

Linking Metatraits of the Big Five to Well-Being and Ill-Being: Do Basic Psychological Needs Matter?

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Accepted: 16 April 2012
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Abstract There is considerable evidence that two higher order factors underlie the Big-Five dimensions and that these two factors provide a parsimonious taxonomy. However, not much empirical evidence has been documented as to the extent to which these traits relate to certain psychological constructs. In this study, we tested a structural model to investigate the individual differences in well-being and ill-being by examining the mediating effects of autonomy, relatedness, and competence on the extent to which two higher order factors of personality, namely Stability and Plasticity, are linked to life satisfaction and depression. In testing the model, we controlled for the effects of current affect. A large community sample participated and responded to self-measures of The Big-Five personality, basic psychological needs satisfaction, satisfaction with life, depressive symptoms, and positive and negative affect. The results revealed that satisfaction of basic psychological needs fully mediated the relationship between Plasticity and life satisfaction, as well as depression. It also fully mediated the relationship between Stability and life satisfaction, and partially mediated the relationship between Stability and depression.

Keywords Personality · Basic psychological needs · Life satisfaction · Depression · Positive and negative affect

1 Introduction

The Five-Factor Model of personality, which suggests that Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to Experience integrate the majority of the personality traits, is a well-established and accepted typology for understanding and

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assessing personality (Costa and McRae 1992; Goldberg 1993). However, in order to formulate different structural models of personality, Digman (1997) started a series of studies which reanalyzed previous studies that obtained the Big-Five. Given the significant intercorrelations among the five dimensions of personality, Digman concluded that these factors could be organized into two higher-order factors, alpha and beta, with alpha consisting of Agreeableness, Conscientiousness, and low Neuroticism; and beta consisting of Extraversion and Openness to Experience. Digman suggested that alpha reflected the socialization process, i.e., child's learning of the socially desirable behaviors in the society; while he interpreted beta in terms of personal growth and self-actualization similar to conceptions of theorists such as Rogers (1961) and Maslow (1967).

A series of studies by DeYoung and colleagues (DeYoung et al. 2002; DeYoung 2006) replicated this model and obtained two similar factors. DeYoung et al. (2002) suggested that alpha can better be labeled Stability, and beta, Plasticity. They argued that the shared variance of Conscientiousness, Agreeableness, and Emotional Stability typically represented a tendency to have a rather stable and controlled emotional, social, and motivational functioning similar to conformity, while Plasticity, including Extraversion and Openness to Experience, reflected a tendency to engage with new information and novel situations. In the current study, we use DeYoung et al.'s (2002) conceptualization, and thus refer to two proposed metatraits as Stability and Plasticity.

In the last 10 years, there has been an increasing interest in studying similar superordinate structures of the Big-Five (e.g., Ashton et al. 2009; DeYoung et al. 2002; Markon et al. 2005). Validity evidence showed that the higher order factors, while not necessarily a result of method artifact, do actually exist (e.g., DeYoung 2006). However, only a handful of studies (e.g., Hirsch et al. 2010; Mount et al. 2005; Slobodskaya 2011) attempted to examine the extent to which these factors similarly or differentially predict certain psychological processes. In this study, we aimed at examining the relations among these factors, life satisfaction, depression, and basic psychological needs.

1.1 Personality and Mental Health

Research emphasizing the dispositional explanations of well-being has consistently shown that personality traits are the most robust predictors of well-being outcomes (Steel et al. 2008). There is considerable evidence as to the strong predictive value of one or more dimensions of The Five-Factor Model of personality on such indicators as life satisfaction, positive affect, job satisfaction, relationship satisfaction, and depression (e.g., DeNeve and Cooper 1998; Judge et al. 2002; Schimmack et al. 2002a; Schimmack et al. 2004; Watson et al. 2000). The studies suggested that individual differences in well-being outcomes are related to individual differences in aspects of personality. In the present study, we attempted to refine the relationship between personality and mental health from a different and a broader perspective by integrating a higher order personality model and basic psychological needs theory, as well as by simultaneously employing both well-being and ill-being indicators, namely life satisfaction and depression.

Past research showed that Extraversion and Openness positively and Neuroticism negatively linked to life satisfaction (DeNeve and Cooper 1998; Diener and Lucas 1999; Schimmack et al. 2002a, b; Steel et al. 2008), while Agreeableness is negatively and Neuroticism is positively related to depression (Bienvenu et al. 2004; Cheng and Furnham 2003; Harkness and Bagby 2002; Kotov et al. 2010). However, the extent to which Stability and Plasticity, as higher order factors, explains individual differences in life satisfaction and depression has yet to be examined.

Nevertheless, assumptions can be made based on existing theories and related research evidence. It is known, for instance, that Stability implies a tendency to avoid disruption in emotional, social, and motivational domains, whereas Plasticity is a reflection of competence and willingness in exploring and engaging with novelty (DeYoung et al. 2002; Digman 1997). In addition, research has shown that Plasticity is closely related to such behaviors as high interpersonal warmth, socializing, and laughter (Hirsch et al. 2010), as well as low conformity (DeYoung et al. 2002) which are also known to differentiate people with high emotional and cognitive well-being (e.g., Eid et al. 2003; Rod et al. 1993; Sagiv and Schwartz 2000). On the other hand, research evidence points out that Stability is negatively related with anger, nervousness and irritation (Hirsch et al. 2010)—characteristics generally possessed by people with depressive symptoms (Vranceanu et al. 2009). Therefore, people who are highly plastic and highly stable can be expected to experience high levels of well-being and correspondingly low levels of ill-being.

Moreover, based on the evidence that the strongest positive predictors of depression are low Agreeableness and high Neuroticism (e.g., Cheng and Furnham 2003), Stability can be argued to have a stronger negative relationship with depression than Plasticity. On the other hand, given the high predictive role of Extraversion on life satisfaction demonstrated in past studies (Steel et al. 2008), compared to Stability, Plasticity should be more highly correlated with life satisfaction.

1.2 Basic Psychological Needs

Basic psychological needs formula, a sub-theory of self-determination theory, is an approach to motivation and personality, and is based on the premise that individuals are endowed with a set of psychological needs, the fulfillment of which are vital for optimal human functioning (Deci and Ryan 2000; Ryan and Deci 2002). Three basic psychological needs—autonomy, relatedness and competence—direct individuals in initiating actions which are essential for growth and development (Deci and Ryan 2000). The need for autonomy refers to the degree to which individuals feel that their actions are volitional and self-governed, indicating that the need to maintain activities is internally motivated; whereas competence refers to the extent to which individuals feel effective in their interactions with the social environment, and a need to engage in challenges; and finally, relatedness refers to the need to belong and to feel connected to others (Deci and Ryan 2000).

Ryan and Deci (2001) argued that these needs are factors that foster well-being—rather than being indicators of well-being itself. They further argued that the thwarting of any of these needs is related to emotional and social dysfunctioning. Thus, the theory assumes levels of well-being are directly proportional to the degree to which such needs are adequately met. Substantial research has been carried out to test the assumptions of the theory. One consistent finding is that the satisfaction of these needs in everyday life is positively associated with a variety of well-being outcomes, including life satisfaction, psychological adjustment, emotional well-being, self-esteem, and psychological growth (e.g., Milyavskaya and Koestner 2011; Reis et al. 2000; Sheldon and Bettencourt 2002; Şimşek and Yalınçetin 2010), while a failure to satisfy these needs manifests itself in ill-being, for example, as anxiety and depression (e.g., Deci et al. 2001; Véronneau et al. 2005; Wei et al. 2005).

Despite the clear relation between satisfaction of psychological needs and positive mental health, not much empirical evidence exists as to the link between general personality traits and psychological needs although basic psychological needs theory has roots in personality approach. While traits are broader than needs and describe one's general

patterns of cognition, affect and behavior, needs are representative of one's goals and desires, describing the motives behind one's behaviors (Winter et al. 1998). Personality traits and needs are, therefore, conceptually different though related. The theoretical conceptualization by Ryan and Deci (2000) suggested that there exist considerable individual differences which influence the degree to which people will experience a certain need satisfaction. In fact, personality temperaments are essential for self-actualization (Ford 1991)—a concept considered closely related to psychological needs (Ryan and Deci 2001). Despite these theoretical arguments, however, the link between dimensions of personality, such as the Big-Five or other structures of personality, and basic psychological needs remains unknown.

1.3 The Current Study

We argue that the existing literature lacks empirical evidence in two important areas. One is the relationship between recently validated two higher order personality dimensions, namely Stability and Plasticity, and psychological processes such as mental health; and the second is the relationship between personality traits and basic psychological needs. We attempted to address both these issues in a single study, based on a theoretical model and sound statistical analyses. Our model proposed that psychological needs mediated the effect of two higher order factors of personality on both life satisfaction and depression (see Fig. 1). By testing this model, we not only attempted to identify the extent to which Stability and Plasticity predict well-being and ill-being, but also proposed and tested a possible underlying mechanism in this relationship by including the degree of fulfillment of basic psychological needs as a mediator.

Personality traits are known to be highly stable (Hampson and Goldberg 2006), and may indicate the potential to help satisfy various individual needs. Based on the characteristics that define individual differences (DeNeve and Cooper 1998), we argue that both Stability and Plasticity positively influence the fulfillment of individual needs, which consequently affect life satisfaction and depression. As theoretical explanations for the superordinate

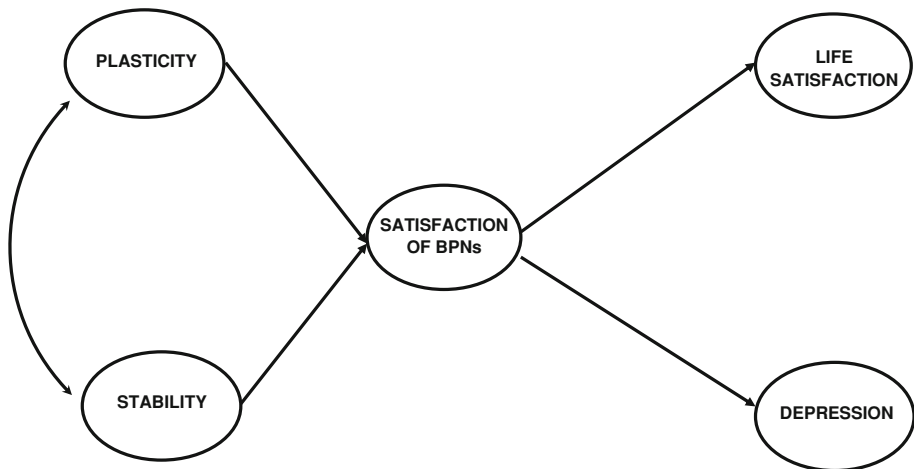


Fig. 1 The proposed model concerning the relationships among the variables
Note: BPNs basic psychological needs; method effects are not displayed in the figure

factors of personality have suggested, Plasticity is an indicator of a self that emphasizes self-actualization and personal growth, while Stability is characterized by altruistic, achievement-striving and conforming behaviors, as well as by the relative absence of negative affect (Becker 1999; Digman 1997; DeYoung et al. 2002). These traits should be expected to greatly influence satisfaction of psychological needs of relatedness, competence, and autonomy. A recent study provided clear evidence of the positive relation of Extraversion, Agreeableness, and Conscientiousness, and the negative relation of Neuroticism to all three psychological needs (Andreassen et al. 2010). Earlier studies also showed that the Big-Five personality dimensions were associated with constructs closely related to psychological needs satisfaction such as self-actualization (e.g., Chan and Joseph 2000; Dahl et al. 1983; Vitterso 2004).

The mediating role of fulfillment of basic psychological needs is theoretically plausible, because, although personality characteristics largely account for mental health, psychological needs theory states that the experience of well-being depends on the fulfillment of psychological needs (Ryan and Deci 2000, Ryan and Deci 2001). Since broad personality traits have the capacity to facilitate satisfaction of each of the basic psychological needs; in turn, these need satisfactions would be expected to mediate the relation between personality and well-being outcomes. In fact, there have been previous demonstrations of the mediating role of psychological needs satisfaction between prosocial behavior and well-being (Weinstein and Ryan 2010), and attachment and depression (Wei et al. 2005). The mediator model in this study assumed that higher order personality factors influence life satisfaction and depression to the extent that people rely on the degree to which their psychological needs are met. In other words, we argued that, for those with high degrees of either plasticity or stability, satisfaction of basic psychological needs is a prerequisite for greater levels of life satisfaction and lower levels of depression (Fig. 1).

Beyond the structural relations among the personality dimensions, basic psychological needs, ill-being and well-being, research findings have shown that the affective experiences are highly important in the assessment of these constructs. That is, affectivity could be another potentially important factor which contaminates the assessments in the current study for at least two reasons. First, it has been argued that the affective experiences of participants at the time of responding to psychological measures have substantial influence on participants' responses (Clark and Watson 1991; Watson et al. 1987; Williams and Anderson 1994). Second, scholars asserted that the most important factor in the evaluation of personality is valence (Fossum and Barrett 2000; Petterson and Turkheimer 2010). Indeed, research showed that evaluative responses are strongly affected by affective experience (Schwarz and Bohner 1996), which indicates a mood congruent evaluative tendency among individuals. Similarly, 'mood as input' model (Martin and Davies 1998; Tesser and Martin 1996) suggested that the process of evaluation is strongly affected by the momentary mood states, even if the implications of such an effect are dependent on the context. Considering these two premises, individuals who respond to a set of items representing relatively positive or negative features are very likely to rate these items taking their affective experience into account. Moreover, as Watson et al. (1987) argued, the negative affectivity of participants may result in responding negatively to any psychological measure.

Therefore, in this study, positive and negative affect are integrated into the conceptual model as a method effect. We believe that when controlled for the influence of present affectivity, the response bias into the ratings concerning the constructs would be partialled out, and thus findings obtained would provide stronger validity for the proposed relationships.

2 Method

2.1 Participants

A sample of 721 individuals living in urban areas in Turkey participated at the study. The ages of the participants ranged between 15 and 65 with a mean of 28.88 (SD = 12.64). Most were female (66 %), and had a high level of education (30 % with high school diploma, 43 % with undergraduate or graduate degree). All participants were volunteers, with no incentives given.

2.2 Instruments

2.2.1 Personality

The 44-item big five inventory (BFI; John and Srivastava 1999) was employed to assess five personality dimensions—Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N), and Openness to Experience (O). The BFI uses a 5-point rating scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). Sample items are: “Outgoing, sociable” (E); “Likes to cooperate with others” (A); “Does a thorough job” (C); “Worries a lot” (N); “Is curious about a number of things” (O). The Turkish version by Sumer et al. (2005) was used in the present study. The Alpha reliabilities for the subscales ranged between .73 and .78 for the current sample.

2.2.2 Basic Psychological Needs

In the assessment of basic psychological needs, The Basic Psychological Needs Scale (BPNS) developed by Deci and Ryan (2000) was employed. The BPNS consists of 21 items concerning the needs of competence (e.g., “Most days I feel a sense of accomplishment from what I do”), autonomy (e.g., “I feel like I am free to decide for myself how to live my life”), and relatedness (e.g., “I get along with people I come into contact with”). Ratings are indicated on a scale from 1 (*not at all true*) to 5 (*very true*) for each item. The Turkish version by Şimşek and Yalınçetin (2010) was utilized for the present study. For the current sample, the Alpha reliability was found to be .84.

2.2.3 Life Satisfaction

Satisfaction with life scale (SWLS; Diener et al. 1985) was used to assess overall cognitive judgments of well-being, i.e., life satisfaction. The SWLS consists of five items (e.g., “In most ways my life is close to ideal”) rated on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and yields a score reflective of one’s satisfaction with his/her life. The Turkish version by Durak et al. (2010) was used in this study. The Alpha reliability for the present sample was .77.

2.2.4 Depression

The depression subscale of the brief symptom inventory (BSI; Derogatis 1992) was used to measure depressive symptoms. The subscale involves 12 items (e.g., “Feeling no interest in things”) related to such symptoms as pessimism, loneliness, and suicide, rated on a

5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). The Turkish version by Şahin and Durak (1994) was employed in the present study, and the Alpha reliability was found to be .89.

2.2.5 Positive and Negative Affect

The positive and negative affectivity was measured by The Positive Affect and Negative Affect Schedule (PA, NA; Watson et al. 1988). The scale has 10 items for positive emotions (e.g., enthusiastic, proud, active) and 10 items for negative (e.g., upset, angry, nervous) on which respondents rate themselves from 1 (*very slightly or not at all*) to 5 (*extremely*). For this study, students were asked to rate themselves with regard to how they felt at the time of participation in the study. The Turkish version by Gençöz (2000) was employed in the present study. Alpha reliabilities of PA and NA in the present study were .80 and .79, respectively.

3 Results

The tests of the measurement and structural models were accomplished using LISREL 8.50 (Jöreskog and Sörbom 2001) with Maximum Likelihood estimation method. In all analyses, common method variance was controlled using a latent variable with paths to the indicators of other latent constructs in the model. The variance of this method variance was set to 1.00 to achieve identification. Positive and negative affect latent variables were also treated as method variables with their indicators which have paths to the observed variables of all other constructs in the model. The test of the indirect effects of the model was evaluated using significance tests provided by the LISREL program. Moreover, a nested models strategy was used to assure relative contributions of the direct effects on model fit.

3.1 Test of the Measurement Model

Measurement model was defined using original factors of the constructs: Extraversion and Openness were used to define Plasticity; Neuroticism, Conscientiousness, and Agreeableness to define Stability; autonomy, competence, and relatedness to define satisfaction of basic psychological needs, and five items of the SWLS to define life satisfaction. Depression was represented as having two parcels using the items of the BSI. Item parceling was also used to define positive and negative affect latent constructs, with three parcels for each. Means, standard deviations and intercorrelations among the indicators are presented in Table 1.

To examine the effects of the method variables, two measurement models were tested. The first model included the method effects, while the second did not. The measurement model in which common method variance and positive and negative affect were not included in the model not as control variables resulted in an acceptable fit to the data with the following statistics: $\chi^2(168, N = 721) = 872.07, p < .05$; GFI = 0.90; CFI = 0.95; SRMR = 0.061; RMSEA = 0.076 (90 % confidence interval for RMSEA = 0.071–0.081). On the other hand, the test of the measurement model with the common method variance and the method effects with positive and negative affect resulted in better goodness of fit statistics: $\chi^2(134, N = 721) = 498.64, p < .05$; GFI = 0.94; CFI = 0.98; SRMR = 0.040; RMSEA = 0.061 (90 % confidence interval for RMSEA = 0.055–0.067). These results suggested that the method effects influenced the measurement of the latent variables, which was also evidently

Table 1 Means, standard deviations and intercorrelations among the observed variables

Variables	M	SD	EXT	OP	NEU	CON	AGR	AUTO	REL	COM	DEP1	DEP2	LS1	LS2	LS3	LS4	LS5	PA1	PA2	PA3	NA1	NA2	NA3		
EXT	26.7	5.4	-																						
OP	34.3	6.3	.46	-																					
NEU	22.6	5.5	-.32	-.13	-																				
CON	32.2	5.8	.20	.31	-.32	-																			
AGR	32.9	5.1	.19	.29	-.34	.38	-																		
AUTO	21.9	4.0	.35	.22	-.31	.31	.30	-																	
REL	33.5	5.6	.46	.34	-.32	.33	.54	.51	-																
COM	21.4	3.9	.47	.40	-.40	.44	.32	.53	.55	-															
DEP1	15.1	5.1	-.29	-.03	.52	-.29	-.23	-.39	-.36	-.46	-														
DEP2	14.1	5.1	-.25	-.08	.50	-.36	-.28	-.43	-.36	-.45	.80	-													
LS1	3.1	1.1	.23	.22	-.12	.20	.04	.17	.20	.30	-.07	-.09	-												
LS2	2.9	1.1	.20	.16	-.07	.11	.02	.06	.15	.21	-.07	-.05	.43	-											
LS3	3.3	1.1	.32	.20	-.25	.22	.19	.29	.34	.38	-.28	-.28	.44	.49	-										
LS4	3.2	1.1	.24	.14	-.11	.18	.05	.20	.23	.29	-.16	-.13	.41	.48	.54	-									
LS5	2.6	1.3	.13	.06	-.17	.13	-.05	.03	.03	.13	-.12	-.10	.26	.29	.37	.39	-								
PA1	9.4	2.7	.28	.37	-.14	.19	.09	.14	.24	.28	-.04	-.02	.24	.18	.21	.14	.18	-							
PA2	9.8	2.5	.25	.32	-.20	.37	.12	.27	.24	.39	-.16	-.15	.28	.22	.30	.20	.16	.54	-						
PA3	12.0	3.2	.34	.28	-.13	.13	-.04	.12	.20	.29	-.10	-.05	.22	.22	.23	.16	.20	.59	.56	-					
NA1	6.3	2.6	-.14	-.07	.38	-.29	-.34	-.38	-.36	-.41	.49	.51	-.01	.06	-.11	-.06	.03	.09	-.09	.13	-				
NA2	6.8	2.6	-.12	-.04	.39	-.25	-.28	-.36	-.34	-.38	.53	.52	-.06	-.01	-.18	-.11	.01	.03	-.09	.06	.71	-			
NA3	9.0	3.3	-.19	-.06	.37	-.28	-.30	-.40	-.35	-.39	.49	.51	-.01	.02	-.18	-.07	.03	.06	-.09	.10	.73	.71	-		

Note: N = 721; EXT extraversion, OP openness, NEU neuroticism, CON conscientiousness, AGR agreeableness, AUTO autonomy, REL relatedness, COM competence, DEP1-2 two parcels from BSI depression sub-scale, LS1-5 five items of the SWLS, PA1-3 three parcels from positive affect subscale of the PANAS, NA1-NA3 three parcels from negative affect subscale of the PANAS, values greater than .08 are significant at $p = .05$ and greater than .11 at $p = .01$

observed from low factor loadings in general (see Table 2), as well as the low factor correlations among the constructs (see Table 3) when method effects were included in the structural equation.

Positive affect was influential on almost all indicators in the measurement model except for Agreeableness, while its effect on depression was weak. The largest effects of positive affect were on the indicators of Plasticity, basic psychological needs, and life satisfaction. Negative affect had impact on most indicators, with relatively weaker effect on life satisfaction, while its greater effects were on the indicators of depression, basic psychological needs, and Stability.

As a result of the effects of method variables on the indicators, the correlations among the variables decreased by nearly 50 %. The largest decrease was observed for the correlations of Stability with Plasticity and basic psychological needs satisfaction. The correlations between depression, as well as satisfaction with life and other variables in the model became dramatically weaker when the method effects were considered in the measurement model.

3.2 Test of the Structural Model

A test of the structural model resulted in acceptable fit to the data with the following statistics: $\chi^2(139, N = 721) = 528.15, p < .05$; GFI = 0.93; CFI = 0.97; SRMR = 0.042; RMSEA = 0.062 (90 % confidence interval for RMSEA = 0.057-0.068). However, modification indices suggested inclusion of a path from Stability to depression, which resulted in better goodness of fit statistics: $\chi^2(138, N = 721) = 495.51, p < .05$; GFI = 0.94; CFI = 0.98; SRMR = 0.040; RMSEA = 0.060 (90 % confidence interval for RMSEA = 0.054–0.066). The Chi square difference tests indicated that this model was indeed better than the previous model (32.64, 1; $p < .001$), while it did not differ from the measurement model (3.13, 4; $p > .05$). Additional tests were conducted to ensure that the addition of direct paths from Plasticity and Stability to life satisfaction and depression did not affect the model fit. Chi-square difference tests showed that the path from Plasticity to life satisfaction (2.96, 1; $p > .05$), from Plasticity to depression (1.01, 1; $p > .05$), and from Stability to life satisfaction (.017, 1; $p > .05$) did not improve the model fit.

These results were deemed to provide support for the structural model, indicating that the satisfaction of basic psychological needs fully mediated the relationship between Plasticity and life satisfaction, Plasticity and depression; as well as Stability and life satisfaction (see Fig. 2). In terms of the relationship between Stability and depression, the mediator role of basic psychological needs satisfaction, however, was not as large, which indicates a partial mediation. As can be seen in Table 4, despite these results, all indirect effects in the model were weak.

4 Discussion

Using a sophisticated research design, the present study tested a structural equation model in which the satisfaction of basic psychological needs, namely autonomy, competence, and relatedness, mediated the relationship of two-factor higher order personality dimensions—Plasticity and Stability (DeYoung et al. 2002)—with depression and life satisfaction.

We approached personality from this higher order perspective for two reasons. First, in personality research, because parsimonious taxonomies have constructs that include several concepts, they can contribute to a fuller explanation of the theoretical ideas (Digman

Table 2 Factor loadings for the measurement model: completely standardized solution

Variable	Plas	Stab	BPNS	Dep	Ls	Na	Pa	CMV
EXT	.69** (.79**)					-.23**	.39**	.05
OP	.65** (.32**)					-.08*	.48**	.23**
NEU		-.68** (-.45**)				.50**	-.22**	.11
CON		.55** (.26**)				-.32**	.33**	.17**
AGR		.53** (.56**)				-.34**	.09*	.75**
AUTO			.65** (.36**)			-.47**	.29**	.04
REL			.70** (.51**)			-.41**	.33**	.33**
COM			.82** (.40**)			-.49**	.49**	.02
DEP1				.89** (.62**)		.59**	-.19**	.26**
DEP2				.90** (.59**)		.60**	-.17**	.20**
LS1					.61** (.51**)	-.05	.34**	.04
LS2					.70** (.66**)	-.03	.29**	.08
LS3					.80** (.66**)	-.21**	.39**	.00
LS4					.74** (.71**)	-.13**	.24**	.02
LS5					.48** (.40**)	-.04	.25**	.19**

Note: N = 721; *Stab* stability, *Plas* plasticity, *BPNS* basic psychological need satisfaction, *Sat* life satisfaction, *Dep* depression, *Pa* positive affect, *Na* negative affect, *CMV* common method variance, *EXT* extraversion, *OP* openness to experience, *NEU* neuroticism, *CON* conscientiousness, *AGR* agreeableness, *AUTO* autonomy, *REL* relatedness, *COM* competence, *DEP1-2* two parcels for depression, *LS1-5* five items of the SWLS; the values in parentheses are loadings after method effects were included into the model

* $p < .05$, ** $p < .01$

Table 3 Correlations of the latent constructs with (above diagonal) and without (below diagonal) control variables

Variable	Stab	Plas	Bpn	Sat	Dep
Stab	–	.27**	.43**	.20**	–.66**
Plas	.58**	–	.57**	.15**	–.18**
Bpn	.83**	.78**	–	.40**	–.47**
Sat	.35**	.41**	.52**	–	–.13*
Dep	–.74**	–.33**	–.64**	–.28**	–

Note: N = 721; *Stab* stability, *Plas* plasticity, *Bpn* basic psychological need satisfaction, *Sat* life satisfaction, *Dep* depression

* $p < .05$, ** $p < .01$

1997). For instance, linking Neuroticism to certain behavior problems could be less explanatory than including a broader personality dimension, such as Stability, which consists of high Conscientiousness, high Agreeableness and low Neuroticism. Therefore, concepts such as psychological needs satisfaction, well-being and ill-being can be better accounted for by two broad personality dimensions. Second, since the introduction of higher order factors to the research on personality (Digman 1997), and the publication of the findings from several validation studies (e.g., Ashton et al. 2009; DeYoung et al. 2002; Jang et al. 2006), there has been no clear establishment of the association between these metatraits and other psychological variables, especially the ones related to personality development. We, thus, attempted to investigate how these metatraits are linked to commonly used indicators of well-being, i.e., life satisfaction, and ill-being, i.e., depression, as well as basic psychological needs satisfaction. To our knowledge, this is the first study in which Stability and Plasticity have been examined in relation to these variables.

The results supported our hypothesis that both Stability and Plasticity were positively associated with satisfaction of basic psychological needs. Although Stability was more strongly related to basic psychological needs satisfaction than Plasticity in the measurement model, the relationship between Plasticity and psychological needs satisfaction became stronger in the structural model, which supported our hypothesis. Plastic personality is indeed theoretically related to a sense of self which strives for self-actualization and personal growth (Becker 1999; DeYoung 2006). Past empirical evidence also showed that characteristics of plastic people, such as high extraversion and having high intellect, reflected a tendency for self-actualization (e.g., Dahl et al. 1983; Vitterso 2004).

We also investigated the link between metatraits and mental health outcomes based on the theoretical assumptions of the Big-Five conceptualization of personality which posit that people with higher well-being demonstrate individual differences, such as high extraversion and emotional stability (DeNeve and Cooper 1998; McCrae and Costa 1991). Specifically, we tested the relationship between higher order personality factors and indicators of mental health, i.e., life satisfaction and depression. Some research points to the link between these two personality dimensions and certain behaviors and emotions. For example, reversed Plasticity is known to be closely related to impulsivity (Blackburn et al. 2004) and disinhibition (Markon et al. 2005), which are both known to be positively related to depression (e.g., Cataldo et al. 2005; Clarke 2006; Shatz 2005). In the current study we found that Stability and Plasticity were positive predictors of life satisfaction, and negative predictors of depression. However, both traits were associated with life satisfaction to a lesser degree than depression after the effects of common method variance and current

affect were partialled out. These findings suggested that the metatraits only modestly accounted for the well-being of individuals—a finding that contradicts with earlier empirical evidence on the strong relationship between subjective well-being and personality (see Steel et al. 2008, for a review). However, past research focused on the role of the Big-Five rather than higher order personality factors, and treated life satisfaction or depression, and affect as separate outcome variables. Statistically controlling for the current mood in this study may have resulted in weaker effect sizes.

In addition to defining the extent to which metatraits are associated with basic psychological needs satisfaction, depression, and life satisfaction, our structural model proposed that satisfaction of basic psychological needs is one of the key underlying mechanisms in the link between metatraits and mental health. The results supported our hypothesis indicating a full mediation for the relationship of Stability and Plasticity with life satisfaction. Despite the relatively weak indirect effects, these findings suggested that the satisfaction of basic psychological needs could be considered as an important mediator between personality and life satisfaction. The importance of basic psychological needs satisfaction in individuals' emotional and cognitive well-being has consistently been established by earlier research (Milyavskaya and Koestner 2011; Philippe et al. 2011; Reis et al. 2000; Sheldon et al. 2001). However, we extended the boundaries of this research by establishing the role of the satisfaction of psychological needs in accounting for the link between personality and cognitive well-being.

In addition, although we expected that basic psychological needs could be considered as an important mediator in the relationship between metatraits and depression, the results only partly supported this assumption. Despite the full mediation between Plasticity and depression by basic psychological needs satisfaction, the relations among variables appeared to be relatively weak after the method effects were statistically controlled for. Furthermore, the relationship between Stability and depression was partially mediated by the satisfaction of basic psychological needs, with a smaller indirect effect. This finding can be attributed to the high emotional content of Stability identified by Markon et al. (2005), and the fact that Neuroticism is highly correlated with negative affectivity (McCrae and Costa 1991; Watson et al. 1992).

5 Conclusion

Based on these findings, a number of general conclusions can be drawn. First, the study once more highlighted the importance of current affect on cognitive judgments of well-being, as well as reports of depressive symptoms. This provided additional support for the importance of the role of affect in the link between personality and well-being outcomes such as life satisfaction (e.g., Schimmack et al. 2002a).

Second, the findings suggested that two higher order factors of personality provide a useful and valid framework for describing general traits. Our study provided empirical evidence as to the description of Stability and Plasticity by showing that stable people may be characterized by a tendency to experience low levels of depressive symptoms, and that people who score high on Plasticity tend to be concerned with satisfying their basic psychological needs. These are highly consistent with theoretical conceptualizations (Digman 1997; DeYoung et al. 2002) and our propositions considering the past research findings discussed earlier (e.g., Andreassen et al. 2010; Cheng and Furnham 2003; Dahl et al. 1983). However, there is a need for more detailed research on the identification of the characteristics of stable and plastic individuals.

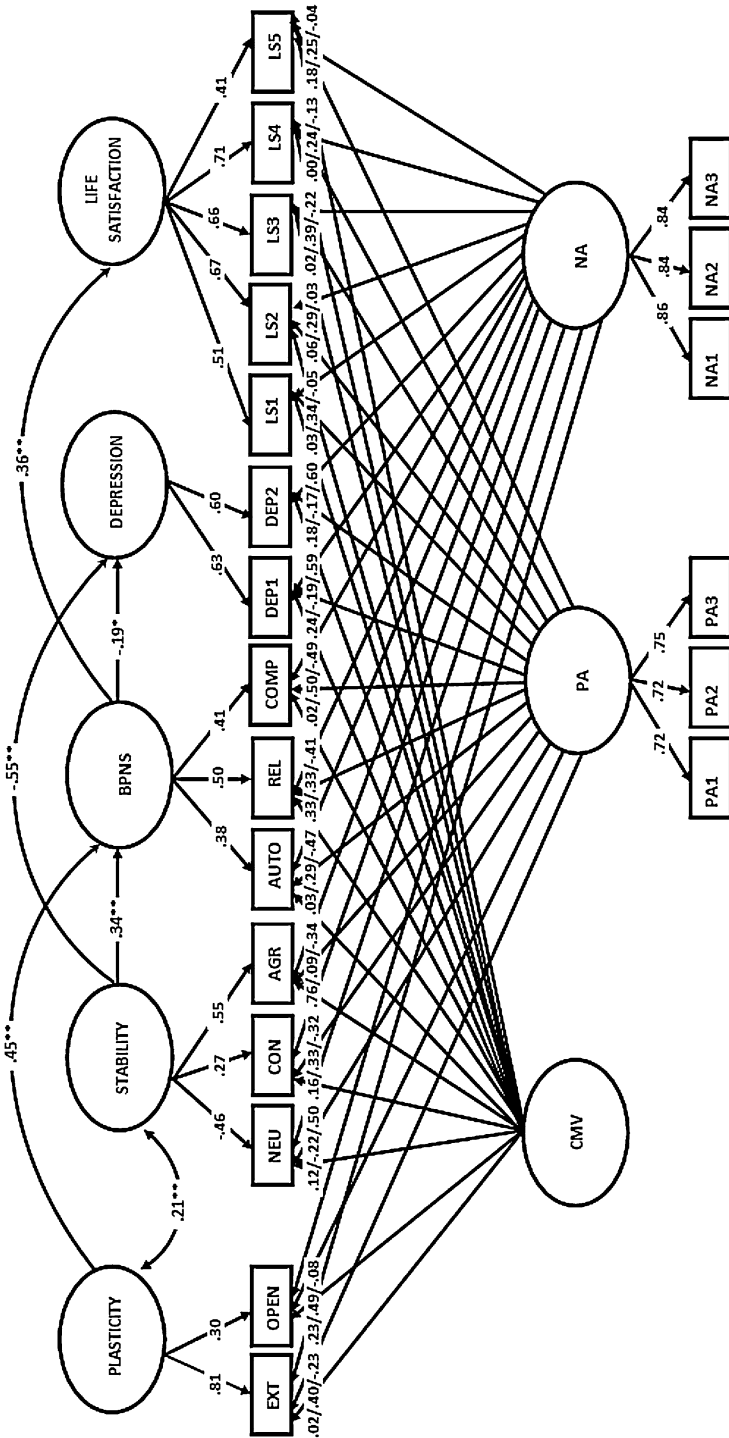


Fig. 2 Standardized parameter estimates for the final model
 Note: N = 721, BPNS basic psychological needs satisfaction, PA positive affect, NA negative affect, CMV common method variance, EXT extraversion, OP openness to experience, NEU neuroticism, CON conscientiousness, AGR agreeableness, AUTO autonomy, REL relatedness, COM competence, DEP 1-2 two parcels for depression, LS1-5 five items of the SWLS; Factor loadings greater than .11 are significant at $p < .05$ and .16 at $p < .01$
 * $p < .05$, ** $p < .01$

Table 4 LISREL estimates of the indirect effects

Indirect effect	Estimate	SE
Stability → Life satisfaction	.12**	.04
Stability → Depression	-.06**	.03
Plasticity → Life satisfaction	.16**	.06
Plasticity → Depression	-.09*	.04

Note: N = 721

* $p < .05$, ** $p < .01$

Finally, although the full mediations obtained suggested that these relationships can be described in terms of indirect effects through basic psychological needs satisfaction, the weak magnitude of the effects makes it difficult to conclude that satisfaction of basic psychological needs is a fundamental mediator in the relationship between personality and the dependent variables, depression in particular. This is mainly a result of the high direct relationship between Stability and depression. Thus, the experience of ill-being does not necessitate low stable people to experience thwart of psychological needs—a fact which supports the argument that Stability is closely associated with lack of depressive tendencies.

6 Limitations and Recommendations

It should be noted that the present study suffers certain limitations. The cross-sectional nature of the study limits the validity of the findings, since the use of additional data collection methods, such as other-reports or longitudinal investigations would certainly increase the validity in personality and well-being research. Furthermore, despite the large sample size, the participants represented a relatively well-educated segment of the population, which necessitates the replication of the study with more diverse samples. In addition, well-being and ill-being are complex concepts which have different indicators. In this study, life satisfaction and depression were used as indicators. Further research may consider including others, such as psychological well-being, self-esteem, stress, and anxiety. Research on metatraits of personality would also benefit such studies, given that little is known as to extent to which higher order personality factors predict a variety of psychological processes.

Another important issue in the current model was the use of momentary affect as a method factor, but not general mood. The relevant literature has been consistent in demonstrating that personality and general mood are closely related (McCrae and Costa 1991). However, this relationship has been considered rather problematic, given the overlap between Extraversion and positive affect, and Neuroticism and negative affect (McCrae and Costa 1991; Meyer and Shack 1989; Schumutte and Ryff 1997). Since Extraversion and Neuroticism are considered as components of rather different higher-order constructs in the Big Two model and that to our knowledge no measurement study has been reported as to the effects of general mood on the metatraits of Stability and Plasticity, we chose not to use general mood as a method variable in the present study. However, future research should examine the effects of general mood on the relationships among the constructs in the present study after illuminating these effects thoroughly. We believe that modeling mood variable in different time points with experience sampling methodology would be one of the best option.

Despite the limitations, the study attempted to fill some gaps in the literature, such as the lack of data as to how higher order personality factors account for mental health outcomes,

and how broad personality traits are linked to basic psychological needs satisfaction, as well as the structural relations among these variables. The findings of the study are also useful for practitioners, in that assisting individuals with highly plastic and stable personality characteristics to meet their needs for competence, relatedness, and autonomy may help them increase their well-being. We believe that research following an approach based on understanding adaptive tendencies, such as satisfaction of psychological needs, may highlight certain strengths and coping strategies which may be used for increasing well-being outcomes.

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