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Original Article

Psychometric Properties of the Basic Psychological Need Satisfaction and Frustration Scale – Intellectual Disability (BPNSFS-ID)

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Abstract: The Basic Psychological Need Satisfaction and Frustration Scale – Intellectual Disability (BPNSFS-ID), an adapted version of the original BPNSFS (Chen, Vansteenkiste, et al., 2015), operationalizes satisfaction and frustration with the three basic psychological needs according to self-determination theory (SDT): autonomy, relatedness, and competence. The current study examined the psychometric properties of the BPNSFS-ID in a group of 186 adults with mild to borderline intellectual disability (MBID). The results indicated an adequate factorial structure of the BPNSFS-ID, comprising the satisfaction and frustration of each of the three needs. The associations between BPNSFS-ID subscales autonomy, relatedness, and competence and the self-determination subscale of the Personal Outcome Scale (POS), the De Jong Gierveld Loneliness Scale, and the General Self-Efficacy Scale – 12 (GSES-12) supported the construct validity. In addition, the BPNSFS-ID demonstrated high internal consistency (α = .92) and 2-week test-retest reliability (r = .81 for the composite subscale autonomy, r = .69 for the composite subscale relatedness, and r = .85 for the composite subscale competence). Overall, the BPNSFS-ID proved to be a valid and reliable measure of basic psychological need satisfaction and need frustration among people with MBID.

Keywords: basic psychological need satisfaction and need frustration, needs universality, self-determination theory, intellectual disability, psychometric properties

Over the past three decades the importance of the quality of life concept of people with intellectual disabilities (ID) has been highlighted. According to Schalock and his colleagues (2002), subjective well-being is a key component of quality of life in this population. Subjective well-being can be described as a positive global perception of one's life, consisting of cognitive (e.g., life satisfaction) and affective (the presence of happiness and absence of negative feelings) components (Diener, 2000). Self-determination theory (SDT) posits that individuals have three innate, universal psychological needs, whose satisfaction is crucial for subjective well-being (Ryan & Deci, 2000). These are the needs for autonomy (i.e., perceiving that people can make their own decisions and choices), relatedness (i.e., feeling that one is connected to and cared for by other people), and competence (i.e., feeling effective in achieving valued outcomes). Consequently, if the needs for autonomy, relatedness, and competence are fulfilled, one should experience subjective well-being (Howell, Chenot, Hill, & Howell, 2011; Tay & Diener, 2011), regardless of level of intellectual functioning (Deci, 2004).

Although it has been argued that the basic psychological needs are universally important (Deci, 2004; Deci & Ryan, 2000), there is a dearth of research on these needs in people with ID. Studying these basic psychological needs in people with ID is important from SDT's perspective as it may provide additional support for the universality claim of SDT (i.e., the theory is applicable to all people, regardless of intellectual functioning). Moreover, studying these needs is critical for the ID field as it may provide insight into how to support people with ID to achieve optimal well-being. Based on their study among students with learning disabilities, Deci, Hodges, Pierson, and Tomassone (1992) concluded that students function more positively when teachers support their autonomy rather than control and pressure them. In addition, Grolnick and Ryan (1990)

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found that many of the motivation and self-evaluative problems that children with learning disabilities have may be nonspecific; they may be apparent in other children who have difficulties in learning as well. It should be mentioned however, that the vast majority of the participants in both studies had a below average IQ (< 80) but not an ID. There are few large-scale studies because of a lack of psychometrically adequate instruments to quantify the extent to which the three psychological needs are fulfilled among people with ID. Therefore, valid and reliable instruments for assessment of autonomy, relatedness, and competence are urgently needed for people with ID. The current study, which focuses on the psychometric properties of such an instrument, is therefore an essential first step.

Self-determination theory researchers have developed several valid and reliable global and domain-specific scales for need satisfaction and need frustration for the nonintellectually disabled population, including

(a) the Basic Psychological Need Satisfaction Scale (BPNS; Ilardi, Leone, Kasser, & Ryan, 1993),
(b) the Balanced Measurement of Psychological Needs (BMPN; Sheldon & Hilpert, 2012),
(c) the Relationship Need Satisfaction Scale (RNSS; La Guardia, Ryan, Couchman, & Deci, 2000),
(d) the Basic Psychological Needs Satisfaction and Frustration Scale (BPNSFS; Chen, Vansteenkiste, et al., 2015),
(e) the Psychological Need Thwarting Scale (PNTS; Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011),
(f) the Work-related Basic Need Satisfaction Scale (W-BNS; van den Broeck, Vansteenkiste, Witte, Soenens, & Lens, 2010), and
(g) the Psychological Need Satisfaction in Exercise (PNSE; Wilson, Rogers, Rodgers, & Wild, 2006).

The BMPN and BPNSFS differ from the other instruments in that they measure both need frustration and need satisfaction. This distinction between need satisfaction and need frustration is consistent with recent theorizing (Vansteenkiste & Ryan, 2013) and empirical research (e.g., Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011), underlining the distinct role of need frustration in predicting ill-being. That is, a low score on need satisfaction ("dissatisfaction") is conceptually not equivalent to need frustration (e.g., "I do not feel related" vs. "I feel I am rejected"). For example, people might already feel lonely because their need for relatedness with their colleagues gets deprived ("dissatisfaction") or because attempts to establish contact are thwarted resulting in a more intense frustration (i.e., need frustration). Such frustrations of basic needs may engender specific emotions, such as defeat and humiliation in the case of rejection by others, depending on context (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011). Differential emotional responses to need frustration and low need satisfaction may predict differential associations with adaptive and maladaptive developmental outcomes. That is, in a study among athletes, Bartholomew, Ntoumanis, Ryan, Bosch, et al. (2011) found that need satisfaction was associated with positive outcomes regarding sport participation (i.e., positive affect and vitality), whereas need frustration was associated with maladaptive developmental outcomes such as negative affect, depression, and burnout. Moreover, need satisfaction was associated with athletes' perceptions of autonomy support, while need frustration was related to coach control.

Because Chen, Vansteenkiste, et al. (2015) provided evidence for the measurement equivalence of the BPNSFS, this questionnaire is preferred over the BMPN. Although recently developed, the BPNSFS has already been applied in several studies in a range of domains, including the examination of the role of psychological need satisfaction in sleep behavior of adults (Campbell et al., 2015) and the role of environmental and financial safety in need satisfaction (Chen, van Assche, Vansteenkiste, Soenens, & Beyers, 2015). As the BPNSFS looked more promising, this questionnaire was chosen for the current study. That is, in the current study, the psychometric properties of an adapted version of the BPNSFS, the Basic Psychological Need Satisfaction and Frustration Scale – Intellectual Disability (BPNSFS-ID), were examined in people with mild ID (defined as IQ between 50 and 70) and with borderline intellectual functioning (IQ between 70 and 85), hereafter designated as people with mild to borderline ID (MBID).

The first hypothesis was that, using confirmatory factor analyses (CFAs), the structure of six correlated but distinct factors of BPNSFS-ID (i.e., the satisfaction and frustration of the needs for autonomy, relatedness, and competence) fit the data from people with MBID. This was important not only to test whether the basic psychological needs are adequately operationalized, but also to test whether the theoretical distinction between the needs is applicable to people with ID too. To investigate this, a series of CFAs were conducted based on theory (Vansteenkiste & Ryan, 2013) and the results of Chen, Vansteenkiste, et al. (2015). That is, four models were tested:

- Model 1 (the null model): a six-factor model differentiating between need satisfaction and need frustration within each of the three needs;
- Model 2: the same six-factor model using two higher-order constructs representing psychological need satisfaction and need frustration;
- Model 3: the same six-factor model with three higher-order constructs representing the basic

psychological needs for autonomy, relatedness, and competence; and
- Model 4: a three-factor model consisting of the three needs for autonomy, relatedness, and competence.

It was also hypothesized that the three basic needs of the BPNSFS-ID would be strongly associated with convergent operationalizations of these needs. That is, based on the nomological web of SDT, satisfaction and frustration of the need for autonomy would be associated with the subscale self-determination of the Personal Outcome Scale (POS; Van Loon, Van Hove, Schalock, & Claes, 2008a), the need for relatedness would be associated with the De Jong Gierveld Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985), and the need for competence would be associated with the General Self-Efficacy Scale-12 (GSES-12; Sherer et al., 1982). In addition, the internal consistency and test-retest reliability of the BPNSFS-ID were tested. The internal consistency measured with Cronbach's α, was used to gauge how well a priori defined items of the questionnaire measured the same construct, whereas the test-retest reliability indicated the stability of the measure in the absence of systematic attempts to induce change, which is a critical characteristic if the measure is to be used in effectiveness research in the future.

Materials and Methods

Participants and Procedures

After ethical approval by the Ethics Committee of Tilburg University, participants were selected at random from four healthcare organizations for people with ID in the southern part of the Netherlands. All four organizations support individuals with ID living in residential homes and 24-hr community residences, receiving ambulant support or attending day care centers. Inclusion criteria for participation were: aged above 18 years, mild to borderline ID (IQ-score between 50 and 85), and at least weekly contact for a minimum of three months with a professional caregiver. A total of 368 individuals were invited to participate in the study; 165 declined, resulting in 203 participants. After participation 17 participants were excluded because they did not meet the inclusion criteria, leaving a total of 186. The mean age was 40.3 years (range 18.1–84.8); 110 were male. The mean IQ on file was 67; 109 participants had a mild ID (range 50–70) and 77 had a borderline level of intellectual functioning (range 71–85).

During each measurement, all items of each questionnaire were read aloud to the participants, while they could also read along with all items. The participants verbally indicated the response by giving the answer (mostly from 1 to 5) which was then recorded and logged by the researchers. The vast majority of the participants understood all items; for those who needed help, a standardized explanation was given. In the case a participant did not understood the item after this standardized clarification, the item was left blank and became a missing value.

Measures

Need Satisfaction and Frustration

The Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS), originally developed by Chen, Vansteenkiste, et al. (2015), is here adapted as the BPNSFS-ID to improve comprehension by people with MBID. The BPNSFS-ID assesses both satisfaction and frustration of the three basic psychological needs defined in SDT: autonomy, relatedness, and competence. The BPNSFS-ID has 24 items (eight for each basic need; four for satisfaction and four for frustration). Examples are: "In my life, I can do whatever I want when I want" (satisfaction of the need for autonomy), "In my life, I feel excluded by the people who I would like to belong to" (frustration of the need for relatedness), and "In my life, I think that I can do things well" (satisfaction of the need for competence). All items were rated on a 5-point Likert scale (1 = *completely untrue* and 5 = *completely true*). Chen, Vansteenkiste, et al. (2015) employed a CFA to validate the factor structure of the original BPNSFS, and found a six-factor model that differentiated between need satisfaction and need frustration within the three needs yielded the best fit (SBS-χ^2 (231) = 372.71, CFI = .97, RMSEA = .03, SRMR = .04). The internal consistency ranged from .64 to .89 for the six factors across four countries in university students (Belgium, China, USA, and Peru).

To adapt the questionnaire to people with MBID, two researchers familiar with both SDT and people with MBID reworded each of the 24 BPNSFS items independently, ensuring that the items were comprehensible for people with MBID while safeguarding the meaning according to SDT. The two researchers and an experienced professional working with people with MBID developed a consensus version based on these two adaptations. This consensus version was discussed with all authors of the present study, resulting in small adaptations. For example, the original item "I feel that people who are important to me are cold and distant towards me" was replaced by "Important people in my life keep me at a distance." In addition, the original item "I feel competent to achieve my goals" was modified into "In my life, I have the feeling that I can reach my goals." Finally, five persons with MBID were invited to complete this adapted BPNSFS-ID. They found

the BPNSFS-ID easy to comprehend and a few minor adaptations to the phrasing and grammar were made to improve clarity, based on their recommendations.

Self-Determination

The subscale self-determination of the Personal Outcomes Scale (POS; Van Loon et al., 2008a) was used to assess whether participants felt free to make their own choices and decisions. This subscale consists of six items, rated on a 3-point Likert scale (1 = *always*, 2 = *sometimes*, and 3 = *seldom or never*). The subscale has a good internal consistency (Cronbach's α = .75) and measuring convergent validity of another instrument with a similar domain (GENCAT; Verdugo, Arias, Gomez, & Schalock, 2008) showed a correlation of .79 (Van Loon, Van Hove, Schalock, & Claes, 2008b). The current study had an internal consistency of .66 (Cronbach's α).

Loneliness

The De Jong Gierveld Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985) was used to measure loneliness. The scale consists of five positively formulated items (e.g., "There are many people I can trust completely") and six negatively formulated items (e.g., "I miss having people around me"), which were rated on a 5-point Likert scale (1 = *completely untrue* and 5 = *completely true*). This scale has been applied in several studies in a range of populations, including a study in people with psychiatric and intellectually disabilities (Broer, Nieboer, Strating, Michon, & Bal, 2011), and showed sufficient reliability and validity (de Jong-Gierveld & van Tilburg, 1999). To ensure comprehension by people with MBID, five persons with MBID were invited to complete the De Jong Gierveld Loneliness Scale. Based on their recommendations on the phrasing and grammar to improve item clarity, six items were slightly rephrased for the current study. The current study had an internal consistency of .89 (Cronbach's α).

General Self-Efficacy

The General Self-Efficacy Scale-12 (GSES-12), originally developed by Sherer and colleagues (1982) and enhanced to 12 items by Woodruff and Cashman (1993), was used to measure self-efficacy. To ensure comprehension by people with MBID, five persons with MBID were invited to complete the GSES-12. Based on their recommendations on the phrasing and grammar to improve item clarity, three items were slightly rephrased for the current study. All items were rated on a 5-point Likert scale (1 = *completely untrue* and 5 = *completely true*). The original scale has been used previously with people who have ID (Forte, Jahoda, & Dagnan, 2011), revealing a good internal consistency (Cronbach's α = .69); the current study had an internal consistency of .84 (Cronbach's α).

Data Analysis

The analysis, performed using IBM SPSS for Windows (version 22) and AMOS (version 22), comprised three stages: (1) confirmatory factor analyses, (2) convergent and discriminant validity, and (3) reliability.

Firstly, to investigate the factorial validity, a series of CFAs were conducted based on theory (Vansteenkiste & Ryan, 2013) and the results of Chen, Vansteenkiste, et al. (2015). That is, four models were tested in CFA using AMOS:

- Model 1 (the null model): a six-factor model differentiating between need satisfaction and need frustration within each of the three needs;
- Model 2: a six-factor model using higher-order constructs in which both the three need satisfaction factors and the three need frustration factors are the six first-order factors, and the two higher-order constructs representing psychological need satisfaction and need frustration;
- Model 3: a six-factor model with the same six first-order factors as Models 1 and 2, in which three higher-order constructs represent the psychological needs for autonomy, relatedness, and competence; and
- Model 4: a three-factor model consisting of the three needs for autonomy, relatedness, and competence.

Because AMOS requires all variables of interest to have complete data, the Expectation Maximization (EM) estimation in SPSS was used to impute the missing values (0.72% of all values were missing). This could be done because data were found to be missing completely at random (MCAR) as indicated by Little's MCAR test [χ^2 (141, N = 186) = 136.40, p = .59]. The four models were evaluated using a normed Chi-square, the root mean square error of approximation (RMSEA), the Bentler Comparative Fit Index (CFI), and the standardized root mean square residual (SRMR; Kline, 2005; Schweizer, 2010). A normed $\chi^2 < 2$ is considered a good model fit and a value < 3 an acceptable model fit (Bollen, 1989). Consistent with Browne and Cudeck (1993), RMSEA values < .05 are considered as good whereas values between .05 and .08 are considered as acceptable. CFI signifies a good model fit for values > .95, whereas values between .90 and .95 indicate an acceptable fit (Hu & Bentler, 1999). Finally, SRMR values < .10 are considered acceptable (Kline, 2005). However, although these traditional fit indices with fixed critical values are useful to evaluate models, they have

important drawbacks as they cannot control for type I and type II errors, resulting in the rejection of correct models and the acceptance of incorrect models (Marsh, Hau, & Wen, 2004). Therefore, Saris, Satorra, and Van der Veld (2009) suggested "the detection of misspecification"-procedure, by using the Modification Index (MI), the Expected Parameter Change (EPC), and the power of the MI test. To interpret the MI test for each of the restricted parameters of the model, the minimum size of the misspecification that one would like to detect by the MI test with a high likelihood (power) was chosen to be .1 and the power was ranked high when it was > .75 (Saris et al., 2009). Because this "detection of misspecification"-procedure is relatively new, in the current study, both approaches (i.e., the traditional fit indices and the detection of misspecifications) will be reported. Next, in addition to the traditionally Chi-square difference test, which may reject reasonable models (Marsh et al., 2004), for choosing the best model the Bayesian Information Criterion (BIC) and CFI indices were used. Models with the lowest BIC are preferred, and a nonsignificance Chi-square difference test suggests that the reduced model is the better fitting model. In addition, to evaluate invariance constraints, the CFI indices were compared; Cheung and Rensvold (2002) suggested that decreases in fit > 0.01 support the more restricted model.

Secondly, to evaluate the convergent validity, the BPNSFS-ID subscales autonomy, relatedness, and competence were correlated with the self-determination subscale of the POS, the De Jong Gierveld Loneliness Scale, and the GSES-12, respectively. The discriminant validity was measured by correlating the autonomy subscale of the BPNSFS-ID with the convergent operationalizations of the other two needs: GSES-12 and the De Jong Gierveld Loneliness Scale. In a similar vein, the relatedness subscale of the BPNSFS-ID was correlated with the GSES-12 and the self-determination subscale of the POS, and the competence subscale of the BPNSFS-ID was correlated with the self-determination subscale of the POS and the De Jong Gierveld Loneliness Scale. Regarding the discriminant validity, dependent correlations derived from the cross-construct and the within-construct were compared using Steiger's *Z*-test (Steiger, 1980). Correlations < .29 were considered weak, between .30 and .49 moderate, and > .49 strong (Cohen, 1988).

Finally, the reliability of the BPNSFS-ID was determined by computing Cronbach's α. Also, the 2-week test-retest reliability was determined by reinterviewing 20% of the participants (N = 40) According to Nunnally, Bernstein, and Berge (1967), a value > .60 is sufficient for early stages research, but values > .80 should be pursued. The test-retest reliability was gauged by computing Pearson correlations between the first and second measurement.

Results

Confirmatory Factor Analyses

The global fit measures of the four models are presented in Table 1. Based on these fit measures, all four models yield an acceptable to good fit. Although Models 1 and 3 yield a statistically significant better fit than the other two models, Model 2 is theoretically important given the importance of the distinction between need satisfaction and need frustration. As Model 2 has an acceptable fit, this model appears to be the best fitting model based on theory and the traditional fit indices. The "detection of misspecification"-output as measured with Modification Index (MI), the Expected Parameter Change (EPC), and the power of the MI test, indicated that there were no serious misspecifications for Model 2 (see Electronic Supplementary Material, ESM 1), therefore, the model is acceptable.

For Model 2 (six factors with higher-order constructs representing psychological need satisfaction and need frustration, see Figure 1), all factor loadings were significant at a $p < .001$ level. The standardized factor loadings varied as follows: between .45–.87 for the latent variable autonomy satisfaction and .72–.80 for autonomy frustration, between .84–.88 for relatedness satisfaction and .59–.77 for relatedness frustration, and between .60–.77 for competence satisfaction and .61–.79 for competence frustration.

Convergent and Discriminant Validity

The autonomy satisfaction and frustration subscales showed strong convergence with the self-determination scale, $r = -.65$, $p < .001$ and $r = .60$, $p < .001$, respectively. The correlations between the competence satisfaction and frustration subscales were assessed by associating these subscales with the self-efficacy scale, and were $r = .66$, $p < .001$ and $r = -.62$, $p < .001$, respectively. The convergent validity of the relatedness satisfaction and frustration subscales was measured by correlating the subscales with the loneliness scale; the correlations were $r = .65$, $p < .001$ and $r = -.71$, $p < .001$.

Discriminant validity of the BPNSFS-ID was measured by assessing the correlation between the six subscales and the convergent operationalizations of the two other basic needs (i.e., two of the following three questionnaires: the self-determination scale, the self-efficacy scale, and the loneliness scale). The correlations for each subscale are reported in Table 2; they ranged between −.32 and .55. A Steiger's *Z*-test was conducted to compare the dependent correlations derived from the cross-construct and the within-construct. Results indicated that all within-construct

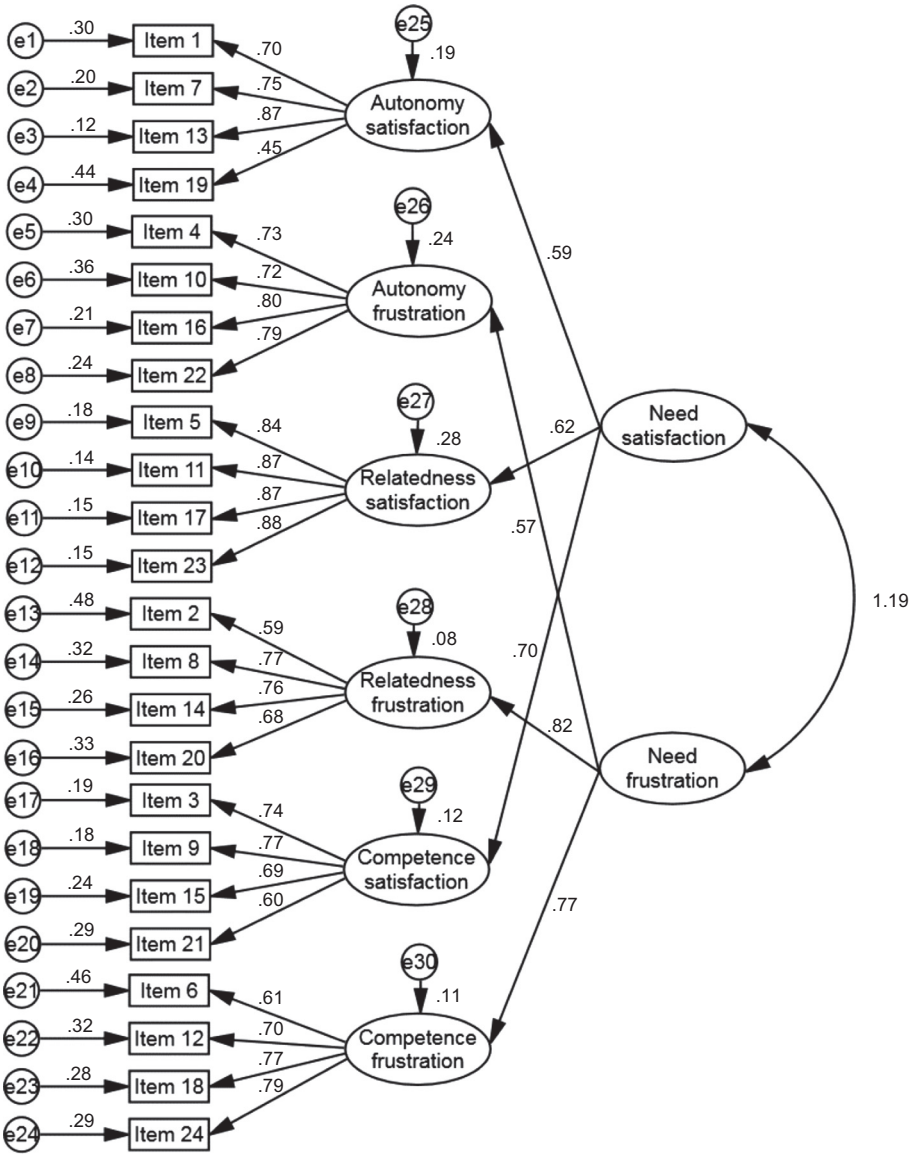

Figure 1. Visual representation of Model 2 with six factors and higher-order factors representing psychological need satisfaction and need frustration (N = 186). The ellipses represent both the factors and the higher-order constructs and the rectangles represent items. Numbers to the left of the rectangles represent residuals (expressed as covariance). Numbers between the single-arrow-lines connecting constructs and items indicate a hypothesized direct effect (expressed as standardized regression coefficients). The number between the bidirectional arrow connecting the higher-order constructs imply a relationship between factors (expressed as covariance).

associations were significantly stronger than the cross-construct associations at a $p < .001$ level, except the comparison between the correlation of the competence satisfaction subscale and the self-efficacy scale (r = .65) and the competence satisfaction subscale and the loneliness scale (r = .55); this resulted in Z_H = 2.13, p = .033.

Reliability

The internal consistency of the BPNSFS-ID was found to be Cronbach's α .92. The internal consistency for each scale is reported in Table 3; alphas ranged between .78 and .92. The 2-week test-retest reliabilities (M = 14.6 days, SD = 2.0, range = 11.0–21.0) of the BPNSFS-ID factors ranged between .68 and .85 (see Table 3).

Discussion

This study provides evidence for the reliability and validity of the Basic Psychological Need Satisfaction and Frustration Scale – Intellectual Disability (BPNSFS-ID). Similar to the results of the original BPNSFS (Chen, Vansteenkiste, et al., 2015), the BPNSFS-ID shows good to excellent internal consistency and test-retest reliability, for both the total scale and the divided subscales.

Confirmatory factor analyses confirmed a six-factor structure of the BPNSFS-ID, comprising the satisfaction and frustration of the needs for relatedness, autonomy, and competence. In addition, similar to the original BPNSFS (Chen, Vansteenkiste, et al., 2015), supplementary higher-order analysis did support the distinction between need satisfaction and need frustration. That is, based on

Table 1. Comparison of the four tested models (N = 186)

Model	χ^2	*df*	χ^2/df	RMSEA (90% CI)	CFI	SRMR	BIC	$\chi^2\Delta$ (*df*)[#]
1. Six factors	319.30*	237	1.34	.043 (.030; .055)	.96	.055	648.53	–
2. Six factors with need satisfaction and need frustration as higher-order constructs	481.29*	245	1.96	.072 (.063; .082)	.90	.099	768.70	161.99 (8)*
3. Six factors with autonomy, relatedness, and competence as higher-order constructs	330.42*	243	1.36	.044 (.031; .056)	.96	.059	628.28	11.12 (6)
4. Three factors	457.45*	249	1.84	.067 (.058; .077)	.91	.076	723.97	127.03 (12)*

Notes. Df = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; BIC = Bayes Information Criterion. [#]$\chi^2\Delta$ (*df*) = Chi-square difference test comparing the fit of Models 2, 3, and 4 with Model 1; *df* is the difference in degrees of freedom between the two compared models. *$p < .05$.

Table 2. Correlations[a] among study variables (N = 186)

Measure	1	2	3	4	5	6	7	8	9
Need satisfaction									
Autonomy	1								
Relatedness	.25**	1							
Competence	.40**	.38**	1						
Need frustration									
Autonomy	−.64**	−.17*	−.35**	1					
Relatedness	−.31**	−.76**	−.47**	.33**	1				
Competence	−.46**	−.33**	−.65**	.44**	.52**	1			
Self-determination scale	−.65**	−.32**	−.37**	.60**	.41**	.50**	1		
−Loneliness scale	.35**	.65**	.55**	−.38**	−.71**	−.52**	−.49**	1	
Self-efficacy scale	.35**	.33**	.66**	−.39**	−.45**	−.62**	−.40**	.62**	1

Notes. [a]As the needs for autonomy, relatedness, and competence are separate but related factors, additional partial correlation analyses were used to control for the covariance with the other two needs. Similar to the Pearson correlations, all partial convergent correlations were strong (between .49 and .57) and significant at a $p < .001$ level, except the correlation between competence frustration and the self-efficacy scale; this partial correlation was moderate (r = .45, $p < .001$). *$p \leq .05$. **$p \leq .01$.

the current data, need satisfaction and need frustration appear to be two dimensions. This finding is consistent with recent studies (Bartholomew, Ntoumanis, Ryan, Bosch, et al., 2011) and theory (Vansteenkiste & Ryan, 2013), suggesting that need satisfaction and need frustration are best viewed as independent concepts with separate precedents and predicting distinct results. For example, Chen and colleagues (2015) found that need satisfaction was related positively to life satisfaction but unrelated to depressive symptoms. On the contrary, need frustration was related positively to depressive symptoms and negatively to life satisfaction. Future research is needed to address these associations among people with MBID.

In addition to the factorial validity, the study showed strong correlations between the three basic needs of the BPNSFS-ID (i.e., the need for autonomy, relatedness, and competence) and convergent operationalization of these needs (i.e., self-determination, loneliness, and self-efficacy, respectively). In addition, discriminant validity of the BPNSFS-ID appeared to be adequate. An exception applies to the divergent correlation between the competence satisfaction and frustration subscales of the BPNSFS-ID and the De Jong Gierveld Loneliness Scale and between the competence frustration subscale of the BPNSFS-ID and the POS. That is, these correlations were, in contrast with the expectation, found to be strong. However, all within-construct associations were significantly higher than the cross-constructs.

The present results should be interpreted in light of the limitations of the study. Firstly, of the 368 individuals who were invited to participate in the study, 165 declined. The potential nonresponse bias could not be calculated by comparing participants with nonparticipants because there were no demographics available for the nonparticipants. The nonparticipants (45%) mainly said that they declined to participate due to the time investment of 1.5 hr or because professional caregivers argued it would be too stressful for them. In addition, only a small number participated in the test-retest reliability and results need to be replicated with larger sample sizes. Lastly, as no measures for both adaptive and maladaptive psychosocial functioning were included in the current study, it was not possible to actual test the notion that need satisfaction and need frustration have differential outcomes among people with MBID.

Overall, the results of the present study provide support for the psychometric properties of the BPNSFS-ID in a

Table 3. Internal consistencies and test-retest correlations of the composite need scores, need satisfaction, and need frustration (N = 186)

	Internal consistencies*			Test-retest reliabilities**		
Factor	Composite scores	Satisfaction	Frustration	Composite scores	Satisfaction	Frustration
Autonomy	.87	.78	.85	.81	.72	.79
Relatedness	.91	.92	.79	.69	.76	.83
Competence	.86	.79	.81	.85	.68	.71

Notes. *Internal consistencies are measured as Cronbach's α; **Test-retest reliabilities are measured as Pearson correlations.

group of people with MBID in the Netherlands. This is an important first step in testing the universality of the theoretical premises across populations of people with and without ID, because a reliable and valid measurement is urgently needed for fulfillment of autonomy, relatedness, and competence. Future research might focus on the evaluation of the predictive validity to further confirm the validity of the BPNSFS-ID. That is, the link between need satisfaction and need frustration and subjective well-being and ill-being among people with MBID should be examined in a longitudinal design. This is not only theoretically interesting, but also, from the practical point of view, useful as it may provide valuable insights to enhance subjective well-being and thus quality of life of people with MBID.

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Electronic Supplementary Materials

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ESM 1. Table 1 (Excel).
The Test on Misspecifications in the six-factor model with higher-order constructs representing need satisfaction and need frustration, based on Saris et al. (2009).

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