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Exploratory analysis on five-factor personality traits and parental bonding in predicting personality functioning using structural equation modeling

Su Luo, Marek Preiss, Edel Sanders

Abstract

Objectives: Recognizing the shift from categorical to dimensional approaches in personality research, this study examined the relationships among parental bonding, Five-Factor personality traits, age, and personality functioning as conceptualized in the Alternative Model of Personality Disorders (AMPD) in DSM-5.

Methods: Structural equation modeling was conducted on data from 107 Czech university students.

Results: Among the hypothesized predictors, stability – reflecting the need and ability to regulate emotional experience – and age significantly predicted personality functioning, particularly the identity and intimacy dimensions, which reflect sense of self and interpersonal relatedness, respectively. Plasticity and parental bonding did not significantly predict personality functioning.

Discussion and conclusions: These findings underscore the importance of the stability domain, including neuroticism, conscientiousness, and agreeableness, as well as age, in shaping personality functioning.

semi-structured interview; big five; structural equation model; personality functioning

INTRODUCTION

The field of personality psychology is undergoing a paradigm shift in both the conceptualization and diagnosis of personality disorders, moving from traditional categorical models toward more nuanced dimensional approaches. This shift reflects growing recognition of the limitations of categorical frameworks and increasing acceptance of spectrum-based models.

Su Luo[1,2], **Marek Preiss**[1,3], **Edel Sanders**[1]: [1]Department of Psychology, University of New York in Prague, Prague, Czech Republic; [2]First Faculty of Medicine, Charles University, Prague, Czech Republic; [3]Clinical Research of Mental Disorders, National Institute of Mental Health, Klecany, Czech Republic
Corresponding author: Su Luo; Russell.luo.su@gmail.com

Traditional categorical models classify individuals according to sets of traits or symptoms that correspond to predefined diagnostic categories. A prominent example is the DSM-5 categorical model of personality disorders, in which each disorder is defined by specific diagnostic criteria (APA, 2013). Within this framework, personality disorders are viewed as discrete and relatively stable entities: an individual either meets criteria for a category or does not. The strengths of this approach include simplicity, diagnostic clarity, and ease of communication among clinicians, as well as straightforward guidance for treatment planning. However, its rigidity can oversimplify the complexity of personality pathology.

The label-based nature of categorical approaches may also contribute to stigmatization

and a sense of otherness among individuals with personality disorders. More importantly, categorical models have been criticized because of the high rates of comorbidity observed with other mental disorders. Clinicians and researchers have long noted that personality disorders commonly co-occur with conditions such as bipolar disorder (Uçok et al., 1998; Latalova et al., 2013), depression (Shea et al., 1992; Corruble et al., 1996; Friborg et al., 2014), anxiety disorders (Friborg et al., 2013), and eating disorders (Martinussen et al., 2017; Friborg et al., 2014; Sansone et al., 2005) across different populations.

Furthermore, because of its rigid structure, the traditional approach does not facilitate a sufficiently nuanced understanding of psychopathology. Patients with the same diagnosis and apparently similar symptom presentations may differ substantially in their internal experience and etiology. In subclinical populations, individuals may not present symptoms that are severe or stable enough to warrant a formal diagnosis, yet their impairments may still substantially disrupt everyday functioning and life satisfaction. Such individuals may therefore remain underserved.

To address these limitations, the field has gradually developed new ways of conceptualizing personality disorders. This transition is reflected both in DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; American Psychiatric Association, 2013) and in ICD-11 (International Classification of Diseases, 11th Revision; World Health Organization, 2019). ICD-11 adopted a fully dimensional system for personality disorders, while retaining a borderline pattern qualifier (Tyrer et al., 2019).

In the DSM-5 appendix, the Alternative Model for Personality Disorders (AMPD) was introduced. This model includes a dimensional criterion assessing the severity of personality impairment (Criterion A) and five broad trait domains describing stylistic expression (Criterion B). Criterion A centers on the level of personality functioning (Bender et al., 2011; Morey, 2017), encompassing identity, self-direction, empathy, and intimacy. These dimensions form two broader domains: self-functioning (identity and self-direction) and interpersonal functioning (empathy and intimacy). In contrast to categorical models, dimensional models focus not on symptom clusters alone but on core capacities that are relevant to both healthy and pathological personality functioning.

As the central construct of the AMPD, the level of personality functioning draws on several classical psychological traditions, particularly more contemporary psychoanalytic theories such as object relations theory and attachment theory. Indeed, the model used to assess personality functioning is strongly informed by the Object Relations Inventory (Bender et al., 2011; Morey, 2017).

Both object relations theory and attachment theory emphasize the importance of early parental interactions for later mental functioning. Object relations theory proposes that early interactions with primary caregivers shape core self-representations and subsequent interpersonal relationships (Ainsworth, 1969; Clarkin et al., 2020). Attachment theory further elaborates how early caregiving experiences shape emotional and relational patterns that influence socioemotional functioning in adulthood (Pad et al., 2021; Flemming et al., 2022). Stable and loving parental interactions are associated with secure attachment and healthier social engagement, whereas inconsistent or hostile parenting may foster insecure attachment and impair the development of adaptive, stable relationships. From both theoretical and empirical perspectives, it is therefore plausible to expect a close association between parental bonding and personality functioning.

In addition to psychopathology, personality traits represent another major focus of personality research. By examining relatively stable patterns that shape thoughts, emotions, and behavior, trait research has contributed substantially to both theory and practice. Among trait models, the Five-Factor Model has had a particularly strong influence since its introduction (Lewis & Goldberg, 1990). The model captures five broad and salient dimensions of personality and has provided a common language for personality assessment. Research based on this framework has demonstrated considerable cross-cultural consistency as well as important practical applications.

Although no previous study has directly examined the association between the Big Five and personality functioning, substantial evidence suggests that personality traits are close-

ly related to constructs relevant to personality functioning, including self-esteem (Robins et al., 2001; Zeigler-Hill et al., 2015), emotion regulation (Berkovich & Eyal, 2019; Purnamaningsih, 2017; Barańczuk, 2019), empathy (Barrio et al., 2004; Song & Shi, 2017), attachment styles (Noftle & Shaver, 2006; Shiota et al., 2006), relationship satisfaction (O'Meara & South, 2019; Malouff et al., 2010; Noftle & Shaver, 2006; Holland & Roisman, 2008; Orzeck & Lung, 2005), well-being (Sun et al., 2018; González Gutiérrez et al., 2005; Grant et al., 2009; Cosentino & Castro Solano, 2017), occupational functioning and satisfaction (Petasis & Economides, 2020; Hurtz & Donovan, 2000), attraction (Graziano et al., 2007), depression (Karsten et al., 2012; Koorevaar et al., 2017), and anxiety (Lee-Baggley et al., 2005; Bunevicius et al., 2008).

Given research on the Five-Factor Model indicating heritability estimates of approximately 40%-60% (Power & Pluess, 2015), alongside strong theoretical emphasis on parental influences, we sought to investigate the relationships among personality functioning, Big Five personality traits, and parental care. By integrating trait-based and developmental perspectives, this study addresses an important gap in the literature. Such integration may contribute to a more nuanced understanding of personality as a dynamic construct shaped by both dispositional and environmental factors. Clinically, better understanding of these relationships may improve therapeutic formulations and support the development of more comprehensive predictive models for identifying maladaptive personality patterns.

METHODS

Participants

Participants were recruited through both physical and digital advertisements. Notices were posted in online student forums and distributed via flyers on two university campuses in Prague, Czech Republic, inviting students to participate voluntarily. The final sample consisted of 107 students (32 men and 75 women): 45 from an international university (University of New York in Prague; 11 men and 34 women) and 62 from a state university (Charles University; 21 men and 41 women). All participants were adult Czech citizens enrolled in higher education, including both undergraduate and postgraduate programs. The mean age was 24.98 years (SD = 5.91) in the international university subsample, 24.04 years (SD = 4.60) in the state university subsample, and 24.44 years (SD = 5.19) in the total sample. See Table 1. The study was approved by the Ethics Committee of the National Institute of Mental Health (Klecany, Czech Republic; No. 107/18).

Table 1. Demographics

	International University		State University		Total	
Age (M, SD)	24.98	5.91	24.04	4.60	24.44	5.19
Gender (N) Male	11		21		32	
Female	34		41		75	

Procedure

Data were collected in a designated office on campus. After providing informed consent, participants first completed the Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1) (Heissler et al., 2021). Interviews were conducted by assessors who had completed the training program recommended in the STiP-5.1 handbook (Hutsebaut et al., 2014). At the international university, interviews were conducted in English; at the state university, they were conducted in Czech using the validated Czech version of the STiP-5.1 (Heissler et al., 2021). After the interview, participants received a link to an online questionnaire battery used to collect demographic and self-report data.

Measures

Semi-Structured Interview for Personality Functioning DSM-5 (STiP-5.1)

The STiP-5.1, developed by Hutsebaut et al. (2017), is a clinician-rated semi-structured interview that assesses the overall level of personality functioning.

In line with the Level of Personality Functioning Scale (LPFS) (Morey, 2017), the interview evaluates 12 specific aspects of mental functioning on a five-point scale ranging from 0 to 4, where 0 indicates no impairment and 4 indicates extreme impairment. These 12 aspects are organized into two broad domains – self-functioning and interpersonal functioning – each divided into two subdimensions with three aspects per subdimension. Self-functioning comprises identity (uniqueness, self-esteem, emotional experience) and self-direction (goals, standards, self-reflection), whereas interpersonal functioning comprises empathy (understanding, perspective taking, awareness of impact on others) and intimacy (relationships, closeness, mutual respect). Thus, identity and self-direction form the domain of self-functioning, while empathy and intimacy form the domain of interpersonal functioning. The final STiP-5.1 score can be interpreted either as a global indicator of personality functioning or as separate scores for self-functioning and interpersonal functioning.

Previous studies have shown excellent internal consistency for the STiP-5.1, with Cronbach's alpha of 0.97 for the total scale and 0.94 for both self-functioning and interpersonal functioning domains. The instrument has also demonstrated strong interrater reliability, with intraclass correlation coefficients ranging from 0.81 to 0.92 (Hutsebaut et al., 2017). Translated versions have shown similarly strong psychometric properties, including the German version (Zettl et al., 2019) and the Czech version (Heissler et al., 2021).

Parental Bonding Instrument (PBI)

The Parental Bonding Instrument (PBI) (Parker et al., 1979) is a self-report questionnaire designed to assess the quality of the relationship between a parent and child. It consists of 25 items measuring two parenting dimensions: care and overprotection. Care reflects the extent to which a parent provides emotional support and nurturance, whereas overprotection reflects the extent to which a parent restricts a child's independence and autonomy. The PBI has demonstrated good reliability, with internal consistency coefficients ranging from 0.76 to 0.89 across studies. It has also shown construct and criterion validity, with scores associated with other measures of parenting style, child adjustment, mental health, self-esteem, and academic achievement (Parker et al., 1979; Čikošová & Preiss, 2011).

Big Five Inventory

The Big Five Inventory (BFI) (John et al., 1991) is one of the most widely used measures of personality within the Five-Factor Model framework. It is a 44-item self-report instrument assessing the five broad personality dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Items are rated on a five-point Likert scale. Since its development, the BFI has been extensively examined across diverse populations, with studies supporting its psychometric properties (Halama et al., 2020; Garrashi et al., 2023; Leung et al., 2012; Li et al., 2015; Zhang et al., 2022).

RESULTS

Data were analyzed using IBM SPSS AMOS version 29 (Arbuckle, 2022). A latent variable model was constructed to examine the relationships among Big Five personality traits, parental bonding, age, and personality functioning using maximum likelihood estimation. The Shapiro-Wilk test indicated that several variables departed from normality ($p < .05$; see Table 2). Accordingly, 2,000 bootstrap samples were used to estimate the prediction of personality functioning.

Table 2. Test of Normality

	Statistics	df	Sig	Statistics	df	Sig
STIP_Identity	.197	107	<.001	.882	107	<.001
STIP_Direction	.280	107	<.001	.808	107	<.001
STIP_Empathy	.265	107	<.001	.792	107	<.001

STIP_Intimacy	.230	107	<.001	.843	107	<.001
Extraversion	.102	107	.008	.984	107	.237
Agreeableness	.119	107	<.001	.960	107	.003
Conscientiousness	.112	107	.002	.984	107	.240
Neuroticism	.081	107	.081	.984	107	.214
Openness	.106	107	.005	.961	107	.003
Father_Care	.096	107	.018	.953	107	<.001
Father_Overprotection	.127	107	<.001	.948	107	<.001
Mother_Care	.148	107	<.001	.868	107	<.001
Mother_Overprotection	.089	107	.037	.967	107	.010

Following the higher-order factor model proposed by DeYoung (2005), the Big Five personality traits were organized into two latent variables: stability and plasticity. Stability comprised neuroticism, agreeableness, and conscientiousness, representing emotional, social, and motivational stability, respectively. This composite dimension reflects the need to maintain a stable and coherent sense of self. Plasticity, by contrast, encompassed extraversion and openness and captured the tendency to explore and engage with novel information. This higher-order structure has previously shown strong factor loadings, satisfactory model fit, and theoretical usefulness.

Personality functioning includes 12 specific subdimensions, such as emotional regulation, self-esteem, empathy, and interpersonal dynamics. Although each of these elements is observable to some degree, their interplay and their contribution to overall personality organization are not directly observable. Theorists have long argued that such information is dynamically organized (Banai et al., 2005), and although the STiP is a semi-structured interview, drawing conclusions about an individual's personality organization necessarily involves interpretation and synthesis by trained experts. This process requires more than recording responses to interview questions; it also involves integrating these responses into an overall picture of the person's underlying personality structure. For this reason, personality functioning is better conceptualized as a latent rather than an observed variable (Hopwood, 2024).

Hypothesized Model

A Bollen-Stine bootstrap p value was calculated using 2,000 bootstrap samples. The result was non-significant (p = .052). Absolute fit indices indicated an acceptable fit: the X2/df ratio was 1.631, below the criterion of 3. The root mean square error of approximation (RMSEA) was .077, slightly above the .07 threshold, indicating moderate fit. The goodness-of-fit index (GFI) was .878, also suggesting moderate fit. Among incremental fit indices, the normed fit index (NFI) was .785, again indicating moderate fit, whereas the robust comparative fit index (CFI) was .900, indicating good fit. Parsimonious fit indices also supported the hypothesized model: the parsimony comparative fit index (PCFI) was .702 and the parsimony normed fit index (PNFI) was .613, both above the criterion of .50. Although some indices suggested adequate fit, the overall pattern indicated that the model required further improvement.

To improve model fit, we respecified the model by removing indicators with mis-specified error covariances greater than 10. In the hypothesized model (see Table 3), Direction and Empathy were the only two indicators exceeding this threshold, and both showed the highest regression loadings on other variables.

We first attempted to correlate the errors of these two indicators; however, this led to only minimal improvement in model fit. In addition, both indicators showed reduced beta weights and factor loadings after covariance was introduced (Direction: beta weight decreased from .67 to .64 and factor loading from .45 to .42; Empathy: beta weight decreased from .53 to .48 and

factor loading from .28 to .23). Given that Identity and Intimacy capture core emotional functioning, whereas Direction and Empathy reflect more executive aspects of functioning, we decided to remove the latter two indicators in the respecified model (see Table 4).

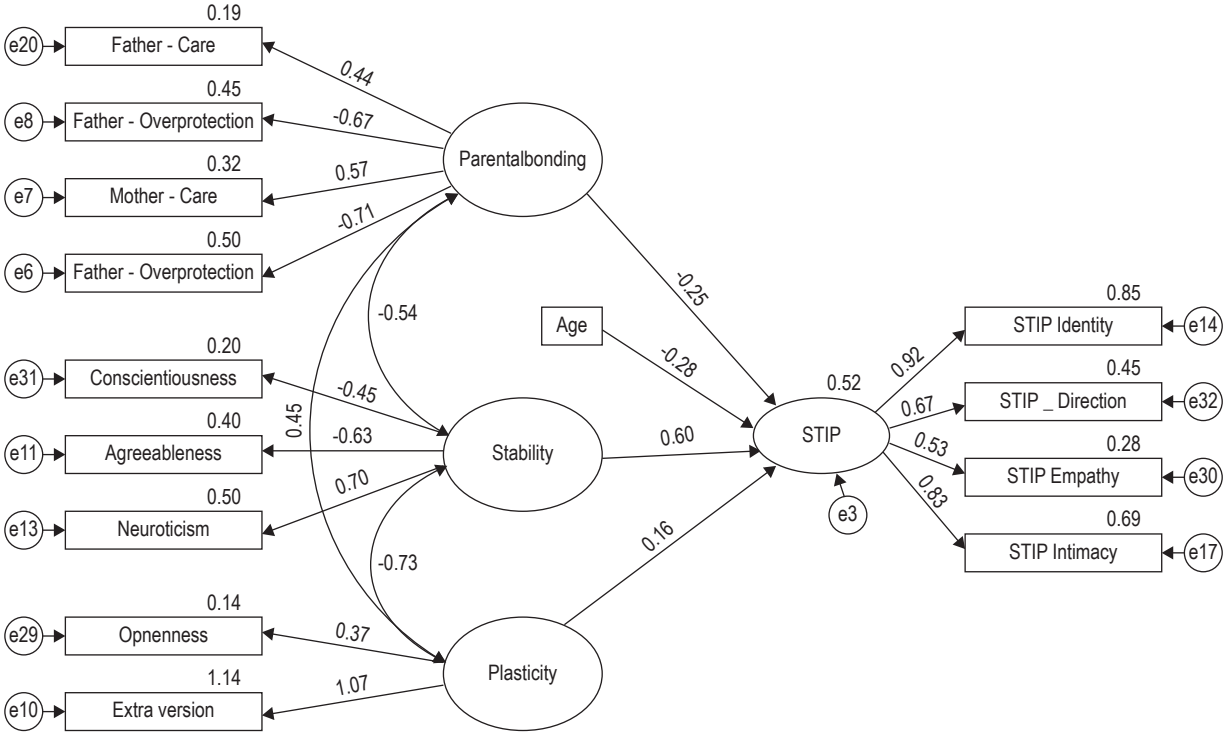

Figure 1. Hypothesized Model

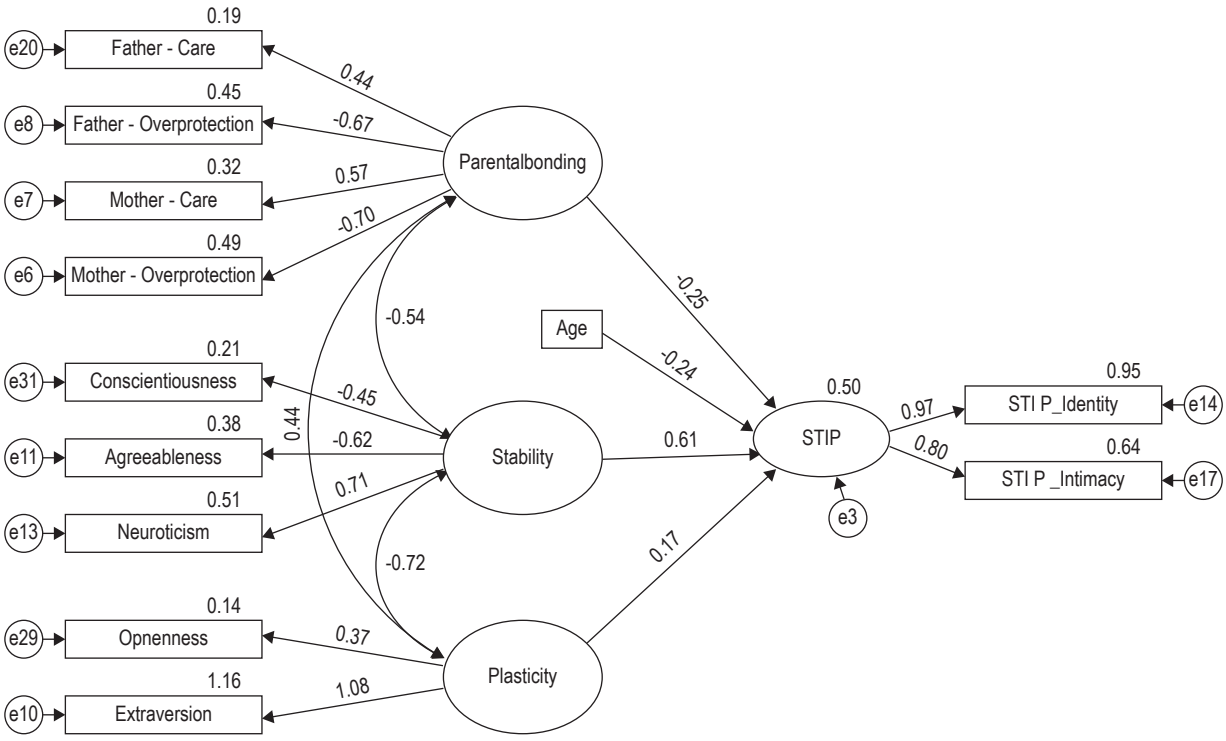

Figure 2. Respecified Model

Respecified Model

After removal of these two personality functioning dimensions, the respecified model showed improved fit. The chi-square goodness-of-fit statistic indicated a good correspondence between the proposed model and the data, X2(51) = 68.069, p = .069. Because the chi-square statistic is sensitive to sample size and deviations from normality, a Bollen-Stine bootstrap was also performed using 2,000 samples. This result was non-significant (p = .225), suggesting good fit between the proposed model and the observed data.

Absolute, incremental, and parsimonious fit indices were then examined to further evaluate model fit. The absolute fit indices indicated good fit: the X2/df ratio was 1.317, below the criterion of 3; the RMSEA was .055, below the .07 threshold; and the GFI was .955. Among the incremental indices, the NFI was .844, indicating moderate fit, whereas the robust CFI was .955, indicating very good fit.

Parsimonious fit indices also supported the respecified model. The PCFI was .695 and the PNFI was .614, both above the criterion of .50, indicating satisfactory model fit. No variable showed mis-specified error covariance greater than 10.

Next, we examined the standardized regression weights to determine how the two higher-order personality dimensions, parental bonding, and age predicted personality functioning and interacted with one another. This analysis used 2,000 bootstrap samples with bias-corrected 95% confidence intervals. Stability, plasticity, parental bonding, and age together explained 50% of the variance in personality functioning as indexed by the Identity and Intimacy subdimensions. Specifically, stability (β = .61, 95% CI [.013, 2.091], p = .045) and age (β = – .24, 95% CI [-3.82, – .061], p = .045) significantly predicted personality functioning. Plasticity did not reach significance (β = .169, 95% CI [-.163, 1.850], p = .206), and parental bonding was likewise non-significant (β = – .250, 95% CI [-5.66, .514], p = .262).

DISCUSSION

The present study examined how personality traits, parental bonding, and age relate to personality functioning in university students. The initial hypothesized model was evaluated using structural equation modeling with bootstrapping to increase robustness. After refinement, the respecified model demonstrated improved fit and provided a more nuanced understanding of the relationships among the study variables.

In the respecified model, overall fit indices indicated that the model structure adequately represented the observed data. Taken together, the indices suggest that the model captured the covariance structure among the measured variables reasonably well. Consistent with prior evidence, the results indicate that stability and age explained 50% of the variance in personality functioning when Identity and Intimacy were used as indicators.

The standardized regression weights showed that the stability domain emerged as the strongest predictor of emotional functioning, self-esteem, self-image, and the capacity to form meaningful and enduring interpersonal relationships. This finding is consistent with the assumption that enduring personality traits shape core aspects of personality functioning. More specifically, it accords with DeYoung's (2006) conceptualization of stability as the tendency to maintain a coherent psychosocial organization. Age also showed a significant negative association with impaired personality functioning (β = – .24), suggesting that older participants displayed lower levels of impairment.

Parental bonding and plasticity, however, did not significantly predict personality functioning. One possible explanation is that the effects of parental bonding and personality traits are mediated by other variables, such as peer relationships. Measurement-related limitations may also have played a role. For example, social desirability bias may have affected responses, particularly on emotionally sensitive topics such as parental relationships, thereby reducing the accuracy of self-report data.

Higher levels of impairment in personality functioning are associated with greater reliance on maladaptive defense mechanisms (Sarrar & Goth, 2022). Elevated impairment in the present sample may therefore indicate greater use of such mechanisms, which in turn could have influenced responses concerning parental bond-

ing. Another possible explanation is the discrepancy between self-report measures and expert-rated interviews. The STiP-5.1 is an expert-rated semi-structured interview, and clinician ratings may capture aspects of functioning that are not fully reflected in self-report data, which may partly explain the non-significant findings.

In addition, the latent structure of parental bonding may require reconsideration. The PBI has been studied extensively, and different factor structures have been proposed across populations. Three-factor and four-factor solutions have both been reported. For example, Cubis et al. (1989) proposed a three-factor model consisting of care, protection-personal, and protection-social domains. Murphy et al. (1997) proposed another three-factor model comprising care, protectiveness, and authoritarianism. In a Japanese sample, Uji et al. (2006) proposed a four-factor model consisting of care, indifference, overprotection, and autonomy. It is plausible that alternative model structures would yield different results in regression and path analyses, thereby offering a more nuanced understanding of these relationships.

LIMITATIONS

The present study has several limitations. First, the sample size was modest. Because the STiP-5.1 is a semi-structured interview that requires trained assessors and considerable administration time, it is challenging to balance methodological rigor with practical time and resource constraints.

Replication in other populations is also warranted. To provide a more comprehensive understanding of the relationships among the relevant variables, future studies should include samples from the general population. As noted above, university students are at a developmental stage during which identity and interpersonal relationships are still actively being shaped. As individuals approach major life milestones, such as establishing a stable career or starting a family, their perspectives on life and on relationships with others, including their parents, may also change.

We also recommend testing alternative factor structures of the parental bonding scale. A three-factor or four-factor representation of the instrument may yield different findings.

CONCLUSION

In summary, this study explored the relationships among personality traits, parental bonding, age, and the recently introduced construct of personality functioning. To the best of our knowledge, it is the first study to examine these variables jointly in this way.

We believe that this research offers a useful contribution to the personality and clinical psychology literature, and may also have broader relevance for psychological practice.

The data supporting the findings of this study are available from the corresponding author, Su Luo, upon reasonable request.

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