Learning and Individual Differences 47 (2016) 51–60

Contents lists available at ScienceDirect

Learning and Individual Differences

journal homepage: www.elsevier.com/locate/lindif

Factor structure and dimensionality of the balanced measure of psychological needs among Portuguese high school students. Relations to well-being and ill-being☆

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ARTICLE INFO

Article history:
Received 12 January 2015
Received in revised form 4 December 2015
Accepted 22 December 2015

Keywords:
Balanced measure of psychological needs
Self-determination theory
Confirmatory factor analysis
Regression analysis
Well-being
Ill-being

ABSTRACT

Previous research on the Balanced Measure of Psychological Needs Scale (BMPN) fitted a 5-factor structure distinguishing the three need factors of autonomy, competence and relatedness and the two method factors of need satisfaction and dissatisfaction. The current study explores the dimensionality and construct validity of the Portuguese version of the Balanced Measure of Psychological Needs (Sheldon & Hilpert, 2012) in two samples of high school students. We compared the original 5-factor model to three alternative models to assess the ability of each model to represent the factorial organization of the data. Confirmatory factor analysis yielded a good fit for solutions that separately modeled the satisfaction and frustration components of needs. The best-fitting solution of six factors, one per subscale, was supported in both high school samples, and was also shown by multigroup analysis to be invariant across gender. Regression analyses found that basic need satisfaction was related to subjective vitality and satisfaction with life (SWL) and need dissatisfaction predicted anxiety, depression and somatization. The substantive distinction between the satisfaction and frustration components of needs, and implications for educational settings, are discussed. Overall, the Portuguese BMPN appears to be reliable and valid to measure basic need satisfaction and need frustration for Portuguese high school students.

1. Introduction

Self-Determination Theory (Deci & Ryan, 2000, 2008) is a macro-organismic theory of motivational and personality development that proposes innate, universal, psychological needs as key motivational constructs (Deci & Ryan, 1985). For SDT, experiences of autonomy, competence and relatedness satisfaction are postulated to be innately rewarding experiences that energize behavior and help people develop greater integrity and well-being (e.g., Deci & Ryan, 2000; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). *Autonomy* satisfaction is the experience of self-endorsement, volition and choice in the initiation and regulation of behavior (e.g., Deci & Ryan, 1985), *competence satisfaction* corresponds to the feelings of being skilled and competent to master various challenges (e.g., Deci & Ryan, 1985; Schunk & Zimmerman, 2006), and *relatedness satisfaction* is expressed in the feelings of being emotionally connected to others within warm, supportive and caring interpersonal relations (Baumeister & Leary, 1995; Ryan, 1995). On the other hand, the *dissatisfaction* of each need corresponds to the subjective experiences of low satisfaction of autonomy, competence and relatedness needs.

For SDT the inner experience of need satisfaction/dissatisfaction is distinct from the experience of need frustration for different reasons (Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013). Firstly, the subjective experience of need frustration is characterized by distinct features. *Autonomy frustration* relates to perceptions of being controlled through externally enforced or self-imposed pressures (perception of pressure from teachers, or from self-imposed high standards for achievement), *competence frustration* expresses feelings of incompetence and failure to accomplish achievement-related goals (perception of not having the skills to succeed in school) and *relatedness frustration* is associated with the experience of relational exclusion and loneliness (perception of being different or apart from others). Secondly, need satisfaction and frustration seem to be rooted in distinct social experiences. *Need satisfaction* is experienced in social milieus that actively foster or support the three needs (e.g., the teacher provides effort-based praise for the good grade), *need dissatisfaction* develops from "passive" socialization styles that deprive the child from the basic nutriments necessary for need satisfaction (e.g., the teacher does not involve the students in the organization of class activities) and *need frustration* grows from

☆ This research was fully supported by the first author's scholarship from the Foundation for Science and Technology — Portugal.

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http://dx.doi.org/10.1016/j.lindif.2015.12.010
1041-6080/

more "directive" educational styles that actively and chronically thwart the satisfaction of needs (e.g., the teacher uses guilt-induction when the student's grade does not meet his/her standards; Deci & Ryan, 2008; Sheldon, 2011; Vansteenkiste & Ryan, 2013). Thirdly, experiences of *need* frustration have been also distinguished from experiences of *need satisfaction and dissatisfaction* for their unique effects on motivational criteria (Deci & Ryan, 1985; Vansteenkiste & Ryan, 2013). *Need satisfaction* primarily relates to well-being and optimal integrated functioning (e.g.,Sheldon & Niemiec, 2006; Ryan & Deci, 2000; Sheldon, Ryan, & Reis, 1996), *need dissatisfaction* positively predicts feelings of low well-being, but not necessarily experiences of ill-being (e.g., Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011; Quested & Duda, 2010), whereas *need frustration* predicts ill-being/psychopathology and low well-being (e.g., Bartholomew et al., 2011; Vansteenkiste, Lens, Soenens, & Luyckx, 2006). Taking into account their different developmental roots, nature and unique effects on psychological criteria, SDT suggests that need frustration should not be equated with need dissatisfaction, or with the extreme pole of the need satisfaction continuum. This distinction has important implications for the measurement of psychological needs.

1.1. Measurement of basic needs

SDT-based measures of psychological needs have recently evolved to include separate item sets that assess the subjective experiences of psychological need satisfaction/dissatisfaction (indexed by positively-worded items) and of need frustration (indexed by negatively-worded items). Among the most well-validated are the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon & Hilpert, 2012), the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS; Chen et al., 2015), and the domain-specific Psychological Need Thwarting Scale — PNTS (Bartholomew et al., 2011).

The BMPN (Sheldon & Hilpert, 2012) is generally used as three separate but distinguishable autonomy, competence, and relatedness subscales that measure the subjective experiences of need satisfaction for life as a whole. The internal structure of the BMPN was validated in a 3 × 2 model. Three factors distinguish the autonomy, competence and relatedness need satisfaction. Two additional method factors distinguish the satisfaction (scores of positively-worded items) and dissatisfaction poles (scores of negatively-worded items) of the need satisfaction continuum. Following a different conceptualization, the BPNSFS (Chen et al., 2015) measures the satisfaction and frustration components of the three needs as substantively distinct constructs. The BPNSFS was validated for a 6-factor model. Three scales, of 12 positively-worded items, assess autonomy, competence and relatedness need satisfaction, and three other scales, of 12 negatively worded items, assess the frustration of each need. Finally, the PNTS (Bartholomew et al., 2011), a domain-specific measure of the needs developed for the sports context, assess, in three separate scales, the subjective experiences of autonomy, competence and relatedness need thwarting. At this purpose, two issues are noteworthy. As we can see the three scales used conceptually diverse labels to describe the subjective negative experiences related to basic needs, defined as need dissatisfaction (Sheldon & Hilpert, 2012), need frustration (Chen et al., 2015) or need thwarting (Bartholomew et al., 2011).

In addition, the dissatisfaction, thwarting and frustration components of needs, measured with reverse-scored negative items were examined either as opposite poles of need satisfaction (Sheldon & Hilpert, 2012) or as substantively distinct from need satisfaction (Bartholomew et al., 2011; Chen et al., 2015). Yet, to date, the comparative fit of the three models altogether was not yet performed for the BMPN, leaving unanswered the question of whether need frustration (dissatisfaction or thwarting) and satisfaction of needs are distinguished by virtue of statistical artifacts or, in fact, correspond to substantive constructs.

For conceptual clarity, in this paper we use the term need thwarting to reflect influence of contexts that block the needs' satisfaction (Ryan, 1995) and need frustration to describe the inner feelings that develop from these experiences (Vansteenkiste & Ryan, 2013). Moreover, in line with Chen et al., (2015) we interpreted the negatively-worded items as indicators of need frustration, and examined whether the satisfaction and frustration components of autonomy, competence and relatedness needs are best interpreted as separate constructs, or as opposite poles of the need satisfaction continuum. To attain this goal we compared four non-nested models for model fit. Fig. 1 provides a graphic portrayal of the four models tested in *CFA*.

Model 1 (Deci & Ryan, 2000) organized the six BMPN scales into three latent factors, that distinguish the three psychological needs, assuming that the satisfaction and dissatisfaction components of needs lie within the need satisfaction continuum. For parsimony, Factor 1 assesses autonomy satisfaction versus autonomy dissatisfaction; Factor 2, competence satisfaction versus competence dissatisfaction and Factor 3, relatedness satisfaction versus relatedness dissatisfaction. Best-fit of Model 1 suggests, in line with more traditional perspectives, that the satisfaction and dissatisfaction components of needs are opposite poles of the need satisfaction continuum, with need dissatisfaction being equated as the lack of need satisfaction (e.g., Hodge, Lonsdale, & Ng, 2008).

In addition, Model 2 (Sheldon & Hilpert, 2012), adds to the structure of the three factors described for Model 1, two additional method factors assessing the satisfaction (indicated by nine positively-worded items) and dissatisfaction of needs (indicated by nine negatively-worded items). Best-fit for Model 2 supports the tripartite structure of basic needs posited by SDT (Deci & Ryan, 2000), controlling for potential bias associated to the shared method variance of positively and negatively-worded items (Sheldon & Hilpert, 2012).

In Model 3 we modeled the negatively-worded BMPN scales as substantively distinct measures of autonomy, competence and relatedness need frustration, with need satisfaction and need frustration representing two different motivational continuums. In this model the BPNSFS is organized in a two-factor higher-order need satisfaction and need dissatisfaction latent factors, each indicated by three first order factors of autonomy, competence and relatedness satisfaction (e.g., Haerens, Aelterman, Vansteenskiste, Soenens, & Petegen, 2015). Best-fit for Model 3 asserts the substantive nature of the satisfaction and dissatisfaction components of needs.

Finally, Model 4 (Chen et al., 2015) arranged the six scales in six latent factors that distinguish the components of satisfaction (3 scales) and frustration (3 scales) for autonomy, competence and relatedness needs. Best fit for Model 4 extends the structural distinction between need satisfaction and frustration (Model 3) to each of the three needs (Bartholomew et al., 2011; Chen et al., 2015).

1.2. Present study and hypotheses

To examine this premise, we re-examined the internal structure of the BMPN in Study 1, to ascertain whether the six scores of satisfaction and frustration of the three needs should be best interpreted as two general method factors reflecting the positively/negatively wording of items (as in Sheldon & Hilpert, 2012), two higher-order substantive factors of need satisfaction and frustration (as in Bartholomew et al., 2011) or six substantive factors distinguishing the satisfaction and frustration components of each need (Chen et al., 2015). In so doing we fitted the BMPN data to four competitive models, conceptualizing the components of satisfaction and frustration of psychological needs as opposite dimensions (Model 1), as distinct method effects (Models 2) or as substantively distinct constructs (Models 3 and 4). We expect the good fit of Models 2, 3 and 4 but the poor fit of Model 1, under the assumption that need frustration is distinct (*versus* opposite) of need satisfaction (*Hypothesis 1a*; see also Bartholomew et al., 2011; Deci & Ryan, 2000; Sheldon & Gunz, 2009; Vlachopoulos & Michailidou, 2006). In addition we expect the progressive better fit from Models 2 to 4, as the distinction moves from distinct need satisfaction and frustration as method