

## WORK ENGAGEMENT: A QUANTITATIVE REVIEW AND TEST OF ITS RELATIONS WITH TASK AND CONTEXTUAL PERFORMANCE

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Many researchers have concerns about work engagement's distinction from other constructs and its theoretical merit. The goals of this study were to identify an agreed-upon definition of engagement, to investigate its uniqueness, and to clarify its nomological network of constructs. Using a conceptual framework based on Macey and Schneider (2008; *Industrial and Organizational Psychology*, 1, 3–30), we found that engagement exhibits discriminant validity from, and criterion related validity over, job attitudes. We also found that engagement is related to several key antecedents and consequences. Finally, we used meta-analytic path modeling to test the role of engagement as a mediator of the relation between distal antecedents and job performance, finding support for our conceptual framework. In sum, our results suggest that work engagement is a useful construct that deserves further attention.

In recent years, work engagement has become a well-known construct to both scientists and practitioners. An emerging body of research is beginning to converge around a common conceptualization of work engagement as connoting high levels of personal investment in the work tasks performed on a job (e.g., Kahn, 1990; Macey & Schneider, 2008; May, Gilson, & Harter, 2004; Rich, LePine, & Crawford, 2010; Schaufeli, Salanova, Gonzalez-Roma, & Bakker, 2002). However, several issues remain unresolved that have important implications for the future of engagement research. Historically, engagement research has been plagued

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by inconsistent construct definitions and operationalizations (Macey & Schneider, 2008). As a result, there is confusion as to whether engagement is conceptually and empirically different from other constructs (e.g., Dalal, Brummel, Wee, & Thomas, 2008; Macey & Schneider, 2008; Newman & Harrison, 2008). Thus, some researchers are ambivalent about the incremental value of engagement over other constructs as a predictor of behavior (Newman & Harrison, 2008).

Macey and Schneider (2008) point out that “the relationships among potential antecedents and consequences of engagement. . . have not been rigorously conceptualized, much less studied” (p. 3–4), resulting in an inadequate understanding of work engagement’s nomological network. Moreover, although researchers have argued that engagement, as a motivational variable, should lead to high levels of job performance (e.g., Kahn, 1990; Rich et al., 2010; Schaufeli et al., 2002), we know little about engagement’s uniqueness as a predictor of job performance. Thus, the overarching intent of the current research is to resolve these deficiencies by organizing and integrating the available evidence in the literature. Specifically, our goals were to (a) examine the literature to find areas of commonality among the conceptualizations of engagement in order to arrive at an agreed-upon definition, (b) investigate the extent to which engagement is a unique construct, and (c) clarify the nomological network of constructs associated with engagement.

The remainder of this study unfolds as follows. We begin by identifying and describing the commonalities contained in this body of research in order to arrive at an operationalization of work engagement that exhibits relative consensus. We next situate engagement in a conceptual framework that specifies its associations with antecedents, outcomes, and conceptually similar constructs. Using this framework, we then argue that engagement is a unique construct and develop expectations for its discriminant validity. Next, we draw on our framework to discuss the antecedents and consequences (i.e., job performance) of engagement and develop expectations for their correlations. We then argue that engagement will predict job performance over and above the job attitudes in our framework. Next, we propose a test of our framework, which specifies engagement as a mediating link between its antecedents and consequences. Finally, we use meta-analytic techniques to test our predictions.

### *Defining Work Engagement*

Although there have been many studies that measure constructs that carry the “engagement” label, operational definitions are not always consistent. In order to define engagement in this research, we reviewed the literature to find commonalities among the measures of engagement.

Because the vast majority of studies that we reviewed drew on Kahn's (1990) conceptual foundation (e.g., Ashforth & Humphrey, 1995; May et al., 2004; Rich et al., 2010; Rothbard, 2001; Saks, 2006; Schaufeli et al., 2002), we used his work as our starting point for organizing the literature.

Kahn (1990) proposed that *personal engagement* represents a state in which employees "bring in" their personal selves during work role performances, investing personal energy and experiencing an emotional connection with their work. In this view, work roles represent opportunities for individuals to apply themselves behaviorally, energetically, and expressively, in a holistic and simultaneous fashion (Kahn, 1992; Rich et al., 2010). As such, work engagement is fundamentally a motivational concept that represents the active allocation of personal resources toward the tasks associated with a work role (Kanfer, 1990; Rich et al., 2010).

We found two characteristics of Kahn's (1990) conceptualization of engagement to be noteworthy in establishing an operational definition. First, work engagement should refer to a psychological connection with the *performance of work tasks* rather than an attitude toward features of the organization or the job (Maslach, Schaufeli, & Leiter, 2001). Thus, a measure such as the Gallup Workplace Audit (GWA; Harter, Schmidt, & Hayes, 2002) does not conform to this conceptualization because it refers to work conditions not the work task. For example, the GWA refers to a range of job characteristics including resource availability, rewards, feedback, task significance, development opportunities, and clarity of expectations (Harter et al., 2002). As shown in Table 1, we identified several measures of work engagement that refer to individuals' experiences during the performance of their work tasks. For example, the Utrecht Work Engagement Scale (UWES) references the experience of working; the Demerouti, Bakker, Vardakou, and Kantas (2003) scale<sup>1</sup> refers to work tasks; and the May et al. (2004) measure refers to the harnessing of employees' selves to their work roles.

Second, work engagement concerns the *self-investment of personal resources* in work. That is, engagement represents a commonality among physical, emotional, and cognitive energies that individuals bring to their work role (Rich et al., 2010). In this sense, work engagement is more than just the investment of a single aspect of the self; it represents the

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<sup>1</sup>We included the disengagement subscale of the Oldenburg Burnout Inventory (OLBI; Demerouti, 1999) as a measure of engagement for three reasons. First, the scale refers to the performance of the work itself, in terms of identification with and emotions towards the task (Demerouti et al., 2003). Second, the items for disengagement are written to reflect both ends of the engagement continuum rather than only disengagement (Demerouti et al., 2003), consistent with many other measures of work engagement (e.g., May et al., 2004). Third, burnout is widely recognized as a construct consisting of the three dimensions of exhaustion, cynicism, and reduced efficacy, which are not reflected in the OLBI disengagement subscale.

TABLE 1  
*Measure Descriptions*

| Measure                              | Original source (s)                                   | Description of measure   | Key components of definition   | Sample items   | k  |
|--------------------------------------|---|--|--|--|----|
| Utrecht Work Engagement Scale (UWES) | Schaufeli, Salanova, Gonzalez-Roma, and Bakker (2002) | <ul style="list-style-type: none"> <li>• 9–17 items</li> </ul>                                 | <ul style="list-style-type: none"> <li>• Positive, fulfilling, work-related state of mind</li> <li>• Persistent and pervasive affective-cognitive state</li> <li>• Energy and mental resilience while working</li> <li>• Significance, enthusiasm, inspiration, pride, and challenge</li> <li>• Fully concentrated and engrossed in one's work, time passes quickly, and one has difficulties detaching from work</li> </ul> | <ul style="list-style-type: none"> <li>• "Time flies when I am working."</li> <li>• "I am proud of the work that I do."</li> <li>• "At my job I feel strong and vigorous."</li> </ul>                                    | 73 |
| Disengagement (subscale of OLB)      | Demerouti, Bakker, Vardakou, and Kantas (2003)        | <ul style="list-style-type: none"> <li>• Measures vary in length, commonly 8 items.</li> </ul> | <ul style="list-style-type: none"> <li>• Emotions toward the work task</li> <li>• Relationship between employees and their job, particularly with respect to their engagement, identification, and willingness to continue in the same occupation</li> </ul>   | <ul style="list-style-type: none"> <li>• "I get more and more engaged in my work."</li> <li>• "I find my work to be a positive challenge."</li> <li>• "I always find new and interesting aspects in my work."</li> </ul> | 6  |

*continued*

TABLE 1 (continued)

| Measure                                   | Original source (s)                  | Description of measure  | Key components of definition   | Sample items   | <i>k</i> |
|---|--------------------------------------|---|--|--|----------|
| Shirom-Melamed<br>Vigor Measure<br>(SMVM) | Shirom (2004)                        | <ul style="list-style-type: none"> <li>• 14 items</li> </ul>                      | <ul style="list-style-type: none"> <li>• Affective response in the context of work organizations</li> <li>• Feelings of physical strength, emotional energy, and cognitive liveliness.</li> </ul>                | <ul style="list-style-type: none"> <li>• "I feel energetic."</li> <li>• "I feel like I can think rapidly."</li> <li>• "I feel able to show warmth to others."</li> </ul>   | 4        |
| Psychological<br>engagement               | May, Gilson, and<br>Harter (2004)    | <ul style="list-style-type: none"> <li>• 13 items based on Kahn (1990)</li> </ul> | <ul style="list-style-type: none"> <li>• Harnessing of members' selves to their work roles</li> <li>• Employ and express themselves physically, cognitively, and emotionally during role performances</li> </ul> | <ul style="list-style-type: none"> <li>• "Performing my job is so absorbing that I forget about everything else."</li> <li>• "I often feel emotionally detached from my job."</li> </ul>                                       | 3        |
| Job engagement                            | Rich, LePine, and<br>Crawford (2010) | <ul style="list-style-type: none"> <li>• 18 items based on Kahn (1990)</li> </ul> | <ul style="list-style-type: none"> <li>• Simultaneous investment of cognitive, affective, and physical energies into one's role performance</li> </ul>   | <ul style="list-style-type: none"> <li>• "I exert a lot of energy on my job."</li> <li>• "I am enthusiastic about my job."</li> <li>• "At work I am absorbed by my job."</li> </ul>  | 3        |
| Job engagement                            | Saks (2006)                          | <ul style="list-style-type: none"> <li>• 6 items based on Kahn (1990)</li> </ul>  | <ul style="list-style-type: none"> <li>• Extent to which an individual is psychologically present in a particular organizational role</li> <li>• All consuming</li> </ul>  | <ul style="list-style-type: none"> <li>• "I really 'throw' myself into my job."</li> <li>• "Sometimes I am so into my job that I lose track of time."</li> <li>• "This job is all consuming; I am totally into it."</li> </ul> | 1        |

investment of multiple dimensions (physical, emotional, and cognitive) so that the experience is simultaneous and holistic (Kahn, 1992; Rich et al., 2010). Thus, individuals who are engaged experience a connection with their work on multiple levels. We identified many measures that refer to the investment of multiple personal resources (see Table 1), either conceptualized as distinct dimensions (e.g., Schaufeli et al., 2002) or as a composite measure representing investment of the entire self (e.g., Saks, 2006). Some researchers report results for each dimension separately (e.g., vigor; Schaufeli & Baker, 2004), whereas others report a single factor (e.g., work engagement; Sonnentag, 2003). However, given that every study that we reviewed that reported dimension-level correlations showed strong correlations among the factors,<sup>2</sup> we conceptualized engagement as a higher-order construct (see LePine, Erez, & Johnson, 2002). Thus, several measures conceptualizing a single dimension of work engagement (e.g., cognitive absorption or flow; Bakker, 2005, Rothbard, 2001) did not fit our definition.

Another important factor in defining engagement is its conceptualization as a “state” versus as a “trait.” Most of the research conceptualizes engagement as a relatively stable individual difference variable that varies between persons (e.g., Schaufeli et al., 2002; Schaufeli & Salanova, 2007). However, recent research has indicated that engagement is subject to moderate day-level fluctuations around an average level (Sonnentag, 2003). This is consistent with Kahn (1990), who postulated that work engagement ebbs and flows—a condition that may vary both between and within individuals. Hence, a debate has emerged as to whether engagement is best thought of as a relatively stable trait, a temporally dynamic state, or both (Dalal et al., 2008). What is clear is that engagement varies both between and within persons, which is a common characteristic of many constructs in organizational behavior such as affect (Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003) and job satisfaction (JS; Ilies & Judge, 2002). Thus, we agree with Dalal et al.’s (2008) position, that “what Macey and Schneider call state engagement is probably better referred to simply as *engagement*, with the recognition that engagement is likely to contain both trait-like and state-like components” (p. 54–55). Therefore, we refer to engagement as a state of mind that is relatively enduring but may fluctuate over time (Schaufeli et al., 2002). However, because between-person and within-person methods contain different sources of variation,

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<sup>2</sup>We also performed a meta-analysis to test the strength of the relations between the factors of engagement in order to justify our conceptualization as a higher-order construct. As expected, the three components were strongly correlated. The correlation between physical and emotional was  $M\rho = .82$ , between physical and cognitive was  $M\rho = .81$ , and between emotional and cognitive was  $M\rho = .76$ . For a full description of the results of these analyses, readers can write to the first author.

we examined study design as a moderator of engagement's relations with antecedents and consequences.

Thus, based on our review, we defined work engagement as a relatively enduring state of mind referring to the simultaneous investment of personal energies in the experience or performance of work. Next, we turn to a discussion of the nomological network of work engagement.

### *Conceptual Framework*

In order to develop a model delineating work engagement's relationship with conceptually similar constructs, its antecedents, and its consequences, we utilized a modified version of the framework (Figure 1) put forth by Macey and Schneider (2008). This framework was useful for two reasons. First, it offered a clear description of engagement's nomological network. We utilized the portion of the framework specifying engagement's conceptual overlap with job attitudes to organize our discussion of discriminant validity, which we turn to in the following section. Second, we chose this framework because, although not a theory in itself, it specifies engagement as a mediating variable situated among its antecedents and outcomes. Specifically, the framework is grounded in the idea that distal antecedents such as job characteristics, leadership, and dispositional characteristics influence proximal motivational factors in order to affect job performance (e.g., Barrick, Mount, & Strauss, 1993; Hackman & Oldham, 1980; Kanfer, 1990; Piccolo & Colquitt, 2006). This idea is a key tenet of Kahn's (1990) theory of engagement, which was based in part on Hackman and Oldham's (1980) notion of critical psychological states. Kahn (1990) proposed that individual and organizational factors influence the psychological experience of work and that this experience drives work behavior. Following from this, Macey and Schneider (2008) identified several distal antecedents that should influence the extent to which an individual experiences a desire to self-invest their personal energies into performing their work at a high level. Thus, by drawing on research from job characteristics theory (Hackman & Oldham, 1980), charismatic leadership (e.g., Bass & Avolio, 1990), and personality, Macey and Schneider (2008) make the case that (a) job characteristics, (b) leadership, and (c) personality traits should all be directly related to work engagement and, thus, indirectly related to performance.

### *Discriminant Validity With Job Attitudes*

A particularly important question to researchers and practitioners is whether work engagement is simply a repackaging of similar constructs (Macey & Schneider, 2008). The idea that engagement is measured with

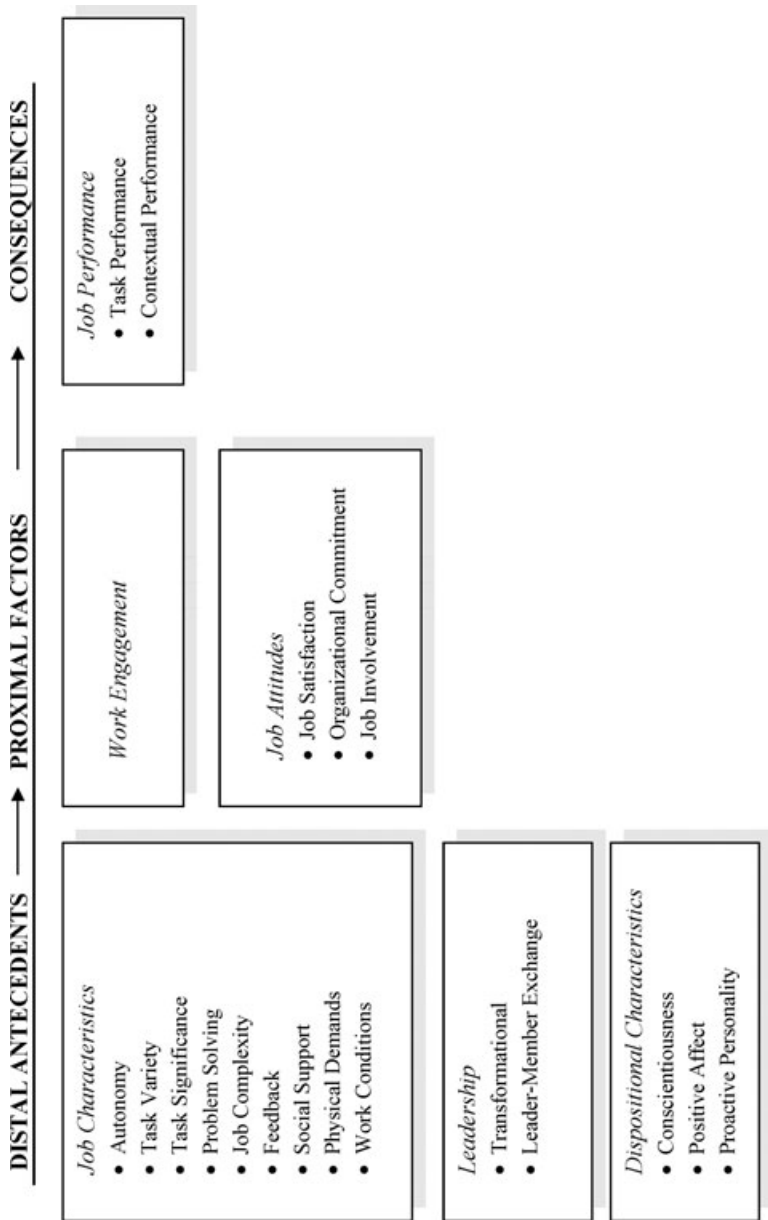


Figure 1: Conceptual Framework.



bits and pieces of other constructs is otherwise known as the “Jangle Fallacy” (Kelley, 1927), or putting “old wine in a new barrel” (Macey & Schneider, 2008). Although some engagement measures may share similar item content with measures of other constructs (Newman & Harrison, 2008), it is likely that these items are combined in such a way as to create a unique concept (Macey & Schneider, 2008). Despite this conjecture, little empirical evidence exists to affirm that engagement is distinct from other similar constructs. Thus, evidence of discriminant validity—correlations that are not too high between constructs that are purported to be different (Campbell & Fiske, 1959)—must be established in order to verify that engagement is unique from other constructs. As noted by Harter and Schmidt (2008), “a key question is whether the newer constructs of engagement have discriminant validity relative to the older constructs of JS and organizational commitment” (p. 36). If the correlations between engagement and job attitudes are considerably less than 1.00, they can be considered empirically distinct (Anderson & Gerbing, 1988; Harter & Schmidt, 2008). We next discuss how engagement is distinguishable from JS, organizational commitment, and job involvement (JI).

*Job satisfaction.* Job satisfaction is an attitude often defined as a “positive (or negative) evaluative judgment one makes about one’s job or job situation” (Weiss, 2002, p. 175). JS and engagement have fundamental differences, in that engagement connotes activation, as opposed to satisfaction, which is more similar to satiation (Erickson, 2005; Macey & Schneider, 2008). Further, JS is an evaluative description of job conditions or characteristics (e.g., “I like my pay”), which is a feature of a job attitude (Brief & Weiss, 2002; Eagly & Chaiken, 1993), whereas work engagement is a description of an individual’s experiences resulting from the work (e.g., “I feel vigorous when working”).

*Organizational commitment.* Affective organizational commitment (AC) is characterized by an emotional attachment to one’s organization that results from shared values and interests (Mowday, 1998). As we have argued, the most common conceptualization of engagement differs from AC in two ways. First, AC references an affective attachment to the values of the *organization as a whole* (Brooke, Russell, & Price, 1988), whereas engagement represents perceptions that are based on the *work itself* (Maslach et al., 2001). Second, engagement is a broader construct in that it involves a holistic investment of the entire self in terms of cognitive, emotional, and physical energies. In the sense that AC represents an emotional state of attachment, Macey and Schneider (2008) suggested that commitment might be a facet of engagement but not sufficient for engagement.

*Job involvement.* Kanungo (1982) defined JI as a “cognitive or belief state of psychological identification” (p. 342). JI refers to the cognitive

belief that a job satisfies one's needs and represents the degree to which an individual identifies strongly with that job both at work and outside of work (Brown, 1996). As such, JI reflects the centrality of performance to an individual because it represents the degree to which job performance affects an employee's self-esteem (Lodahl & Kejner, 1965). Engagement differs from JI in two ways. First, JI is a cognitive construct (Kanungo, 1982) and, as a result, might be considered a facet of engagement rather than equated with engagement (Macey & Schneider, 2008; Salanova, Agut, & Peiro, 2005). Second, JI refers to the degree to which the job situation, broadly defined, is central to an individual's identity (Kanungo, 1982). Thus, it does not refer to work tasks specifically but rather to aspects of the job including how much the job can satisfy an individual's needs.

Therefore, we expected that engagement's relation with job attitudes would be moderate and positive, indicating discriminant validity. If engagement is a unique construct, verifying the relationships among its nomological network of antecedents and consequences is important in order to establish its theoretical relevance. We next turn to a discussion of the antecedents and consequences of engagement specified by our framework.

### *Antecedents*

*Job characteristics.* Job characteristics theory (Hackman & Oldham, 1976) suggests that features of the work environment facilitate motivation, which is empirically documented (Fried & Ferris, 1987). Both Kahn (1990) and Macey and Schneider (2008) argue that some aspects of work are intrinsically motivating and will thus affect the extent to which an individual is willing to self-invest their personal energy in their tasks. Recently, the job characteristics model has been expanded to include three distinct categories of motivating factors associated with work design (Humphrey, Nahrgang, & Morgeson, 2007). These include motivational, social, and contextual characteristics.<sup>3</sup>

Motivational characteristics likely associated with engagement include autonomy (freedom in carrying out one's work), task variety (performing different tasks in a job), task significance (how much a job impacts others' lives), feedback (extent to which a job provides performance information), problem solving (extent to which a job requires innovative solutions or

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<sup>3</sup>There are several other recognized job characteristics that are conceptually linked with work engagement, according to job characteristics models (see Humphrey et al., 2007). However, we focus on those job characteristics that have been examined in the engagement literature.

new ideas), and job complexity (extent to which a job is multifaceted and difficult to perform). These characteristics motivate workers by engendering experiences of meaningfulness, responsibility, and knowledge of results (Hackman & Oldham, 1976). Because employees who have resources that facilitate their job tasks are more apt to invest energy and personal resources in their work roles (Bakker, van Emmerik, & Euwema, 2006; Salanova et al., 2005), we expected that work engagement would be positively related to autonomy, task variety, task significance, feedback, problem solving, and job complexity.

Social support (the extent to which a job provides opportunities for assistance and advice from supervisors or coworkers) is a social characteristic likely associated with engagement. Kahn (1990) reported that engagement increased when work included rewarding interactions with coworkers. Social characteristics motivate by creating meaningfulness (Gersick, Bartunek, & Dutton, 2000; Kahn, 1990), resilience, and security (Ryan & Deci, 2001). Thus, we expected that engagement would be positively related to social support.

Physical demands (the amount of physical effort necessary for a job) and work conditions (health hazards, temperature, and noise) are contextual work characteristics likely associated with engagement. Recent work by Humphrey and colleagues (2007) suggests that contextual features should be conceptually integrated into the job characteristics model developed by Hackman and Oldham (1976) because they represent a class of job characteristics that focus on contextual elements of one's work and are thus nonredundant with motivational or social characteristics, which focus on individual job components and interactional components, respectively. Further, Kahn (1990) suggested that because physical demands and work conditions lead workers to perform tasks as if guided by external scripts, rather than self-invest in their work, they are likely to be negatively associated with engagement. As physical demands and stressful work conditions increase, workers will become physically uncomfortable (Campion, 1988), leading to more negative experiences while at work (Humphrey et al., 2007). Thus, we expected that engagement would be negatively related to physical demands and work conditions.

*Leadership.* Leaders are critical elements of the work context that can influence how individuals view their work. In line with the arguments presented by Kahn (1990), Macey and Schneider (2008) argue that when leaders have clear expectations, are fair, and recognize good performance they will have positive effects on employee engagement by engendering a sense of attachment to the job. Further, when employees have trust in their leaders, they will be more willing to invest themselves in their work because they feel a sense of psychological safety (Kahn, 1990). Specifically, research suggests that transformational leaders are able to bring

about feelings of passion and identification with one's work (Bass & Avolio, 1990; Macey & Schneider, 2008). Leaders that display positive affect (PA) and charisma tend to produce similar levels of activation and PA in their followers (George, 2000). The quality of leader-member relationships, or leader-member exchange (LMX; Graen & Scandura, 1987), can also positively affect follower's positive emotions and attitudes (Engle & Lord, 1997; Gerstner & Day, 1997). Therefore, we expect engagement to be positively related to transformational leadership and LMX.

*Dispositional characteristics.* Kahn (1990) argued that dispositional individual differences are likely to shape people's tendencies toward engagement. As such, dispositional factors are a key set of antecedents in the Macey and Schneider (2008) framework. In particular, personality traits concerned with human agency, or one's ability to control their thoughts and emotions in order to actively interact with their environments (Bandura, 2001), are likely to lead to engagement (Hirschfeld & Thomas, 2008). Such traits include Conscientiousness, PA, and proactive personality.

First, we expected that Conscientiousness would be positively related to engagement, because conscientious individuals have a strong sense of responsibility and are thus more likely to involve themselves in their job tasks (e.g., Furnham, Petrides, Jackson, & Cotter, 2002). In addition, we expected that trait PA, known as Extraversion in some personality theories (Watson, Clark, & Tellegen, 1988), would be positively related to engagement. Individuals high in PA are predisposed to experiencing activation, alertness, and enthusiasm (Macey & Schneider, 2008; Watson & Clark, 1997). In support, PA has been linked directly to motivation (Judge & Ilies, 2002). Finally, we expected that proactive personality would positively relate to engagement. Proactive individuals demonstrate initiative and perseverance (Bateman & Crant, 1993; Crant, 1995). Thus, proactive personality is likely related to engagement because individuals who are involved in their work environment are also likely to immerse themselves in their work.

### *Consequences*

Engagement, as we have conceptualized it, focuses on work performed at a job and represents the willingness to dedicate physical, cognitive, and emotional resources to this work. As Kahn (1990) suggested, an engaged individual is one who approaches the tasks associated with a job with a sense of self-investment, energy, and passion, which should translate into higher levels of in-role and extra-role performance.

*Task performance.* In-role performance, which we refer to as task performance, reflects how well an individual performs the duties required by the job (Borman & Motowidlo, 1997). As a motivational concept,

engagement should relate to the persistence and intensity with which individuals pursue their task performance (Ashforth & Humphrey, 1995; Burke, 2008; Kanfer, 1990; Rich et al., 2010). Engaged employees will be more vigilant and more focused on their work tasks, and thus, engagement should be positively related to task performance.

*Contextual performance.* When individuals invest energy into their work roles, they should have higher contextual performance, which relates to an individual's propensity to behave in ways that facilitate the social and psychological context of an organization (Borman & Motowidlo, 1993). Engagement is thought to be an indicator of an employee's willingness to expend discretionary effort to help the employer (Erickson, 2005). Kahn (1990) suggested that individuals who invest their personal selves into their work role are likely to carry a broader conception of that role and are more likely to step outside of the formal boundaries of their job to facilitate the organization at large and the people within (cf., Rich et al., 2010). Thus, we expected that work engagement would be positively related to contextual performance.

*Incremental validity for task and contextual performance.* If engagement exhibits relations with job performance, it is important to determine whether it explains variance over the job attitudes discussed earlier that share its conceptual space. We expected that engagement would explain incremental variance in job performance over and above JS, organizational commitment, and JI. As we have argued, although engagement shares some conceptual space with each of these constructs, it likely represents a unique concept. Thus, it may share variance with job performance not shared with job attitudes. We expected that engagement would therefore contribute incremental validity for predicting task and contextual performance.

### *Testing the Process Model*

Finally, the proposition underlying our framework (Figure 1) is that engagement mediates the relations between antecedents and job performance. Based on Kahn (1990) and Macey and Schneider (2008), we expected that contextual factors and personal traits would relate to individuals' investment of their selves into their work roles, which should lead to higher levels of performance. Thus, we used meta-analytic path modeling to examine a model that included job characteristics, leadership, and dispositional characteristics as distal variables, engagement as an endogenous proximal variable, and task and contextual performance as outcomes. In selecting variables, we chose those that were available in the literature and most accurately represented Macey and Schneider's (2008) framework. We included as many "core" motivational job

characteristics (Fried & Ferris, 1987) as possible because of their proximal relation to work tasks (Humphrey et al., 2007), as well as transformational leadership, Conscientiousness, and PA.

### *Method*

#### *Literature Search*

An extensive search was conducted to identify as many published and unpublished studies as possible. The process involved a search of computerized databases from 1990 to April of 2010. Databases utilized in the search included the following: ABI/Inform, EBSCO, ProQuest, PsycInfo, JSTOR, Google Scholar, Social Sciences Citation Index, and Web of Science. The search included the terms *job*, *work*, *employee*, *physical*, *emotional*, *cognitive*, *vigor*, *dedication*, and *absorption*, with the keyword *engagement*. We also conducted a manual search of major journals (e.g., *Journal of Applied Psychology*, *Academy of Management Journal*, *Personnel Psychology*, *Journal of Organizational Behavior*) as well as the reference lists of pertinent articles on work engagement. Finally, we collected unpublished dissertations, conference presentations, and e-mailed authors of published research on engagement to obtain any unpublished work. This process resulted in over 200 published and over 30 unpublished articles.

#### *Primary Inclusion Criteria and Coding Procedures*

We included all studies that contained a measure of engagement, as described below. In addition, for inclusion, a study must (a) have provided the necessary data to compute a correlation between a measure of engagement and at least one of our constructs of interest, and (b) be at the individual level. The aforementioned criteria reduced our initial population to 91 studies (80 published) resulting in 770 effect sizes.

All studies were double coded by the authors, with an initial agreement of 94%, resolved to 100% agreement after discussion. When multiple effect sizes for a given sample were reported, a sample size weighted average was computed to generate a single data point for each construct (cf. Hunter & Schmidt, 2004). We utilized the construct definitions discussed earlier in coding the job attitudes and antecedents; however, because of the importance of our coding decisions for engagement and job performance, we next describe these in detail.

*Work engagement.* We used two main criteria when deciding which measures of engagement to include in our study. First, the measure had to refer to the *actual work* performed. Second, the measure had to refer to a

*psychological investment* in the work or in the performance of the work. As such, a measure of work engagement had to reference a physical, emotional, and/or cognitive personal investment in one's work. As our analyses focus on engagement as a higher-order construct, we included measures with definitions and/or items associated with at least two of the conceptual dimensions of work engagement: *physical* (i.e., energetic, resilient, vigorous), *emotional* (i.e., emotionally attached or dedicated to one's work or job performance), and *cognitive* (i.e., cognitively focused, absorbed, vigilant). For a list of measures included, we refer the reader to Table 1.

*Job performance.* We divided job performance into task and contextual performance based on the classification system referred to by Borman and Motowidlo (1993). Task performance was defined as "the effectiveness with which job incumbents perform activities that contribute to the organization's technical core" (Borman & Motowidlo, 1997, p. 99). Thus, any behavior related to the substantive tasks required by the job was included in this classification. Contextual performance was defined as performance that is not formally required as part of the job but that helps shape the social and psychological context of the organization (Borman & Motowidlo, 1993). Related constructs, like organizational citizenship behaviors (Organ, 1988) and extra-role performance (Van Dyne, Cummings, & Parks, 1995), were also included. In order to code job performance, we used two decision rules, following Christian, Edwards, and Bradley (2010). First, we sorted the performance facets that utilized appropriate labels (i.e., task or contextual performance) into their respective categories. Next, for studies that did not report a label, we used the job title or item content to determine whether the rating was task or contextual.

#### *Meta-Analytic Calculations*

We used the RBNL meta-analysis procedure (Raju, Burke, Normand, & Langlois, 1991). RBNL corrects for artifactual error (i.e., sampling error, unreliability of measures) using sample-based data as opposed to using artifact distributions. These procedures estimate appropriately defined standard errors for corrected correlations when sample-based artifact values are incorporated into the corrections. We used the equation from Burke and Landis (2003) to estimate the standard error of the mean corrected correlation, assuming a random-effects model, which has more accurate Type I error rates and more realistic confidence intervals than a fixed-effects model (e.g., Erez, Bloom, & Wells, 1996; Overton, 1998). Confidence intervals provide an estimate of the variability of the corrected mean correlation due to sampling error (Hunter & Schmidt, 2004). We also report credibility intervals, which indicate the extent that

individual correlations varied for a particular analysis distribution across studies (Hunter & Schmidt, 2004).

We corrected for unreliability using the information in primary studies where possible; however, no corrections for range restriction were made due to the unavailability of these data. When reliability information was not reported, we used sample-based estimates of internal consistency (Hunter & Schmidt, 2004) for all constructs except other-rated task and contextual performance. Meta-analyses that include self- and other ratings of performance should correct for the most appropriate sources of unreliability (e.g., Judge & Bono, 2001). Thus, we corrected for unreliability in the other-rated criteria using interrater reliability, which accounts for more sources of error than internal consistency (Schmidt, Viswesvaran, & Ones, 2000). For missing interrater reliability values, we used values from Christian et al. (2010); for task performance, .59, and for contextual performance, .51. For objective measures, we assumed perfect reliability.

### *Moderator Analyses*

We examined for evidence of moderators by examining the percentage of variance in the correlations accounted for by artifacts, which suggests moderation if less than 60% of the variance is accounted for when range restriction is not corrected (Horn, Caranikas-Walker, Prussia, & Griffeth, 1992; Mathieu & Zajac, 1990). The variance attributable to artifacts in the majority of our analyses was below 60%, so we proceeded with our analyses of moderation where the number of studies ( $k$ ) was sufficient to do so (i.e., when each moderator category contained two or more studies). Cortina (2003) suggests that when moderators are present, an appropriate method is to break down the effect sizes into categories and test for differences. When the 95% confidence intervals between two mean correlations do not overlap for a given moderator test, this is evidence of support for moderation (Finkelstein, Burke, & Raju, 1995).

*Measure type.* In order to examine differences among engagement measures, we compared the UWES (the most frequently used measure) to other measures of engagement.

*Study design.* Typically, the magnitude of a correlation decreases as the length of time between measurements increases (Nunnally & Bernstein, 1994). Thus, lagged studies should have lower correlations than concurrent studies. We were also interested in whether relations differed between and within persons. Because within-person studies account for more sources of variation, we expected they would have stronger correlations than between-person designs.



*Rater type.* We also examined whether the type of rater of performance would influence the results. We expected that other ratings would be subjected to fewer biases associated with leniency and common method variance than self-ratings of performance (Holzbach, 1978; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) and would have lower correlations than self-ratings.

*Publication bias.* In order to assess the possibility that publication bias (Rosenthal, 1979) influenced our results, we classified studies as either published or unpublished.

## Results

### *Descriptive Information*

Table 2 presents sample-weighted mean reliability coefficients. Specific information on meta-analytic findings is reported in Tables 3–8. A corrected mean correlation (i.e.,  $M_\rho$ ) is statistically significant at the  $p < .05$  level when its 95% confidence interval does not include zero within its bounds. Unless reported otherwise, confidence intervals did not include zero.

### *Discriminant Validity With Job Attitudes*

Table 3 reports the correlations of engagement with job attitudes. Engagement was positively related to JS ( $M_\rho = .53$ ), organizational commitment ( $M_\rho = .59$ ), and JI ( $M_\rho = .52$ ). As expected, no relations were approaching unity (no 95% CI included 1.0), indicating discriminant validity (see Anderson & Gerbing, 1988; Harter & Schmidt, 2008).

### *Antecedents*

*Job characteristics.* Table 4 shows that, as expected, engagement was positively related to autonomy ( $M_\rho = .39$ ), task variety ( $M_\rho = .53$ ), task significance ( $M_\rho = .51$ ), feedback ( $M_\rho = .33$ ), problem solving ( $M_\rho = .28$ ), job complexity ( $M_\rho = .24$ ), and social support ( $M_\rho = .32$ ). Also as expected, engagement was negatively related to physical demands ( $M_\rho = -.23$ ) and work conditions ( $M_\rho = -.22$ ).

*Leadership.* Table 4 shows that, as expected, engagement was positively related to transformational leadership ( $M_\rho = .27$ ) and leader-member exchange ( $M_\rho = .31$ ).

*Dispositional characteristics.* Table 4 shows that, as expected, engagement was positively related to Conscientiousness ( $M_\rho = .42$ ), PA ( $M_\rho = .43$ ), and proactive personality ( $M_\rho = .44$ ).

TABLE 2  
*Mean Sample-Based Reliability Estimates Used for Analyses*

| Category<br>construct                             | <i>k</i> | N      | Mean reliability<br>estimate |
|---|----------|--------|------------------------------|
| Work engagement                                   | 90       | 63,813 | .88                          |
| Job attitudes                                     |          |        |                              |
| Job satisfaction                                  | 21       | 11,214 | .85                          |
| Organizational commitment                         | 15       | 11,449 | .80                          |
| Job involvement                                   | 8        | 2,095  | .85                          |
| Job characteristics                               |          |        |                              |
| Autonomy  | 41       | 25,730 | .81                          |
| Task variety                                      | 8        | 9,107  | .79                          |
| Task significance                                 | 6        | 7,660  | .83                          |
| Problem solving                                   | 9        | 10,122 | .78                          |
| Job complexity                                    | 5        | 3,531  | .69                          |
| Feedback  | 10       | 10,155 | .80                          |
| Social support                                    | 47       | 22,324 | .83                          |
| Physical demands                                  | 2        | 2,974  | .81                          |
| Work conditions                                   | 9        | 6,565  | .80                          |
| Leadership  |          |        |                              |
| Transformational                                  | 6        | 3,148  | .87                          |
| Leader–member exchange                            | 3        | 2,466  | .90                          |
| Dispositional characteristics                     |          |        |                              |
| Conscientiousness                                 | 15       | 8,233  | .82                          |
| Positive affect                                   | 13       | 6,578  | .77                          |
| Proactive personality                             | 6        | 4,304  | .77                          |
| Job performance <sup>a</sup>                      |          |        |                              |
| Task performance (self-rated)                     | 10       | 3,951  | .83                          |
| Task performance (other-rated) <sup>a</sup>       | 6        | 819    | .59                          |
| Contextual performance (self-rated)               | 6        | 2,740  | .77                          |
| Contextual performance (other-rated) <sup>a</sup> | 5        | 642    | .51                          |

*Note.* <sup>a</sup>For other-rated performance, corrections were made using interrater reliability. Because no studies were available in our dataset providing these estimates, the values for other-rated task and contextual performance were taken from Christian et al. (2010).

### *Consequences*

*Task and contextual performance.* Table 4 shows that, as expected, engagement was positively related to task performance ( $M_\rho = .43$ ) and contextual performance ( $M_\rho = .34$ ).

### *Moderator Analyses*

For the moderator analyses of *engagement measure* (Table 5), all 95% CIs overlapped, with the exception of contextual performance. In this case, other measures had a significantly stronger relationship with contextual

TABLE 3  
*Results for Meta-Analysis of Work Engagement With Job Attitudes*

| Category construct        | <i>k</i> | <i>N</i> | <i>Mr</i> | <i>SDr</i> | <i>M<sub>ρ</sub></i> | <i>SE<sub>M,ρ</sub></i> | 95% Conf. int. |     | 80% Cred. int. |     | % Due to artifacts |       |
|---------------------------|----------|----------|-----------|------------|----------------------|-------------------------|----------------|-----|----------------|-----|--------------------|-------|
|                           |          |          |           |            |                      |                         | L              | U   | L              | U   |                    |       |
| <i>Job attitudes</i>      |          |          |           |            |                      |                         |                |     |                |     |                    |       |
| Job satisfaction          | 20       | 9,725    | .46       | .19        | <b>.53</b>           | .04                     | .44            | .61 | .19            | .29 | .76                | 3.70  |
| Organizational commitment | 14       | 7,569    | .47       | .10        | <b>.59</b>           | .03                     | .53            | .64 | .11            | .46 | .71                | 12.47 |
| Job involvement           | 5        | 1,175    | .45       | .06        | <b>.52</b>           | .04                     | .45            | .59 | .08            | .44 | .59                | 51.42 |

*Note.* *k* = the number of independent effect sizes included in each analysis; *N* = sample size; *Mr* = mean uncorrected correlation; *SDr* = standard deviation of uncorrected correlations; *M<sub>ρ</sub>* = mean corrected correlation (corrected for unreliability in the predictor and criterion); *SE<sub>M,ρ</sub>* = standard error of *M<sub>ρ</sub>*; 95% Conf. int. = 95% Confidence interval for *M<sub>ρ</sub>*; *SD<sub>ρ</sub>* = standard deviation of estimated *ρ*'s; 80% Cred. int. = 80% Credibility interval.

TABLE 4  
*Results for Meta-Analysis of Antecedents and Consequences of Work Engagement*

| Category construct                   | <i>k</i> | <i>N</i> | <i>Mr</i> | <i>SDr</i> | <i>M<sub>ρ</sub></i> | <i>SE<sub>M,ρ</sub></i> | 95% Conf. int. |      | 80% Cred. int. |      | % Due to artifacts |        |
|--------------------------------------|----------|----------|-----------|------------|----------------------|-------------------------|----------------|------|----------------|------|--------------------|--------|
|                                      |          |          |           |            |                      |                         | L              | U    | L              | U    |                    |        |
| <i>Job characteristics</i>           |          |          |           |            |                      |                         |                |      |                |      |                    |        |
| Autonomy                             | 43       | 24,499   | .33       | .10        | <b>.39</b>           | .02                     | .36            | .43  | .11            | .26  | .53                | 15.18  |
| Task variety                         | 9        | 9,211    | .44       | .05        | <b>.53</b>           | .02                     | .49            | .57  | .06            | .46  | .60                | 22.51  |
| Task significance                    | 4        | 5,870    | .42       | .06        | <b>.51</b>           | .03                     | .44            | .57  | .06            | .43  | .58                | 12.47  |
| Feedback                             | 10       | 7,179    | .27       | .07        | <b>.33</b>           | .02                     | .28            | .38  | .08            | .24  | .41                | 26.52  |
| Problem solving                      | 9        | 9,578    | .23       | .08        | <b>.28</b>           | .03                     | .22            | .33  | .09            | .17  | .38                | 16.17  |
| Job complexity                       | 6        | 1,662    | .19       | .02        | <b>.24</b>           | .03                     | .18            | .30  | .06            | .21  | .27                | 100.00 |
| Social support                       | 38       | 18,226   | .27       | .08        | <b>.32</b>           | .02                     | .29            | .35  | .10            | .22  | .43                | 26.44  |
| Physical demands                     | 2        | 2,333    | -.19      | -          | <b>-.23</b>          | .00                     | -.24           | -.22 | .01            | -    | -                  | 100.00 |
| Work conditions                      | 9        | 5,488    | -.18      | .03        | <b>-.22</b>          | .02                     | -.26           | -.18 | .06            | -.26 | -.17               | 63.78  |
| <i>Leadership</i>                    |          |          |           |            |                      |                         |                |      |                |      |                    |        |
| Transformational                     | 4        | 777      | .24       | .05        | <b>.27</b>           | .05                     | .18            | .36  | .06            | .21  | .33                | 100.00 |
| Leader-member exchange               | 4        | 4,695    | .28       | .02        | <b>.31</b>           | .02                     | .28            | .35  | .02            | .28  | .34                | 100.00 |
| <i>Dispositional characteristics</i> |          |          |           |            |                      |                         |                |      |                |      |                    |        |
| Conscientiousness                    | 12       | 5,821    | .36       | .08        | <b>.42</b>           | .03                     | .37            | .47  | .09            | .32  | .52                | 25.94  |
| Positive affect                      | 14       | 6,715    | .37       | .16        | <b>.43</b>           | .04                     | .35            | .52  | .16            | .23  | .64                | 7.19   |
| Proactive personality                | 6        | 4,304    | .35       | .07        | <b>.44</b>           | .03                     | .37            | .51  | .08            | .34  | .53                | 22.35  |
| <i>Job performance</i>               |          |          |           |            |                      |                         |                |      |                |      |                    |        |
| Task performance                     | 14       | 4,562    | .36       | .10        | <b>.43</b>           | .03                     | .37            | .49  | .11            | .30  | .55                | 27.78  |
| Contextual performance               | 10       | 3,654    | .26       | .08        | <b>.34</b>           | .03                     | .28            | .40  | .10            | .23  | .45                | 35.19  |

Note. *k* = the number of independent effect sizes included in each analysis; *N* = sample size; *Mr* = mean uncorrected correlation; *SDr* = standard deviation of uncorrected correlations; *M<sub>ρ</sub>* = mean corrected correlation (corrected for unreliability in the predictor and criterion); *SE<sub>M,ρ</sub>* = standard error of *M<sub>ρ</sub>*; 95% Conf. int. = 95% Confidence interval for *M<sub>ρ</sub>*; *SD<sub>ρ</sub>* = standard deviation of estimated *ρ*'s; 80% Cred. int. = 80% Credibility interval.

TABLE 5  
Moderator Analyses by Engagement Measure Type

| Category<br>Construct<br>Measure type | <i>k</i> | <i>N</i> | <i>M<sub>r</sub></i> | <i>SD<sub>r</sub></i> | <i>M<sub>p</sub></i> | <i>SE<sub>M,p</sub></i> | 95% Conf.<br>int. |          | 80% Cred.<br>int. |          | Artifacts |        |
|---------------------------------------|----------|----------|----------------------|-----------------------|----------------------|-------------------------|-------------------|----------|-------------------|----------|-----------|--------|
|                                       |          |          |                      |                       |                      |                         | <i>L</i>          | <i>U</i> | <i>L</i>          | <i>U</i> |           |        |
| <i>Job attitudes</i>                  |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| Job satisfaction                      |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 13       | 6,654    | .46                  | .22                   | <b>.52</b>           | .06                     | .40               | .64      | .22               | .24      | .80       | 2.42   |
| Other measures                        | 8        | 3,453    | .49                  | .10                   | <b>.55</b>           | .04                     | .48               | .62      | .10               | .42      | .67       | 14.48  |
| <i>Organizational commitment</i>      |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 13       | 7,467    | .47                  | .10                   | <b>.59</b>           | .03                     | .53               | .65      | .10               | .46      | .72       | 11.97  |
| Other measures                        | 2        | 484      | .41                  | .09                   | <b>.48</b>           | .07                     | .33               | .62      | .10               | .36      | .59       | 28.90  |
| <i>Job involvement</i>                |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 4        | 930      | .46                  | .08                   | <b>.52</b>           | .05                     | .42               | .62      | .10               | .42      | .63       | 34.16  |
| Other measures                        | 2        | 627      | .47                  | -                     | <b>.53</b>           | .02                     | .48               | .58      | .04               | -        | -         | 100.00 |
| <i>Job characteristics</i>            |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| <i>Autonomy</i>                       |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 38       | 20,247   | .33                  | .11                   | <b>.39</b>           | .02                     | .36               | .43      | .12               | .25      | .54       | 14.54  |
| Other measures                        | 5        | 3,800    | .38                  | .06                   | <b>.43</b>           | .03                     | .36               | .49      | .07               | .35      | .51       | 26.60  |
| <i>Feedback</i>                       |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 8        | 4,130    | .28                  | .06                   | <b>.36</b>           | .03                     | .30               | .41      | .08               | .28      | .44       | 37.63  |
| Other measures                        | 2        | 3,049    | .26                  | .05                   | <b>.29</b>           | .04                     | .21               | .37      | .06               | .22      | .35       | 18.81  |
| <i>Social support</i>                 |          |          |                      |                       |                      |                         |                   |          |                   |          |           |        |
| UWES                                  | 32       | 17,258   | .27                  | .08                   | <b>.32</b>           | .02                     | .29               | .35      | .09               | .21      | .42       | 25.04  |
| Other measures                        | 8        | 1,643    | .32                  | .10                   | <b>.38</b>           | .04                     | .29               | .46      | .12               | .24      | .51       | 33.07  |

*continued*

TABLE 5 (continued)

| Category                             | Construct      | Measure type | <i>k</i> | <i>N</i> | <i>Mr</i> | <i>SDr</i> | <i>M<sub>ρ</sub></i> | <i>SE<sub>M,ρ</sub></i> | 95% Conf. int. |     | 80% Cred. int. |     | Artifacts |
|--------------------------------------|----------------|--------------|----------|----------|-----------|------------|----------------------|-------------------------|----------------|-----|----------------|-----|-----------|
|                                      |                |              |          |          |           |            |                      |                         | L              | U   | L              | U   |           |
| <i>Dispositional characteristics</i> |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
| Conscientiousness                    |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
|                                      | UWES           |              | 9        | 4,167    | .34       | .05        | <b>.41</b>           | .02                     | .36            | .45 | .35            | .47 | 51.33     |
|                                      | Other measures |              | 4        | 2,036    | .38       | .11        | <b>.44</b>           | .06                     | .33            | .56 | .30            | .58 | 13.41     |
| Positive affect                      |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
|                                      | UWES           |              | 8        | 3,897    | .44       | .17        | <b>.52</b>           | .06                     | .40            | .63 | .30            | .73 | 5.39      |
|                                      | Other measures |              | 7        | 3,200    | .31       | .11        | <b>.36</b>           | .04                     | .28            | .45 | .22            | .50 | 15.35     |
| <i>Job performance</i>               |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
| Task performance                     |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
|                                      | UWES           |              | 9        | 3,755    | .39       | .07        | <b>.45</b>           | .03                     | .40            | .51 | .36            | .55 | 30.71     |
|                                      | Other measures |              | 5        | 807      | .23       | .10        | <b>.30</b>           | .06                     | .19            | .42 | .18            | .43 | 50.06     |
| Contextual performance               |                |              |          |          |           |            |                      |                         |                |     |                |     |           |
|                                      | UWES           |              | 6        | 3,029    | .24       | .06        | <b>.31</b>           | .03                     | .25            | .37 | .23            | .39 | 43.83     |
|                                      | Other measures |              | 4        | 625      | .36       | .03        | <b>.48</b>           | .05                     | .39            | .58 | .44            | .52 | 100.00    |

*Note.* *k* = the number of independent effect sizes included in each analysis; *N* = sample size; *Mr* = mean uncorrected correlation; *SDr* = standard deviation of uncorrected correlations; *M<sub>ρ</sub>* = mean corrected correlation (corrected for unreliability in the predictor and criterion); *SE<sub>M,ρ</sub>* = standard error of *M<sub>ρ</sub>*; 95% Conf. int. = 95% Confidence interval for *M<sub>ρ</sub>*; *SD<sub>ρ</sub>* = standard deviation of estimated *ρ*'s; 80% Cred. int. = 80% Credibility interval.

TABLE 6  
Moderator Analyses by Study Design

| Category                      | Construct     | Study design | k  | N      | Mr  | SDr | M <sub>ρ</sub> | SE <sub>M,ρ</sub> | 95% Conf. int. |     |                 | 80% Cred. int. |     |                 | % Due to artifacts |
|-------------------------------|---------------|--------------|----|--------|-----|-----|----------------|-------------------|----------------|-----|-----------------|----------------|-----|-----------------|--------------------|
|                               |               |              |    |        |     |     |                |                   | L              | U   | SD <sub>ρ</sub> | L              | U   | SD <sub>ρ</sub> |                    |
| <i>Job characteristics</i>    |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
| <i>Autonomy</i>               |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
|                               | Concurrent    |              | 34 | 20,536 | .34 | .09 | <b>.41</b>     | .02               | .37            | .44 | .10             | .29            | .52 | 18.48           |                    |
|                               | Lagged        |              | 6  | 3,020  | .29 | .16 | <b>.33</b>     | .06               | .20            | .46 | .16             | .13            | .53 | 9.15            |                    |
|                               | Within-person |              | 3  | 243    | .35 | .15 | <b>.41</b>     | .10               | .20            | .61 | .18             | .21            | .60 | 30.05           |                    |
| <i>Social support</i>         |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
|                               | Concurrent    |              | 34 | 16,306 | .27 | .07 | <b>.32</b>     | .02               | .29            | .35 | .09             | .23            | .42 | 30.60           |                    |
|                               | Lagged        |              | 3  | 1,866  | .25 | .13 | <b>.29</b>     | .08               | .14            | .45 | .13             | .13            | .46 | 10.91           |                    |
|                               | Within-person |              | 2  | 98     | .40 | .14 | <b>.51</b>     | .14               | .23            | .79 | .05             | .33            | .69 | 100.00          |                    |
| <i>Job performance</i>        |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
| <i>Task performance</i>       |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
|                               | Concurrent    |              | 9  | 3,557  | .39 | .07 | <b>.45</b>     | .03               | .39            | .51 | .09             | .35            | .54 | 35.13           |                    |
|                               | Lagged        |              | 3  | 881    | .26 | .08 | <b>.31</b>     | .06               | .20            | .43 | .10             | .22            | .41 | 43.81           |                    |
|                               | Within-person |              | 4  | 213    | .45 | .08 | <b>.57</b>     | .08               | .42            | .71 | .15             | .46            | .67 | 71.00           |                    |
| <i>Contextual performance</i> |               |              |    |        |     |     |                |                   |                |     |                 |                |     |                 |                    |
|                               | Concurrent    |              | 8  | 3,061  | .25 | .08 | <b>.32</b>     | .04               | .25            | .39 | .10             | .21            | .43 | 33.75           |                    |
|                               | Lagged        |              | 3  | 637    | .30 | .07 | <b>.44</b>     | .06               | .32            | .57 | .03             | .35            | .54 | 100.00          |                    |
|                               | Within-person |              | 1  | 44     | .39 | -   | -              | -                 | -              | -   | -               | -              | -   | -               |                    |

Note. k = the number of independent effect sizes included in each analysis; N = sample size; Mr = mean uncorrected correlation; SDr = standard deviation of uncorrected correlations; M<sub>ρ</sub> = mean corrected correlation (corrected for unreliability in the predictor and criterion); SE<sub>M,ρ</sub> = standard error of M<sub>ρ</sub>; 95% Conf. int. = 95% Confidence interval for M<sub>ρ</sub>; SD<sub>ρ</sub> = standard deviation of estimated ρ's; 80% Cred. int. = 80% Credibility interval.

TABLE 7  
*Moderator Analyses for Task and Contextual Performance by Rater Type*

| Criterion Rater type   | k  | N     | Mr  | SDr | M <sub>ρ</sub> | SE <sub>M,ρ</sub> | 95% Conf. int. |     | SD <sub>ρ</sub> | 80% Cred. int. |     | % Due to artifacts |
|------------------------|----|-------|-----|-----|----------------|-------------------|----------------|-----|-----------------|----------------|-----|--------------------|
|                        |    |       |     |     |                |                   | L              | U   |                 | L              | U   |                    |
| Task performance       |    |       |     |     |                |                   |                |     |                 |                |     |                    |
| Self-rated             | 10 | 3,951 | .38 | .10 | <b>.43</b>     | .04               | .36            | .50 | .11             | .30            | .57 | 19.95              |
| Other rated            | 4  | 1,139 | .29 | .05 | <b>.39</b>     | .04               | .30            | .48 | .09             | .32            | .45 | 67.37              |
| Objective              | 1  | 45    | .22 | -   | -              | -                 | -              | -   | -               | -              | -   | -                  |
| Contextual performance |    |       |     |     |                |                   |                |     |                 |                |     |                    |
| Self-rated             | 5  | 2,495 | .25 | .08 | <b>.30</b>     | .04               | .22            | .38 | .09             | .19            | .40 | 24.96              |
| Other rated            | 5  | 1,159 | .29 | .05 | <b>.43</b>     | .04               | .34            | .51 | .06             | .36            | .50 | 100.00             |

*Note.* k = the number of independent effect sizes included in each analysis; N = sample size, Mr = mean uncorrected correlation; SDr = standard deviation of uncorrected correlations; M<sub>ρ</sub> = mean corrected correlation (corrected for unreliability in the predictor and criterion); SE<sub>M,ρ</sub> = standard error of M<sub>ρ</sub>; 95% Conf. int. = 95% Confidence interval for M<sub>ρ</sub>; SD<sub>ρ</sub> = standard deviation of estimated ρ's; 80% Cred. int. = 80% Credibility interval.



TABLE 8  
Moderator Analyses for Publication Bias

| Category                             | Construct                 | Publication status | k  | N      | Mr  | SDr | M <sub>ρ</sub> | SE <sub>M<sub>ρ</sub></sub> | 95% Conf. int. |     | 80% Cred. int. |     | % Due to artifacts |        |
|--------------------------------------|---------------------------|--------------------|----|--------|-----|-----|----------------|-----------------------------|----------------|-----|----------------|-----|--------------------|--------|
|                                      |                           |                    |    |        |     |     |                |                             | L              | U   | L              | U   |                    |        |
| <i>Job attitudes</i>                 |                           |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Job satisfaction          |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 13 | 6,715  | .43 | .19 | <b>.49</b>     | .05                         | .39            | .60 | .19            | .25 | .74                | 3.64   |
|                                      | Unpublished               |                    | 7  | 3,010  | .54 | .15 | <b>.60</b>     | .06                         | .49            | .71 | .15            | .41 | .79                | 5.27   |
|                                      | Organizational commitment |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 12 | 6,981  | .47 | .10 | <b>.59</b>     | .03                         | .53            | .65 | .11            | .46 | .72                | 10.91  |
|                                      | Unpublished               |                    | 2  | 588    | .46 | -   | <b>.55</b>     | .03                         | .49            | .60 | .04            | -   | -                  | 100.00 |
| <i>Job characteristics</i>           |                           |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Autonomy                  |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 39 | 20,268 | .32 | .11 | <b>.38</b>     | .02                         | .35            | .42 | .12            | .24 | .52                | 15.77  |
|                                      | Unpublished               |                    | 4  | 4,231  | .40 | .06 | <b>.45</b>     | .04                         | .38            | .52 | .07            | .36 | .53                | 17.75  |
|                                      | Feedback                  |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 8  | 4,044  | .29 | .07 | <b>.37</b>     | .03                         | .31            | .43 | .09            | .27 | .46                | 30.54  |
|                                      | Unpublished               |                    | 2  | 3,135  | .25 | .03 | <b>.28</b>     | .03                         | .22            | .33 | .00            | .24 | .31                | 100.00 |
|                                      | Social support            |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 35 | 17,275 | .26 | .08 | <b>.31</b>     | .02                         | .28            | .34 | .09            | .21 | .41                | 28.72  |
|                                      | Unpublished               |                    | 3  | 951    | .40 | .02 | <b>.46</b>     | .03                         | .40            | .53 | .05            | .44 | .49                | 100.00 |
| <i>Dispositional characteristics</i> |                           |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Conscientiousness         |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 8  | 3,785  | .35 | .05 | <b>.41</b>     | .02                         | .36            | .46 | .07            | .34 | .48                | 46.64  |
|                                      | Unpublished               |                    | 4  | 2,036  | .38 | .11 | <b>.44</b>     | .06                         | .33            | .56 | .12            | .30 | .58                | 13.33  |
|                                      | Positive affect           |                    |    |        |     |     |                |                             |                |     |                |     |                    |        |
|                                      | Published                 |                    | 8  | 3,257  | .37 | .10 | <b>.45</b>     | .04                         | .37            | .53 | .11            | .32 | .58                | 16.54  |
|                                      | Unpublished               |                    | 6  | 3,645  | .44 | .11 | <b>.51</b>     | .04                         | .42            | .59 | .12            | .37 | .64                | 17.61  |

Note. k = the number of independent effect sizes included in each analysis; N = sample size; Mr = mean uncorrected correlation; SDr = standard deviation of uncorrected correlations; M<sub>ρ</sub> = mean corrected correlation (corrected for unreliability in the predictor and criterion); SE<sub>M<sub>ρ</sub></sub> = standard error of M<sub>ρ</sub>; 95% Conf. int. = 95% Confidence interval for M<sub>ρ</sub>; SD<sub>ρ</sub> = standard deviation of estimated ρ'; 80% Cred. int. = 80% Credibility interval.

performance ( $M_\rho = .48$ ) than the UWES ( $M_\rho = .31$ ). For the analyses of *study design* (Table 6), all 95% CIs overlapped. For the analyses of *rater type* (Table 7), in all cases, 95% CIs overlapped. Finally, for the analyses of *publication bias* (Table 8), all 95% CIs overlapped except for social support, which had a stronger correlation for unpublished ( $M_\rho = .46$ ) versus published ( $M_\rho = .31$ ).

### *Meta-Analytic Correlation Matrix*

In order to analyze (a) the incremental validity of engagement and (b) the path model, we generated correlation matrices containing corrected correlations between each variable. Table 9 presents the intercorrelations among the variables used in the analyses of incremental validity. We computed the harmonic mean ( $N_h$ ) for each input matrix (Viswesvaran & Ones, 1995). For the analysis of incremental validity for task performance, the  $N_h$  was 3,698, for the incremental validity for contextual performance, the  $N_h$  was 3,191, and for the path model, the  $N_h$  was 1,091. In order to minimize common-method and leniency bias concerns, all matrices were computed using estimates for other-rated (i.e., not self-rated) task and contextual performance. In addition, we were unable to generate correlations for all of the cells due to unavailability of the data in our primary studies. Thus, we used assumed population estimates of these relationships (e.g., Colquitt, LePine, & Noe, 2000; Harrison, Newman, & Roth, 2002; Viswesvaran & Ones, 1995). We provide information on the sources used for each of the population estimates below Table 9.

### *Incremental Validity of Engagement for Predicting Task and Contextual Performance*

Table 10 presents the results of the multiple regression analysis of the incremental validity of engagement for predicting task performance over job attitudes. We entered JS, organizational commitment (OC), and JI in the first step, followed by engagement in the second step. The standardized regression coefficients for JS (.33) and JI (-.06) were significant ( $p < .001$ ) in Step 1 and explained a significant proportion of variance in task performance ( $R^2 = .11, p < .001$ ). OC was not significant. However, in Step 2, engagement ( $\beta = .43, p < .001$ ) explained incremental variance, as the change in  $R^2$  was significant ( $\Delta R^2 = .19, p < .001$ ).

Table 10 also presents the results of the regression analysis of the incremental validity of engagement for predicting contextual performance over job attitudes. We entered JS, OC, and JI in the first step, followed by engagement in the second step. At Step 1, the standardized regression coefficients for JS (.14) and JI (.17) were significant at  $p < .001$ . OC (.03)

TABLE 9  
*Meta-Analysis of Relationships Between Variables in Incremental Validity Analyses*

| Construct                    | Engagement                           |  | JS  |  | Organizational commitment                 |  | JI  |  | Task performance                     |  |
|------------------------------|--------------------------------------|--|---|--|---|--|---|--|--------------------------------------|--|
|                              | <i>Mr, M<sub>ρ</sub></i><br>(95% CI) | <i>SD<sub>ρ</sub></i><br>( <i>SE<sub>M,ρ</sub></i> ) | <i>Mr, M<sub>ρ</sub></i><br>(95% CI)      | <i>SD<sub>ρ</sub></i><br>( <i>SE<sub>M,ρ</sub></i> ) | <i>Mr, M<sub>ρ</sub></i><br>(95% CI)      | <i>SD<sub>ρ</sub></i><br>( <i>SE<sub>M,ρ</sub></i> ) | <i>Mr, M<sub>ρ</sub></i><br>(95% CI)      | <i>SD<sub>ρ</sub></i><br>( <i>SE<sub>M,ρ</sub></i> ) | <i>Mr, M<sub>ρ</sub></i><br>(95% CI) | <i>SD<sub>ρ</sub></i><br>( <i>SE<sub>M,ρ</sub></i> ) |
| 1. Engagement                | —                                    | —  | —   | —  | —   | —  | —   | —  | —                                    | —  |
| 2. Job satisfaction          | .46, .53<br>(.44, .61)               | .19<br>(.04)   | —   | —  | —   | —  | —   | —  | —                                    | —  |
| <i>k, N</i>                  | 20                                   | 9,725  | —   | —  | —   | —  | —   | —  | —                                    | —  |
| 3. Organizational commitment | .47, .59<br>(.53, .64)               | .11<br>(.03)   | .53, .64<br>(.48, .80)                    | .16<br>(.08)   | —   | —  | —   | —  | —                                    | —  |
| <i>k, N</i>                  | 14                                   | 7,569  | 4   | 2,834  | —   | —  | —   | —  | —                                    | —  |
| 4. JI                        | .45, .52<br>(.45, .59)               | .08<br>(.04)   | .37, .45 <sup>a</sup><br>( <sup>§</sup> ) | .16<br>( <sup>§</sup> )                              | .36, .44 <sup>d</sup><br>( <sup>§</sup> ) | .19<br>( <sup>§</sup> )                              | —   | —  | —                                    | —  |
| <i>k, N</i>                  | 5                                    | 1,175  | 87  | 27,925   | 20  | 5,779  | —   | —  | —                                    | —  |
| 5. Task performance          | .29, .39<br>(.30, .48)               | .09<br>(.04)   | 18, .30 <sup>b</sup><br>(.27, .33)        | .21<br>( <sup>§</sup> )                              | .18 <sup>c</sup><br>(.01, .34)            | .10<br>( <sup>§</sup> )                              | .07, .09 <sup>a</sup><br>( <sup>§</sup> ) | .08<br>( <sup>§</sup> )                              | —                                    | —  |
| <i>k, N</i>                  | 4                                    | 1,139  | 312                                       | 54,471   | 87  | 20,973   | 8   | 2,313  | —                                    | —  |
| 6. Contextual performance    | .29, .43<br>(.34, .51)               | .06<br>(.04)   | .20, .24 <sup>c</sup><br>(.22, .26)       | .17, .20 <sup>c</sup><br>( <sup>§</sup> )            | .17, .20 <sup>c</sup><br>(.17, .24)       | .18, .25 <sup>a</sup><br>( <sup>§</sup> )            | .18, .25 <sup>a</sup><br>( <sup>§</sup> ) | .20<br>( <sup>§</sup> )                              | n/a <sup>b</sup>                     | n/a  |
| <i>k, N</i>                  | 5                                    | 1,159  | 72  | 7,100  | 54  | 5,133  | 7   | 3,478  | n/a                                  | n/a  |

*Note.* Correlations with performance represent other-rated task and contextual performance. *k* = the number of independent effect sizes included in each analysis; *N* = sample size; *Mr* = mean uncorrected correlation; *M<sub>ρ</sub>* = mean corrected correlation (corrected for unreliability in the predictor and criterion); 95% CI = 95% Confidence Interval for *M<sub>ρ</sub>*; *SD<sub>ρ</sub>* = standard deviation of estimated *ρ*; *SE<sub>M,ρ</sub>* = standard error of *M<sub>ρ</sub>*.  
<sup>a</sup>Assumed values, calculated as corrected sample-weighted mean correlations derived from Brown (1996). <sup>b</sup>Judge et al. (2001). <sup>c</sup>LePine et al. (2002). <sup>d</sup>Mathieu and Zajac (1990). <sup>e</sup>Rickett (2002). <sup>f</sup>Information not provided in article. <sup>h</sup>The relationship between task performance and contextual performance was not calculated because each was involved in separate analyses.

TABLE 10  
*Incremental Validity Analysis for Task and Contextual Performance*

| Predictor                 | Task performance       |         |
|---------------------------|------------------------|---------|
|                           | Step 1                 | Step 2  |
| Job satisfaction          | .33***                 | .24***  |
| Organizational commitment | -.01                   | -.16*** |
| Job involvement           | -.06***                | -.18*** |
| Engagement                |                        | .43***  |
| Total $R^2$               | .11***                 | .30***  |
| $\Delta R^2$              |                        | .19***  |
| Predictor                 | Contextual performance |         |
|                           | Step 1                 | Step 2  |
| Job satisfaction          | .14***                 | .06***  |
| Organizational commitment | .03*                   | -.12*** |
| Job involvement           | .17***                 | .04**   |
| Engagement                |                        | .44***  |
| Total $R^2$               | .05***                 | .21***  |
| $\Delta R^2$              |                        | .16***  |

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ,  $N_h = 3,698$  for task performance and 3,191 for contextual performance. Values are standardized estimates ( $\beta$ s).

was also significant at  $p < .05$ . Step 1 explained a significant proportion of variance in contextual performance ( $R^2 = .05$ ,  $p < .001$ ). In Step 2, engagement ( $\beta = .44$ ,  $p < .001$ ) explained incremental variance, as the change in  $R^2$  was significant ( $\Delta R^2 = .16$ ,  $p < .001$ ).

#### *Meta-Analytic Path Model*

Table 11 presents the meta-analytic correlations among the variables in the path model. We sequentially tested two nested models, beginning with our hypothesized full mediation model, which specifies job characteristics, transformational leadership, and personality characteristics as exogenous, engagement as an endogenous mediator, and task and contextual performance as endogenous outcomes. Because job characteristics are related with each other and with perceptions of transformational leadership (e.g., Piccolo & Colquitt, 2006), we allowed each of these exogenous variables to correlate, as well as the disturbance terms for task and contextual performance, consistent with past research (Piccolo & Colquitt, 2006). We first evaluated the full mediation model using the comparative fit index (CFI) and the root mean squared residual (RMSR), which are typically considered to be indicators of adequate fit when the CFI is less than or equal to .90 and the RMSR is less than or equal to .08

TABLE 11  
*Meta-Analysis of Relationships Between Variables in Path Model*

| Construct                      | Engagement  |  | Autonomy  |  | Task variety  |  | Task significance                                       |  | Feedback  |  | Transformational leadership                             |  | Positive affect   |  | Conscientiousness                                       |  | Task performance  |  |
|--------------------------------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
|                                | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) | <i>M<sub>r</sub></i> , <i>M<sub>o</sub></i><br>(95% CI) | <i>SD<sub>o</sub></i><br>( <i>SE<sub>M<sub>r</sub></sub></i> ) |
| 1. Engagement                  | —   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |   |  |
| <i>k</i> , <i>N</i>            | 33, 39  | .11  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| 2. Autonomy                    | .43   | (.36, .43)   | .43   | 24,499   | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 44, 53  | .06  | .38, .47  | .15  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| 3. Task variety                | .49, .57  | (.02)  | .35, .60  | (.06)  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 9   | 9,211  | 6   | 2,124  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| 4. Task significance           | .42, .51  | (.03)  | .33, .44 <sup>a</sup>                                   | .08  | .38, .51 <sup>a</sup>                                   | .11  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 4   | 5,870  | 3   | 875  | .39, .64  | (.06)  | —   |  | —   |  | —   |  | —   |  | —   |  | —   |  |
| 5. Feedback                    | .27, .33  | (.02)  | .26, .42  | .11  | .35, .46  | .20  | .33, .43 <sup>a</sup>                                   | .09  | —   |  | —   |  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 10  | 7,179  | 7   | 3,009  | .26, .65  | (.10)  | .32, .54  | (.05)  | —   |  | —   |  | —   |  | —   |  | —   |  |
| 6. Transformational leadership | .24, .27  | (.05)  | .31, .37 <sup>b</sup>                                   | .02  | .31, .37 <sup>b</sup>                                   | .02  | .25, .29 <sup>d</sup>                                   | .06  | .31, .37 <sup>c</sup>                                   | .10  | —   |  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 4   | 777  | 3   | 868  | .28, .47  | (.05)  | .24, .35  | (.03)  | .31, .42  | (.03)  | —   |  | —   |  | —   |  | —   |  |
| 7. Positive affect             | .37, .43  | (.04)  | .09, .13 <sup>c</sup>                                   | .08  | .08, .10 <sup>f</sup>                                   | .09  | .13, .16 <sup>d</sup>                                   | .06  | .12, .14 <sup>e</sup>                                   | .08  | .09, .06 <sup>m</sup>                                   | .11  | —   |  | —   |  | —   |  |
| <i>k</i> , <i>N</i>            | 14  | 6,715  | 3   | 470  | -.01, .20   | (.06)  | .08, .25  | (.04)  | .08, .21  | (.03)  | 5   | 1,341  | 3   | 1192   | —   |  | —   |  |

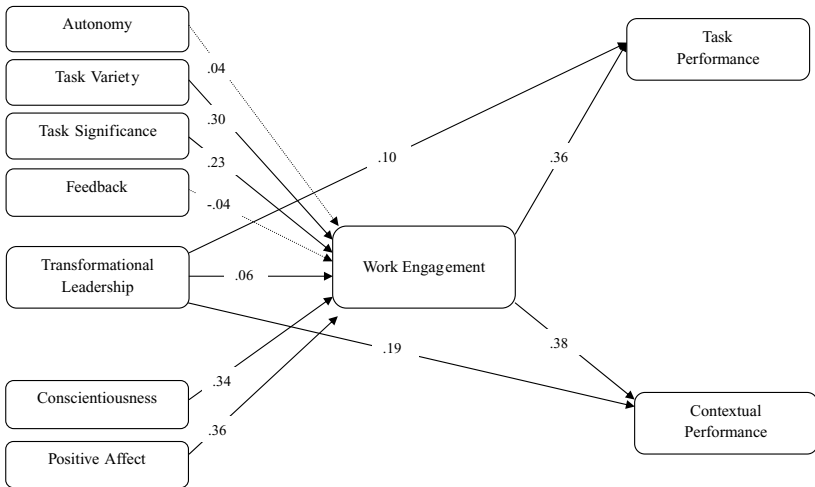
*continued*

TABLE 11 (continued)

| Construct                  | Engagement             |   | Autonomy                            |   | Task variety                        |   | Task significance                    |   | Feedback                              |   | Transformational leadership          |   | Positive affect                             |   | Conscientiousness                           |   | Task performance                       |   |  |     |
|----------------------------|------------------------|---|-------------------------------------|---|-------------------------------------|---|--------------------------------------|---|---------------------------------------|---|--------------------------------------|---|---|---|---|---|--|---|--|-----|
|                            | <i>Mr.</i> (95% CI)    | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                 | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                 | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                  | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                   | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                  | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                         | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                         | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) | <i>Mr.</i> (95% CI)                    | <i>SD<sub>p</sub></i> ( <i>SE<sub>M<sub>p</sub></sub></i> ) |  |     |
| 8. Conscientiousness       | .36, .42<br>(.37, .47) | .09<br>(.03)  | .12, .16<br>(.02, .31)              | .04<br>(.07)  | .13, .16 <sup>a</sup><br>(.04, .28) | .09<br>(.06)  | -.12, .15 <sup>a</sup><br>(.07, .24) | .07<br>(.04)  | -.12, .14 <sup>d</sup><br>(-.10, .38) | .04<br>(.12)  | .07, .03 <sup>h</sup><br>(-.07, .13) | .07<br>(.05)  | .00 <sup>h</sup><br>( <sup>(t)</sup> )      | .00 <sup>h</sup><br>( <sup>(t)</sup> )                      | .00 <sup>h</sup><br>( <sup>(t)</sup> )      | .00 <sup>h</sup><br>( <sup>(t)</sup> )                      | .00 <sup>h</sup><br>( <sup>(t)</sup> ) | .00 <sup>h</sup><br>( <sup>(t)</sup> )                      | .00 <sup>h</sup><br>( <sup>(t)</sup> ) |     |
| <i>k</i> , <i>N</i>        | 12                     | 5,821   |                                     | 624   | 2                                   | 348   | 7                                    | 1,151   | 2                                     | 179   | 3                                    | 1,148   | 632   | 683,001   |   |   |  |   |  |     |
| 9. Task performance        | .29, .39<br>(.30, .48) | .09<br>(.04)  | .18, .23 <sup>d</sup><br>(.19, .28) | .1<br>(.1)  | .21, .23 <sup>d</sup><br>(.16, .29) | .1<br>(.1)  | .16, .23 <sup>d</sup><br>(.16, .29)  | .1<br>(.1)  | .14, .20 <sup>d</sup><br>(.15, .24)   | .1<br>(.2)  | .18, .20 <sup>d</sup><br>(.14, .26)  | .06<br>(.03)  | .04, .07 <sup>r</sup><br>( <sup>(t)</sup> ) | .14<br>( <sup>(t)</sup> )                                   | .17, .28 <sup>r</sup><br>( <sup>(t)</sup> ) | .16<br>( <sup>(t)</sup> )                                   |  |   |  |     |
| <i>k</i> , <i>N</i>        | 4                      | 1,139   | 42                                  | 7,886   | 2                                   | 918   | 20                                   | 3,303   | 26                                    | 5,241   | 4                                    | 1893  | 75  | 11940   | 90  | 19460   |  |   |  |     |
| 10. Contextual performance | .29, .43<br>(.34, .51) | .06<br>(.04)  | .28, .35 <sup>e</sup><br>(.18, .52) | .15<br>(.09)  | .21 <sup>b</sup><br>(.1)            | .15<br>(.1)   | .20 <sup>b</sup><br>(.1)             | .0<br>(.1)  | .18 <sup>b</sup><br>(.1)              | .1<br>(.1)  | .25, .29 <sup>b</sup><br>(.02, .1)   | .1<br>(.1)  | .18, .23 <sup>b</sup><br>( <sup>(t)</sup> ) | .1<br>( <sup>(t)</sup> )                                    | .24, .30 <sup>b</sup><br>( <sup>(t)</sup> ) | .1<br>( <sup>(t)</sup> )                                    |  |   | n/a                                    | n/a |
| <i>k</i> , <i>N</i>        | 5                      | 1,159   | 3                                   | 4,79  | 8                                   | 1,948   | 8                                    | 1,948   | 7                                     | 1,909   | 6                                    | 2,562   | 5   | 970   | 12  | 1963  |  |   | n/a                                    | n/a |

*Note.* Correlations with performance represent other-rated task and contextual performance when possible. *k* = the number of independent effect sizes included in each analysis; *N* = sample size; *Mr* = mean uncorrected correlation; *M<sub>p</sub>* = mean corrected correlation (corrected for unreliability in the predictor and criterion); 95% CI = 95% Confidence interval for *M<sub>p</sub>*; *SD<sub>p</sub>* = standard deviation of estimated *ρ*; *SE<sub>M<sub>p</sub></sub>* = standard error of *M<sub>p</sub>*.

<sup>a</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Spector and Jex (1991), Munz, Huelsman, Konold, and McKinney (1996), and Thomas et al. (2004).  
<sup>b</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Purvanova, Bono, and Dziewieczynski (2006), Whittington, Goodwin, and Murray (2004), and Judge and Piccolo (2004).  
<sup>c</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Barrick and Mount (1993), van den Berg and Feij (2003), and Thomas et al. (2004).  
<sup>d</sup> Humphrey et al. (2007).  
<sup>e</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Kim, Shin, and Swanger (2009), van den Berg and Feij (2003), and Parker, Williams, and Turner (2006).  
<sup>f</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Kim, Shin, and Swanger (2009), van den Berg and Feij (2003), and Thomas et al. (2004).  
<sup>g</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Kim et al. (2009) and van den Berg and Feij (2003).  
<sup>h</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Podsakoff, MacKenzie, Paine, and Bachrach (2000).  
<sup>i</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Purvanova et al. (2006), Whittington et al. (2004), Judge and Piccolo (2004), and Podsakoff, MacKenzie, and Bommer (1996).  
<sup>j</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Rothbard (2001) and Thomas et al. (2004).  
<sup>k</sup> Averaged other JC studies.  
<sup>l</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Campbell, Ward, Sommersfeld, and Simmering, Colquitt, Noe, and Porter (2003) and Denerouti (2006).  
<sup>m</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Campbell et al. (2008), Connell (2005), and Agle (2008).  
<sup>n</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Piccolo and Colquitt (2006), Howell and Hall-Merenda (1999), Whittington et al. (2004), and Piccolo (2004).  
<sup>o</sup> Assumed values, calculated as corrected sample-weighted mean correlations derived from Piccolo and Colquitt (2006), Howell and Hall-Merenda (1999), Whittington et al. (2004), and Podsakoff et al. (1996).  
<sup>p</sup> Organ and Ryan (1995).  
<sup>q</sup> Ones, Viswesvaran, and Reiss (1996).  
<sup>r</sup> Salgado (2003).  
<sup>s</sup> Borman, Penner, Allen, and Motowidlo (2001).  
<sup>t</sup> Information not provided in article.



Note: Statistics are standardized path coefficients. Dashed paths are not significant; otherwise, all paths are significant at  $p < .01$ .  $N_h = 1091$ .

**Figure 2: Maximum Likelihood Parameter Estimates for the Hypothesized Model.**

(Browne & Cudeck, 1993; Mathieu, Gilson, & Ruddy, 2006; Medsker, Williams, & Holahan, 1994). The model showed moderate fit ( $\chi^2 (25) = 679.80$ ,  $p < .001$ ; CFI = .85; RMSR = .10). However, previous studies have shown that transformational leadership is likely to have direct effects on task and contextual performance even when motivational characteristics are taken into account (Bono & Judge, 2003; Piccolo & Colquitt, 2006). Thus, after inspecting the model parameters, we freed direct paths between transformational leadership and the two performance variables. This final model (see Figure 2) fit the data better than the full mediation model ( $\chi^2 (23) = 320.97$ ;  $\chi^2 \text{ dif} = 358.88$ ,  $2 \text{ df}$ ,  $p < .001$ ; CFI = .93; RMSR = .08). Although modification indices suggested that freeing additional paths could improve the fit of the model, we retained this model because of its acceptable fit and parsimony.

### Discussion

Our study attempted to provide resolution for several deficiencies in the engagement literature. Our goals were to find areas of commonality among studies of engagement in order to arrive at an agreed-upon definition, to demonstrate the uniqueness of this operationalization, and to clarify the nomological network of the constructs associated with work engagement. We found evidence that engagement is related to job performance and

that it appears to demonstrate incremental validity over job attitudes in predicting performance.

### *Theoretical Contributions and Future Research Directions*

Our data suggest that Macey and Schneider's (2008) assertion appears to have merit: Rather than being merely a blend of old wines, engagement also has characteristics of new wines. Our evidence provides support for Macey and Schneider's (2008) prediction that these attitudes would correlate with engagement around  $r = .50$ , suggesting that work engagement is unique although it shares conceptual space with job attitudes. Interestingly, our results for other-rated task performance ( $\rho = .39$ ), when compared with meta-analytic estimates for JS ( $\rho = .30$ ; Judge, Thoresen, Bono, & Patton, 2001) and organizational commitment ( $\rho = .18$ ; Riketta, 2002), suggest that engagement relates to performance with a similar magnitude. However, our finding that engagement has incremental criterion-related validity over these attitudes adds to the reasoning that engagement's conceptual space is somewhat different. Thus, the extent to which individuals invest their "full selves" in the execution of their work appears to be a different concept from the extent to which individuals are satisfied with their jobs or value their organizations.

One way that engagement differs conceptually from many traditional attitudes is that it is closely aligned with task-specific motivation, which helps to explain why it was related equally strongly with task performance and contextual performance. This finding is at odds with the belief that engagement is predominantly associated with extra-role behaviors (e.g., Macey & Schneider, 2008). Because engaged employees experience a high level of connectivity with their work tasks, they strive toward task-related goals that are intertwined with their in-role definitions and scripts, leading to high levels of task performance. Despite this, our findings also suggest that engaged employees are likely to perform extra-role behaviors, perhaps because they are able to "free up" resources by accomplishing goals and performing their tasks efficiently, enabling them to pursue activities that are not part of their job descriptions. Another possibility is that engaged employees consider all aspects of work to be part of their domain, and thus, they step outside of their roles to work toward goals held by coworkers and the organization. These viewpoints suggest alternative explanations for the relations between engagement and task and contextual performance. Future research could investigate whether engagement *simultaneously* leads to task and contextual performance, or whether engaged employees tend to prioritize in-role tasks.

Regarding the "state versus trait" debate, our findings were inconclusive. Consistent with past research on state versus trait conceptualizations



of positive and negative affect (Thoresen et al., 2003), we did not find significant differences between studies of “engagement in general” versus “in the moment.” Given that most of these analyses were conducted with very few studies, our results should be interpreted with caution. What we can conclude from our data, however, is that there is a dearth of research on within-person engagement and that future studies should use experience-sampling methods to determine the extent to which within- and between-person methods may differ. For example, if engagement fluctuates over time, it could have stronger momentary relations with performance such that high engagement on a particular day leads to high performance on that same day. In addition, future research could be conducted to uncover whether engagement is indeed a stable dispositional trait by using longitudinal designs to track engagement within-persons across years and jobs, and by controlling for Conscientiousness, PA, and proactive personality.

We also found initial, tentative support for engagement as a partial mediator of the relations between distal factors and job performance. However, we do note that the path weights for autonomy, feedback, and transformational leadership were near zero in terms of their relations with engagement in our final model, implying that the practical importance of these variables may be minimal when other factors are taken into account. Moreover, we did not test alternative models specifying different causal ordering of the variables because we were limited by the cross-sectional nature of our data. Thus, we can only tentatively conclude that our framework appropriately specified the causal direction of relationships. However, our moderator analyses demonstrated that engagement was related to all of the available antecedents and consequences when assessed in time-lagged designs. Given that the majority of studies were assessed concurrently, however, future research should be conducted using lagged designs that can better enable causal inferences. Related to this, it is possible that reverse or reciprocal causality is an alternative explanation for the relations between engagement and some factors in our model, such as contextual performance and social support. For example, as workers become more willing to engage in behaviors that facilitate the social context, they are also creating an environment conducive to further engagement of their peers (i.e., increasing social support). In a similar vein, engagement has been shown to increase other job characteristics such as perceived autonomy (Llorens, Schaufeli, Bakker, & Salanova, 2007). Future research could investigate this possibility with intervention studies designed to increase engagement and measuring how factors conceptualized as antecedents may increase as a *result* of increases in engagement.

The present investigation also helps to clarify the role of engagement as a motivational construct that is related to contextual and individual factors. First, we add work engagement to the range of motivational factors that are related to work characteristics, as suggested by job characteristics theory (Hackman & Oldham, 1976). This suggests that work engagement is to some degree aligned with the motivating potential of the work context and can be facilitated through job design. However, as we note above, our path model suggests that only task variety and significance appear to be related with engagement, given that autonomy and feedback were not strongly related with engagement in the final model. This finding might indicate that work engagement is more strongly related to job characteristics that are associated with the perception of meaningfulness of the work itself, which Kahn (1990) notes is a precursor to engagement. Task significance and task variety are both thought to impact an individual's perception of the meaningfulness of their work (Hackman & Oldham, 1976). Conversely, autonomy and feedback lead to perceptions of experienced responsibility and knowledge of results rather than to meaningfulness (Humphrey et al., 2007). Future research concerning the differential effects of job characteristics on engagement could help shed light on this issue.

Second, we found tentative evidence that leadership was related to engagement. However, the results of our path model suggested that, at best, leadership is only weakly related to engagement when other factors are taken into account. It is possible that other processes might account for the relation between leadership and performance (i.e., changes in basic values or beliefs; Podsakoff, Mackenzie, Moorman, & Fetter, 1990). It is also possible that there are moderator variables, such as trust in leadership or psychological safety, which might influence the relation between leadership and engagement (Macey & Schneider, 2008). Thus, future research could investigate whether the extent to which individuals feel that it is "safe to engage" in the work (Kahn, 1990) increases the relation between leadership and engagement.

Third, our findings are consistent with research suggesting that more proximal states and motivation can explain the relation between personality and performance (Barrick, Stewart, & Piotrowski, 2002; Judge & Ilies, 2002). It remains unclear, however, the extent to which perceived job characteristics or leadership could moderate the extent to which dispositional factors will relate to engagement (e.g., Macey & Schneider, 2008). Future studies could investigate whether certain personality traits might not relate to engagement when jobs are demanding or have little intrinsic meaning.

In addition, future research could also broaden the range of antecedents to engagement. For example, two aspects of person-environment (P-E) fit

are especially relevant: *demands–abilities fit*, or congruence between job demands and employee abilities, and *needs–supplies fit*, or congruence between employee needs and the rewards a job supplies (Cable & DeRue, 2002). Because engagement reflects an employee's investment of their whole selves into their work, it is likely that demands–abilities fit and needs–supplies fit perceptions are important cognitive precursors to one's willingness to make that investment. Given the findings of the present study, and observed relations between needs–supplies fit and contextual performance (Cable & DeRue, 2002) and between demands–abilities and task performance (Greguras & Diefendorff, 2009), it also seems likely that engagement serves as a mediator in the P–E fit–performance relationship. We therefore recommend that researchers consider these aspects of P–E fit in future research on engagement. Further, research could examine the possibility of reciprocal relations between fit perceptions and engagement. Engaged workers, after fully investing themselves in their jobs, may begin to develop a sense of P–E fit that is stronger than it was previously, by increasing or changing their abilities to meet the demands of the job, by adjusting their needs to be satisfied by what the job supplies, or by actively changing the job itself to one that is a better fit for them.

Future research should also address how engagement fits in with other theories of motivation such as goal setting or self-regulation theories. For example, work engagement could explain why individuals stay committed to goals or, alternatively, how goal-setting could lead to engagement. In addition, though the literature on self-regulation suggests that motivation may be depleted through factors that limit cognitive resources (e.g., Muraven & Baumeister, 2000), few studies have considered engagement from this perspective (for an exception, see Sonnentag, 2003).

### *Practical Implications*

Our findings also have potential implications for practice. First, using the defining features of work engagement, which we have shown adequately differentiate from conceptualizations of more traditional job attitudes, practitioners may be able to augment their methodologies for assessing the capability and motivation of workers. As such, practitioners can use the guidelines that we have specified to develop more consistent measures that focus on the defining elements of engagement.

Second, we have illustrated that engagement might indeed help employers to improve or maintain their competitive advantage. Our results show that engagement has significant relations with in-role and discretionary work performance. In terms of task performance, this signals that an engaged workforce will likely perform their tasks more efficiently and effectively. In terms of contextual performance, this means that

employees, when engaged, will be more likely to create a social context that is conducive to teamwork, helping, voice, and other important discretionary behaviors that can lead to organizational effectiveness (Podsakoff, Whiting, Podsakoff, & Blume 2009).

Third, practitioners should attempt to support and cultivate engagement in their workforce. Our study suggests at least two ways that managers can improve the engagement of their workers, through selection and through job design. Importantly, organizations should ideally attend to more than one of these methods of improvement because one might not be sufficient alone (Macey & Schneider, 2008). First, organizations might attempt to hire employees predisposed to engagement by selecting individuals with high Conscientiousness proactivity, and PA. However, selecting for these traits might not be enough because of the likelihood that employees can only be as engaged as the work itself allows. Thus, managers might be able to increase engagement by designing jobs that include motivating characteristics, particularly with regard to the significance and variety of the tasks performed. This way, managers might be able to “set the stage for engagement” by creating contextual conditions that facilitate employees’ perceptions of meaningful work.

### *Limitations*

Our study had several limitations. First, the vast majority of the studies that we found assessed variables using concurrent methods. Although our moderator analysis failed to show differences between methods, given the small number of studies that were not concurrent, the data are not conclusive. This is especially distressing, given that the question of within-person versus between-person measurement is paramount in developing a conceptual understanding of engagement as a state versus as an enduring condition. Second, the majority of studies used self-report methods, which could have inflated the correlations among the variables. Third, the quality of studies contained in the meta-analysis may have had a systematic impact on the observed effect sizes. However, in our moderator analyses of publication bias, we did not find consistent evidence that this was true.

Fourth, there were limitations associated with our use of meta-analytic regression and path analysis. In some cases there were no correlations in our dataset for the relationships among the variables in the correlation matrices; instead, we used estimates taken from other studies and, thus, other samples. This raises the possibility that the magnitudes of the effects in some cells might not be generalizable to the sample populations in the other cells. However, when possible we used sample-based estimates derived from our primary studies, and when not possible, we attempted to use estimates based on large samples from other meta-analyses to

minimize sampling error. However, these results should be interpreted with caution, and future studies should attempt to replicate our path analyses using single-sample studies. Also, because each cell in the path-analysis and regression analyses was based on different sample sizes we chose to use the harmonic mean as a conservative estimate of sample size (Ones, Viswesvaran, & Reiss, 1996). However, for a small number of cells this estimate was higher than the actual sample size, potentially leading to the underestimation of sampling error (Colquitt, LePine, & Noe, 2000). Finally, our meta-analysis was limited to a small number of data points in several analyses, which made the testing of some moderators impossible (e.g., Sackett, Harris, & Orr, 1986). Although thus, several moderators that we investigated accounted for the variability among correlations, many analyses still indicated heterogeneity. Thus, although this is often the case in meta-analyses (Cortina, 2003), future research may be needed to uncover the variables causing the observed variability in effect sizes.

### *Conclusion*

As is common in emerging areas of study, engagement research has undergone growing pains. Although conceptualizations drawing on Kahn (1990) appear to represent a somewhat unique and useful addition to the organizational literature, we found areas that can still use improvement. Engagement research can benefit from methodological refinements, especially with regard to time: lagged designs and within-person studies need to be conducted to better understand state engagement, and longitudinal research might shed light on trait engagement. In addition, future research should continue to expand work engagement's nomological network, in particular with regard to work-related criteria (e.g., workplace deviance, workplace safety, creativity, or adaptive performance). Efforts such as these should be undertaken because, as our study suggests, work engagement is a useful construct meriting further attention.

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