The Association Between Rejection Sensitivity and Borderline Personality Traits: A Meta-Analysis

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Abstract

Using meta-analysis to integrate existing empirical studies examining the association between rejection sensitivity and borderline personality features, this study aimed to analyze their relationship and simultaneously investigate other variables that may influence this association. Following literature search and screening, 50 eligible original studies were included, comprising 84 effect sizes with a total sample of 7,400 participants. Homogeneity tests indicated substantial heterogeneity among the included studies; consequently, subgroup and meta-regression analyses were conducted on various moderating variables. The results revealed that the association between rejection sensitivity and borderline personality features varied across subgroups of study design type, participant geographic location, sample type, borderline personality feature indicators, and rejection sensitivity measurement methods. Specifically, the strongest associations were observed in cross-sectional designs, samples from other regions, mixed participant groups, overall borderline personality features, and scale-based measurements. Age and proportion of female participants did not significantly moderate this association. Future research should employ longitudinal designs to further clarify the predictive directionality between the two constructs, examine associations between different components of rejection sensitivity and borderline personality features, and investigate their relationship within domestic contexts.

Full Text

The Relationship Between Rejection Sensitivity and Borderline Personality Features: A Meta-Analysis

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Abstract

This meta-analysis integrated existing empirical research examining the association between rejection sensitivity and borderline personality features, aiming to analyze their relationship while investigating potential moderating variables. Following systematic literature searching and screening, 50 original studies meeting inclusion criteria were identified, comprising 84 effect sizes and a total sample of 7,400 participants. Homogeneity tests indicated substantial heterogeneity among included studies, prompting further subgroup and meta-regression analyses of potential influencing factors. Results revealed that the association between rejection sensitivity and borderline personality features varied across different subgroups of study design type, geographic location, sample type, borderline personality feature indicators, and rejection sensitivity measurement type. Specifically, the strongest associations were observed in studies employing cross-sectional designs, non-Western samples, mixed clinical and non-clinical samples, overall borderline personality features, and questionnaire-based measurement of rejection sensitivity. Neither participant age nor proportion of female participants significantly moderated this association. Future research should employ longitudinal designs to clarify predictive directions, examine associations between different components of rejection sensitivity and borderline personality features, and investigate this relationship within Chinese cultural contexts.

Keywords: rejection sensitivity, borderline personality features, meta-analysis, subgroup analysis, meta-regression analysis

1 Introduction

Rejection sensitivity refers to a cognitive-affective processing disposition in which individuals anxiously anticipate, readily perceive, and overreact to cues of interpersonal rejection during social interactions (Zheng et al., 2020; Ding et al., 2020; Downey et al., 2004). The social-cognitive model of rejection sensitivity posits that the association between rejection cues and specific situations activates individuals' expectations of rejection from others. Consequently, individuals high in rejection sensitivity tend to perceive ambiguous behaviors as rejection (Downey & Feldman, 1996; Romero-Canyas et al., 2010). This pattern, in turn, may elicit rejecting behaviors from others, creating a self-fulfilling prophecy that negatively impacts interpersonal relationships (Pietrzak et al., 2005). Rejection sensitivity can be assessed through standardized psychological measures and behavioral experiments, including the Rejection Sensitivity Questionnaire (Downey & Feldman, 1996), Children' s Rejection Sensitivity Questionnaire (Downey et al., 1998), Adult Rejection Sensitivity Questionnaire (Berenson et al., 2009), Race-Based Rejection

Sensitivity Questionnaire (Mendoza-Denton et al., 2002), Appearance-Based Rejection Sensitivity Questionnaire (Park, 2007), Weight-Based Rejection Sensitivity Questionnaire (Brenchley & Quinn, 2016), and the Cyberball paradigm (Williams et al., 2000).

Borderline Personality Disorder (BPD) represents a severe and complex psychological condition that typically emerges in adolescence, becomes consolidated in early adulthood, and manifests across various contexts (APA, 2013). Its prevalence is approximately 1.5% in the general population and substantially higher in clinical populations, ranging from 9.3% to 46.3% (Torgersen, 2012). Compared to BPD, borderline personality features (hereafter referred to as BP features) are more prevalent in the general population (Ayduk et al., 2008; De Panfilis et al., 2016; Peters et al., 2015), primarily characterized by pervasive instability in emotion, interpersonal relationships, self-image, and marked impulsivity (Zhang et al., 2017; APA, 2013; Jobst et al., 2016). Research indicates that individuals with BPD and those high in BP features exhibit numerous social and emotional adjustment difficulties, including smaller social networks, poorer social skills, fewer diverse social roles (Beeney et al., 2018; Liebke et al., 2017), emotion dysregulation and intense negative emotions (Bottesi et al., 2018; Winter et al., 2017), and impulsive and suicidal behaviors (Berenson et al., 2016; Temes et al., 2019). BPD and BP features are typically assessed through clinical interviews and standardized psychological measures, including the Structured Clinical Interview for DSM-IV Patient Version (Spitzer et al., 1992) and Structured Clinical Interview for DSM-IV Axis II Personality Disorders (First et al., 1997), as well as instruments such as the McLean Screening Instrument for Borderline Personality Disorder (Zanarini et al., 2003), Personality Assessment Inventory-Borderline Features Scale (Morey, 1991), and Borderline Symptom List (Bohus et al., 2009).

Numerous studies have demonstrated an association between high rejection sensitivity and BP features (Ayduk et al., 2008). Need-to-belong theory posits that forming and maintaining stable interpersonal relationships constitutes a fundamental human motivation and foundation for psychological well-being (Baumeister & Leary, 1995). When individuals fail to gain acceptance from others, their need to belong remains unfulfilled (Twenge et al., 2002), making social rejection a significant negative event in social contexts and an important indicator of individual adaptation (Ding et al., 2015; Ma & Chen, 2019). On one hand, rejection sensitivity reflects patterns and tendencies in interpersonal interactions (Downey et al., 2004), while individuals high in BP features experience highly unstable interpersonal relationships. The rejection sensitivity model suggests that rejection experiences lead to elevated rejection sensitivity, which subsequently associates with perceived rejection cues, triggering cognitive-affective and behavioral responses that increase the likelihood of social exclusion and affect the mental health of individuals high in BP features (Levy et al., 2001). On the other hand, rejection sensitivity is associated with negative emotions (Ding et al., 2020; McDonald et al., 2010; Watson & Nesdale, 2012) and social avoidance and domestic violence behaviors (Gardner et al., 2020; Murphy &

Russell, 2016). These characteristics align with core features of BP features and correspond to the clinical features of BPD— "fear of rejection" and "real or imagined abandonment" (APA, 2013), suggesting a potential association between the two constructs. Additionally, rejection sensitivity may represent an adaptive response that helps individuals high in BP features avoid potential rejection cues or experiences, thereby minimizing their emotional pain and dysphoria, thus establishing an association with BP features (Ayduk et al., 2008).

From the perspective of BP features influencing rejection sensitivity levels, this occurs primarily through two pathways: negative emotional experiences and social relationships (Zheng et al., 2020). Bungert, Koppe, et al. (2015) found that compared to healthy individuals, BPD patients under conditions of social exclusion experienced more intense pain in response to temperature stimuli, indicating that individuals high in BP features experience more intense distress from social exclusion. Other research demonstrates that individuals high in BP features display fewer positive facial expressions in response to rejection information and exhibit more complex emotional expressions (Staebler et al., 2011). Furthermore, from the social relationships pathway, individuals high in BP features show lower facial trust evaluation (Miano et al., 2013) and lower expectations for future interpersonal relationship satisfaction (Lazarus et al., 2016), suggesting that individuals high in BP features have difficulty trusting others and lack social functioning, leading to more negative reactions in social interactions and subsequently increased rejection sensitivity levels.

It should be noted that despite extensive research examining the association between rejection sensitivity and BP features, findings remain inconsistent, with considerable divergence in the magnitude of correlations (De Panfilis et al., 2016; Dixon-Gordon et al., 2013; Foxhall et al., 2019; Gao et al., 2017; Lazarus et al., 2018). These discrepancies may be attributable to factors such as demographic variables of study participants, BP feature indicators, and rejection sensitivity assessment tools. For instance, from a research design perspective, data collection methods often represent important factors influencing research outcomes. Most studies on rejection sensitivity and BP features have employed either cross-sectional homologous and paired designs or laboratory experimental designs, both of which, in conjunction with rejection sensitivity measurement tools, may affect the association between the two constructs. Generally, rejection sensitivity measurement tools include standardized psychological questionnaires and experimental paradigms (i.e., Cyberball). The former relies on participants' imagined scenarios (Berenson et al., 2009; Downey & Feldman, 1996), while the latter immerses participants in more realistic interpersonal interactions (Williams et al., 2000; Williams, 2007). Moreover, compared to psychological questionnaires, laboratory experiments tend to simulate potential social scenarios, more easily activating brain regions related to emotion regulation and social feedback, thus providing greater immersion (Renneberg et al., 2012; Wang et al., 2017; Williams et al., 2007; Wrege et al., 2019). Consequently, data obtained solely through questionnaire measurement or cross-sectional data collection may yield relatively weaker associations.

Demographic variables may also influence the association between rejection sensitivity and BP features. First, the proportion of female participants in samples may affect this relationship, as gender differences exist in both rejection sensitivity and BP features, potentially influencing the strength of their association. Downey and Feldman (1996) noted that men high in rejection sensitivity are more likely to experience anger in response to rejection cues, leading to more violent behaviors, whereas women are more prone to rumination and reduced positive investment in relationships, resulting in more anxiety. Additionally, compared to men, women are more sensitive to negative evaluation in social contexts (Ran et al., 2018). Nevertheless, some studies have found that men' s BP features are negatively correlated with social support from friends, whereas no significant correlation exists among women, possibly because women' s friendships are more intimate and provide more social support (Eschenbeck et al., 2007; Koster et al., 2018). Second, age may exert an influence. From the perspective of rejection sensitivity levels, Sebastian et al. (2011) found that functional development of affective circuits influences individuals' sensitivity to rejection cues, suggesting that adolescents exhibit higher rejection sensitivity compared to developmentally mature adults. Moreover, emotion regulation abilities improve with age (Hay & Diehl, 2011), meaning that for younger children and adolescents, maladaptive cognitions and behavioral impulsivity are more easily triggered (Zhang et al., 2020; Zheng et al., 2019), resulting in stronger associations at younger ages. Third, geographic location of participants may play a role. Different regions exhibit distinct patterns of interpersonal relationship establishment. Compared to collectivist cultures where interpersonal relationships are relatively fixed and focus more on others' evaluations, individuals in individualist cultures tend to establish social relationships through more autonomous choices and focus more on personal interests (Chen et al., 2018; Falk et al., 2009). Additionally, regarding tolerance for ambiguous information or perceived threat from ambiguous information, uncertainty avoidance levels are relatively low in European and American countries, whereas high uncertainty avoidance may lead individuals to rely on rigid behavioral norms, resulting in higher rejection sensitivity and social exclusion (Zotzmann et al., 2019). Therefore, the association between rejection sensitivity and BP features may be stronger in non-European and American samples. Fourth, sample type may influence the relationship. Research indicates that BPD patients exhibit higher rejection sensitivity levels compared to patients with other psychiatric disorders (Gao et al., 2017), and when healthy samples are included, BPD patients still show significantly higher rejection sensitivity than healthy individuals (Foxhall et al., 2019). Zielinski and Veilleux (2014) also argue for the necessity of examining differences between healthy samples and BPD patients. Most previous research on the association between rejection sensitivity and BP features has been based on three sample types: clinical samples, healthy samples, and mixed samples (including both clinical and non-clinical participants). Given the difficulties in diagnosing and treating BPD, more research has shifted focus to BP features, suggesting that the association may be stronger in broader, more heterogeneous mixed samples.

Finally, BP feature indicators may affect the association between rejection sensitivity and BP features. BP features comprise four clinical indicators of BPD: emotional instability, interpersonal instability, self-image instability, and behavioral impulsivity (APA, 2013; Jobst et al., 2016). However, most previous studies examining the association between rejection sensitivity and BP features have investigated overall BP feature levels without focusing on specific aspects (Armenti & Babcock, 2018; Masland, 2016; Sato et al., 2018). Therefore, this study examines the influence of different BP feature indicators on their association, hypothesizing that the association may be stronger when examining overall BP feature levels.

Although existing meta-analyses have examined associations between rejection sensitivity and BPD or BP features, they primarily aimed to draw general conclusions about the relationship and only examined sample type (clinical vs. nonclinical) as a moderator, without comprehensively exploring other potential influencing factors (Cavicchioli & Maffei, 2019; Foxhall et al., 2019; Gao et al., 2017). Consequently, this study adopts a more comprehensive perspective to analyze studies on the relationship between rejection sensitivity and BP features and examine differences in their association across various subgroups. This approach not only prevents biased results due to sample heterogeneity but also helps researchers obtain more precise conclusions in specific subgroups, providing direction for future research.

In summary, this study hypothesizes that study design type, proportion of female participants, age, geographic location, sample type, BP feature indicators, and rejection sensitivity measurement tools all influence the association between rejection sensitivity and BP features.

2.1 Literature Search

Literature for this meta-analysis included both Chinese and English studies. Chinese literature was systematically searched in the China National Knowledge Infrastructure (CNKI) Journal Full-text Database, Chinese Excellent Master' s and Doctoral Dissertation Database, Wanfang Database, and VIP Information Database. Keywords "rejection" and "rejection sensitivity" were paired with "borderline personality" and "borderline personality disorder." English literature was searched in Ebsco, Science Direct, Springer Online Journals, Wiley, and ProQuest databases. Keywords "rejection sensitivity," "sensitivity of rejection," or "rejection" were paired with "borderline personality disorder," "borderline characteristic," "borderline states," "borderline personality," "borderline personality features," "borderline personality symptoms," or "BPD" to identify articles containing these terms in titles or keywords. Additionally, a backward citation search was conducted by examining reference lists of retrieved articles to identify any missing studies. A total of 1,184 articles were initially identified.

Inclusion criteria for this meta-analysis were as follows: (1) studies must examine the association between rejection sensitivity and BP feature indicators (over-

all, emotional, interpersonal, self-image, behavioral); (2) studies must clearly report measurement tools and provide statistical information sufficient for effect size calculation (including sample size, means, standard deviations, t-values, p-values, and correlations between the two variables); (3) when multiple articles used the same dataset, only the one with the most comprehensive information was coded; (4) articles containing multiple independent samples (e.g., examining both emotional and self-image aspects of BP features) were coded separately; (5) imaging-related information and effect sizes were excluded. Based on these criteria, 50 articles were included in the meta-analysis, comprising 7,400 participants and 84 effect sizes. The literature screening flowchart is presented in Figure 1 [Figure 1: see original paper].

2.2 Literature Coding

Following literature retrieval and screening, eligible studies were organized and coded as shown in Table 1 . Given that this study aimed to examine whether different subgroups moderate the association between rejection sensitivity and BP features, the coding process recorded not only relevant statistical results but also coded potential moderating variables such as study design and age. The coding sheet included the following variables in order: publication information, sample size, study design, geographic location, sample type, proportion of female participants, age, rejection sensitivity measurement type, BP feature indicator, and correlation coefficient. Notably, if an article reported multiple independent samples, each sample was coded separately.

Table 1 Basic Information of Original Studies Included in the Meta-Analysis

Note: Multiple independent samples from the same study are distinguished by uppercase letters. "/" indicates that the information was not reported in the article.

2.3 Meta-Analysis Procedure

Comprehensive Meta-Analysis 2.0 (CMA 2.0) was used to code and analyze data from the selected studies. Given that this study focused on how different variables influence the association between rejection sensitivity and BP features, correlation coefficients (r) were selected as the effect size. During coding, some studies did not directly report correlation coefficients (r) between the two variables but instead reported F-values, t-values, or d-values. However, regardless of the original data format, CMA software could convert the coded data into the required effect size, yielding synthesized correlation coefficients. Additionally, because some articles included multiple participant groups, this study presents multiple independent effect sizes for each study, resulting in a total of 84 independent effect sizes.

Current meta-analyses primarily employ fixed-effect models and random-effects models to analyze results. The fixed-effect model assumes that all included

studies share a single true effect size, with variation in effect sizes attributable solely to random error. In contrast, the random-effects model assumes that each included study may have a different true effect size, with variation resulting from both true differences and random error (Borenstein et al., 2009). When meta-analytic studies involve different participant populations, measurement tools, and other variables that may influence main effects, the random-effects model should be used (Shao et al., 2019; Zhang et al., 2019). Given that this study aimed to examine how different variables influence the association between rejection sensitivity and BP features, the random-effects model was adopted for data analysis.

Furthermore, this study employed two methods to examine how other variables influence the association: (1) subgroup analysis for categorical variables, and (2) meta-regression analysis for continuous variables.

3.1 Heterogeneity Test

Heterogeneity test results are presented in Table 2 . The Q statistic was 1,715.73 ($p < 0.001$), and the I-squared value was 95.16%, indicating that 95.16% of the observed variation in the association between rejection sensitivity and BP features resulted from true differences in the association, while only 4.84% of the variation was due to random error. According to the I-squared cutoffs of 25%, 50%, and 75%, corresponding to low, moderate, and high heterogeneity (Higgins et al., 2003), the effect sizes in this study exhibited high heterogeneity, suggesting that the variation in estimates may be influenced by other factors. Therefore, drawing overall general conclusions was not appropriate, and further examination of variables influencing the association was warranted.

Table 2 Heterogeneity Test of Effect Sizes (Q Statistics)

3.2 Publication Bias Test

The fail-safe N was 5,018. When the fail-safe N exceeds 5K + 10 (where K represents the number of independent samples), the likelihood of publication bias is small (Rothstein et al., 2006). Accordingly, this meta-analysis showed minimal publication bias. Additionally, the funnel plot showed a symmetrical distribution, further indicating low likelihood of publication bias. The plot showed fewer points in the lower right region, indicating fewer studies with large effect sizes and low precision. Finally, most points were concentrated at the top of the funnel, where points clustered at the vertex indicate smaller error and larger sample sizes. Taken together, these results suggest that this meta-analysis was minimally affected by publication bias (see Figure 2 [Figure 2: see original paper]).

3.3 Subgroup Analysis

Given the high heterogeneity, this study focused on subgroup analyses of the association between rejection sensitivity and BP features, examining whether the association differed significantly across subgroups defined by study design type, geographic location, sample type, BP feature indicators, and rejection sensitivity measurement type. Study design types included cross-sectional and laboratory experimental designs (longitudinal designs were not included due to absence in the literature). Geographic locations were categorized as European/American regions and other regions. Sample types included clinical samples, healthy samples (non-clinical), and mixed samples (including both clinical and non-clinical participants). BP feature indicators were classified according to their definitions as overall (without examining specific aspects), emotional, interpersonal, self-image, and behavioral. Rejection sensitivity measurement types included questionnaire/scale measures and behavioral experiments.

As shown in Table 3 , subgroup analysis results indicated that for study design, the correlation between rejection sensitivity and BP features was highest in cross-sectional designs ($r = 0.41$, $p < 0.001$). For geographic location, the correlation was highest in non-European/American samples ($r = 0.58$, $p < 0.001$). For sample type, the correlation was highest in mixed samples ($r = 0.53$, $p < 0.001$). For BP feature indicators, the correlation was highest for overall BP features ($r = 0.45$, $p < 0.001$). For rejection sensitivity measurement type, the correlation was highest when measured by questionnaires ($r = 0.43$, $p < 0.001$).

Table 3 Subgroup Analysis Results

3.4 Meta-Regression Analysis of Age and Female Participant Proportion Across Subgroups

This study further employed meta-regression to examine the influence of age and proportion of female participants—two continuous variables—on the association between rejection sensitivity and BP features across different subgroups. Following Jin et al.' s (2019) recommendation, this study selected subgroups with larger independent sample sizes to investigate the effects of age and female proportion. As shown in Table 4 , in the subgroups of cross-sectional design, European/American samples, overall BP features, and questionnaire measurement, neither age nor proportion of female participants significantly moderated the association ($ps > 0.05$).

Table 4 Meta-Regression Analysis Results

4 Discussion

This meta-analysis collected and integrated previous empirical research to examine the magnitude of association between rejection sensitivity and BP features, finding substantial heterogeneity among included studies. Based on this finding, this study focused on further analysis of factors influencing the association

between rejection sensitivity and BP features, including study design type, geographic location, sample type, BP feature indicators, rejection sensitivity measurement type, age, and proportion of female participants. Subgroup analysis was employed for categorical variables, while meta-regression was conducted for continuous variables within subgroups with larger sample sizes to examine differences in the association between rejection sensitivity and BP features across subgroups.

Previous research has demonstrated a positive correlation between rejection sensitivity and BP features (Cavicchioli & Maffei, 2019; Foxhall et al., 2019; Gao et al., 2017). On one hand, the rejection sensitivity model suggests that rejection sensitivity promotes activation of defensive motivational systems to help individuals maintain safety and avoid anticipated or perceived threats (Downey et al., 2004), particularly in response to rejection cues in interpersonal interactions. This is closely related to "fight-or-flight responses" characterized by specific emotions (e.g., anger, anxiety) and hostility, manifesting as negative emotions and social avoidance or violent behaviors (Gardner et al., 2020; McDonald et al., 2010; Murphy & Russell, 2016), which aligns with core features of BP features. The behavioral impulsivity characteristic of individuals high in BP features may represent maladaptive self-regulation mechanisms more likely to manifest in individuals high in rejection sensitivity. Their belief of being "abandoned by the world" can be explained through expectations of social rejection, representing extreme sensitivity to rejection cues (Cavicchioli & Maffei, 2019), and this effect may be exacerbated when individuals experience intense emotions that impair their ability to discriminate social cues (Daros et al., 2013). On the other hand, individuals high in rejection sensitivity experience interpersonal difficulties similar to those high in BP features (Downey & Feldman, 1996). Self-fulfilling prophecies may be realized through the pathway: "high rejection sensitivity $\rightarrow$ perceiving more rejection messages and stronger behavioral reactions when facing the same ambiguous social threat cues $\rightarrow$ influencing others' behaviors $\rightarrow$ being socially rejected" (Pietrzak et al., 2005). For individuals high in BP features, experiencing rejection from others increases their rejection sensitivity levels through self-fulfilling prophecies and validates their core belief of abandonment, reinforcing this belief and further impairing their social functioning (Beeney et al., 2018). Moreover, BPD patients or individuals high in BP features inherently tend to perceive social cues as social rejection due to poor social skills and emotion regulation abilities (Beeney et al., 2018; Bottesi et al., 2018; Winter et al., 2017), attributing rejection from others to personal qualities and exhibiting impulsive behaviors (Berenson et al., 2016; Berenson et al., 2018), which may further negatively impact others' behaviors or perceptions, leading to actual rejection. This rejection not only increases rejection sensitivity levels but also intensifies BP features, creating a vicious cycle. However, numerous factors may influence the association between rejection sensitivity and BP features, making it essential to examine how specific moderating variables affect this relationship and under what conditions the association is strongest.

4.1 The Influence of Different Variables on the Association Between Rejection Sensitivity and Borderline Personality Features

Previous research has paid insufficient attention to variables that may influence the relationship between rejection sensitivity and BP features, though different subgroups may explain the wide range of associations reported in previous studies. This study examined the influence of study design type, geographic location, sample type, BP feature indicators, and rejection sensitivity measurement type on the association through subgroup analysis, with results partially consistent with hypotheses.

Results showed significant differences in correlation coefficients between rejection sensitivity and BP features across different study designs, with larger effect sizes obtained in cross-sectional studies. Similarly, rejection sensitivity measurement type significantly influenced the association, with questionnaire-based measures producing larger effect sizes than behavioral experiments. These findings contradict our hypotheses, suggesting that the strength of association is not affected by experimental context or participant engagement but is instead stronger when using cross-sectional designs and questionnaire measures. This may be related to the core BPD feature of "real or imagined abandonment," as BPD patients tend to amplify the likelihood of rejection scenarios (APA, 2013). In laboratory experiments, the Cyberball paradigm used by participants has predetermined parameters for social rejection and acceptance set by experimenters. Although this creates immersion, it also imposes limitations, such as fewer interaction partners and lack of real-world context. When facing questionnaire scenarios without predetermined rejection parameters, individuals may associate questionnaire situations with specific life events and tend to believe they will be rejected, perceiving higher levels of exclusion and consequently reporting higher rejection sensitivity. Additionally, this may be due to the relatively small number of studies using experimental methods or the Cyberball paradigm to measure rejection sensitivity.

Regarding sample demographic variables, significant differences emerged based on geographic location. Compared to European/American regions where individualist culture prevails, the association was stronger in samples from other regions. This may reflect cultural differences. On one hand, Asian regions, deeply influenced by Confucian culture, place high value on interpersonal relationships, and individuals are particularly concerned with others' evaluations (Chen et al., 2018). For example, Chinese children are taught from an early age to prioritize interpersonal relationships and pay attention to group dynamics (Ding et al., 2015), which may lead to higher rejection sensitivity and tendency to perceive ambiguous social cues as rejection. On the other hand, European/American countries generally exhibit lower uncertainty avoidance, while other regions (particularly Asia) show higher uncertainty avoidance and greater reliance on strict behavioral norms, which may contribute to higher rejection sensitivity and affect interpersonal processes (Zotzmann et al., 2019). Therefore, the association between rejection sensitivity and BP features appears stronger

in non-European/American samples.

Second, sample type significantly influenced the association, with the largest effect size observed in mixed samples (including both healthy and clinical participants), consistent with our hypothesis. This may be because studies with mixed samples often simultaneously examine differences between clinical patients and control groups, focusing more broadly on BP features with more diverse participant characteristics, resulting in larger effect sizes. This suggests that the association between rejection sensitivity and BP features exists universally across healthy individuals, BPD patients, and individuals with other psychiatric disorders. Regarding BP feature indicators, studies reporting overall BP feature levels showed the largest effect sizes, consistent with hypotheses and indicating that although rejection sensitivity is based on interpersonal relationships, its association with BP features extends beyond interpersonal instability to comprehensive effects. For example, individuals high in rejection sensitivity may respond to perceived rejection with anger, leading to hostile reactions or aggressive behaviors to gain recognition or retaliate against those who rejected them (Bondü & Richter, 2016; Jacobs & Harper, 2013), thus linking to behavioral instability in BP features. This validates the cognitive-affective personality system theory perspective that "individuals' cognition, emotion, and behavior are functions of the interpersonal systems in which they are embedded." Furthermore, rejection sensitivity may influence emotion, behavior, and self-image (Ding et al., 2020; Gardner et al., 2020; McDonald et al., 2010), thereby affecting overall BP feature levels. Alternatively, the instability in emotion, interpersonal relationships, and self-image, along with behavioral impulsivity characteristic of individuals high in BP features, may increase vulnerability to social exclusion (Beeney et al., 2018; Berenson et al., 2016; Bottesi et al., 2018; Winter et al., 2017). Combined with their core cognition of "fear of abandonment" (APA, 2013), this may further elevate rejection sensitivity levels, creating a vicious cycle.

Additionally, following previous recommendations (Jin et al., 2019), this study selected subgroups with larger independent sample sizes and used meta-regression to examine the influence of age and proportion of female participants on the association between rejection sensitivity and BP features. Contrary to hypotheses, age and proportion of female participants did not significantly moderate the association in subgroups of cross-sectional design, European/American samples, overall BP features, and questionnaire measurement. Regarding age, this may be because interpersonal relationships are important for individuals across all age groups. The samples included in this meta-analysis primarily comprised adolescents and adults, and existing research has found that certain social relationship stressors (e.g., adolescents interpreting lack of peer support as criticism or social exclusion) can predict depressive symptoms in adolescents, particularly for individuals high in rejection sensitivity (Chango et al., 2012). However, adult stressors such as socioeconomic status and childhood experiences can also predict anxiety and depression (Fan et al., 2020; Jones et al., 2018). Thus, both adolescents and

adults may experience internalizing problems due to different interpersonal stressors. Additionally, researchers have found that from adolescence onward, as self-awareness strengthens, individuals begin to pay more attention to connections between self and society (Guo & Lei, 2006), suggesting that age effects may not be evident between adolescence and adulthood but may emerge between childhood and other age groups. Regarding proportion of female participants, although women often have more social support, better empathy, and communication skills (Zhang et al., 2019; Eschenbeck et al., 2007), they are also more sensitive to negative evaluation in social contexts (Ran et al., 2018). Gender differences may exist in specific aspects of the association rather than in the overall relationship. For example, men and women process rejection information differently, with men showing more anger and women showing more anxiety in response to rejection (Downey & Feldman, 1996). Women may exhibit more emotional distress corresponding to emotional indicators of BP features, while men may show more impulsive behaviors corresponding to behavioral indicators (Carlson et al., 2020; Sher et al., 2019).

4.2 Limitations and Future Directions

This study has several limitations: (1) Meta-analytic methods require comprehensive inclusion of existing literature. Although this study used systematic search tools to collect studies as thoroughly as possible, some data may have been missed, such as studies still in progress not yet available in public databases or studies excluded due to language restrictions. (2) Some subgroups exhibited uneven sample distribution, with some categories containing only a few effect sizes, creating large discrepancies in sample sizes across levels and potentially introducing bias in subgroup analysis results. (3) Additional variables that may influence the association were not included in the analysis.

Future research should consider: (1) This study only extracted zero-order correlation coefficients and possible moderators from original articles; future research could explore potential mediating mechanisms. (2) This meta-analysis did not include longitudinal studies, preventing examination of predictive directions between rejection sensitivity and BP features, primarily because longitudinal empirical evidence is still lacking. Future research should employ longitudinal designs to investigate potential reciprocal predictive relationships. (3) Few included studies examined the influence of rejection sensitivity components (anger component, anxiety component, rejection expectations) on BP features; future research could explore differential associations among these components. (4) Chinese researchers could investigate this issue further by examining moderating variables within Chinese cultural contexts.

Key Findings: 1. The strongest correlations between rejection sensitivity and borderline personality features were found in studies using cross-sectional designs, non-Western samples, mixed clinical and non-clinical samples, overall borderline personality features, and questionnaire-based measurement. 2. In subgroups of cross-sectional design, European/American samples, overall bor-

derline personality features, and questionnaire measurement, neither age nor proportion of female participants significantly moderated the association between rejection sensitivity and borderline personality features.

(* indicates studies included in the meta-analysis)

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Note: Figure translations are in progress. See original paper for figures.