensurate levels of complexity” (Pinder & Moore, 1980, p.191).

Doty and Glick (1994) highlight that:

...the problems with many existing typologies are the result of a misunderstanding about what typologies are (or should be), improper development of the typology, and a failure to take full advantage of the unique form of theory building represented by the typology approach. (Doty & Glick, 1994, p. 231)

Appendix B reviewed the differences between taxonomies and typologies, as well as the characteristics of typological theories. For more information, see Bobko and Russell (1991), Doty and Glick (1994), and Pinder and Moore (1980). Not covered in Appendix B was the process for developing typological theory. For heuristics on the typological theory-building method, Doty and Glick (1994, pp. 246-248) recommended five steps:

1. Make grand theoretical assertions specific
2. Completely define all ideal types
3. Completely describe all ideal type using the same set of constructs or taxonomic categories
4. Explicitly describe all theoretical assumptions of the constructs used in the ideal types and which constructs, if any, are of greater importance for the ideal type in operation
5. Test the typological theory with conceptual and analytical models that are consistent with the theory

**Critique and summary of methods specific to conceptual development.** Regardless of how one approaches conceptual development, there appear to be at least a couple basics that are in some ways unavoidable, but in others fundamental to methods of the phase. These basics are unavoidable in the sense that left incomplete, the conceptual development phase is incomplete;

they are fundamental in the sense the goal of conceptual development making these basic elements explicit.

First, conceptual development is, by definition, generation of concepts. How one approaches conceptual development determines whether the generation process is one of intersubjective construction (e.g., constructivist grounded theory), one of *tabula rasa* identification (e.g., Glaserian grounded theory), or something in between. No matter the approach though, the outcome is the same; that is, a set of concepts or constructs that define a phenomenon. Second, the set of constructs must be related to each other systematically. There appears to be at least three ways that constructs can be related: by law, by similarity, and by organization. Dubin's (1978) laws of interaction capture the nature of the ways that constructs can relate to each by law. Constructs can further relate to each other by similar through belonging to the same category of construct. Similarly, constructs can relate to each other by organization within the same taxonomic or typological system of categorical constructs. Lastly, a context must be defined for the theory, one that both suggests where the theory comes from and the things about which it is meant to explain.

### **Key Considerations of the Theory-building Process**

Understanding the process of theory building involves consideration of numerous features of the research process. (At least) seven key features of theory-building research may be pulled forward in summary. These include:

- Justification of the research as a theory-building process, e.g., why may the systematic process be considered a theory-building process?

- Understanding of the theoretical products produced and any evidence of becoming a full-blown theory.
- Positioning of the research as the theorizing half, i.e., “the theory development side” (Lynham, 2000b, p. 243), or the practice half, i.e., “research operation side” (Lynham, 2000b, p. 244), of the theory-building process (Chermack, 2006, Lynham, 2002b, 2002b; Reynolds, 1971; Torraco, 1994, 1997).
- Mapping of the inquiry process to a theory-building research strategy: Lynham (2002b) positioned the General Method within two common theory-building research strategies, theorizing to practice and practice to theorizing (Lynham, 2002b; Reynolds, 1971).
- Mapping of the theory-building research to phases of theory-building process (Lynham, 2002b).
- Mapping of the theory-building research to specific theoretical processes, i.e., Type II (Storberg-Walker, 2006).
- Mapping of the theory-building research to specific theoretical methods, i.e., Type III (Storberg-Walker, 2006).

### **Requirements for Theory Building**

Theory building is a specialized and highly skilled research activity that involves both theorizing and empirical proficiencies (Sutton & Staw, 1995). Torraco describes the process of producing good theory as...

...the result of intensive study of the phenomenon or topic of the theory, intense thought and conceptualizing by the theorist about the phenomenon and how it might work, and, usually, multiple attempts at crafting a theoretical model or framework that contains all of

the necessary elements of the theory and that appears to offer a defensible explanations of the phenomenon. (Torraco, 2005, pp. 364-365)

Given the complexities of the full theory-building process, a number of requirements for theory building have been offered by theory-building scholars (e.g., Lynham, 2002b; Torraco, 2005a). At a high level, the requirements may be split into requirements of the theory-building process and requirements of the theorist. Three requirements of the theory-building process will be discussed here: (a) a clear demonstration of a theoretical gap in knowledge (i.e., theoretical need or problem), (b) an explicit linkage of theoretical problem to theoretical solution, and (c) operationalization of the theoretical framework for extension into empirical practice (Torraco, 2005a). In addition, three requirements of the theorist engaged in theory building will also be discussed: (a) expertise with the core phenomenon to be theorized about and (b) expertise with theory and the theory-building process (Lynham, 2002b; Torraco, 2005a).

### **Requirements of the Theory-Building Process**

In his chapter on *Theory Development Methods*, Torraco (2005a) defined three specific requirements for excellence in the theory-building process; they were: (a) a clear demonstration of a theoretical gap in knowledge, (b) an explicit linkage of theoretical problem to theoretical solution, and (c) operationalization of the theoretical framework for extension into empirical practice.

A theoretical gap in knowledge relates to the research problem or need that is both catalyst for, and entry point into, the theory-building research process. The first requirement for excellence in the theory-building process is clear and explicit demonstration of the research problem or need (Torraco, 2005a). Recall that theory building can be considered the “ongoing



process of producing, confirming, applying, and adapting” (Lynham, 2002b, p. 222) theoretical descriptions, explanations, and representations of and with the world around us. Depending on the particular point, or phase, in whole of the theory-building process, different research needs will be relevant. To this point, Torraco (2005a) clearly articulated what a research need is, and made the distinction between the research need and other elements of the research process, in particular, the purpose:

*Need* is defined here as a condition or situation in which something is required or wanted. When applied to a piece of theoretical research, the notion of *need* is not synonymous with the purpose of the work. The notion of *need* retains a key element that is, a priori, external to the interests and purposes of the individual researcher. The *problem* or *need* for theory building on a phenomenon or area that has been previously studied is based on identifying deficiencies, omissions, and inadequacies in existing theoretical knowledge about the phenomenon. Readers of articles addressing this type of theory expect to see a comprehensive review of literature related to the topic of theory, on which the problem or need to be addressed by additional theory should be based. (Torraco, 2005a, p. 369)

Once a research need has been clearly demonstrated as catalyst and entry point into the research, the inquiry process does not head haphazardously forward towards an undefined, unknown solution state; “The selection and use of theory-building research methods depends, in part; on the nature of the phenomenon and the problem or need to be addressed by theory-building research” (Torraco, 2005a, p. 370). The second requirement for excellence in the theory-building process is definition of the theoretical solution and explicit demonstration of “the logic and theoretical reasoning used by the theorist to link the research problem with the theoretical outcome” (Torraco, 2005a, p. 364). While the degree of detail that the theorist might define the theoretical solution with will vary across phases of theory-building research, some definition of solution state or theoretical outcome is a necessary part of demonstrating how the proposed solution will meet, and in hindsight met, the defined research need with the envisioned logic, theoretical reasoning, and research design. “Research that presents the theory-building

process and the theory offers a holistic view of theory-building research. Such research provides a means for tracing the author's theory-building strategies as they give rise to a theoretical product" (Torraco, 2005a, p. 370). Not only does this resonate with Goldman's (2002) *ex ante* and *ex post* justification, but this similarly reflects the Kuhnian puzzle solving activity where the solution itself is of less interest than demonstration of the puzzle solving process that arrives at the solution; a solution whose existence was presumed, even ensured, by the theory prior to engaging in the inquiry (Kuhn, 1996).

Because a theory is intended to be a description, explanation, or representation of the world around us (Lynham, 2002b), theoretical research should attempt to relate the theoretical outcome back to the empirical world it is meant to represent. Relating theoretical products to the empirical world is done through operationalization of the theory framework with propositions, empirical indicators, and hypotheses, as well as through application and definition of further theoretical research to be done. The third requirement for excellence in the theory-building process is extension of the theory into practice and ongoing research by proposing and discussing "research propositions, questions, or hypotheses for further theoretical and empirical study of the phenomenon" (Torraco, 2005a, p. 364).

Table 48 synthesizes the key characteristics of each requirement of the theory-building process and organizes the key characteristics under one of the three more general categories described (i.e., a clear demonstration of a theoretical gap in knowledge, an explicit linkage of theoretical problem to theoretical solution, and operationalization of the theoretical framework for extension into empirical practice).

Table 48

*Key Characteristics of the Requirements for the Theory-building Process*

<b>Requirements of the Theory-building Process</b>	<b>Key Characteristics of Requirements</b>	<b>Description</b>
Clear demonstration of a theoretical gap in knowledge	Theoretical Need	Identified deficiencies, omissions, and inadequacies in existing theoretical knowledge about the phenomenon (Torraco, 2005, p. 369).
	Entry point into the theory-building cycle	The entry point into the theoretical process (i.e., conceptual development, operationalization, confirmation, application, and continuous refinement and development of the theory [Lynham, 2002b]) commensurable with the theoretical need.
Explicit linkage of theoretical problem to theoretical solution	Description of the theoretical solution	Characterization of the theoretical outcome of the theory-building process that is expected to address the theoretical need
	Description of the theoretical logic	Description of how the logic employed in the theory-building process links the theoretical need to the theoretical solution
Extension of the theoretical framework into empirical practice	Operationalization of the theoretical framework	Definition of propositions, empirical indicators, and hypotheses, so that the theoretical framework is extended into practice
	Definition of further theoretical research to be done	Suggested research questions or hypotheses for further theoretical or empirical study

**Requirements of the Theorist**

The knowledge requirements of the theorist engaging in theory building can be further understood as possession of two types of expertise by the theorist, a) expertise with the core phenomenon to be theorized about and b) expertise with theory and the theory-building process. In particular, in this case, expertise is defined as the conjunction of conceptual knowledge and practical knowledge; where conceptual knowledge is gained through intensive study and scholarly attempts to abstractly understand, and, practical knowledge is gained through experience from practice (Lynham, 2002b; Storberg-Walker, 2007; Torraco, 2005a).

Viewed systematically, the expertise requirements of the theorist come in two forms of knowledge, i.e., (1) conceptual and (2) practical, and three topics for which the theorist should

have the required knowledge, i.e., (1) the core phenomenon, (2) theory, (3) and theory-building research methods. That is, the theorist is required to have conceptual and practical “knowledge of the elements of theory and of the process of developing new theoretical knowledge (i.e., knowledge of theory-building research methods)” (Torraco, 2005a, p. 365), in addition to, conceptual and practical knowledge of “the phenomenon central to the theory” (Lynham, 2002b, p. 229). Together, the two forms of knowledge and three topics highlight the six specific requirements of the theorist engaged in theory-building research. These six requirements are summarized in Table 49 below.

Table 49

*Table of the Requirements of the Theorist Engaged in Theory Building*

Form of Expertise	Knowledge Requirements of the Theorist
Practical knowledge of:	Theory-building research methods from experience attempting to build theory Theory from experience attempting to apply theory in practice The phenomenon and topic of theory from experience with the phenomenon in practice
Conceptual knowledge of:	Theory-building research methods from intensive study of theory-building processes The elements and structures of theory from intensive study of theory itself The phenomenon and topic of theory from intensive study of the phenomenon itself

*Source:* Modified from Torraco (2005a) and Lynham (2002b).