

THESIS

ASSESSING EMPLOYEE ENGAGEMENT: A COMPARISON OF THE JOB ENGAGEMENT
SCALE AND THE UTRECHT WORK ENGAGEMENT SCALE

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ABSTRACT

ASSESSING EMPLOYEE ENGAGEMENT: A COMPARISON OF THE JOB ENGAGEMENT SCALE AND THE UTRECHT WORK ENGAGEMENT SCALE

Two employee engagement measures were compared and contrasted to determine if one is better than the other, or if both are required to adequately assess the construct domain. The first measure is Rich, LePine, and Crawford's (2010) Job Engagement Scale based on Kahn's (1990) conceptualization of engagement. The second measure is Schaufeli, Salanova, Gonzalez-Romá, and Bakker's (2002) Utrecht Work Engagement Scale, based on Maslach and Leiter's (1997) conceptualization of engagement. The measures were compared by examining their convergent and discriminant construct validity, examining the factor structure of each measure, and examining the criterion-related validity of each through dominance analysis. Using responses from 470 working adults, results showed significant differences between the UWES and JES in terms of construct and criterion-related validity evidence.

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Assessing Employee Engagement:

Comparison of the Job Engagement Scale and the Utrecht Work Engagement Scale

The study of employee engagement (i.e., the full investment of oneself into work) has been justified by noted comparisons to disengagement or the lack of engagement. For example, in the applied arena, engaged employees have been shown to have lower rates of absenteeism (-37%), turnover (-25% to -49%), internal employee theft (-27%), safety incidents (-49%), patient safety incidents (-41%), and work quality defects (-60%) than unengaged employees (see Harter, Schmidt, Killham, & Agrawal, 2009 meta-analysis). Additionally, practitioner publications quote large financial figures to convey the cost to businesses of disengaged employees, with the assumption that such losses become gains when organizations can convert disengaged employees into engaged employees (Van Allen, 2008). Given the substantial differences between engaged and unengaged employees, as well as the potential upswing of converting unengaged to engaged, employee engagement as a topic domain has accumulated growing interest amongst practitioners and researchers.

Though interest is increasing (Macey, Schneider, Barbera, & Young, 2009), only recently have theoretically grounded definitions been offered and measures of engagement been developed to describe and assess the construct (Kahn, 1990; Macey & Schneider, 2008; Rich, LePine, & Crawford, 2010; Schaufeli, Salanova, Gonzalez-Romá, & Bakker, 2002). With the growing interest in studying employee engagement, its antecedents, and its consequences, researchers are turning to the few measures that exist without information as to whether one captures the construct domain better than the other.

The purpose of this study was to investigate the similarities and differences between two employee engagement measures: Rich et al.'s (2010) Job Engagement Scale (JES) and Schaufeli

et al.'s (2002) Utrecht Work Engagement Scale (UWES). Though both scales purport to measure employee engagement, they are each derived from different theoretical backgrounds suggesting that there may be differences in their construct, content, and criterion-related validity evidence. Specifically, the JES was based on Kahn's (1990) definition of engagement, which is comprised of three components: physical, cognitive, and affective, and grounded in theories of individuals' expression of themselves in their work roles (Goffman, 1961). In contrast, the UWES has roots in the burnout literature (i.e., Maslach, Jackson, & Leiter, 1997). Originally, the UWES intended to conceptualize engagement as the opposite of burnout, and was comprised of three components: vigor, dedication, and absorption; opposites of exhaustion, cynicism, and inefficacy, respectively. Schaufeli et al. have since noted that engagement is not quite the exact opposite of burnout, but the UWES retains the fundamental scale structure.

To date, no study has examined the two measures side-by-side; hence, there is no information to suggest whether one assesses the construct better than the other, or whether each captures some unique aspect of the construct that could make unique theoretical contributions to the study of engagement. By comparing the scales to each other and evaluating their psychometric properties, this study serves to inform researchers on which measure may be most appropriate for assessing employee engagement, or whether both should be considered in some capacity to fully capture the construct domain. Historically, new or related measures have received similar treatment (e.g., Ilgen, Nebeker, & Pritchard, 1981), with results serving as a guide for researchers who may have different purposes or foci for their research. Hence, this study follows an established practice.

Background on Engagement

The empirical study of employee engagement is relatively new, resulting in a few disparate definitions for the construct (e.g., Saks, 2008; Shuck, 2011). At least three models of employee engagement have been proposed, each specifying that employee engagement is a construct unique from other similar constructs (i.e., satisfaction), and some have been supported by empirical evidence (Kahn, 1990; Macey & Schneider, 2008; Maslach, Schaufeli, & Leiter, 2001; Saks, 2008; Schaufeli et al., 2002). However, only two conceptualizations appear to have taken hold in the literature and have associated measures. Despite the growing popularity of these two perspectives, discussion has ensued around what defines employee engagement, how it should be measured, and whether or not it is a unique construct (e.g., Hallberg & Schaufeli, 2006; Macey & Schneider, 2008; Newman & Harrison, 2008). This next section provides a brief review of the two dominant models of engagement.

Perspective One

To learn how employees vary in their investment in work, and to explore whether such investment varied between settings, Kahn (1990) conducted a qualitative study of camp counselors and workers at an architectural firm. Grounded in the work of Goffman (1961) on individuals' attachment and detachment from their work roles, Kahn observed the 'preferred self' in everyday activities. The preferred self refers to the identity and behavior that people choose to use when in different roles. Kahn observed that camp counselors and architects employed themselves physically, cognitively, and emotionally in their work roles, and he subsequently defined engagement as this three-component expression of the employee's self in the work role. He analyzed work experiences in both settings, gathering contextual and psychological explanations for why employees engaged or disengaged at work. He further found that three

psychological states: meaningfulness, safety, and availability, seemed necessary for fostering employee engagement (Kahn, 1992). The concepts of the preferred self and the three psychological states form the basis of Kahn's conceptualization of engagement. Specifically, Kahn proposed that people enter a state of engagement, noted by the employment of their preferred selves cognitively, affectively, and physically, when they find meaningfulness, safety, and availability in their work roles.

Perspective Two

A second definition of employee engagement was proposed by Maslach and Leiter (1997), who suggested that engagement was the direct opposite of burnout and comprised of energy, involvement, and efficacy. These three components were the opposite of the three burnout components: exhaustion, cynicism, and lack of efficacy, respectively. The authors recommended that the Maslach Burnout Inventory (MBI; Maslach et al., 1997) could be used to assess both engagement and burnout, with each falling on an opposite end of the scale. Thus, low scores on the dimensions of the MBI should correspond with high levels of engagement.

However, Schaufeli et al. (2002) suggested that defining engagement as the opposite of burnout and using the MBI to assess both constructs created a measurement challenge in assessing whether they are indeed two distinct constructs, and also in developing validity evidence for engagement. Hence, Schaufeli et al. redefined engagement as retaining some of the elements of burnout, but argued that it was indeed a distinct construct. By editing the burnout inventory, the authors developed the UWES to distinguish between engagement and burnout. They redefined the three factors of burnout as vigor, dedication, and absorption. Vigor was defined as having high levels of energy even in challenging situations and serves as the opposite of the MBI's exhaustion factor. Dedication referred to enthusiasm, pride, inspiration, and

significance, and functions as the opposite of the MBI's cynicism factor. Absorption, taking the place of efficacy (which would be considered the opposite of the MBI's lack of efficacy factor), was defined as having a high level of concentration while working.

Measures of Employee Engagement

Having a measure with good construct validity evidence is necessary for advancing the field theoretically and practically. For example, using a measure with poor discriminant validity evidence can lead to conclusions that suggest a construct relates to another construct, when it actually does not. Conversely, a scale that has high convergent and discriminant validity evidence advances the research by appropriately specifying the construct domain (Benet-Martinez & Oishi, 2000), showing that the construct relates to other similar constructs as it should (convergence) and is different from constructs that should differ (discrimination).

For practitioners and researchers alike, not using a measure that appropriately captures the construct domain has far-reaching consequences. One can waste valuable time and resources chasing down inappropriate solutions or interventions, or specifying and pursuing a nomological network (Cronbach & Meehl, 1955) that is inherently flawed. Research builds on previous research; hence, results from a measure ill-suited for the purpose can affect an entire stream of research. Though businesses tend to be more interested in antecedent and outcome variables than in advancing a research stream (Shuck, 2011), practitioners reliance on well-developed measures that demonstrate construct validity evidence is justified by evidence-based practice. Evidence-based practice refers to the practice of using evidence over habit, history, or other non-scientifically based criteria (Hodgkinson, 2011).

The two theoretically established measures for assessing employee engagement examined in this study are the JES (Rich et al., 2010) and the UWES (Schaufeli et al., 2002). These two scales were chosen because they represent the two dominant theories of engagement in the field.

Although Kahn's (1990) conceptualization of engagement has informed research, his framework has rarely been used or cited for assessing employee engagement; most likely because of the lack of a measurement instrument designed to assess his conceptualization. An early attempt to create a measure using Kahn's framework failed (see May, Gilson, & Harter, 2004), primarily because survey items did not distinguish between the three components of engagement.

Recently, however, Rich and colleagues (2010) developed and published a measure, the JES, based on Kahn's conceptualization. Items for this scale are based on research related to the three dimensions. For example, Rich et al. drew upon Brown and Leigh's (1996) research on work intensity and effort, which showed that employees who work hard exhibit higher levels of performance. For constructing questions for the cognitive and emotional subscales, Rich et al. respectively drew upon the work of Rothbard's (2001) measure of attention and absorption, and Russell and Barrett's (1999) work on generalized affect encompassing feeling good and having energy. Rich et al.'s first examination of their scale, using a sample of 84 full-time employees, revealed high intercorrelations among the sub-scales ($r = .63$ to $.74$), which they suggested supported the concept of an overall job engagement score.

Subsequent modification of items and confirmatory factor analysis (CFA) on a field sample of 180 employees at an assisted-living healthcare facility, revealed support for a three dimension model of physical, cognitive, and emotional, with engagement as a higher-order factor (Rich et al., 2010). The authors concluded that their resulting measure captured Kahn's (1990)

conceptualization of engagement as a higher-order construct comprised of three distinct dimensions.

Furthermore, using a sample of 245 full-time firefighters, Rich and colleagues (2010) conducted CFAs and obtained further construct validity evidence for the second-order with three first-order factors structure of their measure. To obtain discriminant validity evidence they examined how job engagement related to a variety of constructs such as perceived support, job involvement, core self-evaluations (i.e., a higher order positive self-appraisal construct comprised of self-esteem, locus of control, neuroticism, and self-efficacy), and intrinsic motivation. To obtain predictive validity evidence, the authors obtained supervisory ratings of organizational citizenship behavior (OCBs; i.e., extra-role performance behaviors) and task performance. Their results, using structural equation modeling, supported their hypothesized relationships – engagement was positively related to support and core self-evaluations, as well as OCBs and task performance, and engagement was appropriately distinct from job satisfaction, intrinsic motivation, and job involvement. The JES is still relatively new (Crawford, LePine, & Rich, 2010), and therefore, no other validity studies were found in a recent search of the literature. Schaufeli and colleagues (2002) first proposed the UWES as a 17-item scale. Using exploratory factor analysis, they found three distinct factors of employee engagement: vigor, absorption, and dedication, consistent with their conceptualization. Schaufeli, Bakker, and Salanova (2006) later shortened the UWES-17 to create a 9-item version of the measure. The authors obtained construct validity evidence for the 9-item scale using (CFA) and internal reliability estimates. The model fit that emerged from the CFA was slightly worse than the 17-item scale. Fit, or goodness of fit, indicates how well a statistical model describes or explains a set of real world observed data (Brown, 2006). When comparing the fit of two models, a worse

fit indicates that the comparison model does not relate as closely to the observed data as the previous model, but in this case the difference between the 17-item and 9-item versions was considered negligible. Thus, there exist two different versions of the UWES, which are both used and cited in the literature. Because the 9-item measure does not have as much empirical support and it tends to show slightly worse fit than the 17-item scale for Schaufeli et al.'s conceptualization of employee engagement for most samples studied, the 17-item scale is used in this study.

Using the MBI-General Survey (MBI-GS; Maslach, Jackson, & Leiter, 1997) to assess burnout and the UWES (Schaufeli et al., 2002) to assess engagement, Schaufeli and colleagues (2002) found that engagement and burnout were psychometrically unique. That is, the authors used CFA across two Spanish samples (314 college students and 619 professional employees) and found that the burnout model did not fit as well as the UWES for assessing their definition of engagement. When modeling a two-factor solution where the MBI-GS subscales (lack of efficacy, cynicism, exhaustion) load onto one factor and the UWES subscales (vigor, dedication, absorption) load onto a second factor, this 2-factor higher-order solution of *engagement* and *burnout* emerged after some additional fit effort (see Schaufeli et al., 2002 for details). The authors concluded that burnout and engagement were not quite opposite sides of the same construct. Although Schaufeli et al. argue that their new scale, the UWES, is not the exact opposite of burnout, they obtained strong negative correlations with burnout as measured using the MBI-GS, most likely because the UWES retains many of the original MBI-GS items (positively phrased).

The UWES is currently the most commonly used measure to assess work engagement (Shuck, 2011). Although the initial focus on studying the UWES mainly looked at stress-related

outcomes, it has recently been used to examine the relationship between engagement and efficacy (Schaufeli & Salanova, 2007), and proactive behavior (Salanova & Schaufeli, 2008).

Current Study

With increasing research and practice attention on determining how to foster employee engagement, the need for understanding which measure to use grows. Given that participant attention and time is a premium, and researchers are seeking to develop the nomological network (Chronbach & Meehl, 1955) of engagement, using the instrument that best captures the construct of employee engagement becomes crucial (Harter, Schmidt, & Hayes, 2002; Rich et al., 2010). By studying both measures, the JES and UWES, simultaneously, using the same sample and examining validity evidence, it may be possible to obtain a clearer understanding of where and when to use each measure when studying employee engagement.

Validity evidence serves to inform conclusions and inferences about test scores; it is not a property of a test (Lawshe, 1985; Murphy, 2009). A number of strategies exist for accumulating validity evidence and these include focus on the content, the construct, and what outcomes the resulting scores correlate with and to what degree. Such evidence can inform a user's decision as to which engagement measure, whether the UWES or the JES, is most appropriate for their specific area of research. Though recent progress in understanding validity has moved towards referring to a single type of validity, construct validity (Murphy, 2009), it is easiest to discuss comparing measures by referring to the most relevant individual strategies used to accumulate validity evidence for the two engagement scales: construct and criterion-related.

Construct Validity

To evaluate if a measurement instrument is accurately and fully capturing a construct, one needs to investigate its construct validity evidence. Construct validity evidence, however, is not a

one-time demonstration; it requires a program of research that includes evidence that speaks to whether and how the scores on the measure relate to and do not relate to constructs that theory suggests should be related and unrelated (Campbell & Fiske, 1959). There are two distinct types of construct validity evidence described in the literature: convergent and discriminant (Campbell & Fiske, 1959). Convergent construct validity evidence is provided when test scores correlate with other tests or variables that overlap with the construct. In this case, one measure of engagement should be related to other measures of engagement, and related to constructs that the theory suggests should be strongly related to engagement (e.g., satisfaction or performance). Since both measures, the UWES and JES, are supposed to be measuring the same construct, they should demonstrate moderate to high correlations with each other. For example, vigor on the UWES should be highly correlated with physical engagement on the JES. Additionally, their second-order factor scores should be highly correlated with each other. That is, an overall score on the UWES should correlate highly with an overall score on the JES.

Discriminant validity evidence is demonstrated when the scores on the measure do not correlate with variables that should differ, or are expected by theory to not correlate with the construct. For example, engagement should not correlate with gender, as no theory suggests nor does evidence exist indicating that engagement differs by gender. However, age has been shown to be related to engagement in a few studies (James, McKechnie, & Swanberg, 2011; Avery, McKay, & Wilson, 2007), but there is very little research in the area. Thus, gender and age will be used to show discriminant validity evidence, with the possibility that age will be slightly related to engagement. Additionally, positive and negative affect can also be used to demonstrate discriminant validity evidence. Given that Rich et al.'s (2010) JES is based on Kahn's definition of engagement, which includes affect as a component, it is expected that there will be at least

some correlation between the affect factor of the JES and both positive and negative affectivity. Furthermore, Schaufeli et al. (2006) referred to engagement as an affective-cognitive state, which suggests there may be some evidence of affect being at least minimally related to their definition of engagement as well. However, high correlations are not expected. It should be noted that these variables (i.e., age, gender, positive affectivity, negative affectivity) were chosen based on the available data set for this study.

Another technique used for demonstrating whether two measures assess the same construct conceptualization is to examine the factor structure of the scale scores. Analyzing factor structure involves investigating whether or not a large data set can be reduced to a smaller data set with a fixed number of distinct interpretable factors (Brown, 2006). The factors can be either different constructs or components of a higher-order construct.

Factor analysis determines factor loadings (e.g., a standardized mathematical score of 0-1) for each item. Factor loadings represent how correlated an item is with the common factor underlying the items for a given data set (Brown, 2006). If the construct is conceptualized as comprised of only one concept, then each item from the questionnaire should load onto one factor only. For example, all of the vigor items for the UWES should load mainly on to vigor and not onto absorption or dedication. This means that a question on the vigor subscale should be representative of the construct of vigor and not overlap with the other factors or other constructs. If items do not load cleanly (meaning they load significantly on to more than one factor), they may need to be rewritten or removed from the measurement instrument (Lackey, Pett, & Sullivan, 2003).

For the current study, confirmatory factor analysis was used to determine whether the factor structure of the two engagement measures are the same. CFA is used to determine the fit of

a predefined model to a set of observed data. For this study, the model for both measures will be a three-factor model. Based on the previously mentioned studies, both scales are expected to have three factors. It should be noted that the three factors for each model are not expected to be the same or equivalent, but that the original authors of the measures each offered three factor solutions. An exploratory factor analysis (EFA) was not used because EFAs are primarily appropriate when no hypothesized factors exist or when a previous CFA demonstrates poor fit (Schmitt, 2011). Since neither of these criteria apply, a CFA is appropriate. The CFAs inform construct validity by determining if the assigned factor structure is appropriate for the current set of data (see Figure 1).

Models Tested

In addition to testing the theoretically imposed factor structure suggested by the literature (i.e., Model 1: JES = three factors, UWES = three factors), three alternative models were also tested in this study. The first model tests engagement as a single construct with the JES and the UWES items grouped together (Model 2). The second model explores whether the UWES and JES each form a separate construct of engagement resulting in two separate factors (a JES factor and a UWES factor; Model 3). The final model (Model 4) combined the physical, emotional, and cognitive subscales from the JES with the vigor, absorption, and dedication subscales of the UWES, creating a single 3-factor scale of engagement as opposed to two scales of three factors each.

Model 2

The second model tests the idea that engagement is one construct and that all the items from the JES and UWES are measuring the same construct. Thus, all items from both scales combined will result in a single factor (see Figure 2). If this model fits well, it indicates that both

scales are measuring the same construct and that either scale could be used for measuring engagement. It is hypothesized that this model will not fit well because the scale items were based on different foundations. That is, the JES has roots in Kahn's (1990) conceptualization of engagement whereas the UWES has roots in the burnout literature (Maslach & Leiter, 1997).

Hypothesis 1: A model with all items from the JES and UWES loading onto one factor will have poor psychometric fit.

Model 3

The third model tests the idea that the UWES and JES each capture different and unique pieces of the construct of engagement. Thus, this model is represented by the UWES as one factor and the JES as second factor (see Figure 3). If this model fits well, it will indicate that each measure offers a unique contribution to assessing and explaining engagement. It is hypothesized this model will not fit well because the scales share quite a bit of overlap.

Hypothesis 2: A model with the JES and UWES as separate factors will have poor psychometric fit.

Model 4

The fourth and final model tests the idea that the JES and UWES are both measuring the same construct, and that their subscales are just different iterations of the same underlying constructs of affect, behavior, and cognition. Thus, Rich et al.'s and Schaufeli et al.'s models should factor such that emotional and absorption capture an affect factor, physical and vigor capture a behavior factor, and cognition and dedication capture a cognitive factor.

Combining factors has some support; there is evidence that Schaufeli et al. (2002) originally conceptualized affective, behavioral, and cognitive components when they developed the UWES. The authors referred to engagement as, "...a more persistent, pervasive affective-

cognitive state that is not focused on any particular object, event, individual, or behavior” (p.74), so the concept of cognition was initially used. They characterized vigor as “...having high levels of energy and mental resilience, willingness to invest oneself in one’s work” (p.74), which is very similar to behavior. Furthermore, dedication was originally defined in terms of “psychological identification with one's work” (p.74), which is very similar to psychological affect. Although the items of the UWES do not precisely match these three basic psychological concepts, the general idea is that their model of engagement contains affective, behavioral, and cognitive components.

As previously noted, Rich and colleagues (2010) were explicit in linking their scale to affect, behavior, and cognition components of engagement. They note that while these three constructs have been used as predictors in workplace research, Kahn (1990) suggests the possibility that individuals “...can choose to invest their affective, cognitive, and physical energies simultaneously in role performances” (p. 617). As mentioned earlier, Rich et al. explicitly drew upon some of the research in areas of affect, behavior, and cognition when crafting their items for the subscales. Holistically, the concepts of emotional, physical, and cognitive engagement are a close parallel to the constructs of affect, behavior, and cognition, respectively.

Despite the similarities of the JES and UWES, the overall fit of model 4 is expected to be poor, but good relative to models 2 and model 3. Although the UWES does encapsulate some aspects of affect, behavior, and cognition, the items were not written explicitly from this grounded framework. Items such as, “I find the work I do full of meaning and purpose” and “When I get up in the morning I feel like going to work” seem to capture concepts that fit in between the categories. I hypothesize that model 4 will fit better than models 2 and 3, but still

have poor overall fit because of the theoretical, temporal, and psychometric differences between the two scales.

Hypothesis 3: A model with affect, behavior, and cognition as separate factors made up of items from the JES and UWES will have poor psychometric fit, but it will fit better than model 2 and model 3.

Criterion-related Validity

Criterion-related validity is demonstrated when engagement measures predict or relate to relevant workplace outcomes, called criteria. There are many relevant outcomes that researchers have related to employee engagement. For example, in a meta-analysis, Harter, Schmidt, and Hayes (2002) found significant relationships between engagement and customer satisfaction, productivity, profit, turnover, and accidents.

To compare the criterion-related validity evidence for the UWES and the JES, with the intention of determining whether one might be a better measure than the other in capturing the construct domain or simply determining if they are different at all, I have selected the criterion available in the archival data set used for this study; specifically, perceived stress, and job and organizational tenure.

Using stress as a criterion may provide insight into similarities and differences between the UWES and JES, since the UWES was originally conceived from the MBI (Maslach & Leiter, 1997), which is a stress-based measure. A substantial portion of the literature on engagement using the UWES as the measurement instrument has been based in the stress literature (see van Doornen, Houtveen, Langelaan, Bakker, van Rhenen, & Schaufeli, 2009; Zhang, Gan, & Cham, 2007), and demonstrated that scores on the UWES are related to stress outcomes, such as burnout and physical stress symptoms. In contrast, the JES was based on a conceptualization of

engagement that had no direct relationship to stress. Therefore, it is anticipated that the concurrent validity evidence (criterion and predictor collected at the same time) will demonstrate that the UWES is better than the JES for predicting stress-related outcomes.

Hypothesis 4: The UWES will have a stronger relationship with stress outcomes than the JES.

Job tenure and organizational tenure are generally used as correlates of engagement (see Kamalanabhan, Sai, & Mayuri, 2009) and not used as criteria, per se; however, they are still helpful in determining if the two engagement measures are similar. Specifically, if both the UWES and JES assess job engagement comparably, they should both correlate similarly (i.e., same direction and magnitude) with job and organizational tenure.

Additionally, to evaluate whether one measure outperforms the other in relating to the criteria chosen for this study, I used dominance analysis to compare the importance of predictors for one or more outcomes. Dominance analysis is a statistical technique for comparing the relative importance of predictors in multiple regression. Dominance analysis is used in conjunction with regression analysis to compare and rank order the relative important of predictor variables (Budescu, 1993). The technique works by comparing the amount of added variance explained by each variable across all subset models (Azen & Budescu 2003; Budescu, 1993). Such an analysis is particularly informative when ordering of predictors cannot be hypothesized a priori from theory (Johnson & LeBreton, 2004). Results from this analysis will show whether the UWES outperforms the JES, or vice-versa, in relating to the outcomes of interest. Thus, the results of this analysis contribute to the criterion-related validity evidence for each measure, while also satisfying the objectives of this study. Because there is no theory or evidence suggesting one of the measures is better than the other in predicting job and

organizational tenure, I offer the following as a research question:

Research Question 1: Will the UWES outperform the JES in predicting job tenure and organizational tenure?

Method

Participants and Procedures

The archival data set, comprised of two samples, used for this study was collected by undergraduate psychology students for class credit in 2009 and 2010. Students were instructed to recruit five adults working at least part-time (20 hours or more per week). Students were supervised during the recruitment process and used scripts approved by the human subjects review board. Half of the recruits were randomly called to ensure that students followed the protocol. The recruitment efforts resulted in a data set consisting of 297 adult participants who worked at least part-time. Participants voluntarily completed a secure web-based survey; no incentives were offered.

The second data set was collected almost identically, the main difference being that the collection was temporally separated across two surveys, two weeks apart. The recruit efforts resulted in a data set consisting of 173 adult participants who worked at least part-time. The data sets were then combined for a total of 470 participants. Participants were mostly female (56.5%), Caucasian (90.0%), and reported a mean age of 39.5 years old with a standard deviation of 14.1 years. The data sets were combined because structural invariance was expected. The methods, sample collection, and scales used across both studies were all very similar.

Job Engagement Scale

The job engagement scale was developed by Rich et al. (2010) based on Kahn's (1990) definition of employee engagement and its three dimensions: physical, cognitive, and emotional

engagement. Each dimension is represented by six questions. Participants rated their levels of employee engagement on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Example items include: “I work with intensity on my job” (physical), “I am enthusiastic about my job” (emotional), and “At work, my mind focuses on my job” (cognitive).

Utrecht Work Engagement Scale

The Utrecht Work Engagement Scale was developed by Schaufeli et al. (2002) originating as the opposite of the MBI (Maslach et al., 1997). The UWES assesses three dimensions: vigor, dedication, and absorption. There are six questions for vigor and absorption and five questions for dedication, creating a total of 17 questions. Participants rated their levels of employee engagement on a 7-point Likert scale (0 = *Never* to 6 = *Always/Every day*). Example items include: “At my work I feel bursting with energy” (vigor), “I find the work I do full of meaning and purpose” (dedication), and “Time flies when I’m working” (absorption).

Stress

The Perceived Stress Scale (PSS) consisting of ten items was developed by Cohen, Kamarck, and Mermelstein (1983). Participants rated their perceived stress on a 5-point Likert scale (0 = *Never* to 4 = *Always/Every day*). Example items include: “been upset because of something that happened unexpectedly” and “felt that you were on top of things” (reverse coded).

Affect

Affectivity, both positive and negative, was measured using a 20-item scale developed by Watson, Clark, and Tellegen (1988). The scale contains words that describe different emotions. Participants are asked to rate the extent to which they feel these emotions (1 = *Very Slightly* to 5

= *Extremely*). Sample items include: “interested” (positive affect) and “distressed” (negative affect).

Demographics

Demographic information for the sample included gender, race, and age. Additionally, job tenure and organizational tenure (in years) were collected as single-item measures (i.e., “what is your job/organizational tenure in years”).

Data Analysis

Two main statistical analyses were conducted to compare the UWES and the JES. First, a confirmatory factor analysis was conducted using M-Plus (Muthén & Muthén, 2007). For all CFAs, there are several different rules of thumb for what constitutes poor or good fit. The proposed models were assessed using a variety of fit indices including the chi-square statistic, comparative fit index (CFI), Tucker-Lewis index (TLI), and the root-mean square error of approximation (RMSEA). Non-significant chi-square values constitute a good fit; however, because of the sensitivity to sample size, the chi-square statistic is typically significant for large samples such as this one. Hence, the use of additional fit indices. According to Hu and Bentler (1998), a cutoff score of .95 or above is recommended for maximum likelihood-based fit indices such as those used here (the CFI and TLI), and a cutoff value of .06 or less is recommended for the RMSEA. The authors do caution, however, that it is difficult to designate a specific cutoff score for each fit index since they function differently based on different model parameters. Therefore, they recommend that the strict use of rules of thumb is not as important as a reporting a wide variety of fit indices (Hu & Bentler, 1998; Hayduk, Cummings, Boadu, Pazderka-Robinson, & Boulianne, 2007).

Additionally, in comparing models, one must consider the idea of nested models. A model is nested when it contains the same number of parameters as the comparison model, but the set of paths within one model is a subset of the other. Thus, one or more parameters that are freely estimated in one model are constrained in the other. The change in chi-square ($\Delta\chi^2\Delta df$) is used for determining comparative fit of nested models (Hu & Bentler, 1998). Non-nested models of the JES and UWES cannot be compared using the change in chi-square statistic. The Bayes information criterion (BIC: Raftery, 1993) is used for this purpose, where lower values indicate a better fit. If there is no difference in BICs across models (less than 6 points), one favors the model that is more parsimonious.

Dominance analysis was used to inform the criterion-related validity of the two measures, assessing whether one is better or worse than the other, or if the scales are the same at predicting job tenure, organizational tenure, and perceived stress. Dominance analysis was run using methods described in Azen and Budescu (2003) and Budescu (1993).

Results

Descriptive statistics and overall correlations are shown in Table 1. Table 2 includes correlations between the JES and UWES subscales and study variables. Examination of the Pearson correlations in Table 2 provides some initial evidence for both convergent and discriminant validity. For example, for discriminant validity, there was no relationship between either the JES or UWES and gender. There were low to moderate correlations between the measures of engagement and age. For convergent validity, it was expected that positive affect would have a mild to moderate positive relationship with both the UWES and the JES. This was confirmed with positive affect being related significantly to both the JES and the UWES. The higher correlations between the JES and UWES and positive affect, as compared visually to their

correlations with negative affect were anticipated, given that positive affect is incorporated in both conceptualizations of engagement. The JES and UWES were strongly correlated with each other (Table 1 & 2), suggesting that even though they are based on different theoretical backgrounds, they are both still assessing a similar construct.

Turning to the sub-scales, they were only moderately related as hypothesized (shown in Table 2). The moderate correlations between physical and vigor ($r = .51$), emotional and absorption ($r = .57$), and cognitive and dedication ($r = .56$) subscales of the UWES and JES demonstrate that the two conceptualizations are similar yet still distinct.

All factor analyses were run using MPlus (Muthén & Muthén, 2007). To test the factor structure of the measures as originally hypothesized by their respective scale authors (Model 1, Figure 1), a three-factor model was tested for both the JES and the UWES. In their initial study of the JES, Rich et al. (2010) found that the three-factor solution fit better than a one-factor solution, but that the one-factor solution also demonstrated acceptable fit. For the UWES, both a one-factor structure and a three-factor structure have also been reported. For this study, acceptable fit will be defined as a model having a CFI greater than or equal to .90. The results in this study show that for the JES, the three-factor solution fit much better than the one-factor solution as evidenced by the CFI and $\Delta\chi^2$ (see Table 3). These results offer strong support for the three-factor engagement model. For the UWES, the three-factor solution fit similarly to the one factor solution as evidenced by the fit indices (shown in Table 3). It should be noted that the fit of the three-factor solution is less adequate than usually reported for the UWES (see Schaufeli et al., 2002; Salanova & Schaufeli, 2008). That is, other studies have reported higher CFIs and lower RMSEAs. Overall, the fit of many models was below acceptable. Even though low residuals and high factor loadings for both the UWES and the JES indicate that there may not be

problems with individual items for either measure, because of their less than outstanding fit and in particular the higher than desired RMSEAs, I examined their discrepancy matrices.

The discrepancy matrices were examined for the three-factor solution for both the JES and the UWES (see Table 4 for JES; see Table 5 for UWES). Discrepancy matrices provide information as to whether items are more related to, or less related to, other items than expected. Generally, items that have high or low values in clusters point to possible problems. Items with values greater than .1 or less than -.1 are potentially problematic (McDonald, 1999). Problematic items are then either modified or removed to improve the measure. Results for the JES indicate that only item 4 should potentially be removed, “I try my hardest to perform well on my job.” It had three large discrepancies with other items. Results for the UWES suggest that item number 1, “At my work, I feel bursting with energy,” and item number 16, “It is difficult to detach myself from my job,” should be removed. These items all had two to three large discrepancies. Determining discrepancies is analyzed by looking for clusters of greater than .1 or less than -.1, indicating that the item is over or under related to numerous other items. If an item has large discrepancies with several other items it means the item is not relating to the others in the way the model predicts.

Looking closely at the discrepancy matrices (Table 4 and Table 5), there are some other items that future researchers may want to consider for modification. For the JES, item 10, “I am proud of my job” (emotional), is correlated greater than .1 with items 4 and 5 (both from the physical subscale). Although intuitively the concept of pride does not seem related to the physical subscale, if future samples replicate these large discrepancies, it may be worth examining and editing these items. For the UWES, item 13, “To me, my job is challenging” (dedication) needs further examination because it is positively related to both item 14 and item

16 (both from the absorption subscale). This relationship is not expected since the subscales are purported to assess distinct subcomponents of engagement.

CFAs on the proposed alternative models comparing the JES and UWES were conducted (see Table 6). The fit of model 2 (Figure 2), where all items from both scales are combined to load on a single factor of engagement, was particularly poor. This poor fit, evidence by inadequate fit indices, is a good indicator that the JES and UWES are measuring constructs that are not identical. This finding offered support for Hypothesis 1.

Next, model 3 was tested (Figure 3). Although the fit was also not good (Table 6), this model showed an improvement over the one-factor solution as evidenced by the increase in the CFI and TLI and decrease in RMSEA and BIC. This lack of fit also offers some evidence that the two scales are distinct and not capturing the exact same aspect of the construct domain, offering support for Hypothesis 2.

Model 4 (Figure 4) showed similar fit indices as the two-factor solution (shown in Table 6). These results offer evidence that the two scales, UWES and JES, are structured similarly. However, the poor overall fit as demonstrated by less than ideal fit indices suggests the two scales are not identical or similar enough to be interchangeable. These results show support for Hypothesis 3, with model 4 being the best fitting alternative model, albeit not the best fitting overall.

Results of dominance analysis (shown in Table 7), which compares the predictive capability of each measure, showed that the UWES outperformed the JES in predicting all outcomes, though the variance in job and organizational tenure explained by the JES or UWES was very minimal (i.e., 1% to 2%). Neither the JES nor the UWES provided strong criterion-related evidence, with both predictors combined only accounting for 8.8%, 1.9%, and 1.5% of

the variance in stress, job tenure, and organizational tenure, respectively. As hypothesized, the dominance weight favored the UWES (76.14%) over the JES (23.86%) for predicting stress. Interestingly, dominance weights also favored the UWES over the JES in predicting job and organizational tenure (65.79% over 24.21%, and 73.33% over 26.67%, respectively).

Discussion

Using correlation matrices, confirmatory factor analysis, and dominance analyses, this study shows that the two measures of engagement, JES and UWES, were similar, yet also varied in many different aspects, suggesting that they capture slightly different conceptualizations of the same engagement construct. One of the ways in which the UWES and the JES differed was in the factor structure of the two scales. Both the JES and the UWES factored as described by Rich et al. (2010) and Schaufeli et al. (2002), respectively. Overall, this study sample indicates that the JES, developed based on Kahn's (1990) conceptualization of engagement, confirms the factor structure proposed by Rich et al. in their original study. An examination of the discrepancy matrix for the JES indicated that improvements to the JES could be made that would potentially strengthen the overall structure of the measure. The UWES factored best, though not ideally, into three factors as previously hypothesized and shown by Schaufeli et al. (2002). This is not the first time that the UWES demonstrated less than desirable fit for its proposed model (for example, see Storm & Rothman, 2003). Additionally, the factor analysis and discrepancy analysis for the UWES using the current study sample suggests that there may be some item-level problems that could be addressed, potentially resulting in a better factor structure and hence, a cleaner assessment of the construct. For example, an examination of the discrepancy matrix revealed several items that could be removed or modified to improve the distinctiveness of the three subscales from one another.

In addition to comparing and contrasting the JES and UWES, this study also adds to the divergent and convergent validity evidence for both measures. For example, as expected gender was not correlated with either the JES or UWES, and positive affect was correlated moderately with both. Additionally, negative affect had a small to moderate negative correlation with both measures. Interestingly, there was a small but significant correlation between age and engagement. Though both the UWES and the JES were related to age, the UWES had a bigger correlation to age than did the JES. Although age being related to engagement is not unheard of (James, McKechnie, & Swanberg, 2011; Avery, McKay, & Wilson, 2007), there is very little research in the area. Another interpretation of the findings is that the UWES captures a slightly different interpretation of engagement than does the JES, one that suggests engagement changes as we age. Exploring possible differences in engagement between ages and the implications of those differences could be a direction for future engagement research.

In addition to examining construct validity and factor structure, criterion-related validity was also an important part of this study. I sought to evaluate whether either the JES or the UWES could account for more variance than the other in stress, job tenure, or organizational tenure. As hypothesized, the UWES was a better predictor of stress than the JES. Unexpected was that the UWES was also better at predicting job and organizational tenure in terms of variance explained. These findings could be explained by the relationship between the UWES and stress; tenure is related to stress and therefore the UWES may better predict tenure because of this stronger relationship with stress as compared to the JES. Future research should examine other outcome variables to extend this study's findings for criterion-related validity.

Finally, I proposed and answered several questions regarding the overall concept of engagement as theorized by both Rich et al. (2010) and Schaufeli et al. (2002). The first question

was whether or not both the JES and the UWES combined were really measuring one overall construct of engagement. The findings did not support this supposition and lead to several possible conclusions. First, the UWES and JES simply offer different conceptualizations of employee engagement and therefore combining them results in two different concepts stuck together. Second, because of the diverse theoretical backgrounds of the two scales, the items written for the scales are different enough that fitting engagement to a single higher order construct would be challenging using these items. For example, the UWES uses a frequency Likert scale (i.e., a every day, a few times a week), whereas the JES measures level of endorsement (i.e., strongly agree, agree). These different response scales capture different ideas of what it means to be engaged – either it is something that is done frequently or it is like an attitude or opinion. Furthermore, there is a difference in language between the two scales. For example, the JES has the item, “I feel energetic about my job,” whereas the UWES has the item, “at my work, I feel bursting with energy.” Though the items capture the same sentiment, the language of the item for the UWES is more direct and expressive. As a result, the respondents might more strongly endorse the UWES item over the JES item even if they had the same level of energy. Thus, the UWES may capture a more explosive feeling of engagement, whereas the JES captures a more subtle feeling of engagement. Because of these differences, one can conclude that a single factor conceptualization using either the JES or the UWES, or a combination of the two, would be hard to produce without significant changes to the items or theory behind one or both of the scales.

The second question I sought to answer was whether engagement could be conceptualized as being made up of two separate factors, the JES and the UWES, each capturing a unique part of an overall engagement construct. Though results supported this model as more

plausible than the single factor model, overall it was still not the best representation of the data for this sample. These results, however, do provide evidence that the UWES and the JES assess engagement differently, and that each captures unique pieces to the construct of engagement, in addition to having some overlap. For example, “vigor” from the UWES and “physical” from the JES were strongly related and most likely both explain some of the same variance. However, the other subscales were not as closely related, and thus they may explain unique variance in the model.

The last question proposed was whether the subscales from both of the measures could be combined to form a factor of affect, behavior, and cognition. The results suggest that the models have many similarities, in addition to the previously found differences. Model fit indicated that the subscales between the two measures (e.g., vigor related to physical) were related at least modestly, as hypothesized. The implications of these findings are that both the UWES and the JES contribute unique theoretical contributions to the study of engagement, despite their commonalities. That is, though they are capturing the engagement construct differently, they each capture three components: an affective component, a behavioral or physical component, and a cognitively based component.

Overall, the UWES did not hold up quite as well as the JES in a comparison of psychometric properties (i.e., factor structure); however, the UWES did outperform the JES in prediction of outcomes. Although counterintuitive, psychometric quality and criterion-related validity are not always related. Since factor analysis is the process of explaining data, a stronger factor structure and better psychometric properties indicates the chosen model for the JES had acceptable fit with this data set while the chosen model for the UWES did not. The difference in predicting outcomes is based on how closely related these conceptualizations are to the outcomes

of interest (stress, job tenure, and organizational tenure). The UWES was more strongly related to these outcomes, and the differences in psychometric fit were not pronounced enough to affect the relationship. The implication of these findings, therefore, is that the UWES is capturing a conceptualization of engagement that is strongly tied to stress, which studies have shown is strongly related to tenure. The JES, in contrast, captures a conceptualization of engagement that is not inherently tied to stress or tenure. The results of this study confirm that researchers conceptually associating the UWES with stress models are not in the wrong.

Strengths and Limitations

A strength of this study is the large data set that includes participants from a wide range of professions and industries. On one hand, the diversity of participants can be considered a strength. On the other hand, that the participants came from a range of organizations could be a limitation in that there may be differences in the participants for which this study cannot account (e.g., differences in organizational experiences). However, given that the object of this study was to compare the UWES and the JES without constraints of organizational culture, the sample used here can be considered a strength.

Another strength of the study is the rigorous analyses of the two measures. The factor structure of both the JES and the UWES was analyzed, comparing a number of alternative models in a manner that goes above and beyond previous employee engagement studies (e.g., the inclusion of discrepancy and dominance analyses). Past studies generally assumed the originally hypothesized factor structure of the measures, in particular the UWES (see Schaufeli et al., 2002; Schaufeli & Salanova, 2007; Salanova & Schaufeli, 2008). I sought to advance the literature and explore other possible configurations of employee engagement, thereby providing a deeper understanding of the two measures, in particular the UWES, than previously available.

Limitations of this study are related to the use of archival data. First, there were only a few different constructs with which to examine discriminant and convergent validity evidence. Second, this same limitation applies to obtaining criterion-related validity, as there were only three suitable criterion variables available. Additionally, two of the criteria were assessed with single-item measures, and single-item measures have been criticized for psychometric deficiencies (Nunnally & Bernstein, 1994). However, job and organizational tenure are demographic variables and tend to be assessed with single-item questions. Hence, this study is similar to many others that use job and organizational tenure as outcomes.

Theoretical and Practical Contributions

This study contributes to both theory and practice. First, this study examines both the JES and the UWES side by side using a large diverse sample to examine the factor structure of both the measures. Analysis of the discrepancy matrices suggest that both measures, but the UWES in particular, may need some work at the item level. Taking the results of the discrepancy matrices together with examining both scales in a similar manner using a different sample could offer guidance into how to best adjust these scales and their items. Although the UWES has been examined over many different samples, discrepancy matrices have not been provided in any of the previously published psychometric work.

This study further contributes to theory by showing that the construct of employee engagement still has plenty of room for discovery and improvement. Although both measures had good fit and explained different criterion (to an extent), neither demonstrated excellent fit to the data. This means that participants view engagement a little differently than how the measures suggest they should view engagement. Despite the differences these two scales have from each other, they are correlated at the scale, factor, and item level. Given that each measure was based

on a different theoretical framework, it is revealing that the two measures are indeed highly correlated. This suggests that although their conceptualizations of engagement seem different, they are actually have some similarities as well. The study findings further suggest that researchers can discuss at a theoretical level engagement as a three component construct comprised of an affect, physical/behavior, and cognitive component. However, the model did still have poor fit overall. further studying the similarities and differences of these scales at the criterion level, researchers could determine more precisely which measure is more appropriate for any given research question or practical application, or devise a single measure that captures the uniqueness of the UWES and JES that captures their core similarities, removing the need for two measures.

Future Research

Future research exploring the similarities and differences between these engagement scales should first seek to expand upon this study by examining more variables for both criterion-related and construct-related validity evidence. For example, performance, organizational citizenship behaviors, and burnout measures could all provide insight into how these measures perform in different situations. Though these criteria have been studied for each scale separately, they have not been studied with both measures as independent variables to see where any shared variance lies. Evaluating strong criterion-related evidence for the UWES and JES simultaneously would further support an evaluation of the appropriateness of using either or both scales. A good starting point would be picking variables that are theoretical related to the different conceptualizations of engagement as defined by the JES and UWES.

Future research could also examine other measures of engagement (i.e., Saks, 2006). By comparing another measure that purports to measure engagement to the JES and UWES,

researchers could create a clearer picture of how other conceptualizations of engagement are possibly related to the JES and UWES conceptualizations. Creating a clear understanding of the measured constructs of engagement contributes to both science and practice. If the current scales all function mostly equivalently, then choosing a scale would be a matter of preference; however, if the scales capture different components of engagement, then using the most appropriate measure would make more sense.

Conclusion

Given the lack of information about how the different engagement measures relate to one another, specifically the JES and UWES, the goal of the current study was to explore and identify the similarities, differences, strengths, and weaknesses of the JES and the UWES. By exploring engagement as assessed with these measures and how they are related, the findings of this study serves as a preliminary guide as to when one scale is more appropriate or useful than the other. The results suggest that the UWES has less psychometric strength than the JES, however, it is more strongly related to stress-related criterion than the JES. Researchers are encouraged to replicate the findings and extend them in future research.

JES (Rich, LePine, & Crawford, 2010)

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

1. I work with intensity on my job. (physical)
2. I exert my full effort to my job. (physical)
3. I devote a lot of energy to my job. (physical)
4. I try my hardest to perform well on my job. (physical)
5. I strive as hard as I can to complete my job. (physical)
6. I exert a lot of energy on my job. (physical)
7. I am enthusiastic about my job. (emotional)
8. I feel energetic about my job. (emotional)
9. I am interested in my job. (emotional)
10. I am proud of my job. (emotional)
11. I feel positive about my job. (emotional)
12. I am excited about my job. (emotional)
13. At work, my mind is focused on my job. (cognitive)
14. At work, I pay a lot of attention to my job. (cognitive)
15. At work, I concentrate on my job. (cognitive)
16. At work, I focus a great deal of attention on my job. (cognitive)
17. At work, I am absorbed in my job. (cognitive)
18. At work, I devote a lot of attention to my job. (cognitive)

UWES (Schaufeli & Bakker, 2003)

The following 17 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the “0” (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

0	Almost never	Rarely	Sometimes	Often	Very often	Always
Never	1 A few times a year or less	2 Once a month or less	3 A few times a month	4 Once a week	5 A few times a week	6 Every day

1. At my work, I feel bursting with energy. (vigor)
2. I find the work that I do full of meaning and purpose. (dedication)
3. Time flies when I’m working. (absorption)
4. At my job, I feel strong and vigorous. (vigor)
5. I am enthusiastic about my job. (dedication)
6. When I am working, I forget everything else around me. (absorption)
7. My job inspires me. (dedication)
8. When I get up in the morning, I feel like going to work. (vigor)
9. I feel happy when I am working intensely. (absorption)
10. I am proud of the work that I do. (dedication)
11. I am immersed in my work. (absorption)
12. I can continue working for very long periods at a time. (vigor)
13. To me, my job is challenging. (dedication)
14. I get carried away when I’m working. (absorption)
15. At my job, I am very resilient, mentally. (vigor)
16. It is difficult to detach myself from my job. (absorption)
17. At my work I always persevere, even when things do not go well. (vigor)

Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

Never 0	Almost Never 1	Sometimes 2	Fairly Often 3	Very Often 4
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1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

PANAS (Watson et al., 1988)

The following scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate number in the space next to that word. Indicate to what extent you generally feel this way, that is, how you feel on the average. Use the following scale to record your answers.

Very Slightly (1)	A Little (2)	Moderately (3)	Quite A Bit (4)	Extremely (5)
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1.	Distressed	1	2	3	4	5
2.	Upset	1	2	3	4	5
3.	Guilty	1	2	3	4	5
4.	Scared	1	2	3	4	5
5.	Hostile	1	2	3	4	5
6.	Irritable	1	2	3	4	5
7.	Ashamed	1	2	3	4	5
8.	Nervous	1	2	3	4	5
9.	Jittery	1	2	3	4	5
10.	Afraid	1	2	3	4	5
11.	Enthusiastic	1	2	3	4	5
12.	Interested	1	2	3	4	5
13.	Determined	1	2	3	4	5
14.	Excited	1	2	3	4	5
15.	Inspired	1	2	3	4	5
16.	Alert	1	2	3	4	5
17.	Active	1	2	3	4	5
18.	Strong	1	2	3	4	5
19.	Proud	1	2	3	4	5
20.	Attentive	1	2	3	4	5

Demographic Variables

1. In what year were you born? (years range from 1915-1995)
2. Gender (M/F)
3. Race
 - a. Hispanic or Latino
 - b. White
 - c. Black or African American
 - d. Native Hawaiian or other Pacific Islander
 - e. Asian
 - f. American Indian or Alaska Native
 - g. Two or more races
4. Are you...
 - a. Part-time (at least 20 hrs/wk but less than 40 hrs/wk)
 - b. Full-time (at least 40 hrs/wk)
5. What is your tenure in years...
 - a. With your company
 - b. In your current job

Table 1

Descriptive Statistics and Correlations (N=470)

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Age	39.54	14.16	--								
2. Gender	1.57	0.50	-.05	--							
3. Organizational Tenure	4.85	4.95	.39**	.01	--						
4. Job Tenure	4.45	4.97	.40**	-.10	.57**	--					
5. Stress	1.61	0.47	-.20**	.02	-.07	-.06	(.82)				
6. JES	4.10	0.66	.13**	.067	.08	.11*	-.21**	(.95)			
7. UWES	4.07	1.04	.28**	-.01	.12**	.14**	-.30**	.72**	(.94)		
8. Positive Affect	3.67	0.69	.03	.03	.09	.12*	-.33**	.61**	.56**	(.91)	
9. Negative Affect	1.67	0.60	-.02	-.08	-.08	-.01	.59**	-.21**	-.23**	-.19**	(.87)

Note. * $p < .05$ ** $p < .01$ *For gender: male = 1, female = 2.*

Table 2

Convergent and Discriminant Validity of JES, UWES, and Subscales (Pearson)

	1	2	3	4	5	6	7	8	9
1. JES									
2. UWES	.72**								
3. Vigor	.66**	.92**							
4. Dedication	.71**	.95**	.83**						
5. Absorption	.65**	.93**	.77**	.83**					
6. Physical	.56**	.56**	.51**	.51**	.54**				
7. Emotional	.86**	.71**	.65**	.74**	.56**	.56**			
8. Cognitive	.90**	.55**	.55**	.56**	.57**	.75**	.61**		
9. Positive Affect	.61**	.60**	.60**	.56**	.42**	.45**	.61**	.50**	
1. Negative Affect	-.21**	-.31**	-.31**	-.24**	-.10*	-.08	-.28**	-.16**	-.19**
0.									

Note. * $p < .05$

** $p < .01$

Shaded cells indicate correlation between similar subscales of the JES and UWES.

Table 3

Confirmatory Factor Analysis for Model 1, Original Scales

	Model χ^2 (<i>df</i>)	$\Delta\chi^2\Delta df$	RMSEA	CFI	TLI
JES 1-Factor	2550.36(135)		0.20	0.69	0.65
JES 3-Factor	753.41(132)	1496.95(3)**	0.10	0.92	0.91
UWES 1-Factor	855.76(119)		0.12	0.85	0.83
UWES 3-Factor	769.10(116)	86.66(3)**	0.11	0.87	0.84

Note. * $p < .05$

** $p < .01$

Table 4

Discrepancy Matrix for JES

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12
Item 1	0											
Item 2	0.038	0										
Item 3	0.025	0.012	0									
Item 4	-0.052	0.02	-0.062	0								
Item 5	-0.052	-0.021	-0.043	0.129	0							
Item 6	0.004	-0.045	0.108	-0.044	-0.037	0						
Item 7	0.057	0.071	0.064	0.13	0.092	0.073	0					
Item 8	0.048	0.058	0.055	0.096	0.054	0.096	0.114	0				
Item 9	-0.024	-0.048	-0.039	0.057	0.043	-0.055	-0.019	-0.021	0			
Item 10	0.012	0.004	0.02	0.118	0.125	-0.028	-0.06	-0.086	0.084	0		
Item 11	-0.107	-0.084	-0.088	-0.011	-0.017	-0.113	-0.05	-0.03	-0.012	0.029	0	
Item 12	-0.085	-0.057	-0.1	-0.065	-0.055	-0.114	-0.031	-0.015	-0.005	0.003	0.085	0
Item 13	0.025	0.025	-0.014	0.002	0.003	-0.02	0.09	0.061	-0.001	0.064	-0.038	-0.024
Item 14	0.023	0.014	-0.037	0.007	0.034	-0.056	0.054	0.005	-0.005	0.049	-0.063	-0.067
Item 15	-0.017	-0.061	-0.04	-0.005	0.009	-0.026	0.033	0.017	0.017	0.058	-0.058	-0.08
Item 16	0.002	-0.024	-0.026	0.024	0.052	-0.014	0.06	0.031	0.03	0.076	-0.032	-0.057
Item 17	0.083	0.017	0.027	0.01	0.023	0.031	0.029	0.021	-0.011	0.024	-0.069	-0.053
Item 18	0.05	-0.014	0.01	0.075	0.043	0.029	0.051	0.029	0.012	0.048	-0.09	-0.089

Note. Shaded cells equal values $>.1$ or $<-.1$

Table 4 (continued)

Discrepancy Matrix for JES

	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18
Item 1						
Item 2						
Item 3						
Item 4						
Item 5						
Item 6						
Item 7						
Item 8						
Item 9						
Item 10						
Item 11						
Item 12						
Item 13	0					
Item 14	0.027	0				
Item 15	-0.007	0.012	0			
Item 16	-0.023	-0.005	0.022	0		
Item 17	0.024	-0.028	-0.023	-0.02	0	
Item 18	-0.01	-0.011	-0.019	-0.002	0.076	0

Note. Shaded cells equal values $>.1$ or $<-.1$

Table 5

Discrepancy Matrix for UWES

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12
Item 1	0											
Item 2	-0.025	0										
Item 3	0.042	-0.043	0									
Item 4	0.138	-0.042	0.089	0								
Item 5	0.079	-0.024	0.045	0.086	0							
Item 6	-0.074	-0.025	0.021	-0.028	-0.023	0						
Item 7	-0.013	0.047	-0.044	-0.039	-0.008	0.002	0					
Item 8	-0.007	-0.002	0	-0.07	0.075	-0.043	0.118	0				
Item 9	0.04	0.016	-0.047	0	0.047	-0.028	0.053	0.143	0			
Item 10	-0.08	0.072	-0.01	-0.055	0.014	-0.063	-0.031	0.032	0.095	0		
Item 11	-0.051	-0.044	-0.008	-0.023	0.006	-0.004	0.001	-0.004	-0.036	0.036	0	
Item 12	-0.045	-0.076	0.06	-0.025	-0.041	0.012	-0.057	-0.048	0.091	0.017	0.082	0
Item 13	-0.107	0	0.082	-0.012	-0.076	0.058	-0.009	0.045	0.06	-0.006	0.102	0.082
Item 14	-0.058	-0.06	-0.005	-0.044	-0.066	0.068	-0.008	-0.039	-0.037	-0.094	0.01	0.02
Item 15	-0.033	-0.063	-0.039	0.013	-0.002	0.03	-0.05	-0.065	0.009	-0.016	0.004	0.066
Item 16	-0.147	-0.062	-0.046	-0.085	-0.098	0.063	-0.001	-0.065	-0.098	-0.121	0.09	0.039
Item 17	-0.015	-0.046	0	0.007	-0.036	-0.017	-0.084	-0.055	0.058	0.053	-0.019	0.09

Note. Shaded cells equal values $>.1$ or $<-.1$

Table 5 (continued)

Discrepancy Matrix for UWES

	Item 13	Item 14	Item 15	Item 16	Item 17
Item 1					
Item 2					
Item 3					
Item 4					
Item 5					
Item 6					
Item 7					
Item 8					
Item 9					
Item 10					
Item 11					
Item 12					
Item 13	0				
Item 14	0.184	0			
Item 15	0.045	0.064	0		
Item 16	0.176	0.132	0.01	0	
Item 17	-0.023	-0.04	0.216	-0.019	0

Note. Shaded cells equal values $>.1$ or $<-.1$

Table 6

Confirmatory Factor Analysis for Proposed Scales

Model	$\chi^2(df)$	BIC	RMSEA	CFI	TLI
1 One Factor (JES & UWES)	5658.35(560)	42170.61	0.14	0.63	0.60
2 Two Factor (JES & UWES)	4336.82(559)	40855.24	0.12	0.72	0.71
3 Three Factor (Affect, Behavior, Cognition)	4277.71(557)	40808.43	0.12	0.73	0.71

Table 7

Dominance Analysis for Stress, Job Tenure, and Organizational Tenure

Predictors	Stress			Job			Org		
	Model R ²	ΔR ²	% R ²	Model R ²	Tenure		Model R ²	Tenure	
					Model R ²	ΔR ²		% R ²	Model R ²
JES	.04	.04	23.86	.01	.01	24.21	.01	.01	26.67
UWES	.09	.05	76.14	.02	.01	65.79	.01	.01	73.33
JES & UWES	.09	.00		.02	.00		.02	.00	

Note. Org = organizational; R² = R-Square, the amount of variance explained by the variable or set of variables. ΔR² = change in R² when adding new variable. %R² = percentage of R² attributed to the variable, from general dominance weights analysis.

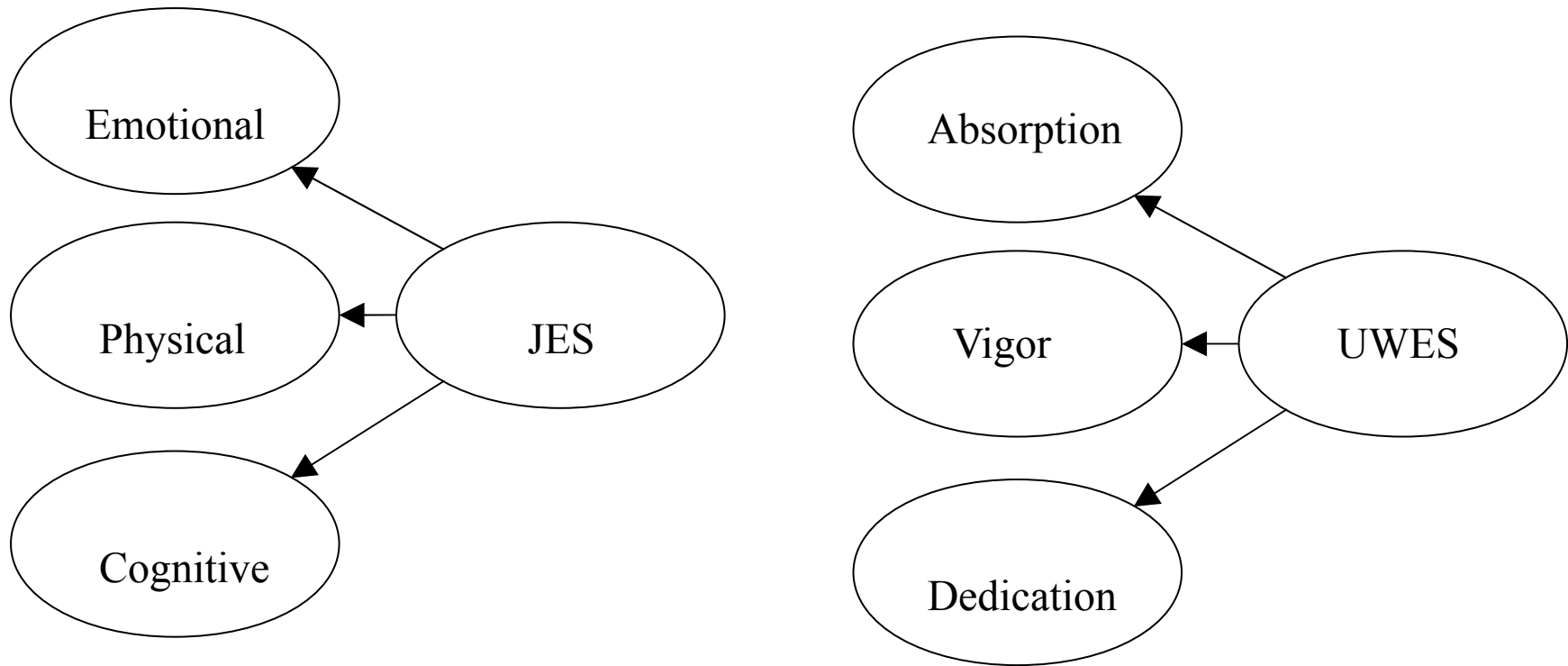


Figure 1. *UWES and JES (Model 1)*

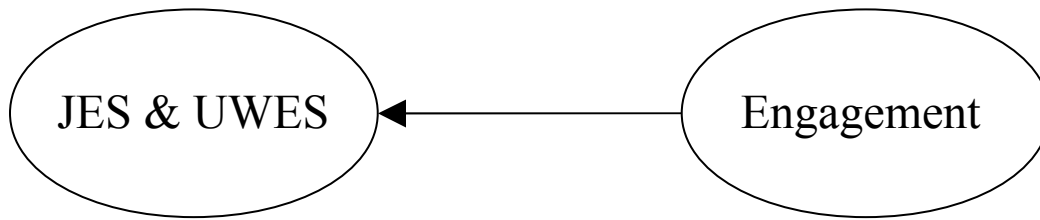


Figure 2. *UWES and JES Combined (Model 2)*

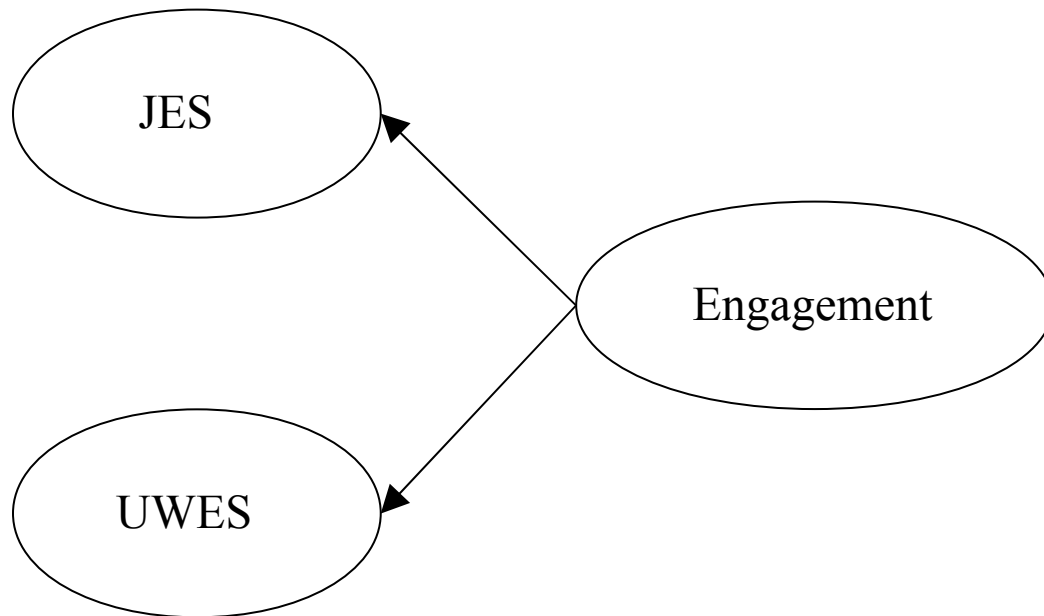


Figure 3. *UWES and JES as Separate Factors (Model 3)*

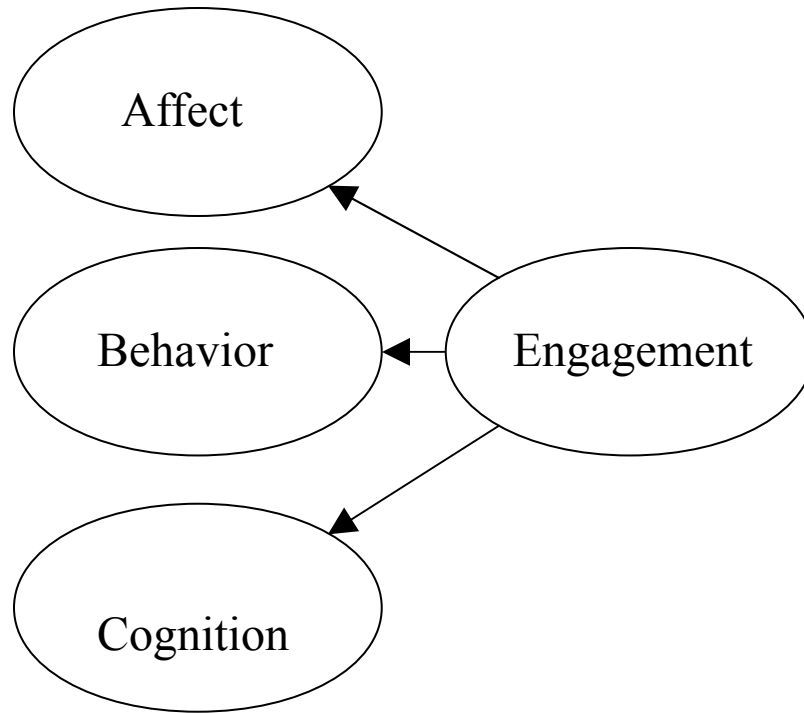


Figure 4. *JES and UWES Combined: Affect, Behavior, and Cognition as Factors of Engagement (Model 4)*

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