

Development of an Intentional BiFactor Engagement Measure

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Abstract

Employee engagement has, in recent years, enjoyed a surge in popularity as a positive employee outcome. Despite this burgeoning interest, disagreement still remains regarding its factor structure and nomological relationship with similar concepts, such as burnout. The classical definition of engagement divides it between the dimensions of vigor, dedication, and absorption, while the tripartite model of attitudes divides engagement between its cognitive, behavioral, and affective manifestations. Using bifactor analysis, study 1 proposes a scale that reconciles these two models. Study 2 convergently and discriminantly validates this scale.

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words “**here we show**” or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: Engagement, engagement

Word count: X

Development of an Intentional BiFactor Engagement Measure

Renata's SEM paper will come in handy

Recent decades have seen a proliferation of interest and research in the construct of employee engagement.

Several competing definitions have been proposed for engagement. William A. Kahn (1990) 's seminal paper introducing engagement to the psychological literature defined 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."¹

Khan's definition mirrors (although (**khan1990psychological?**) does not cite it) the tripartite model of attitudes proposed by Rosenberg (1960) . This model frames attitudes as a latent variable that manifests cognitively, affectively and behaviorally. Although falling out of favor in the decades following its construction, interest in the tripartite model was revived by Kaiser and Wilson (2019),

Although

more on why we're looking at tripartite model

The roots of employee (aka work; e.g., W. Schaufeli & Bakker, 2010) 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

¹ Footnote1 test test

(1995) or actual semantic reference; William A. Kahn (1990)). Staw, Sutton, and Pelled (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 (1990) 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). Comparing the two, Goering, Shimazu, Zhou, Wada, and Sakai (2017) concluded that they have a moderate (negative) association, but also distinct nomological networks. Wilmar B. Schaufeli, Taris, and Van Rhenen (2008) investigated both internal and external association indicators, concluding that engagement and burnout (as well as *workaholism*) should be considered three distinct constructs.

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 (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."

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.

we need to do some market research on the Q12: 1. what's the feedback report look like? (google images show one overall "satisfaction" score and/or one overall "engagement" score), 2. how much does it cost, 3. what are the 200 pulse items Gallup refers to? (6/7/21)

Our conceptualization of work engagement is a mental state wherein employees...

- ...feel energized (**Vigor**)
- ...are enthusiastic about the content of their work and the things they do (**Dedication**)
- ...are so immersed in their work activities that time seems compressed (**Absorption**)

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).

need more on criticisms of model

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.

Methods

Choice of focus on BIC versus AIC discussed in Dziak, Coffman, Lanza, Li, and Jermiin (2020).

```
## [1] 2 3 1 2 3 2 1 1 2 2 2 3 1 1 3 2 3 2 3 1 1 3 1 3 2 2 1 2 2 1 2 3 2 2 2 4 2
## [38] 3 3 3 2 2 3 2 1 3 1 2 3 2 1 2 2 1 2 3 3 1 1 2 2 1 2 2 3 2 1 2 3 2 3 2 1 7
## [75] 1 2 2 2 1 2 2 1 3 2 4 2 8 2 2 3 5 2 1 2 3 2 2 2 1 2 1 3 3 2 3 2 2 2 3 3 2
## [112] 2 2 1 2 2 3 2 5 2 3 2 3 2 3 3 1 2 1 3 8 2 1 3 2 3 3 5 3 2 2 2 2 1 3 2 3 3
## [149] 5 2 2 3 2 1 2 3 1 2 3 4 1 2 1 2 1 2 3 5 2 3 2 2 1 3 5 8 5 2 2 3 3 2 1 2 2
## [186] 3 1 1 3 3 1 2 2 2 1 2 2 2 2 3 2 3 2 2 2 2 1 3 3 4 2 2 2 3 1 2 2 1 2 1 2 1
## [223] 1 2 5 2 2 1 2 2 2 2 1 2 3 3 1 3 2 2 2 2 1 2 2 2 3 3 2
```

Participants

330 individuals provided ratings across 36 candidate items. These participants were gathered via snowball sampling, with an initial population of undergraduate and graduate students, as well as professional acquaintances of faculty members.

Participant job title, hours worked per week, and organizational tenure were recorded. Mean hours worked per week was 40.59 (SD = 13.69), see Figure 2. Mean organizational tenure was 6.82 years with a standard deviation of 8.50, see Figure 1. Participants who did not exactly specify their tenure (e.g. “A bit over a year”) were not included in this average.

Participants provided their job titles via an optional free text-entry box at the end of the survey. From there, we classified job titles according to the International Standard

Classification of Occupations (ISCO-8) with the `classify_occupation` function within the `labourR` package ((kouretsis2020?)). The ISCO hierarchically organizes jobs in increasing order of specificity. For example, the first level of the hierarchy distinguishes a professional from a clerical worker or a technician. On the second level, professionals are distinguished among each other by whether they are engineers, medical workers, lawyers, and so on.

4, 1, 51, 3, 120, 8, and 62

Material

Our survey was administered on Qualtrics.

Item generation. We generated a set of 36 items for our engagement measure, with the ultimate goal of reducing them to a final set of 18. These items were generated according to a review of extant tripartite engagement measures, as well as *WHAT RESEARCH DID WE USE FOR ATTITUDINAL WORDING? WAS IT LITERALLY JUST “I THINK,” “I FEEL,” “I DO?”* Each item was worded to reflect both a substantive dimension as well as an attitudinal dimension. For example, the item “My job makes me feel like I’m part of something meaningful” reflects the affective dimension with “feel” and the dedication dimension with “I’m part of something meaningful.”

Our 3x3 bifactor model produced nine pairs of dimensions (e.g., Vigor-Cognitive, Vigor-Affective, Vigor-Behavioral, etc.). With 36 initial items, this left four items per pair of substantive and attitudinal dimensions.

The substantive scale definitions provided for ratings were:

- *Absorption*: Being fully immersed in one’s work, where time passes quickly and one has difficulty detaching from work tasks
- *Vigor*: Experiencing persistent levels of energy, effort, and enthusiasm while working

- *Dedication*: Experiencing pride and challenge in ones work, as well as strong feelings of support from and loyalty toward the organization

The attitudinal scale definitions were:

- *Cognitive*: Pertaining to thoughts or general mental processes (for example what someone thinks)
- *Affective*: Pertaining to feelings or emotions (for example, how someone feels)
- *Behavioral*: Pertaining to acts or actions (for example, what someone does)

See table *X* for a full list of items and their respective dimensions.

Procedure

Looking into the specification of polychoric covariances (Jöreskog, 1994). This seems to be not very commonly leveraged (only package that seems to estimate these is `semPlot`).

The effective result of this was two divergent quasi-experimental approaches: 1) focus on corrected item-total correlations, and 2) focus on CFA modification indices.

Corrected item-total correlations.

To Casey: document your process here

CFA Modification Indices. We followed two parallel stepwise item-reduction processes centered around eliminating items in decreasing order of modification indices. Looking at the 36-item substantive and attitudinal models independently, we requested modification indices from each, with the intent of retaining indicators whose fixed shared residual covariances were associated with high modification indices (indicating better

model fit if the paths were freed). The item pair with the highest modification index was scrutinized, with a subjective group judgment made on wording/semantics content domain coverage. The less preferred item was removed from the model. In cases where the highest modification index was between the only two remaining items in a substantive-attitudinal pair, these items were passed over for scrutiny in favor of the items with the next-highest index. This process was repeated until 18 items remained (i.e., 2 items for each of the 9 substantive-attitudinal pairs)

For example, the path with the highest modification index across both CFAs was between item 2 and item 4, which are both indicators of “Absorption” and “Cognition.” One of these items was therefore a candidate for deletion, and semantic preference was given to item 4, “I find it difficult to mentally disconnect from work” over item 2. After item 2 was excluded from both scale definitions (substantive and attitudinal), the CFAs were re-run and modification indices re-checked for bi-factor structure optimizing modifications.²

The end result was two separate final scale definitions (one optimized for the substantive model and one for the attitudinal).

We prioritized item deletions such that an item was implicated for deletion if: 1) modification index was high (relative to others) and 2) error residual was within same “cell.” The choice of item to delete was based on author preference for wording/semantics as well as construct element coverage (considering the possible consequences for construct deficiency). Item variance was also consulted (retention more likely with greater item variance).

Actually it doesn’t matter that much with only 1 item deletion -
probably go ahead and do a few before recheck modification indices

² Probably put a table in here highlighting certain modification indices (with a key to intended factor-item association). Look at “modincides1”

Single factor versus bifactor approaches.

Casey this is where you come in

Data analysis

We used R [Version 4.1.0; R Core Team (2021)] and the R-packages *apaTables* [Version 2.0.8; Stanley (2021)], *dplyr* [Version 1.0.6; Wickham, François, Henry, and Müller (2021)], *DT* [Version 0.18; Xie, Cheng, and Tan (2021)], *forcats* [Version 0.5.1; Wickham (2021a)], *ggplot2* [Version 3.3.3; Wickham (2016)], *kableExtra* [Version 1.3.4; Zhu (2021)], *labourR* [Version 1.0.0; Kouretsis, Bampouris, Morfiris, and Papageorgiou (2020)], *lavaan* [Version 0.6.8; Rosseel (2012)], *magrittr* [Version 2.0.1; Bache and Wickham (2020)], *papaja* [Version 0.1.0.9997; Aust and Barth (2020)], *purrr* [Version 0.3.4; Henry and Wickham (2020)], *readr* [Version 1.4.0; Wickham and Hester (2020)], *sem* [Version 3.1.11; Fox, Nie, and Byrnes (2020); Epskamp (2019)], *semPlot* [Version 1.1.2; Epskamp (2019)], *stringr* [Version 1.4.0; Wickham (2019)], *tibble* [Version 3.1.2; Müller and Wickham (2021)], *tidyr* [Version 1.1.3; Wickham (2021b)], and *tidyverse* [Version 1.3.1; Wickham et al. (2019)] for all our analyses.

Results

CFA drafts below

##		lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 176		Item_1	~~	Item_11	23.897	0.436	0.436	0.318	0.318
## 151	Affective	=~		Item_11	15.429	-3.949	-1.878	-1.558	-1.558
## 291		Item_19	~~	Item_26	13.236	0.222	0.222	0.354	0.354
## 309		Item_22	~~	Item_35	12.338	0.166	0.166	0.279	0.279
## 178		Item_1	~~	Item_16	12.237	0.267	0.267	0.267	0.267

```

## 299    Item_21 ~~ Item_28 11.658  0.187   0.187   0.256   0.256
## 248    Item_11 ~~ Item_16 11.262  0.227   0.227   0.230   0.230
## 100 Absorption =~ Item_14 10.747 -6.649  -1.795  -1.300  -1.300
## 121      Vigor =~ Item_32 10.583  0.287   0.310   0.248   0.248
## 222      Item_8 ~~ Item_14 10.378 -0.345  -0.345  -0.551  -0.551
## 225      Item_8 ~~ Item_19 10.143 -0.169  -0.169  -0.310  -0.310
## 137 Cognitive =~ Item_8   9.803  0.782   0.539   0.411   0.411
## 142 Cognitive =~ Item_21  9.475  0.849   0.586   0.497   0.497
## 102 Absorption =~ Item_17  9.373  1.937   0.523   0.512   0.512
## 143 Cognitive =~ Item_22  8.938 -0.743  -0.513  -0.466  -0.466
## 258      Item_11 ~~ Item_35 8.496  0.190   0.190   0.194   0.194
## 229      Item_8 ~~ Item_28 8.478  0.155   0.155   0.274   0.274
## 310      Item_26 ~~ Item_28 8.472  0.294   0.294   0.451   0.451
## 265      Item_14 ~~ Item_28 8.466 -0.191  -0.191  -0.291  -0.291
## 270      Item_16 ~~ Item_17 8.249 -0.128  -0.128  -0.216  -0.216
## 158 Affective =~ Item_34  8.216  1.960   0.932   1.060   1.060
## 139 Cognitive =~ Item_11  8.204  0.893   0.616   0.511   0.511
## 320      Item_31 ~~ Item_34 8.121  0.098   0.098   0.198   0.198
## 106 Absorption =~ Item_26  7.921 -1.640  -0.443  -0.288  -0.288
## 180      Item_1  ~~ Item_19 7.842 -0.189  -0.189  -0.217  -0.217

```

```
## lavaan 0.6-8 ended normally after 191 iterations
```

```
##
```

```
## Estimator ML
```

```
## Optimization method NLMINB
```

```
## Number of model parameters 78
```

```
##
```

```
## Used Total
```

```

##      Number of observations                279          282
##      Number of missing patterns            23
##
## Model Test User Model:
##
##                                     Standard      Robust
##      Test Statistic                264.700      246.388
##      Degrees of freedom              111          111
##      P-value (Chi-square)            0.000          0.000
##      Scaling correction factor                1.074
##      Yuan-Bentler correction (Mplus variant)
##
## Parameter Estimates:
##
##      Standard errors                Sandwich
##      Information bread                Observed
##      Observed information based on      Hessian
##
## Latent Variables:
##
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
## Absorption =~
##      Item_1      1.000
##                                     0.270    0.194
##      Item_3      1.666    0.926    1.799    0.072    0.450    0.382
##      Item_5      2.813    2.727    1.032    0.302    0.759    0.525
##      Item_8      3.532    3.010    1.174    0.241    0.953    0.727
##      Item_10     -0.356    1.530   -0.233    0.816   -0.096   -0.061
##      Item_11      0.017    0.703    0.024    0.981    0.005    0.004
## Vigor =~

```

##	Item_14	1.000				1.079	0.781
##	Item_16	0.532	0.287	1.856	0.064	0.575	0.471
##	Item_17	0.379	0.329	1.153	0.249	0.409	0.401
##	Item_19	0.150	0.308	0.486	0.627	0.162	0.135
##	Item_21	0.214	0.290	0.737	0.461	0.231	0.196
##	Item_22	0.311	0.328	0.949	0.343	0.335	0.305
##	Dedication =~						
##	Item_26	1.000				1.204	0.783
##	Item_28	0.705	0.161	4.384	0.000	0.849	0.642
##	Item_31	0.297	0.168	1.769	0.077	0.357	0.363
##	Item_32	0.523	0.229	2.281	0.023	0.629	0.503
##	Item_34	0.131	0.122	1.069	0.285	0.157	0.179
##	Item_35	0.569	0.156	3.637	0.000	0.685	0.559
##	Cognitive =~						
##	Item_1	1.000				0.690	0.496
##	Item_3	1.054	0.281	3.745	0.000	0.727	0.618
##	Item_14	0.192	0.580	0.331	0.740	0.133	0.096
##	Item_16	0.955	0.272	3.511	0.000	0.659	0.541
##	Item_26	0.642	0.654	0.981	0.326	0.443	0.288
##	Item_28	0.961	0.470	2.043	0.041	0.663	0.501
##	Affective =~						
##	Item_5	1.000				0.476	0.329
##	Item_8	1.089	0.357	3.048	0.002	0.518	0.395
##	Item_17	1.307	0.442	2.956	0.003	0.622	0.609
##	Item_19	1.961	1.157	1.695	0.090	0.932	0.777
##	Item_31	1.242	0.496	2.504	0.012	0.591	0.601
##	Item_32	1.532	0.389	3.935	0.000	0.729	0.583

```

## Behavioral =~
## Item_10          1.000                      0.709    0.450
## Item_11          0.436    0.180    2.420    0.016    0.309    0.256
## Item_21          0.928    0.279    3.323    0.001    0.658    0.558
## Item_22          1.092    0.341    3.200    0.001    0.774    0.703
## Item_34          0.706    0.178    3.959    0.000    0.500    0.569
## Item_35          0.807    0.480    1.682    0.093    0.572    0.467
##
## Covariances:
##              Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## Absorption ~~
## Affective      0.000                      0.000    0.000
## Behavioral      0.000                      0.000    0.000
## Cognitive      0.000                      0.000    0.000
## Vigor ~~
## Affective      0.000                      0.000    0.000
## Behavioral      0.000                      0.000    0.000
## Cognitive      0.000                      0.000    0.000
## Dedication ~~
## Affective      0.000                      0.000    0.000
## Behavioral      0.000                      0.000    0.000
## Cognitive      0.000                      0.000    0.000
## Absorption ~~
## Vigor          0.242    0.278    0.873    0.383    0.832    0.832
## Dedication     0.218    0.314    0.692    0.489    0.670    0.670
## Vigor ~~
## Dedication     0.804    0.404    1.989    0.047    0.619    0.619

```

Cognitive ~~

Affective 0.246 0.241 1.021 0.307 0.749 0.749

Behavioral 0.411 0.114 3.603 0.000 0.839 0.839

Affective ~~

Behavioral 0.320 0.197 1.627 0.104 0.950 0.950

##

Intercepts:

##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
----	--	----------	---------	---------	---------	--------	---------

##	.Item_1	3.737	0.085	44.146	0.000	3.737	2.688
----	---------	-------	-------	--------	-------	-------	-------

##	.Item_3	4.573	0.072	63.582	0.000	4.573	3.885
----	---------	-------	-------	--------	-------	-------	-------

##	.Item_5	3.087	0.088	35.068	0.000	3.087	2.136
----	---------	-------	-------	--------	-------	-------	-------

##	.Item_8	3.543	0.080	44.121	0.000	3.543	2.702
----	---------	-------	-------	--------	-------	-------	-------

##	.Item_10	3.717	0.096	38.856	0.000	3.717	2.361
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_11	4.549	0.074	61.780	0.000	4.549	3.774
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_14	3.562	0.084	42.442	0.000	3.562	2.579
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_16	4.129	0.074	55.472	0.000	4.129	3.386
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_17	4.503	0.063	71.240	0.000	4.503	4.409
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_19	4.593	0.074	62.003	0.000	4.593	3.826
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_21	4.533	0.072	62.787	0.000	4.533	3.848
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_22	4.751	0.068	70.220	0.000	4.751	4.315
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_26	3.923	0.094	41.796	0.000	3.923	2.550
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_28	4.270	0.081	52.682	0.000	4.270	3.227
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_31	4.973	0.062	80.789	0.000	4.973	5.057
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_32	4.581	0.078	58.435	0.000	4.581	3.664
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_34	4.981	0.054	92.021	0.000	4.981	5.663
----	----------	-------	-------	--------	-------	-------	-------

##	.Item_35	4.715	0.076	62.230	0.000	4.715	3.846
----	----------	-------	-------	--------	-------	-------	-------

##	Absorption	0.000				0.000	0.000
----	------------	-------	--	--	--	-------	-------

##	Vigor	0.000			0.000	0.000
##	Dedication	0.000			0.000	0.000
##	Cognitive	0.000			0.000	0.000
##	Affective	0.000			0.000	0.000
##	Behavioral	0.000			0.000	0.000

##

Variances:

##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.Item_1	1.384	0.193	7.180	0.000	1.384	0.716
##	.Item_3	0.655	0.122	5.346	0.000	0.655	0.472
##	.Item_5	1.286	0.157	8.200	0.000	1.286	0.616
##	.Item_8	0.542	0.154	3.509	0.000	0.542	0.315
##	.Item_10	1.966	0.183	10.767	0.000	1.966	0.793
##	.Item_11	1.357	0.119	11.378	0.000	1.357	0.934
##	.Item_14	0.726	0.524	1.386	0.166	0.726	0.380
##	.Item_16	0.722	0.101	7.119	0.000	0.722	0.486
##	.Item_17	0.489	0.080	6.119	0.000	0.489	0.469
##	.Item_19	0.545	0.148	3.695	0.000	0.545	0.378
##	.Item_21	0.902	0.121	7.453	0.000	0.902	0.650
##	.Item_22	0.501	0.069	7.237	0.000	0.501	0.413
##	.Item_26	0.721	0.235	3.065	0.002	0.721	0.305
##	.Item_28	0.590	0.076	7.717	0.000	0.590	0.337
##	.Item_31	0.491	0.076	6.425	0.000	0.491	0.507
##	.Item_32	0.636	0.086	7.381	0.000	0.636	0.407
##	.Item_34	0.499	0.054	9.184	0.000	0.499	0.645
##	.Item_35	0.706	0.110	6.445	0.000	0.706	0.470
##	Absorption	0.073	0.160	0.454	0.650	1.000	1.000

##	Vigor	1.164	0.502	2.319	0.020	1.000	1.000
##	Dedication	1.449	0.327	4.437	0.000	1.000	1.000
##	Cognitive	0.476	0.188	2.528	0.011	1.000	1.000
##	Affective	0.226	0.278	0.812	0.417	1.000	1.000
##	Behavioral	0.503	0.159	3.153	0.002	1.000	1.000

Study 2

Construct validation was accomplished via administration of the 17-item UWES as well as the Saks (2006) 12-item scale. Saks (2006) aggregates to two scales: job and organizational engagement.

Discussion

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Table 1

Variable 1	Relationship	Variable 2	<U+0394><U+03C7>2
Item_2	~~	Item_4	192.41
Item_8	~~	Item_18	96.05
Item_29	~~	Item_35	62.25
Item_14	~~	Item_20	56.38
Item_1	~~	Item_12	51.39
Item_1	~~	Item_13	50.33



Figure 1. Distribution of organizational tenure (years)

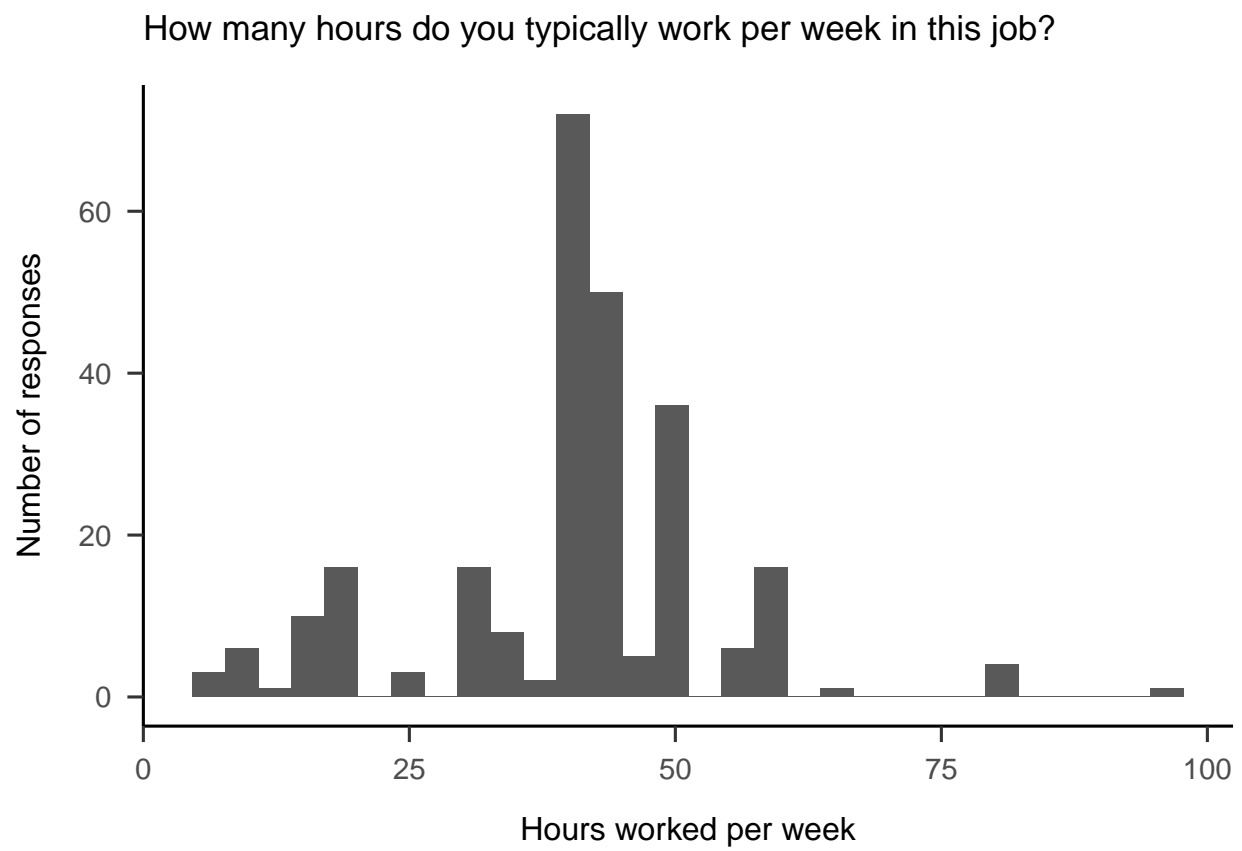


Figure 2. Distribution of mean hours worked per week

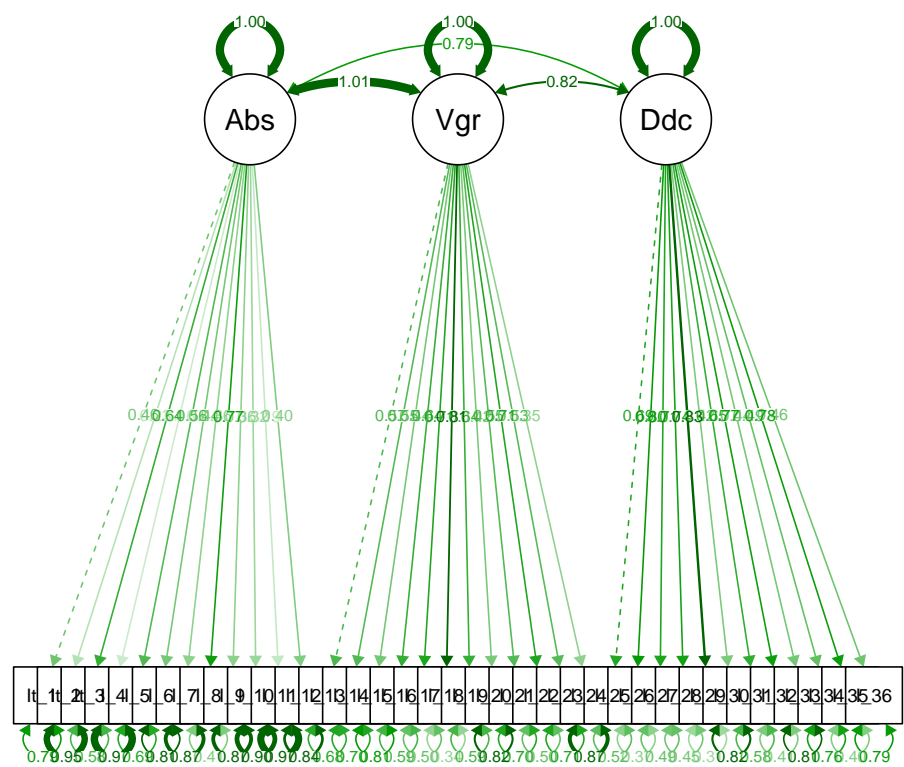


Figure 3. (#fig:CFA.att1)Substantive factor structure CFA

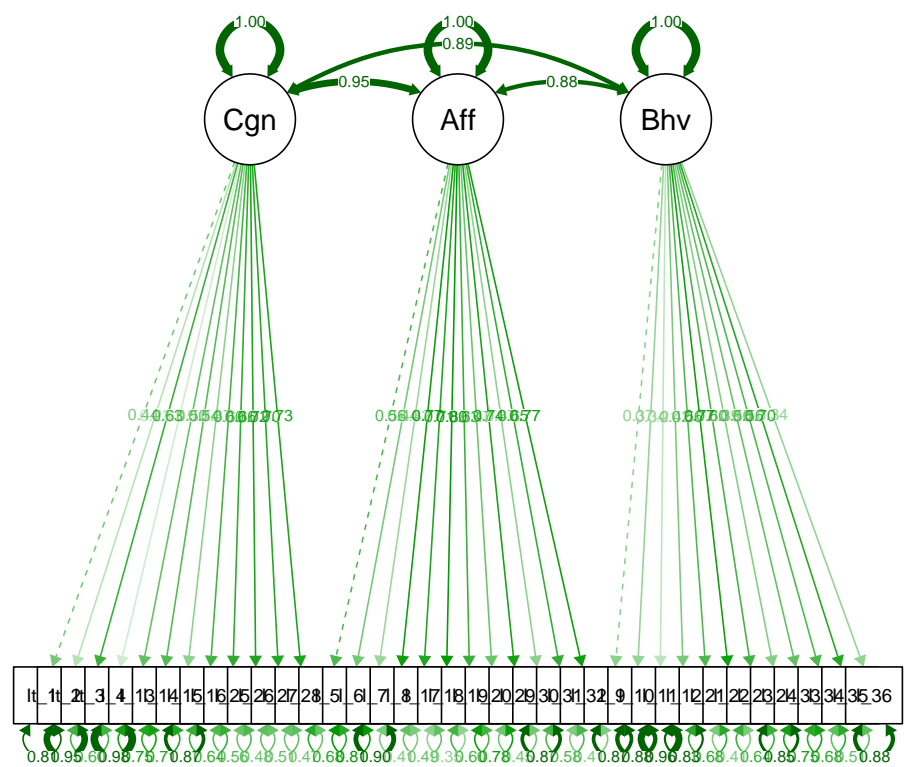


Figure 4. (#fig:CFA.att2)Attitudinal factor structure CFA

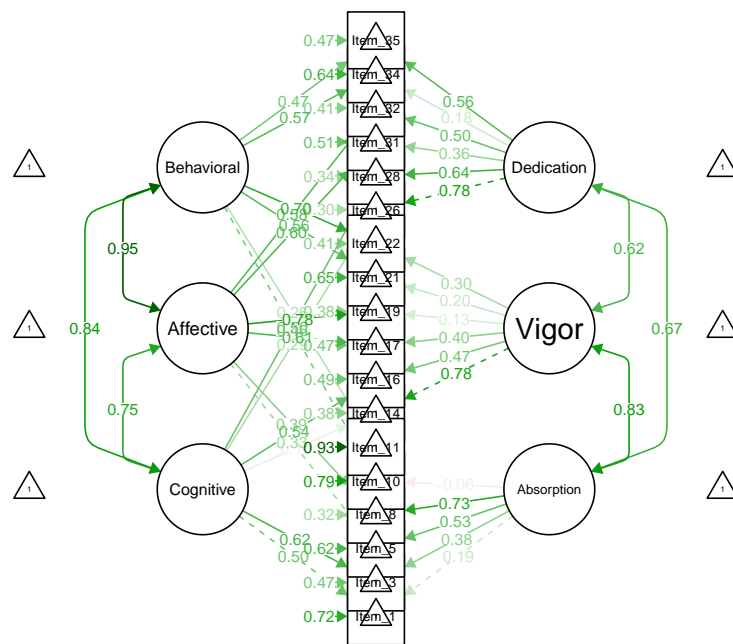


Figure 5. (#fig:CFA.att3)Bifactor structure