20 to 18 - Final Scale Definitions of the Bifactor Engagement Scale

Mike DeFabiis[1], Casey Osorio[2], Morgan Russell[1], & John Kulas[3]

[1] Montclair State University

[2] Harver

[3] eRg

Author Note

Add complete departmental affiliations for each author here. Each new line herein must be indented, like this line.

Enter author note here.

Abstract

We finalize the scale definitions for a bifactor engagement measure that is comprised of intentionally complex items.

Keywords: keywords

Word count: X

20 to 18 - Final Scale Definitions of the Bifactor Engagement Scale

The origins of employee [aka work; e.g., W. Schaufeli and Bakker (2010)] engagement research began with theoretical expansions of forms of employee participation (see, for example, Ferris & Hellier, 1984) and job involvement (e.g., Elloy, Everett, & Flynn, 1991). Overtime research and theory expanded into broader considerations of attitudes and emotions (Staw, Sutton, & Pelled, 1994) and were further supplemented by 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)].

This development inevitably resulted in multiple differing perspectives of engagement. Some viewed engagement from an attitudinal perspective (William A. Kahn, 1990a; Staw et al., 1994), while others viewed it from a substative perspective (Wilmar B. Schaufeli, Salanova, González-Romá, & Bakker, 2002). Wilmar B. Schaufeli (2013) distinguished between various forms of engagement (work engagement and employee engagement). Christina Maslach and Leiter (2008) proposed that engagement and burnout [a psychological syndrome consisting of exhaustion, cynicism, and inefficacy; see Leiter and Maslach (2004); C. Maslach and Leiter (1997)] are direct opposites of each other, though many consider these constructs to be conceptually distinct (Timms, Brough, and Graham (2012); Kim, Shin, and Swanger (2009); Goering, Shimazu, Zhou, Wada, and Sakai (2017); Wilmar B. Schaufeli, Taris, and Van Rhenen (2008); Trógolo, Morera, Castellano, Spontón, and Medrano (2020)). 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

Multiple measures of engagement currently exist, with one notable measure being the Intellectual, Social, Affective (ISA) Engagement Scale (Soane et al., 2012). This 9-item measure draws inspiration from William A. Kahn (1990b)'s theory towards engagement, primarily utilizing his belief that an individual's work role demonstrates a focus for engagement. In the ISA Engagement Scale, the focused role is accompanied by activation and positive affect. Together, these components result in three facets in Soane et al. (2012)'s multidimensional model: Intellectual Engagement, Social Engagement, and Affective 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 (**soan2012development?**), Affective engagement refers to 'the extent to which one experiences a state of positive affect relating to one's work role'. Together these three facets comprise ISA engagement. This is the first known measure of engagement that is validated at both the facet and factor level, having validated both ISA engagement and its three facets (Soane et al., 2012).

Another example of an engagement measure comes from Alan M. Saks (2006), who splits engagement into two distinct entities: job engagement and organization engagement. This dichotomy largely results from William A. Kahn (1990b)'s theory that an individual's role is central to engagement. Alan M. Saks (2006) believes 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 employee engagement were also 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) at the individual and organization level are outcomes of high and low levels of engagement. Recently the model 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 (Alan M. Saks, 2019).

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 (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) found that global levels of engagement 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 is 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 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.

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 specification of engagement as a work *attitude*. Staw et al. (1994) isn't the only reference to engagement as an 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". These theories of engagement as an attitude were heavily inspired by Rosenberg (1960) 's tripartite model of attitudes. According to Rosenberg (1960), attitudes are a molar construct with cognitive, affective, and behavioral dimensions as its molecular parts. While this model is not specifically geared towards engagement, many researchers have drawn inspiration from it and have used it to help better understand individuals' reactions to certain attitude objects (Kaiser & Wilson, 2019). These attiudinal definitions of engagement were 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). Although falling out of favor in the decades following its construction, interest in the tripartite model was revived by Kaiser and Wilson (2019).

Engagement as substantive

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 et al., 2002). The dimension of absorption has been noted as being influenced in conceptual specification by (Csikszentmihalyi, 1990)'s concept of "flow".

Bifactor structures

Typically, bifactor analyses are utilized when exploring common method variance [Biderman, Nguyen, Cunningham, and Ghorbani (2011); Gäde, Schermelleh-Engel, and Klein (2017); reise_rediscovery_2012]. Giordano, Ones, Waller, and Stanek (2020) recently published an overview of exploratory bifactor analyses. In their work they cite past applications as well as potential future uses, and credit Reise (2012) as the catalyst for the revival of bifactor models. Research and application of Item response theory (IRT) and structural equation modeling (SEM) are increasingly integrating the use of bifactor models. Typically, bifactor models are used to analyze compare two phenomena: 1. The degree to which a single general factor reflects the common variance among a set of item responses and their covariance. 2. The degree to which a group of non-correlated factors reflect common variance among item clusters. The current study breaks away from this tradition, as two factor groups, as opposed to one factor group and a general factor, will be compared in order to assess two general factors from each group: attitidunal and substantive.

Our Proposed Model of Engagement

The present article extends our previous exploration of two methods for constructing an engagement scale. The first method incorporates both the substantive and attitudinal models into one based on corrected item-total correlations, while the second method incorporates substantive and attitudinal models into one based on modification indices. 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.

Our contributions:

1. Methodological

- Intentional bi-factor structure

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

Methods

Participants

Of the 743 total Qualtrics panel respondents, 366 were excluded based on conservative indices of carelessness across the larger survey (consistent non-differentiating responses across more than 20 consecutive items or greater than 50% missing responses. For Prolific panel respondents, 568 were retained of 785 total participants due to the same exclusion criteria. The smaller ($n = 232$) snowball sample retained all participants for a total combined analysis sample of 1177.

Material

Procedure

A previous instrument administration reduced 36 candidate items to 20. Primarily for reason of equal balance, we wanted to ultimately land on 18 items (6 per attitudinal/substantive scale dimension, 2 per bifactor subscale). Two primary considerations were given to the decision to retain or delete the 6 deletion candidates: 1) is the content of the item necessary for the definitional content domain, and 2) does the empirical functioning of the item implicate possible revision/deletion. The items considered deletion candidates were from the Absorption-Cognition subscale (Item 1: *I am able to concentrate on my work without getting distracted*, Item 3: *Time passes quickly while I'm working*, and Item 4: *I find it difficult to mentally disconnect from work*) and the Dedication-Cognition subscale (Item 25: *I plan to stay with this company as my career advances*, Item 26: *I believe this company cares about my career goals*, and Item 28: *This organization challenges me to work at my full potential*).

Data analysis

We used R (Version 4.2.0; R Core Team, 2022) and the R-packages *careless* (Version 1.2.1; Yentes & Wilhelm, 2021), *descr* (Version 1.1.5; Dirk Enzmann, Schwartz, Jain, & Kraft, 2021), *lavaan* (Version 0.6.10; Rosseel, 2012), *papaja* (Version 0.1.0.9999; Aust & Barth, 2022), and *tinylabels* (Version 0.2.3; Barth, 2022) for all our analyses.

Looking first at the Absorption-Cognition candidate items, Item 4 stood out as a candidate for exclusion based on empirical indices (corrected item-total correlations, inter-item correlations, and bifactor analysis fit [$\chi^2_{with} = 676.51$, $\chi^2_{without} = 499.05$]). Conceptually we also agreed that Item 4 was not uniquely critical for comprehensive coverage across either the Cognition or Absorption constructs. Figure 1 presents the visual CFA.

Results

The final recommended scale definitions are located in Table 1.

Discussion

References

Aust, F., & Barth, M. (2022). *papaja: Prepare reproducible APA journal articles with R Markdown*. Retrieved from https://github.com/crsh/papaja

Ballendowitsch, J., & Perrin-ISR, T. (2009). Employee engagement–a way forward to productivity. *Towers Perrin-ISR Case Study, Towers Perrin-ISR*, *14*.

Barth, M. (2022). *tinylabels: Lightweight variable labels*. Retrieved from https://cran.r-project.org/package=tinylabels

Baumruk, R. (2004). *The missing link: The role of employee engagement in business success*. *47*, 48–52.

Biderman, M. D., Nguyen, N. T., Cunningham, C. J., & Ghorbani, N. (2011). The ubiquity of common method variance: The case of the big five. *Journal of Research in Personality*, *45*(5), 417–429.

BlessingWhite. (2018). *Employee engagement survey*. Available at https://blessingwhite.com/wp-content/uploads/2019/11/Employee_Engagement_Survey_Fact_Sheet.pdf.

Coffman, C., & Harter, J. (1999). A hard look at soft numbers. *Position Paper, Gallup Organization*.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience* (Vol. 1990). Harper & Row New York.

Dirk Enzmann, J. Aquino. I. R. source code and/or documentation written by, Schwartz, M., Jain, N., & Kraft, S. (2021). *Descr: Descriptive statistics*. Retrieved from https://CRAN.R-project.org/package=descr

Elloy, D. F., Everett, J. E., & Flynn, W. R. (1991). An examination of the correlates of job involvement. *Group & Organization Studies*, *16*(2), 160–177. https://doi.org/10.1177/105960119101600204

Ferris, R., & Hellier, P. (1984). Added value productivity schemes and employee participation. *Asia Pacific Journal of Human Resources*, *22*(4), 35–44.

https://doi.org/10.1177/103841118402200406

Gäde, J. C., Schermelleh-Engel, K., & Klein, A. G. (2017). Disentangling the common variance of perfectionistic strivings and perfectionistic concerns: A bifactor model of perfectionism. *Frontiers in Psychology*, *8*, 160.

Giordano, C., Ones, D. S., Waller, N. G., & Stanek, K. C. (2020). Exploratory bifactor measurement models in vocational behavior research. *Journal of Vocational Behavior*, *120*, 103430. https://doi.org/10.1016/j.jvb.2020.103430

Goering, D. D., Shimazu, A., Zhou, F., Wada, T., & Sakai, R. (2017). Not if, but how they differ: A meta-analytic test of the nomological networks of burnout and engagement. *Burnout Research*, *5*, 21–34.

Harter, J. K., Schmidt, F. L., Agrawal, S., & Plowman, S. K. (2013). The relationship between engagement at work and organizational outcomes 2012 Q12 meta-analysis lincoln. *NE: The Gallup Organization*.

Hewitt, A. (2017). *2017 trends in global employee engagement*. Available at https://content.lesaffaires.com/LAF/lacom/Aon_2017_Employee-Engagement.pdf.

Kahn, William A. (1990a). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, *33*(4), 692–724.

Kahn, William A. (1990b). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, *33*(4), 692–724.

Kaiser, F. G., & Wilson, M. (2019). The Campbell Paradigm as a Behavior-Predictive Reinterpretation of the Classical Tripartite Model of Attitudes. *European Psychologist*, *24*(4), 359–374. https://doi.org/10.1027/1016-9040/a000364

Kim, H. J., Shin, K. H., & Swanger, N. (2009). Burnout and engagement: A comparative analysis using the Big Five personality dimensions. *International Journal of Hospitality Management*, *28*(1), 96–104. https://doi.org/10.1016/j.ijhm.2008.06.001

Leiter, M., & Maslach, C. (2004). Areas of worklife: A structured approach to organizational predictors of job burnout. In *Research in occupational stress and*

well-being (Vol. 3, pp. 91–134). https://doi.org/10.1016/S1479-3555(03)03003-8

Leone, D. R. (1995). *The relation of work climate, higher order need satisfaction, need salience, and causality orientations to work engagement, psychological adjustment, and job satisfaction* (PhD thesis). ProQuest Information & Learning.

Maslach, C., & Leiter, M. (1997). What causes burnout. *Maslach C, Leiter MP. The Truth About Burnout: How Organizations Cause Personal Stress and What to Do about It. San Francisco, CA: Josey-Bass Publishers*, 38–60.

Maslach, Christina, & Leiter, M. P. (2008). Early predictors of job burnout and engagement. *Journal of Applied Psychology*, *93*(3), 498–512.

Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, *1*(1), 61–89.

R Core Team. (2022). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/

Reise, S. P. (2012). The rediscovery of bifactor measurement models. *Multivariate Behavioral Research*, *47*(5), 667–696. https://doi.org/10.1080/00273171.2012.715555

Rosenberg, M. J. (1960). Cognitive, affective, and behavioral components of attitudes. In *Attitude organization and change*.

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Russell, M., Ossorio Duffoo, C., Garcia Prieto Palacios Roji, R., & Kulas, J. (2022). Development of an intentional bifactor measure of engagement. *The Seattle Edition of SIOP*, 1–14. SIOP.

Saks, Alan M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*.

Saks, Alan M. (2019). Antecedents and consequences of employee engagement revisited. *Journal of Organizational Effectiveness: People and Performance*, *6*(1), 19–38.

Schaufeli, Wilmar B. (2013). What is engagement? In *Employee engagement in theory and practice* (pp. 29–49). Routledge.

Schaufeli, W. B., & Bakker, A. B. (2003). UWES–utrecht work engagement scale: Test manual. *Unpublished Manuscript: Department of Psychology, Utrecht University*, *8*.

Schaufeli, Wilmar B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, *3*(1), 71–92.

Schaufeli, Wilmar B., Taris, T. W., & Van Rhenen, W. (2008). Workaholism, burnout, and work engagement: Three of a kind or three different kinds of employee well-being? *Applied Psychology*, *57*(2), 173–203.

Schaufeli, W., & Bakker, A. (2010). The conceptualization and measurement of work engagement. In W. Schaufeli, A. Bakker, & M. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 10–24). New York: Psychology Press.

Shaw, K. (2005). An engagement strategy process for communicators. *Strategic Communication Management*, *9*(3), 26.

Sirota, D., & Klein, D. (2013). *The enthusiastic employee: How companies profit by giving workers what they want*. FT Press.

Soane, E., Truss, C., Alfes, K., Shantz, A., Rees, C., & Gatenby, M. (2012). Development and application of a new measure of employee engagement: The ISA engagement scale. *Human Resource Development International*, *15*(5), 529–547.

Staw, B. M., Sutton, R. I., & Pelled, L. H. (1994). Employee positive emotion and favorable outcomes at the workplace. *Organization Science*, *5*(1), 51–71.

Timms, C., Brough, P., & Graham, D. (2012). Burnt-out but engaged: The co-existence of psychological burnout and engagement. *Journal of Educational Administration*, *50*(3), 327–345.

Trógolo, M. A., Morera, L. P., Castellano, E., Spontón, C., & Medrano, L. A. (2020). Work engagement and burnout: Real, redundant, or both? A further examination using a

bifactor modelling approach. *European Journal of Work and Organizational Psychology*, *29*(6), 922–937.

Yentes, R. D., & Wilhelm, F. (2021). *Careless: Procedures for computing indices of careless responding.*

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 feek 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	Cognitive	28	This organization challenges me to work at my full potential
Dedication	Affective	31	I feel proud of my accomplishments within this organization

Table 1 continued

Substantive	Attitudinal	Item.Number	Item.Stem
Dedication	Affective	32	My job makes me feel like I'm part of something meaningful
Dedication	Behavioral	34	I embrace challenging situations at work
Dedication	Behavioral	35	I speak positively about this organization to others

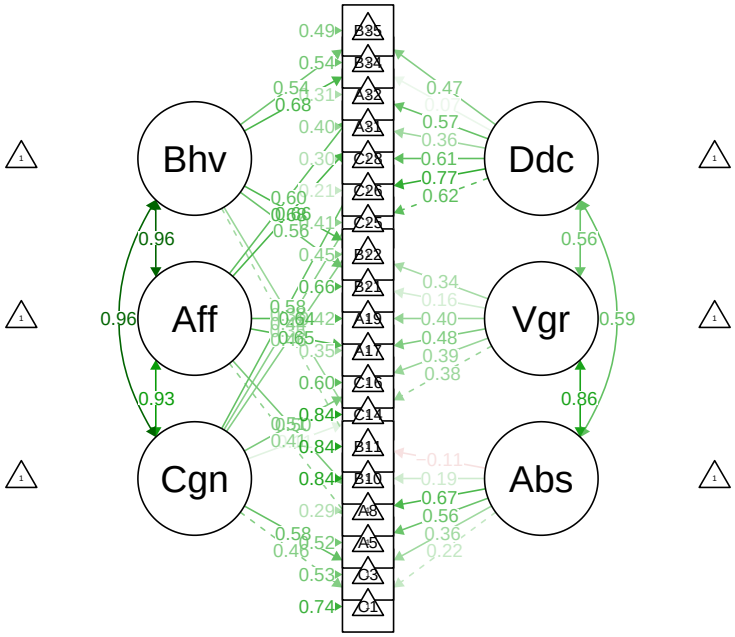

Figure 1. Bifactor analysis minus Item 4.