**Online Supplemental Materials for:**

**Psychological Need Satisfaction, Frustration, and Unfulfillment Profiles in the Workplace: Their Nature, Predictors, and Outcomes**

**Authors’ note:**

These online technical appendices are to be posted on the journal website and hot-linked to the manuscript. If the journal does not offer this possibility, these materials can alternatively be posted on one of our personal websites (we will adjust the in-text reference upon acceptance).

We would also be happy to have some of these materials brought back into the main manuscript, or included as published appendices if you deem it useful. We developed these materials to provide additional technical information and to keep the main manuscript from becoming needlessly long.

**Preliminary Measurement Models**

Due to the complexity of the models underlying all constructs assessed in the present study, preliminary analyses were conducted separately for the psychological need states, predictors (environmental corporate social responsibility and negative moral emotions related to organization’s environmental responsibility), and outcomes (affective organizational commitment, cyberslacking, and turnover intentions). These longitudinal measurement models were estimated using Mplus 8.6 (Muthén & Muthén, 2021) using the maximum likelihood robust (MLR) estimator, which provides parameter estimates, standard errors, and goodness-of-fit that are robust to the non-normality of the response scales used in the present study. Given the known oversensitivity of the chi-square test of exact fit (χ²) to sample size and minor model misspecifications (e.g., Marsh et al., 2005), we relied on sample-size independent goodness-of-fit indices to describe model fit (Hu & Bentler, 1999): The comparative fit index (CFI), the Tucker-Lewis index (TLI), as well as the root mean square error of approximation (RMSEA) and its 90% confidence interval. Values greater than .90 for the CFI and TLI indicate adequate model fit, although values greater than .95 are preferable. Values smaller than .08 or .06 for the RMSEA respectively support acceptable and excellent model fit.

**Psychological Need States**

The goodness-of-fit results from all psychological need states models are reported in Table S1. In line with past studies (e.g., Bhavsar et al., 2020; Huyghebaert-Zouaghi et al., 2020, 2022; Tóth-Király et al., 2018), a series of confirmatory factor analyses (CFA) and exploratory structural equation modeling (ESEM) models were tested: (a) three-factor CFA (Model 1) and ESEM (Model 2) models (need satisfaction, frustration, and unfulfillment); (b) nine-factor CFA (Model 3) and ESEM (Model 4) models (autonomy satisfaction, relatedness satisfaction, competence satisfaction, autonomy frustration, relatedness frustration, competence frustration, autonomy unfulfillment, relatedness unfulfillment, and competence unfulfillment); (c) bifactor CFA (Model 5) and ESEM (Model 6) models with three specific (S)-factors (need satisfaction, frustration, and unfulfillment) and one global (G)-factor (global psychological need experience); and (d) bifactor CFA (Model 7) and ESEM (Model 8) models including nine S-factors (autonomy satisfaction, relatedness satisfaction, competence satisfaction, autonomy frustration, relatedness frustration, competence frustration, autonomy unfulfillment, relatedness unfulfillment, and competence unfulfillment) and one G-factor (global psychological need experience).

In the CFA models, items were only allowed to define their a priori factors, factors were allowed to correlate, and no cross-loadings were estimated. In the ESEM models, the factors were defined as in the CFA models, and all cross-loadings were freely estimated but assigned a target value of zero using an oblique target rotation procedure (Browne, 2001). In bifactor CFA models, items were allowed to define one a priori S-factor as well as one G-factor, and all factors were specified as orthogonal. Bifactor ESEM models were specified as their bifactor CFA counterparts, although all cross-loadings involving the S-factors were freely estimated but assigned a target value of zero using an orthogonal bifactor target rotation procedure (Reise, 2012).

As noted by Morin et al. (2016a, 2017), fit indices are not sufficient to guide the selection of the optimal model. An examination of the parameter estimates is also required to select the best alternative. When contrasting a CFA or an ESEM solution with a bifactor alternative, the key elements supporting a bifactor representation are: (1) an improved level of fit to the data; (2) a well-defined (i.e., presenting moderate to strong significant target loadings) as opposed to a weakly defined (i.e., weak target loadings) G-factor; and (3) at least some reasonably well-defined S-factors. It should be noted that there is no formal guideline regarding the exact values beyond which one can interpret factors to be well-defined and S-factors to retain enough specificity. Instead, target loadings and model-based coefficients of composite reliability (omega coefficient; ω) are typically interpreted in a more holistic manner.

Only two solutions were able to achieve an acceptable level of fit to the data (Models 4 and 8). The ESEM solution with nine factors (Model 4) resulted in a majority of well-defined factors and a minority of more weakly-defined factors. The bifactor ESEM solution with one G-factor and nine S-factors (Model 8) revealed a well-defined G-factor with negative factor loadings associated with the need satisfaction items, and positive factor loadings associated with the need frustration and unfulfillment items. The S-factors retained at least some degree of meaningful specificity over and above employees’ global levels of psychological need experience. However, although these solutions seemed acceptable and superior to alternative solutions, results indicated that the psychometric properties of the Psychological Need States at Work-Scale (PNSW-S; Huyghebaert-Zouaghi et al., 2020) still had room for improvement. Indeed, both solutions (Models 4 and 8) showed that one item (rS5) had low factor loadings, consistent with the problems posed by this item in prior studies using the PNSW-S (Huyghebaert-Zouaghi et al., 2020, 2022). Therefore, in line with the procedure recently followed by Huyghebaert-Zouaghi et al. (2022), this item was excluded from further analyses.

The two best fitting solutions were compared again without item rS5 (Models 9 and 10). The bifactor ESEM solution with one G-factor and nine S-factors (Model 10), although it had a well-defined G-factor, not only displayed decreased levels of fit to the data (relative to Model 9), but it also resulted in several weakly-defined S-factors (relatedness satisfaction, autonomy unfulfillment, and competence unfulfillment). Contrastingly, the ESEM solution with nine factors (Model 10) displayed the best fit to the data and resulted in well-defined factors where all items significantly loaded on their a priori factor (with all positive significant cross-loadings being substantially smaller than the target loadings). These results thus supported the adequacy of the ESEM solution with nine factors (Model 10), which was thus retained, as in Huyghebaert-Zouaghi et al. (2020). Factor scores used in the main analyses were extracted from this solution. This model's parameter estimates are reported in Table S2. Composite reliability coefficients associated with each of the a priori factors are calculated from the model standardized parameters using McDonald (1970) omega (ω) coefficient:

$$ω =\frac{\left(\sum\_{}^{}\left|λ\_{i}\right|\right)^{2}}{\left[\left(\sum\_{}^{}\left|λ\_{i}\right|\right)^{2}+ \sum\_{}^{}δ\_{i}\right]}$$

where $\left|λ\_{i}\right|$are the standardized factor loadings associated with a factor in absolute values, and *δi*, the item uniquenesses.

More precisely, results from this final solution (Model 10) revealed well-defined autonomy satisfaction (*λ* = .461 to .746, ω = .790), competence satisfaction (*λ* = .488 to .731, ω = .743), relatedness satisfaction (*λ* = .444 to .797, ω = .888), autonomy unfulfillment (*λ* = .234 to .862, ω = .799), competence unfulfillment (*λ* = .476 to .565, ω = .615), relatedness unfulfillment (*λ* = .456 to .853, ω = .815), autonomy frustration (*λ* = .511 to .758, ω = .785), competence frustration (*λ* = .444 to .887, ω = .881), and relatedness frustration (*λ* = .427 to .827, ω = .881) factors.

**Predictors and Outcomes**

For the predictors and outcomes, results are reported in Tables S3 (factors loadings and uniquenesses) and S4 (latent correlations). In line with prior person-centered research (e.g., Caesens et al., 2021; Gillet et al., 2022), the unidimensional predictors and outcomes (i.e., environmental CSR, negative moral emotions related to organization’s environmental responsibility, affective organizational commitment, cyberslacking, and turnover intentions) were represented according to a CFA model with five distinct but correlated factors. This model (M11) achieved a satisfactory fit to the data according to all goodness-of-fit indices (see Table S1). Factor scores for the person-centered analyses were thus extracted from this solution.

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**Table S1**

*Goodness-of-Fit Statistics for the Measurement Models*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Description | χ² (*df*) | CFI | TLI | RMSEA | 90% CI |
| *Psychological Need States*  |  |  |  |  |  |
| M1. Three-factor CFA | 10178.824 (666)\* | .730 | .713 | .088 | [.085; .091] |
| M2. Three-factor ESEM  | 10178.824 (666)\* | .782 | .739 | .084 | [.081; .087] |
| M3. Nine-factor CFA  | 10178.824 (666)\* | .908 | .897 | .053 | [.050; .056] |
| M4. Nine-factor ESEM  | 10178.824 (666)\* | .977 | .958 | .034 | [.029; .039] |
| M5. B-CFA: Three S-factors and one G-factor | 10178.824 (666)\* | .788 | .762 | .080 | [.077; .084] |
| M6. B-ESEM: Three S-factors and one G-factor  | 10178.824 (666)\* | .867 | .830 | .068 | [.064; .071] |
| M7. B-CFA: Nine S-factors and one G-factor | 10178.824 (666)\* | .875 | .859 | .062 | [.059; .065] |
| M8. B-ESEM: Nine S-factors and one G-factor  | 10178.824 (666)\* | .982 | .964 | .031 | [.025; .038] |
| M9. Model 4 without rS5 | 9746.239 (630)\* | .983 | .968 | .030 | [.024; .035] |
| M10. Model 8 without rS5 | 9746.239 (630)\* | .982 | .965 | .031 | [.025; .037] |
| *Predictors and Outcomes* |  |  |  |  |  |
| M11. Five-factor CFA | 7395.492 (300)\* | .938 | .929 | .056 | [.051; .061] |

*Note.* \* *p*< .05; CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; B: Bifactor; *χ*²: Scaled chi-square test of exact fit; *df*: Degrees of freedom; CFI: Comparative fit index; TLI: Tucker-Lewis index; RMSEA: Root mean square error of approximation; 90% CI: 90% confidence interval.

**Table S2**

*Standardized Factor Loadings (λ) and Uniquenesses (δ) for Model 9 (Nine-Factor ESEM Representation of Psychological Need States)*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Items | Autonomy Satisfactionλ | Competence Satisfaction λ  | Relatedness Satisfaction λ  | Autonomy Unfulfillmentλ  | Competence Unfulfillment λ | Relatedness Unfulfillment λ  | Autonomy Frustrationλ  | Competence Frustrationλ  | Relatedness Frustration λ  | δ |
| Autonomy Satisfaction |  |  |  |  |  |  |  |  |  |
| Item 1 | **.580**  | *.034*  | .207  | *-.056* | *-.051*  | *.057* | *-.056*  | *.013*  | *-.026*  | .354  |
| Item 2  | **.461**  | *-.001*  | .346  | -.126 | *.025*  | *.052* | *-.033*  | *-.016*  | *-.096*  | .301  |
| Item 3 | **.746** | *.088*  | .*083*   | *-.040* | *.004*  | *-.044* | *-.070*  | *-.035*  | *.046*  | .196  |
| Competence Satisfaction |  |  |  |  |  |  |  |  |  |
| Item 1 | *.008*  | **.625**  | *.098*  | *.021* | .155  | .091 | *-.040*  | -.160  | *-.029*  | .311  |
| Item 2  | *-.004*  | **.731**  | .085  | *-.081* | *.028*  | *-.068* | *-.006*  | *-.057*  | *.114*  | .354 |
| Item 3 | .151  | **.488**  | .038  | *.032* | *.047* | *-.088* | *-.106*  | -.161  | *.050*  | .513 |
| Relatedness Satisfaction |  |  |  |  |  |  |  |  |  |
| Item 1 | *.079*  | -.142  | **.797**  | *-.042* | *-.017*  | *-.039*  | *-.084*  | -.112 | *.035*  | .188  |
| Item 2 | .249  | *-.044*  | **.598**  | *-.028* | *-.006*  | *-.043*  | -.169  | *-.046* | *.036*  | .210 |
| Item 3 | *.097*  | *.030*  | **.679** | *.041* | *-.045* | *-.082*  | *-.036*  | -.119 | *-.023* | .249 |
| Item 4 | *.081*  | .256  | **.607**  | *-.022* | *-.020*  | -.092  | *.063*  | .102 | -.170  | .232  |
| Item 5  | *.111*  | .312  | **.444**  | -.059 | *-.051*  | *-.055*  | .122  | .140 | -.251  | .354  |
| Autonomy Unfulfillment |  |  |  |  |  |  |  |  |  |
| Item 1  | *.032*  | *-.002*  | .*074*   | **.679** | *.101*  | *-.020*  | *.044*  | *-.056*  |  *-.031*  | .450 |
| Item 2  | -.322  | *-.019*  | .210  | **.234**  | .280  | .125  | *-.007*  | *.060*  | *-.102*  | .518  |
| Item 3  | *.065*  | *-.013*  | *.012*  | **.862**  | *.017* | *.054*  | *-.002*  | *.022*  | *.032*  | .216  |
| Item 4 | *-.106*  | *.012*  | *-.006*  | **.690**  | *-.048*  | *.055*  | .146  | *.015*  | *-.069*  | .348  |
| Competence Unfulfillment |  |  |  |  |  |  |  |  |  |
| Item 1 | .143  | *.055*  | -.198  | *.076*  | **.565**  | *-.073*  | *.139*  | *.016*  | *-.081*  | .584  |
| Item 2  | -.143  | *.038*  | *.025*  | *.020*  | **.549**  | .185  | *.016*  | *.085*  | *.003*  | .458  |
| Item 3  | *.025*  | -.171  | *.103*  | *.165*  | **.476**  | *-.024*  | *.022*  | *.123* | *-.009*  | .538  |
| Relatedness Unfulfillment |  |  |  |  |  |  |  |  |  |
| Item 1 | *.005*  | *.095*  | *-.026*  | *.012*  | *.097*  | **.766**  | -*.022*  | *-.003*  | *-.017*  | .391  |
| Item 2 | *.078*  | *.020*  | *-.085*  | *.048*  | *.005*  | **.853**  | *-.020*  | *-.010*  | *.001* | .251  |
| Item 3 | *.021*  | *-.035*  | *-.073*  | .139  | *.083*  | **.456**  | *-.027*  | *-.019* | .232  | .465 |
| Item 4 | *-.012*  | *-.111*  | *.070*  | *.016* | -.195  | **.594** | *.110*  | *.095*  | *-.043*  | .631 |
| Item 5 | *-.030*  | *-.045*  | *-.107*  | *-.025*  | *.084*  | **.542**  | *-.044*  | *-.002* | *.010*  | .609  |
| Autonomy Frustration |  |  |  |  |  |  |  |  |  |
| Item 1 | *-.096*  | *-.038*  | *.116*  | *-.003* | *.087*  | *.047*  | **.615**  | -.150  | .254  | .448 |
| Item 2 | *-.061*  | *.005*  | *.021*  | *.050* | *-.016*  | *.048*  | **.758**  | *.007*  | *-.002*  | .334 |
| Item 3  | *-.016*  | *-.094*  | *-.092*  | *.067* | *.064*  | -.134  | **.511** | *.094*  |  *.070*  | .498 |
| Item 4 | *.087*  | *-.006*  | *-.109*  | .121 | *.036*  | *.001*  | **.619** | *.038*  | *.003* | .434  |
| Competence Frustration |  |  |  |  |  |  |  |  |  |
| Item 1 | *-.062*  | *.007*  | *.021*  | .115 | *-.022*  | *.029*  | *-.049*  | **.695**  | .195  | .274 |
| Item 2 | *.018*  | *-.040*  | *-.057*  | *.096* | *.048*  | *.035*  | *.036* | **.444**  | .216  | .470  |
| Item 3  | *-.016*  | -.173  | *-.030*  | *-.069* | .114 | *.009*  | .096 | **.764**  | *-.050*  | .170 |
| Item 4 | *-.003*  | *-.059*  | *-.002*  | *-.051* | *.037*  | *.002*  | *-.065* | **.887**  | *.055*  | .140  |
| Relatedness Frustration |  |  |  |  |  |  |  |  |  |
| Item 1 | *-.054*  | *.034*  | *.020*  | .173 | *-.072*  | *.032*  | *.017*  | .212  | **.631**  | .278 |
| Item 2 | *-.039*  | *.032*  | *-.012*  | *.059* | *.009*  | *.031*  | *.078*  | *.016*  | **.784**  | .212 |
| Item 3  | *.071*  | *.054*  | -.133  | *.004* | *-.042*  | *.007*  | *.041* | *.154*  | **.650**  | .387 |
| Item 4 | *-.046*  | *.014*  | *-.079*  | *-.077* | *-.029*  | *-.029*  | *.049* | *.058*  | **.827** | .188  |
| Item 5 | *.044*  | *-.037*  | *-.054*  | -.117 | *.067*  | .285  | .254  | *.006*  | **.427**  | .420 |
| ω  | .790 | .743 | .888 | .799 | .615 | .815 | .785 | .881 | .881 |  |

*Note*. λ: Factor loading; δ: Item uniqueness; ω: Omega coefficient of composite reliability; target factor loadings are indicated in bold; non-significant parameters (*p* ≥ .05) are marked in italics. Items are numbered to follow their order in their original scales, see Huyghebaert-Zouaghi et al. (2021) for more detail on the items.

**Table S3**

*Standardized Factor Loadings (λ) and Uniquenesses (δ) for the Predictors and Outcomes*

|  |  |  |
| --- | --- | --- |
| Items | λ | δ |
| Corporate Social Responsibility |  |  |
| Item 1 | .747 | .442 |
| Item 2  | .738 | .456 |
| Item 3  | .868 | .246 |
| Item 4 | .866 | .249 |
| Item 5 | .819 | .329 |
| Item 6 | .766 | .413 |
| Item 7 | .733 | .456 |
| Ω | .922 |  |
| Negative Moral Emotions |  |  |
| Item 1  | .706 | .502 |
| Item 2  | .693 | .519 |
| Item 3 | .814 | .338 |
| Item 4 | .873 | .238 |
| Item 5 | .899 | .191 |
| Item 6 | .790 | .375 |
| Item 7 | .875 | .234 |
| Item 8 | .800 | .359 |
| ω  | .921 |  |
| Affective Organizational Commitment |  |  |
| Item 1  | .900 | .189 |
| Item 2  | .840 | .294 |
| Item 3 | .737 | .456 |
| ω  | .867 |  |
| Cyberslacking |  |  |
| Item 1  | .723 | .478 |
| Item 2  | .898 | .193 |
| Item 3 | .664 | .559 |
| Item 4 | .611 | .627 |
| ω  | .819 |  |
| Turnover Intentions |  |  |
| Item 1  | .752 | .435 |
| Item 2  | .940 | .117 |
| Item 3 | .900 | .189 |
| ω  | .901 |  |

*Note*. λ: Factor loading; δ: Item uniqueness; ω: Omega coefficient of model-based composite reliability. Items are numbered to follow their order in their original scales.

**Table S4.** *Correlations between Latent Variables*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1. Age | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Gender | .002 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Env. concerns | .160\*\* | -.041 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Tenure | .741\*\* | -.003 | .035 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5. Employment type | -.287\*\* | -.026 | .042 | -.190\*\* | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6. CSR† | -.040 | .016 | .017 | -.027 | .007 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7. Negative ME† | -.055 | -.110\* | .042 | -.046 | .041 | .068 | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 8. rS† | .006 | .010 | .044 | -.021 | .025 | .107\* | -.475\*\* | - |  |  |  |  |  |  |  |  |  |  |  |
| 9. aS† | -.050 | .044 | .046 | -.088\* | -.003 | .115\*\* | -.417\*\* | .746\*\* | - |  |  |  |  |  |  |  |  |  |  |
| 10. cS† | .000 | .081 | .060 | -.017 | .022 | .026 | -.244\*\* | .476\*\* | .445\*\* | - |  |  |  |  |  |  |  |  |  |
| 11. rU† | -.028 | .010 | -.051 | -.043 | -.010 | .064 | .302\*\* | -.360\*\* | -.345\*\* | -.261\*\* | - |  |  |  |  |  |  |  |  |
| 12. aU† | -.044 | -.039 | -.054 | -.052 | -.003 | .140\*\* | .370\*\* | -.403\*\* | -.443\*\* | -.237\*\* | .422\*\* | - |  |  |  |  |  |  |  |
| 13. cU† | .023 | -.010 | -.030 | .032 | .004 | .087\* | .304\*\* | -.284\*\* | -.374\*\* | -.418\*\* | .438\*\* | .620\*\* | - |  |  |  |  |  |  |
| 14. rF† | -.014 | -.059 | -.017 | -.010 | .020 | .037 | .372\*\* | -.492\*\* | -.405\*\* | -.250\*\* | .564\*\* | .415\*\* | .336\*\* | - |  |  |  |  |  |
| 15. aF† | .012 | .004 | -.020 | .005 | -.024 | .022 | .416\*\* | -.537\*\* | -.481\*\* | -.175\*\* | .388\*\* | .662\*\* | .508\*\* | .478\*\* | - |  |  |  |  |
| 16. cF† | .007 | -.124\*\* | .006 | .026 | .001 | .089\* | .321\*\* | -.344\*\* | -.270\*\* | -.579\*\* | .262\*\* | .344\*\* | .497\*\* | .590\*\* | .433\*\* | - |  |  |  |
| 17. Cyberslacking† | -.071 | -.026 | .044 | -.042 | -.036 | -.004 | -.181\*\* | .270\*\* | .216\*\* | .122\*\* | -.144\*\* | -.199\*\* | -.194\*\* | -.172\*\* | -.260\*\* | -.148\*\* | - |  |  |
| 18. Turnover† | -.030 | -.010 | .017 | -.027 | .018 | .006 | .248\*\* | -.261\*\* | -.258\*\* | -.103\* | .255\*\* | .367\*\* | .369\*\* | .274\*\* | .356\*\* | .209\*\* | -.521\*\* | - |  |
| 19. AOC† | .030 | .014 | -.007 | .042 | -.009 | .027 | -.641\*\* | .634\*\* | .532\*\* | .294\*\* | -.406\*\* | -.416\*\* | -.315\*\* | -.430\*\* | -.482\*\* | -.282\*\* | .429\*\* | -.370\*\* | - |

*Note*. \* *p* < .05; \*\* *p* < .01; † variables estimated from factor scores with mean of 0 and a standard deviation of 1; gender was coded 1 for women and 2 for men; employment type was coded 1 for full-time and 2 for part-time; Env.: Environmental; CSR: Corporate Social Responsibility; ME: moral emotions; a: autonomy; c: competence; r: relatedness; S: satisfaction; F: frustration; U: unfulfillment; AOC: Affective organizational commitment.

**Table S5**

*Results from the Latent Profile Analysis Models*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model | LL | #fp | Scaling | AIC | CAIC | BIC | ABIC | Entropy | aLMR | BLRT |
| 1 Profile | -6354.029 | 18 | 1.159 | 12744.059 | 12838.800 | 12820.800 | 12763.663 | Na | Na | Na |
| 2 Profiles | -5020.534 | 37 | 1.368 | 10115.068 | 10309.814 | 10272.814 | 10155.367 | .929 | .000 | < .001 |
| 3 Profiles | -4675.307 | 56 | 1.099 | 9462.615 | 9757.365 | 9701.365 | 9523.607 | .897 | .000 | < .001 |
| 4 Profiles | -4532.889 | 75 | 1.306 | 9215.779 | 9610.533 | 9535.533 | 9297.465 | .919 | .358 | < .001 |
| 5 Profiles | -4436.882 | 94 | 1.228 | 9061.764 | 9556.523 | 9462.523 | 9164.144 | .891 | .308 | < .001 |
| 6 Profiles | -4351.226 | 113 | 1.140 | 8298.452 | 9523.216 | 9410.216 | 9051.525 | .891 | .129 | < .001 |
| 7 Profiles | -4298.817 | 132 | 1.217 | 8861.634 | 9556.402 | 9424.402 | 9005.401 | .887 | .502 | < .001 |
| 8 Profiles | -4225.370 | 151 | 1.184 | 8752.740 | 9547.513 | 9396.513 | 8917.201 | .881 | .135 | < .001 |

*Note*. LL: Model loglikelihood; #fp: Number of free parameters; scaling: Scaling correction factor associated with robust maximum likelihood estimates; AIC: Akaïke information criteria; CAIC: Constant AIC; BIC: Bayesian information criteria; ABIC: Sample size adjusted BIC; aLMR: Adjusted Lo-Mendel-Rubin likelihood ratio test; and BLRT: Bootstrap likelihood ratio test.

**Table S6**

*Detailed Results from the Latent Profile Solution*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Profile 1 | Profile 2 | Profile 3 | Profile 4 |
|  | Mean [CI] | Mean [CI] | Mean [CI] | Mean [CI] |
| Autonomy satisfaction | .535 [.434; .637] | 1.131 [1.025; 1.237] | -.717 [-.847; -.587] | -.024 [-.140; .092] |
| Competence satisfaction | .386 [.300; .473] | 1.104 [1.075; 1.133] | -.638 [-.799; -.478] | .046 [-.056; .147] |
| Relatedness satisfaction | .584 [.480; .687] | 1.363 [1.288; 1.438] | -.771 [-.905; -.636] | -.048 [-.164; .069] |
| Autonomy unfulfillment | -.727 [-.788; -.665] | -1.132 [-1.266; -.998] | .733 [.600; .866] | .175 [.064; .285] |
| Competence unfulfillment | -.570 [-.665; -.475] | -1.206 [-1.328; -1.084] | .735 [.627; .843] | .047 [-.046; .141] |
| Relatedness unfulfillment | -.555 [-.655; -.454] | -1.119 [-1.272; -.966] | .679 [.545; .813] | .068 [-.044; .181] |
| Autonomy frustration | -.720 [-.821; -.620] | -.962 [-1.273; -.652] | .828 [.723; .934] | .079 [-.027; .185] |
| Competence frustration | -.524 [-.540. -.509] | -.493 [-.510; -.475] | 1.081 [.893; 1.269] | -.328 [-.372; -.285] |
| Relatedness frustration | -.548 [-.567. -.529] | -.512 [-.559; -.465] | 1.051 [.873; 1.229] | -.284 [-.342; -.225] |

*Note.* CI: 90% confidence interval; Profile 1: *Positive Need States Experience*; Profile 2: *Very Positive Need States Experience*; Profile 3: *Negative Need States Experience*; Profile 4: *Moderate and Mixed Need States Experience*.

**Table S7.** *Classification Accuracy: Average Probability of Membership into Each Latent Profile (Column) as a Function of the Most Likely Profile Membership (Row)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Profile 1 | Profile 2  | Profile 3 | Profile 4 |
| Profile 1 | .960 | .001 | .000 | .039 |
| Profile 2 | .018 | .982 | .000 | .000 |
| Profile 3  | .000 | .000 | .975 | .025 |
| Profile 4  | .024 | .000 | .036 | .940 |

*Note*. Profile 1: *Positive Need States Experience*; Profile 2: *Very Positive Need States Experience*; Profile 3: *Negative Need States Experience*; Profile 4: *Moderate and Mixed Need States Experience*.



**Figure S1**

Elbow Plot of the Value of the Information Criteria for Solutions Including Different Numbers of Latent Profiles