

Engagement as attitude: Development and initial validation of an intentional bi-factor
measure of employee engagement

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Abstract

The most popular conceptual attitudinal specification employee engagement implicates sub-dimensions of vigor, dedication, and absorption. The more general tripartite model of attitudes isolates cognitive, behavioral, and affective components. The current investigation documents the development and validation of an intentionally complex engagement measure - one that intentionally crosses the conceptually substantive and elemental attitude components. An initial item set of 72 were culled to 36 via content validation. The 36 candidate items were piloted with a snowball sample of 330 and reduced to 20. The final 18 items were identified via further administration to 743 Prolific respondents. Construct validation was accomplished via Criterion-related validation included documented associations with intent to quit, satisfaction, and .

Keywords: Engagement, engagement

Word count: X

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Incorporated:

- ...Engagement-Survey-Projects/Construct Validation

The roots of employee [aka work; e.g., Wilmar B. Schaufeli and Bakker (2010a)] engagement research likely started with theoretical expansions of forms of employee participation (see, for example, Ferris & Hellier, 1984) and job involvement (e.g., Elloy, Everett, & Flynn, 1991). This exploration extended into broader considerations of attitudes and emotions (Staw, Sutton, & Pelled, 1994) and were informed by further exploration of the dimensionality of constructs such as organizational commitment (Meyer & Allen, 1991). The 1990's saw focused development and refinement [for example, a dissertation; Leone (1995) or actual semantic reference; William A. Kahn (1990a)]. Staw et al. (1994) investigated the relationships between *positive emotions* and favorable work outcomes, and although they do not use the word, "engagement", their distinction between felt and expressed emotion likely held influence upon the burgeoning interest in the engagement construct.

William A. Kahn (1990a) described engaged employees as being physically involved, cognitively vigilant, and emotionally connected. Although occasionally referred to as residing on the opposing pole to *burnout* (Christina Maslach & Leiter, 2008), these two constructs are currently most commonly conceptualized as being distinct (Goering, Shimazu, Zhou, Wada, & Sakai, 2017; Kim, Shin, & Swanger, 2009; Wilmar B. Schaufeli, Taris, & Van Rhenen, 2008; Timms, Brough, & Graham, 2012), although certainly not universally (Cole, Walter, Bedeian, & O'Boyle, 2012; Taris, Ybema, & Beek, 2017). Goering et al. (2017) explore nomological networks, concluding that these two constructs have a moderate (negative) association, but also distinct nomological networks. Wilmar B. Schaufeli et al. (2008) investigated both internal and external association indicators, concluding that engagement

and burnout (as well as *workaholism*) should be considered three distinct constructs.

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Burnout can be defined as a psychological syndrome characterized by exhaustion (low energy), cynicism (low involvement), and inefficacy (low self-efficacy), which is experienced in response to chronic job stressors (e.g., Leiter & Maslach, 2004; C. Maslach & Leiter, 1997). Alternatively, engagement refers to an individual worker's involvement and satisfaction as well as enthusiasm for work (James K. Harter, Schmidt, & Hayes, 2002). W. B. Schaufeli and Bakker (2003) further specify a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (p. 74). Via their conceptualization, vigor is described as high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work (Wilmar B. Schaufeli, Salanova, González-Romá, & Bakker, 2002). The dimension of absorption has been noted as being influenced in conceptual specification by (Csikszentmihalyi, 1990)'s concept of "flow".

Burnout is a psychological syndrome consisting of exhaustion, cynicism, and inefficacy (see, for example, Leiter & Maslach, 2004).

Regarding measurement, Gallup is widely acknowledged as an early pioneer in the measurement of the construct (see, for example, Coffman & Harter, 1999). The Utrecht Work Engagement Scale (UWES) is another self-report questionnaire developed by W. B. Schaufeli and Bakker (2003) that directly assesses the vigor, dedication, and absorption elements.

Engagement as an attitude

Staw et al. (1994) investigated the relationships between *positive emotions* and favorable work outcomes, and, although they do not explicitly mention the word “engagement”, their distinction between felt and expressed emotion likely held influence upon the burgeoning interest in the engagement construct. Clear in this history is the conceptualization of engagement as a work *attitude*. William A. Kahn (1990a) defines engagement as “the harnessing of organization members’ selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (p. 692). This definition of engagement as an attitude was also heavily influenced by Rosenberg (1960)’s tripartite model of attitudes, which was popular in the 1990’s. According to Rosenberg (1960), attitudes are a molar construct with cognitive, affective, and behavioral dimensions. Although falling out of favor in the decades following its construction, interest in the tripartite model was revived by Kaiser and Wilson (2019). The attitudinal perspectives of engagement eventually blended into perspectives that focused on exploring the engagement construct through the lens of other conceptually similar constructs Shaw (2005).

The first, to our knowledge, use of the word “engagement” as a construct came in William A. Kahn (1990b), defining it as: “the harnessing of organization members’ selves to their work roles; in engagement, people employ and express themselves physically,

cognitively, and emotionally during role performances.” Although this definition was quickly bypassed by subsequent papers (see, for example, (Baumruk, 2004) and (Shaw, 2005), who framed it in terms of one’s cognitive and affective *commitment* to one’s organization), William A. Kahn (1990b)’s definition is notable in that it conforms to the then-ascendant tripartite model of attitudes proposed by Rosenberg (1960). This model frames attitudes as latent variables that manifest cognitively, affectively and behaviorally.

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Item order as a multidimensional assessment response cues

Response cues in general and order effects in particular have their root in Cognitive Psychology, with the bulk of studies occurring in the early days of Cognitive Psychology (e.g., the 1960’s on). Primacy and recency (whether an item is presented at the beginning or end of a list) are known to elicit differences in response (e.g., Krosnick & Alwin, 1987). This effect has also been noted in methodological contexts in the form of differential carryover effects. For example, the order of presentation of samples in a product taste test (see, for example, Dean, 1980). Ackerman, Spray, Reckase, and Carlson (1989) found only small differences in response patterns when presenting *test* items in a fixed versus random ordering. Mashburn, Meyer, Allen, and Pianta (2014) experimentally controlled the presentation of rated material, finding higher indices of reliability and validity of ratings when content was administered randomly (e.g., order effects were controlled for).

Knowles (1988) and Hamilton and Shuminsky (1990) both administered exhaustively crossed orderings of items, noting better item discrimination (e.g., corrected item-total correlations) *later* in the assessment, regardless of actual item content. Steinberg (1994) provides a description of this effect: “...literature converges on the view that responding repeatedly to items representing a single, unidimensional psychological construct increases

the accessibility of relevant beliefs or feelings, which in turn, increases the relation between the item response and the underlying construct.” (p. 341) This statement could be rephrased as: location serves as a response cue. “This attentional focus influences item responses through such processes as item interpretation and ease of retrieval of relevant feelings that are applied to the item” (Steinberg, 1994, p. 341).

Steinberg (1994) looked at order effects in personality measurement,

Weinberg, M. K., Seton, C., & Cameron, N. (2018). The Measurement of Subjective Wellbeing: Item-Order Effects in the Personal Wellbeing Index—Adult. *Journal of Happiness Studies*, 19(1), 315–332.
<https://doi-org.ezproxy.montclair.edu/10.1007/s10902-016-9822-1>

Weinberg, Seton, and Cameron (2018) examine the effects of randomized items and domains in the Personal Wellbeing Index (PWI) in measure subjective wellbeing (SWB). Weinberg et al. (2018) conduct two studies one, looking at the PWI comparing its usual general-specific format to a modified format, furthermore, the order of the domain items will stay the same, while the general items will be random in question order. In the second study, Weinberg et al. (2018) randomized the domain items while the general items will be the same to standard scale order. In Weinberg et al. (2018), study 1 showed no results between general specific format and the modified format, however in study 2, they did find that presenting the random order effects did have lower means, then fixed order effects. Weinberg et al. (2018) present many different reasons for this outcomes, which could be those in the random order effect group had more participant experiencing high levels of wellbeing, and the other explanation is that changing order of items of PWI could affect the score. Weinberg et al. (2018) conducted a multiple regression analysis which showed that random order group account for 9% more variance in GLS than the fixed order group and conducted a confirmatory factor analysis showing that the fixed order groups was not a good model fit.

Serico, NeMoyer, Goldstein, Houck, and Leff (2021) looked at item order effects in self-report measures of aggression perpetration and victimization. Serico et al. (2021) provides a descriptions of two general biases in self-report measures, which are the subject's biases, and bias in wording, order, or format of items in the measure. In previous studies, there was an item order effect and item group effect in the measure that shows participants' response and psychometric properties of an aggression measure. # citation from other articles (Dietz & Jasinski, 2007; Shorey, Woods, & Cornelius, 2016). ##### In Serico et al. (2021), the findings shows that there is an item order affect in the reported frequency of aggression perpetration. It shows that item order can influence a person self-report in aggression perpetration and victimization, showing that there are methodological issue that have to be consider when developing and utilizing measure of aggression and victimization. This methodological issues can still be applicable to other measure such as workplace engagement, since we also look at people's behaviors, cognitive, and emotions.

This model is not without criticism, however. Some critics question its structural validity by pointing out that vigor, dedication and absorption all correlate highly with each other (Kulikowski, 2017).

The present article explores two methods for constructing a scale that incorporates both the substantive and attitudinal models into one, a more classical one based on corrected item-total correlations and one based on modification indices.

Existing Measures of Engagement

Our review of existing instruments non-exhaustively presents measures that are commonly viewed as *either* predominantly academic or applied, although please note that this is an imposed subjective distinction.

Research measures (e.g., freely available). Existing measures include Soane et al. (2012)

W. B. Schaufeli and Bakker (2003) characterize engagement as a “positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74). Via their conceptualization, vigor is described as high levels of energy and mental resilience while working. Dedication refers to being strongly involved in one’s work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one’s work, whereby time passes quickly and one has difficulties with detaching oneself from work (Wilmar B. Schaufeli et al., 2002). This absorption element has been noted as being influenced in conceptual specification by (Csikszentmihalyi, 1990)’s concept of “flow”. W. B. Schaufeli and Bakker (2003) use this tripartite framework to measure engagement via the Utrecht Work Engagement Scale (UWES).

The Intellectual, Social, Affective (ISA) Engagement Scale (Soane et al., 2012) is another option for researchers. This 9-item measure draws inspiration from William A. Kahn (1990a)’s theory of engagement and can aggregate to three 3-item scales (Intellectual Engagement, Social Engagement, and Affective Engagement) or one 9-item summary aggregate (Overall Engagement). Intellectual engagement refers to the degree of intellectual absorption one has in their work and the degree they think about improving work (Soane et al., 2012). Social engagement primarily concerns social connections in a workplace context as well as having shared values with colleagues (Soane et al., 2012). According to Soane et al. (2012), affective engagement refers to a positive emotional state relating to one’s work role. This measure has been explicitly validated at both the subscale and overall aggregate level (Soane et al., 2012).

Another example of an engagement measure comes from Saks (2006), who splits engagement into two distinct entities: job engagement and organization engagement. This

dichotomy largely results from William A. Kahn (1990a)'s theory that an individual's role is central to engagement. Saks (2006) further posits that employees typically have more than one role, with the most important being their work role and their role as a member of an organization. The former role is specific to the employee's job, while the latter is more broad and refers to the organization as a whole. Antecedents and consequences of this measure have been tested, with findings suggesting that perceived organizational support precedes both job and organizational engagement and that job satisfaction, organizational commitment, intent to quit, and organizational citizenship behaviors (OCBs) are consequences (Saks, 2006). Recently the broader theoretical model underpinning the measure was revisited and revised to include several new antecedents (e.g. leadership, job demands, dispositional characteristics, etc.) leading to engagement as well as consequences (e.g. burnout, stress, health and well-being, etc.) resulting from high or low levels of engagement (Saks, 2019).

Commercial measures (e.g., typically fee-based). Gallup's Q12 is a popular commercial measure for engagement. The Q12 is a 12-item measure that originated from a push to use "soft" metrics as opposed to "hard" ones for future action planning (Coffman & Harter, 1999). In this interpretation "soft" metrics tend to be metrics that are more abstract and difficult to measure (e.g. engagement, brand loyalty), while "hard" metrics are easily-measured and typically deal with concrete numbers (e.g. turnover, profitability). In the original creation of the survey, each of the 12 items were found to relate to important organizational outcomes including productivity, profitability, turnover, and customer satisfaction (Coffman & Harter, 1999). A recent meta-analysis of 456 studies revealed that the Q12 also relates to additional performance measures such as absenteeism, wellbeing, and organizational citizenship (J. K. Harter, Schmidt, Agrawal, & Plowman, 2013). While this engagement measure is one of the most popular, some scholars disagree with its conceptualization as "engagement"; some feel that this measure is better described as (or no different than) a measure of overall satisfaction, as the two concepts are highly correlated, $r = .91$ (Sirota & Klein, 2013).

Gallup is not the only organization with an engagement measure; many consulting companies have commercially available surveys, models, and processes for measuring engagement. One such example is Aon Hewitt, a consulting firm that annually measures engagement for over 1000 companies worldwide. Their measurements are centered around an engagement model that focuses on three main factors: say, stay, and strive. Essentially, the model states that employees demonstrate engagement through saying positive statements about their organization, staying at their organization for a long time, and striving to put in their best effort and help the organization succeed (Hewitt, 2017). In their most recent analysis, Hewitt (2017) recently noted that global levels of engagement may be declining as in this report they had retracted since the previous year.

BlessingWhite, another consulting firm, provides a different model for engagement. BlessingWhite's model, the X Model, measures engagement through the lens of satisfaction and contribution. Essentially, BlessingWhite believes that cooperation between the organization and individual employees is necessary, and that maximum engagement can only be reached when an employee reaches maximum levels of satisfaction while also outputting maximum contribution towards the organization (BlessingWhite, 2018). Their model holds each level in the organization accountable for employee levels of engagement. From their view, executive leaders must shape the organization's culture, and managers must be able to effectively communicate with and motivate their subordinates (BlessingWhite, 2018).

The last commercial example discussed here¹ is the Towers Perrin-ISR, which holds the philosophy that employee engagement can only be worked on indirectly; engagement can only be attained through effective leadership, business strategy, and organizational culture (Ballendowitsch & Perrin-ISR, 2009). Rather than focus on building an involved model for

¹ This non-exhaustive list is not meant to be comprehensive. We intended to present some popular measures (albeit from larger vendors) in an attempt to capture the variety of rationales and purposes behind the creation and administration of these measures.

engagement, Towers Perrin-ISR instead focuses on leadership development and creating a healthy organizational culture. Through fulfilling these antecedents of engagement, Ballendowitsch and Perrin-ISR (2009) argues that employees will have a vivid understanding of organizational goals. In addition, employees will become committed to the organization and motivated to contribute.

Our Measure of Engagement

Our theoretical conceptualization of work engagement is primarily informed by W. B. Schaufeli and Bakker (2003) and Rosenberg (1960). Through the lens of our framework, engagement is a mental state wherein employees: a) feel energized (*Vigor*), b) are enthusiastic about the content of their work and the things they do (*Dedication*), and c) are so immersed in their work activities that time seems compressed (*Absorption*). We further decompose each of these facets into three attitudinal components: d) feeling (e.g., affect), e) thought (e.g., cognition), and f) action (e.g., behavior).

Wilmar B. Schaufeli (2013) stated a preference for the label “work engagement” rather than referring to the construct as “employee engagement”, arguing that the “employee” referent perhaps invites a blurring of definitions with other conceptually similar constructs such as commitment or organizational citizenship. Regarding this distinction between “the job” and “the organization”, our measure scatters indicators of both throughout, although we did not intentionally balance the measure with regard to the referent, as do others, such as Saks (2006).

The current study’s focus is on exploring external variable associations with our measure, focusing on indices of construct and criterion-related validity via retention of two alternative measures of engagement (the Saks scale and the UWES), two measures of theoretically orthogonal constructs (activity regarding household chores and tending to pets), and one measure of a theoretically relevant outcome (intentions to quit).

Our conceptualization of work engagement is a mental state wherein employees: a) feel energized (*Vigor*), b) are enthusiastic about the content of their work and the things they do (*Dedication*), and c) are so immersed in their work activities that time seems compressed (*Absorption*). We further decompose each of these facets into three attitudinal components: d) feeling (e.g., affect), e) thought (e.g., cognition), and f) action (e.g., behavior). Development and construct validation of the focal 18-item measure of engagement is described in Russell, Ossorio Duffoo, Garcia Prieto Palacios Roji, and Kulas (2022) whereas the current study on administrative response cues in the form of order of item presentation. The expectation is that either model (attitudinal or substantive) will exhibit stronger factorial validity when item administration parallels latent structure.

Methods

Construct validation

We purchased Qualtrics panels of working adults and administered a standard Qualtrics survey via online delivery, however, as noted below, very cautious screening for indicators of careless responding resulted in our exclusion of many of these Qualtrics respondents from our presented analyses. The total survey was comprised of 74 items across 6 constructs of interest as well as several demographic items that are not the focus of this current presentation.

Participants

Of the 743 total Qualtrics panel respondents, roughly half were excluded based on conservative indices of carelessness across the larger survey. These screens included respondents with more than 50% missing responses, those who provided consistently non-differentiating responses across more than 12 consecutive items, and those who completed the survey in less than 300 seconds. These conservative screens resulted in a retained validation sample of 377. All analyses were derived from this n of 377.

Data analysis

We used R [Version 4.2.2; R Core Team (2021)] for all our analyses. As a straightforward validation study, our analyses consisted predominantly of Pearsons product-moment correlations.

Results

The items comprising the focal measure along with their scale associations and recommended administered response scale are located in Table 1. The current sample internal consistency estimates for our three substantive subscales were: 1) Absorption ($\alpha = 0.75$), 2) Dedication ($\alpha = 0.89$), and 3) Vigor ($\alpha = 0.75$), and estimates for our three attitudinal subscales were: 1) Affect/“Feel” ($\alpha = 0.86$), 2) Behavior/“Do” ($\alpha = 0.77$), and 3) Cognition/“Think” ($\alpha = 0.77$).

Construct validation. For convergent validity indices, we administered the 17-item Utrecht Work Engagement Scale (Wilmar B. Schaufeli & Bakker, 2010b; Wilmar B. Schaufeli et al., 2002) as well as Saks (2006)’s 12-item measure which aggregates to two scales: job and organizational engagement (see also Saks, 2019).² An example item from the Saks (2006) (job) scale is, “Sometimes I am so into my job that I lose track of time”. An example item from the Wilmar B. Schaufeli et al. (2002) scale is, “At my work, I feel bursting with energy”. The Wilmar B. Schaufeli et al. (2002) measure follows the same structure as our focal measure, so we aggregated to subscales of Absorption ($\alpha = 0.84$), Dedication ($\alpha = 0.87$), and Vigor ($\alpha = 0.85$). Internal consistency estimates for the Saks scale were $\alpha = 0.69$ (job engagement) and $\alpha = 0.84$ (organizational engagement). Also note here that the English version of the UWES may actually be a translation (it is difficult to say for sure, as the test manual describes an original Dutch sample although the manual is written in English). Further suggesting that the English version may be a translation, some

² We had also intended to use the Gallup “Q12” for construct validation (J. K. Harter et al., 2013; Thackray, 2005), but Gallup was not willing to share item- or person-level data.

items have odd grammar (for example, “I am proud on *[sic]* the work that I do”).

Two short scales from the Oregon Avocational Interest Scales (Goldberg, 2010) were retained for discriminant validation - the 5-item “Pets” and 5-item “Household Activities” scales. These items asked how frequently respondents engaged in different activities. An example Household Activity item is, “Cleaned the house” (current sample $\alpha = 0.72$) and an example Pets item is “Fed a pet animal” (current sample $\alpha = 0.88$).

Criterion-related validation. We administered a short 4-item intent-to-quit scale developed by Kelloway, Gottlieb, and Barham (1999). An example item is, “I don’t plan to be in this organization much longer” (current sample $\alpha = 0.92$).

Table 2 presents associations among the focal measure subscales, the convergent construct validity subscales, the intent to quit criterion, and the two discriminant validity scales. Here we note higher-than-desired interscale correlations for our focal measure (r ’s range from .68 to .82 for the attitudinal scales and range from .73 to .89 for our substantive scales). The associations between the two scales are inflated due to the sharing of items (for example, the “affect” and “dedication” scales share 2 items in common). Convergent indices are generally higher for our subscales with the Saks “work” scale, which stresses the job referent. This may be due to the majority of our items (see Table 1) also reflecting the job as opposed to the organization. The pattern of convergence with the UWES subscales largely emerged as expected: dedication ($r = .74$), absorption ($r = .68$), and vigor ($r = .74$) exhibited elevated inter-scale correlations, although we also note moderately high values throughout (ranging from a low of $r = .63$ to a high of $r = .77$). The focal scales of Cognition and Dedication did exhibit the highest magnitude associations with the intent to quit criterion of all administered variables, and the discriminant measures revealed generally small associations, although r ’s above .15 are potentially of concern.

The results of internal structural analyses via bifactor analysis (as well as Table 2 correlations) do suggest that overall scale aggregation may be supported, and because this is

likely the desired use for some, we also present overall scale associations in Table 3. Here we see elevated convergent indices among all three engagement measures (ranging from $r = .69$ to $r = .81$). The focal measure retains superiority with regard to intent to quit ($r = -.39$ vs. r 's = $-.29$; Fisher's $z = 3.78$, $p < .05$), however, this association is muted with regard to the superior Dedication scale association ($r = -.49$) found in Table 2. Additionally, one of the discriminant measures (household activities), again exhibited a non-trivial association with the focal measure aggregate (as well as the UWES). Collectively the results suggest a high level of convergent validity, a fair degree of discriminant validity, and potentially superior predictive validity (focused on the intent to quit scale).

Snowball & Qualtrics

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## Some items ( Item_14 ) were negatively correlated with the first principal component
## probably should be reversed.

## To do this, run the function again with the 'check.keys=TRUE' option

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## To do this, run the function again with the 'check.keys=TRUE' option
```

Participants

Data was obtained from two sources. In the first sampling, 282 individuals responded to a snowball sampling initiated by Industrial and Organizational Psychology faculty and graduate students. There were four counterbalanced orderings of item presentations within this administration, as well as an additional 18 contextual items - this sample constituted the original scale development sample, and at the time of administration the additional contextual items were candidates for item retention. In the second data collection initiative, Qualtrics panels were solicited along with 2 additional contextual items. These respondents included 343 working adults who responded to attitudinally clustered items and 404 working

adults who responded to substantively clustered items.

Materials

Our 18-item engagement measure was crafted to be intentionally complex (each item is intended to load on two constructs). This complexity, however, derives from a crossing of the attitudinal components of affect, cognition, and behavior with the substantive engagement components of vigor, dedication, and absorption. Within the current investigation, we realized α 's of 0.81 (Absorption), 0.91 (Dedication), 0.73 (Vigor), 0.73 (Affect), 0.89 (Cognition), and 0.83 (Behavior). The 6-point response scale is: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree. The item stems as well as their scale association are presented in Table XX.

Results

We used R [Version 4.2.2; R Core Team (2021)] for all our analyses.

The omnibus CFA's, regardless of item ordering, across 1025 respondents showed fair fit for both the substantive ($\chi^2_{substantive}=930.38$, $df=132$, $RMSEA=0.08$) as well as attitudinal structures ($\chi^2_{attitudinal}=1,042.75$, $df=132$, $RMSEA=0.09$). Additional fit indices for the two models are presented in Table XX. Figures 1 and 2 present the omnibus models visually (standardized coefficients displayed). Note that the primary source of misfit for both models within the omnibus analysis is item 14, which is the lone reverse-coded item within the inventory, "Thinking about work saps my energy".

Note. Also look at scale intercorrelations when the shared items have been removed (for example, items that define both dedication and cognition when looking at the correlation between dedication and cognition) - 12/2/21

Condition effects. The order of item presentation was: 1) random within substantive dimension, 2) random within attitudinal dimension, 3) parcels of substantive within attitudinal (36-item attitudinal context), 4) parcels of attitudinal within substantive

(36-item substantive context), 5) parcels of substantive within attitudinal (20-item attitudinal context), and 6) parcels of attitudinal within substantive (20-item substantive context). For example, in condition 1, the first items presented were all associated with one attitudinal dimension (for example, “Affect”). Once the Affect item list was fully exhausted, the respondent was then administered the full set of Behavioral items, and once these were completed the respondent was then administered the Cognitive item set³. We view these orderings as cues regarding factor structure, and anticipated empirical factor structures to reflect these cues. The effects did emerge, but were quite moderate (for example, $\Delta\chi^2_{Cond1} = 9.55$, $\Delta AIC_{Cond1} = 10.53$). Given the variety of item orderings administered, this should be considered somewhat comforting regarding the effect of contextual embeddedness within multidimensional inventories. To further explore degree of similarity, we applied explicit tests of measurement invariance.

Measurement invariance. Because our six conditions were obtained across two different sampling procedures, we apply our analyses of measurement invariance twice - first investigating the four conditions administered within our initial snowball sampling and then secondly also extending to the follow-up Qualtrics panel respondents.

We looked at structural invariance as well as latent means (Meredith, 1993; Steinmetz, Schmidt, Tina-Booh, Wieczorek, & Schwartz, 2009).

Discussion

Our contributions:

1. Methodological

- Intentional bi-factor structure

³ Across conditions, the order of presentation of item “blocks” was also randomized. For example, not all respondents in Condition 1 was administered the Affect item block first - roughly 1/3 was presented the Behavioral block first and roughly 1/3 was presented the Cognitive block first.

2. Practical

- A new public domain measure of engagement
- Scalable to two aggregations (research [DAC] and actionable [ABC])

3. Theoretical

- Possibly help explain some of the high inter-scale correlations reported with other measures

The item cues did provide slight response cues (attending to individual model fit indices), however, the effect was quite small. Measurement invariance is plausible within our initial four administration conditions, although it is not attained across all six conditions. This is possibly attributable to differences in sampled population (in addition to the possibility that this difference is attributable to item orderings).

Our primary aspiration for developing this measure was that it would be a public domain instrument that would draw equal appeal from both practitioners and academics. These preliminary investigations suggest that it is scaleable to two aggregations which we have been referring to as: 1) research (DAC), and 2) actionable (ABC). Our (as-of-yet untested) assumption is that practitioners may be more interested in feedback regarding how their employees *think*, *feel*, and *behave* with regard to engagement. Academics, on the other hand, may be more interested in possible differentiation between levels of dedication, absorption, and vigor. Having one assessment that may aggregate to either framework not only addresses the demand of constituent users, but it also facilitates aggregation across samplings for broader purposes such as norms development, validation, and metaanalysis.

The convergent indices provide preliminary evidence that the three engagement measures are measuring similar but not redundant content. The criterion-related indices suggest that the focal variable may have superior prediction, although more validation needs

to occur, both with turnover intentions as well as actual turnover behavior. The discriminant validity indices did exhibit magnitudes slightly higher than anticipated, however, upon close inspection, the largest coefficients (r 's of .15 and .17) emerged across the focal “behavior” and “dedication” scales. In retrospect, our sample respondents who engaged in more engagement behavior and exhibited higher levels of dedication could very well be expected to also extend those proclivities beyond work - perhaps including household and pet-care activities.

Although not explored here, there is also further predictive power potentially located within our intentionally complex instrument. It is possible that combined scale focus (for example, “Cognitively Dedicated” - shared items across the cognitive and dedication scales) exhibits even more predictive power for targeted outcomes of interest. Future investigations may wish to additionally probe for associations at this “cell” level.

name_of_sheet	num	oldest_response	latest_re
qualtrics_pilot_data.csv	330	2020-11-15 09:43:31	2021-03-
Engagement+(Attitudinal)_October+12,+2021_08.02.csv	341	2021-10-08 17:03:31	2021-10-
Engagement+(Substantive)_October+12,+2021_08.01.csv	402	2021-10-08 16:55:26	2021-10-
inital_data_screen.csv	281	2021-10-07 08:55:30	2021-10-
inprogress.csv	503	2021-10-07 08:46:48	2021-10-
Engagement(post-Qualtrics)April1920221118.csv	232	2021-10-27 10:27:49	2022-03-

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Table 1

Suggested final scale definitions.

Substantive	Attitudinal	Item.Number	Item.Stem
Absorption	Cognitive	1	I am able to concentrate on my work without getting distracted
Absorption	Cognitive	3	Time passes quickly while I'm working
Absorption	Affective	5	I enjoy thinking about work even when I'm not at work
Absorption	Affective	8	I love starting my workday
Absorption	Behavioral	10	I have to be reminded to take breaks while I'm at work
Absorption	Behavioral	11	I never miss a work deadline
Vigor	Cognitive	14	Thinking about work saps my energy
Vigor	Cognitive	16	I'm able to maintain good levels of energy throughout the workday
Vigor	Affective	17	I enjoy spending time completing my job tasks
Vigor	Affective	19	I feel motivated to go beyond what is asked of me at work
Vigor	Behavioral	21	When work is slow I find ways to be productive
Vigor	Behavioral	22	I express enthusiasm for my job while at work
Dedication	Cognitive	25	I plan to stay with this company as my career advances
Dedication	Cognitive	26	I believe this company cares about my career goals
Dedication	Affective	31	I feel proud of my accomplishments within this organization
Dedication	Affective	32	My job makes me feel like I'm part of something meaningful

Table 1 continued

Substantive	Attitudinal	Item.Number	Item.Stem
Dedication	Behavioral	34	I embrace challenging situations at work
Dedication	Behavioral	35	I speak positively about this organization to others

Note. The recommended response scale is 'Strongly Disagree', 'Disagree', 'Somewhat Disagree', 'Somewhat Agree', 'Agree', and 'Strongly Agree'

Table 2

Unit-weighted scale intercorrelations (all variables).

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. affect	-												
2. behavior	.74***	-											
3. cognition	.82***	.68***	-										
4. dedication	.87***	.78***	.89***	-									
5. absorption	.84***	.78***	.81***	.73***	-								
6. vigor	.82***	.77***	.79***	.74***	.66***	-							
7. saks.job	.61***	.60***	.60***	.60***	.59***	.59***	-						
8. saks.work	.72***	.59***	.67***	.72***	.67***	.54***	.54***	-					
9. UWES.dedication	.77***	.65***	.72***	.74***	.66***	.70***	.59***	.57***	-				
10. UWES.absorption	.69***	.66***	.66***	.66***	.68***	.63***	.70***	.55***	.82***	-			
11. UWES.vigor	.70***	.67***	.66***	.65***	.63***	.74***	.56***	.46***	.82***	.80***	-		
12. intentquit	-.36***	-.24***	-.48***	-.49***	-.23***	-.36***	-.23***	-.28***	-.32***	-.23***	-.26***	-	
13. pets	.05	.15**	.07	.06	.12*	.07	.16**	.07	.07	.13*	.12*	.03	-
14. household	.10	.15*	.17**	.14*	.13*	.15*	.12*	.03	.20***	.21***	.23***	-.07	.34***

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 3

Scale intercorrelations (Overall engagement aggregates).

	1	2	3	4	5	M	SD
1. focal	-					4.19	0.82
2. Saks	.79***	-				3.55	0.73
3. UWES	.81***	.69***	-			4.83	1.18
4. intentquit	-.39***	-.29***	-.29***	-		2.85	1.22
5. pets	.09	.13*	.11	.03	-	3.71	1.01
6. household	.15**	.09	.23***	-.07	.34***	4.00	0.64

Note. * p < 0.05; ** p < 0.01; *** p < 0.001

Condition	Model	χ^2	<i>df</i>	RMSEA	SRMR	CFI	TLI	AIC
1	3-factor	300.86	132	0.14	1	0.68	0.63	3,282.88
	substantive							
	3-factor at-	290.33	132	0.14	1	0.70	0.65	3,272.35
	titudinal							
2	3-factor	310.01	132	0.15	1	0.71	0.66	3,257.45
	substantive							
	3-factor at-	322.52	132	0.15	1	0.69	0.64	3,269.96
	titudinal							
3	3-factor	252.07	132	0.12	1	0.78	0.74	3,510.32
	substantive							
	3-factor at-	275.74	132	0.13	1	0.73	0.69	3534
	titudinal							
4	3-factor	224.96	132	0.10	0.94	0.82	0.79	3,421.64
	substantive							
	3-factor at-	228.99	132	0.10	0.96	0.81	0.78	3,425.66
	titudinal							
5	3-factor	549.80	132	0.10	1	0.90	0.89	14,932.57
	substantive							
	3-factor at-	497.90	132	0.10	1	0.92	0.90	14,880.67
	titudinal							

Condition	Model	χ^2	<i>df</i>	RMSEA	SRMR	CFI	TLI	AIC
Condition 6	2-factor	468.02	132	0.09	0.87	0.91	0.90	17,953.02
	substan- tive							
	3-factor at- titudinal	610.60	132	0.10	1	0.88	0.86	18,095.61
Overall	3-factor	930.38	132	0.08	0.76	0.92	0.90	46,884.02
	substan- tive							
	3-factor at- titudinal	1,042.75	132	0.09	0.99	0.91	0.89	46,996.40

Table 5

Unit-weighted scale intercorrelations (all conditions).

	1	2	3	4	5	<i>M</i>	<i>SD</i>
1. Absorption	-					4.00	1.02
2. Vigor	.76***	-				4.22	0.85
3. Dedication	.76***	.79***	-			4.41	1.12
4. Affect	.81***	.83***	.85***	-		4.08	0.90
5. Cognition	.87***	.85***	.89***	.79***	-	4.16	1.12
6. Behavior	.84***	.85***	.84***	.73***	.81***	4.39	0.96

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 6

Measurement invariance summary statistics (attitudinal structure).

	Df	AIC	BIC	Chisq	Chisq diff	RMSEA	Df diff	Pr(>Chisq)
configural.a	528	13,645.98	14,453.38	1,117.59	NA	NA	NA	NA
weak.a	573	13,614.45	14,262.50	1,176.06	58.48	0.07	45	0.09
strong.a	618	13,569.48	14,058.18	1,221.09	45.03	0.00	45	0.47
strict.a	672	13,538.35	13,835.82	1,297.96	76.87	0.08	54	0.02

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 7

Measurement invariance summary statistics (substantive structure).

	Df	AIC	BIC	Chisq	Chisq diff	RMSEA	Df diff	Pr(>Chisq)
configural.s	528	13,616.29	14,423.69	1,087.90	NA	NA	NA	NA
weak.s	573	13,588.39	14,236.44	1,150.00	62.10	0.08	45	0.05
strong.s	618	13,546.51	14,035.20	1,198.12	48.12	0.03	45	0.35
strict.s	672	13,521.28	13,818.74	1,280.89	82.77	0.09	54	0.01

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 8

Measurement invariance summary statistics (attitudinal structure [6 conditions]).

	Df	AIC	BIC	Chisq	Chisq diff	RMSEA	Df diff	Pr(>Chisq)
configural.a2	792	46,694.26	48,335.92	2,226.09	NA	NA	NA	NA
weak.a2	867	46,713.85	47,995.49	2,395.68	169.59	0.09	75	0.00
strong.a2	942	46,905.27	47,826.90	2,737.10	341.42	0.15	75	0.00
strict.a2	1032	46,946.38	47,436.00	2,958.21	221.11	0.10	90	0.00

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

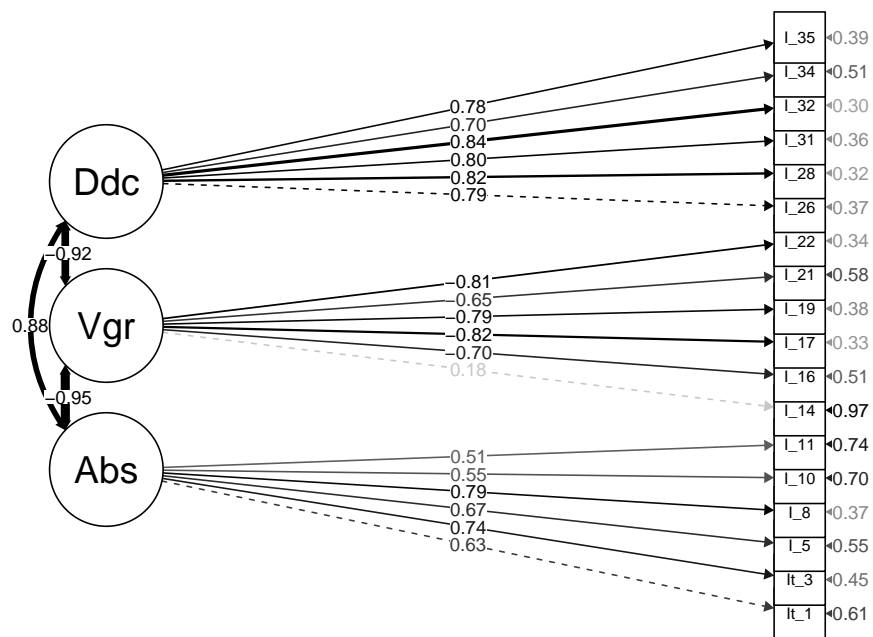


Figure 1. Omnibus Confirmatory Factor Analysis substantive structure.

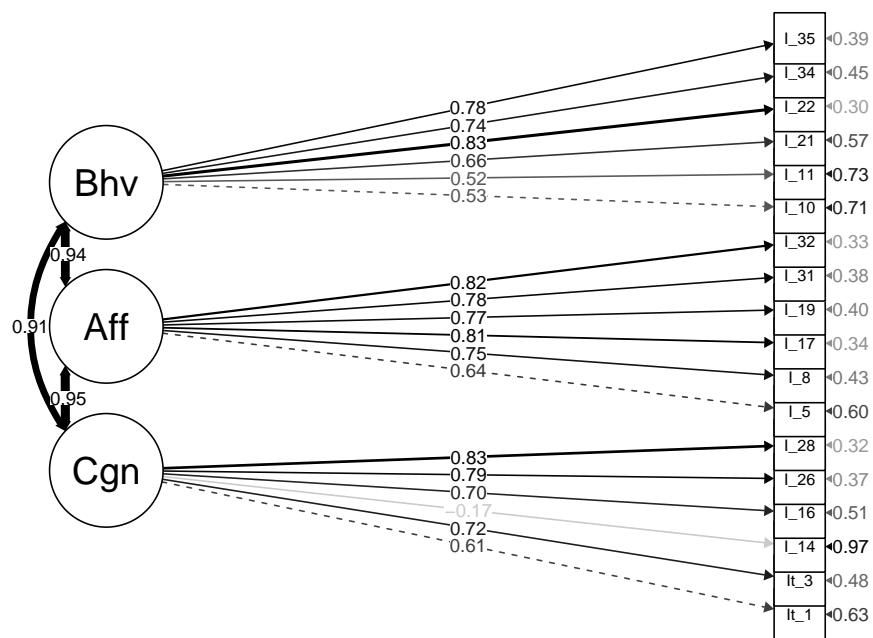


Figure 2. Omnibus Confirmatory Factor Analysis attitudinal structure.