

The Role of Attachment Security and Invalidation in Borderline Symptomatology

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Abstract

This study examined the association between perceived emotional invalidation and Borderline Personality (BP) features, and the role of perceived attachment security within primary caregiver and romantic relationships as a potential mediator. Participants ($n = 180$) were recruited from a university student population and the general public. Data were collected regarding perceived experiences of invalidation and attachment security, as well as the presence of BP features. Perceived invalidation in both caregiver and romantic relationships was positively associated with BP features. These findings support Linehan's hypothesis that childhood invalidation is a risk factor for BP features and suggest that invalidation may have a role in maintaining BP features in adulthood. Additionally, results suggest that perceived attachment security accounted for the association between perceived invalidation and BP features. Findings suggested that attachment-related anxiety, and not attachment-related avoidance, explained the link between perceived invalidation and BP features in childhood and adulthood relationships.

Keywords: Borderline Personality; Symptomatology; Attachment Security; Attachment-Related Anxiety, Attachment-Related Avoidance; Invalidation; Adulthood, Childhood

To Susan.
For without you, I am incomplete.

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1. Introduction

Borderline Personality Disorder (BPD) is described as a “pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity” (American Psychiatric Association [APA], 2013, p. 663). Individuals with BPD experience functional impairment because of disturbed interpersonal relatedness and behavioural and affective dysregulation (Sanislow, Grilo, Morey, Bender, Skodol, & Gunderson, 2002). The prevalence of BPD ranges between 1-6% in the general population and between 15-20% in clinical populations. Individuals diagnosed with BPD make up a larger than expected proportion of individuals receiving inpatient and outpatient mental health services (Crowell, Beauchaine, & Linehan, 2009; Skodol, Gunderson, Pfohl, Widiger, Livesley, & Siever, 2002).

BPD is associated with myriad negative consequences for the affected individual and others who interact with that person. Affected individuals can experience an unclear sense of identity and he or she may struggle with labile states of anger, anxiety, and depression (Koenigsberg et al., 2002). The individual may experience instability in self-image and emotional sensitivity and reactivity (Gunderson, 2007). Disturbed relationships, characterized by abandonment fears and vacillation between extremes of idealization and devaluation, may also be experienced (Gunderson, 2007). Furthermore, BPD is related to heightened trait impulsivity as well as potentially self-damaging behaviours, such as substance abuse, eating disorders, and other reckless behaviours (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). BPD is also associated with high prevalence rates of self-harm (80%; Gunderson & Ridolfi, 2001) and completed suicide (10%; APA, 2010).

Linehan (1993) proposed a biosocial theory suggesting that an invalidating environment and a biological predisposition for emotion vulnerability are precursors of BP features. An invalidating environment occurs when children experience repeated criticism, trivializations and punishment for attempting to communicate their internal

thoughts and feelings, intermittent reinforcement of emotional escalation, and oversimplification of the ease of problem solving and meeting one's needs (Linehan, 1993; Wagner & Linehan, 1997). Emotional vulnerability refers to a low threshold for emotional reactions, intense emotional responses, and a slow return to an emotional baseline (Crowell et al., 2009). The transaction of emotional vulnerability and an invalidating environment influences the development of emotional dysregulation and BP features (Chapman, Dixon-Gordon, Layden, & Walters, 2010; Chapman, Leung, & Lynch, 2008).

Studies examining the development of BP features have been under-represented in the research (Crowell et al., 2009). More specifically, related to the aims of the current study, there has been a significant lack of research into the impact of social environment and the course of BP features (Hooley, Phil, & Hoffman, 1999) beyond the effects of extreme invalidation such as child sexual and physical abuse (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). There are inconsistent findings in previous studies on the association between invalidating environments and emotional dysregulation. Some studies have suggested that different forms of invalidation may be associated with the presence of BP features. Cheavens et al. (2005) completed a self-report study of college students ($n = 202$) and found associations ($r = .23-.38$) between parental criticism and BP features. Rosenthal, Cheavens, Lejuez, and Lynch (2005) completed a self-report study of a community sample ($n = 127$) and found that childhood sexual abuse, which may be considered an extreme form of invalidation (Linehan, 1993), significantly predicted BP features. Shenk and Fruzzetti (2011) found that invalidating responses, compared to validating responses, generally lead to significantly higher levels of negative affect, heart rate, and skin conductance in a group of undergraduate students ($n = 60$), without consideration for levels of BP features. Other studies have not demonstrated a link between invalidation and BP features. Hooley et al. (1999) completed a longitudinal study of patients diagnosed with BPD ($n = 35$) and concluded that relatives' expressed emotion (the outward, invalidating expression of hostile or critical attitudes towards another person) did not predict emotional dysregulation. Reeves, James, Pizzarello, and Taylor (2010) conducted a cross-sectional study to examine the relations among self-reported BP features, two personality traits (negative emotionality and constraint) and three variables from the biosocial theory (emotional

vulnerability, invalidation, and emotional dysregulation) in a sample of female college students ($n = 1004$). Reeves et al. found that although emotional vulnerability and emotional dysregulation were uniquely related to BP features after controlling for personality traits, emotional invalidation was not significantly associated with BP features.

1.1. Attachment Security and Invalidation

One approach to explain the effects of invalidation on BP features is an attachment-based model, which emphasizes the relationship between child and caregiver (Fonagy, Gergely, Jurist, & Target, 2002; Gunderson & Lyons-Ruth, 2008). Attachment theory was originally developed by Bowlby (1982) to explain attachment relationships, which refer to lasting emotional bonds between children and their caregivers. Attachment relationships are marked by the presence of three attachment related functions (Fraley & Shaver, 2000). *Proximity maintenance* refers to the tendency for an individual to remain in close contact with the attachment figure. *Safe haven* refers to an individual seeking safety and support from the attachment figure in times of illness, danger, or threat. *Secure base* refers to how the presence of the attachment figure promotes feelings of security and confidence which allows the individual to explore their surrounding environment. One assumption of attachment theory is that individuals' representations of others plays a fundamental role in determining how they think, feel, and behave in interactions with others (Bowlby, 1982). The attachment system is most active during times of distress or in contexts in which individuals perceive a threat to their relationship (Bowlby, 1982; Levy, Ellison, Scott, & Bernecker, 2011). Hazan and Shaver (1987) later extended the concept of attachment to adult romantic relationships.

In childhood caregiver and adulthood romantic relationships, there can be a variable degree of security (Bowlby, 1982; Hazan & Shaver, 1987). *Security* is defined as a function of anxiety and avoidance (Fraley & Shaver, 2000). *Attachment-related anxiety* refers to the extent to which an individual perceives a significant other as being available, responsive, and attentive (Fraley, 2012; Fraley & Shaver, 2000). *Attachment-related avoidance* refers to the extent to which an individual is uncomfortable being close to others versus secure in depending on others (Fraley, 2012; Fraley & Shaver, 2000).

Attachment-based models suggest that BP features develop through the interaction of caregiving and biological vulnerabilities of the child resulting in an impaired sense of security and self in the child (Cole, Llera, & Pemberton, 2009). In particular, children fail to develop the ability to understand the mental state or reflect on experiences of the self or others which compromises their sense of security and self (Fonagy et al., 2002; King-Casas, Sharp, Lomax-Bream, Lohrenz, Fonagy, & Montague, 2008). Without a properly developed sense of security and self, children who are maltreated by a caregiver have a tendency to detach from the caregiver to cope with their overwhelming emotions (Cole et al., 2009). Negative interaction patterns between the child and the caregiver lead to the development of less secure forms of attachment (i.e., high attachment-related anxiety or high attachment-related avoidance; Fonagy et al., 2002; Gunderson & Lyons-Ruth, 2008) which have a high prevalence in individuals with BP features (Agrawal, Gunderson, Holmes & Lyons-Ruth, 2004). Secure attachment results from an emotionally responsive environment in which children develop confidence that emotional distress can be relieved (Fonagy et al., 2002; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Linehan, 1993; Smith, Calkins, & Keane, 2006). Insecure attachment can result from emotionally restricted environments that lead to underdeveloped emotional awareness and stability (Fonagy et al., 2002; Gilliom et al., 2002; Linehan, 1993; Smith et al., 2006).

Through development from infancy to adulthood, BP features may arise because of real or perceived events in relationships (Levy, Beeney, & Temes, 2011). Unimportant separations of child and caregiver (e.g., absences of the caregiver due to day-to-day responsibilities) may be perceived as rejection, initiation of intimacy may be seen as intrusive, and differences of opinion may be taken as threatening (Pilkonis, 2002; Yeomans & Levy, 2002). In a prospective longitudinal study of potential antecedents of BPD during infancy to adulthood, Carlson, Egeland, and Sroufe (2009) found that temperament, attachment, and disruptions of relationships predicted BP features in adulthood. In a longitudinal study of BP features, Crawford, Cohen, Chen, Anglin, and Ehrensaft (2009) found that maternal separations in early childhood years lasting one month or more were associated with a greater presence of BP features in adolescence and early adulthood. Various self-report studies on the impact of relational experiences on adult BPD have suggested that negative childhood experiences (e.g.,

abuse, trauma, and perceived emotional invalidation) contribute to adult romantic relationship impairments including dysfunctional ideas about self, difficulties in social problem solving, and adult BP features (Bierer et al., 2003; Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009; Goodman & Yehuda, 2002; Kaehler & Freyd, 2009; Selby, Braithwaite, Joiner, & Fincham, 2009; Widom, Czaja, & Paris, 2009). These studies suggest that attachment security may be a significant factor in the development of BP features (Levy, Beeney et al., 2011).

Although attachment-based models provide insight into BPD development during childhood and adolescence, there is a lack of research on how attachment security and invalidation might contribute to BP features in adulthood. Allen and Farmer (1996) have suggested that family interactions, specifically caregiver behaviours of over-involvement and under-involvement, maintain self-destructive behaviours in young adults with BP features. They also claimed that negative family reactions to new behaviours acquired by the individual with BP features during therapy make change in the individual difficult (Allen & Farmer, 1996).

As individuals move through adolescence and adulthood, they form attachments to people other than their caregivers, resulting in a hierarchy of attachment relationships (Trinke & Bartholomew, 1997). The focus of primary attachments shifts from caregivers to others (i.e., peers, romantic partners), as a function of the number and nature of attachment relationships (Trinke & Bartholomew, 1997). Over time, romantic partners become the most significant attachment relationship for those who are coupled (Trinke & Bartholomew, 1997). The attachment hierarchy results in an expansion, as opposed to a replacement, of the relationships that offer attachment related functions (Fraley & Davis, 1997; Trinke & Bartholomew, 1997). The longer new relationships persist, the more attachment related functions evolve within that relationship (Fraley & Davis, 1997). As a result of this expansion of attachment-related functions and the transactional nature of BP features (i.e., interactions of individual functioning and environmental conditions; Linehan, 1993, p. 39), it is possible that individuals with BP features and insecure attachment will experience invalidation in adult romantic relationships. Insecure attachment may stimulate dysfunctional relationship behaviour and contribute to relationship dissatisfaction (Kunce & Shaver, 1994; Simpson, Rholes, & Nelligan, 1992). The relation between couple dynamics and BP features is likely bidirectional or

reciprocal (Bouchard & Sabourin, 2009), suggesting that romantic relationship attachment may affect the presence of BP features.

1.2. Aims and Hypotheses

Successful clinical interventions for individuals with BP features require the development of interpersonal adaptation and emotion regulation skills (Neacsiu, Rizvi, & Linehan, 2010). A thorough understanding of the association between couple dynamics and BP features in romantic relationships has the potential to improve treatment approaches that develop these skills. Furthermore, identifying characteristics that are shared or mutually exclusive to each of the caregiver and romantic partner relationships may lead to the creation of relationship type-specific treatment approaches. To advance these treatment developments, it is critical to understand the specific effects of invalidation and the influence of attachment security on the individual with BP features within adult romantic relationships.

There are limitations in the understanding of BPD development due to a lack of study of attachment security in the romantic relationships of individuals with BP features. First, how the expansion of the attachment relationship hierarchy affects BP features has yet to be explored. Second, the selection of romantic relationships and the strategies taken to interact in those relationships by individuals with BP features is not fully understood. Third, the various factors that may contribute to BP features in adulthood have yet to be organized into a rational theory. To provide a foundation from which the understanding of BPD development in adulthood attachment relationships may advance, the present research aims to: (a) investigate the associations between perceived invalidation and BP features in childhood caregiver relationships and adulthood romantic relationships, and (b) examine the role that attachment security may play as a mediator of the association between invalidating environments and BP features in childhood caregiver and adulthood romantic relationships.

The expansion of attachment-related functions from caregiver to other individuals in the attachment hierarchy (e.g., romantic partners) suggests that the associations between invalidation and BP features observed in childhood may also continue into adulthood. It is possible that the associations between perceived invalidation and BP

features in the childhood caregiver and adulthood romantic relationships may differ. Invalidation may have a greater impact in childhood when there is one primary attachment-based relationship, compared to adulthood where there are multiple attachment-based relationships. Given that attachment security reflects the degree of stability in the emotional bond between two individuals in a relationship, the degree of attachment security in the romantic relationship may mediate the association between invalidation and BP features.

With respect to the aims of this study, a multiple correlation and mediational data analytic approach was taken. Specifically, associations between invalidation, attachment security, and BP features, and the mediational effects of attachment security on the relationship of invalidation on BP features, were examined. This approach was taken to test the following hypotheses:

- Hypothesis 1: Perceived childhood invalidation (i.e., from caregiver) and adulthood invalidation (i.e., from romantic partner) will each positively associate with BP features.
- Hypothesis 2: The magnitude of the association of perceived childhood invalidation with BP features will be larger than the magnitude of the correlation of perceived adulthood invalidation with BP features.
- Hypothesis 3: Perceived attachment security between child and caregiver will mediate the association between perceived childhood invalidation and BP features, and perceived attachment security between adult and romantic partner will mediate the association between perceived adulthood invalidation and BP features.

2. Methods

2.1. Participants and Recruitment

Participants ($n = 152$ females, $n = 28$ males) were recruited from the Simon Fraser University student population and the general public. Students were recruited through on-campus advertising on the Burnaby campus. Public participants were recruited using flyers posted in public locations (e.g., common areas, bus stops) on the University campus and Craigslist advertisements. In addition, targeted recruitment of individuals identified as having more severe BP features was employed to increase the representation of high BP feature participants by posting advertisements to BPD and personality disorder support websites. BP features are relatively prevalent in the nonclinical population, and clinical populations are unrepresentative in that they tend to include only the most severe or dysfunctional cases of BPD (Trull, 1995; Trull, Useda, Conforti, & Doan, 1997). Trull (1995) also found that nonclinical young adults with BP features demonstrate various levels of dysfunction across different aspects of functioning. To be included in the study, participants had to be in a romantic relationship at the time of their participation, with no limit on the length of the relationship, and be at least 19 years of age.

Participants ($n = 180$) were aged 19 to 57 ($M = 24.59$, $SD = 8.56$), and 79.4% reported their ethnicity as White or Eastern European ($n = 99$, 55%) and Asian ($n = 44$, 24.4%). The majority of participants reported their country of residence as Canada ($n = 124$, 68.9%) and a large proportion reported having started or completed post-secondary education ($n = 127$, 70.6%). Many of the participants reported a familial income of \$40,000 to less than \$100,000 ($n = 94$, 52.2%), with 25.6% reporting a familial income of less than \$40,000 ($n = 46$) and 22.2% reporting a familial income of greater than \$100,000 ($n = 40$). The majority of participants reported their biological mother as their primary caregiver ($n = 155$, 86.1%). Most participants reported being employed ($n = 83$, 46.1%) or attending school ($n = 72$, 40%), while 13.9% ($n = 25$) reported being unemployed or retired. The majority of participants reported a heterosexual orientation

($n = 161$, 89.4%). Participants reported the length of their current romantic relationship being between one month and 27.08 years ($M = 3.86$, $SD = 4.57$), with 16.7% of participants having a relationship length of less than one year. All participants were in a dating relationship but not living together ($n = 138$, 76.7%), living with a romantic partner but not married ($n = 22$, 12.2%), or married ($n = 20$, 11.1%). Table 2.1 depicts the demographic characteristics of the participants.

Table 2.1. Demographic Characteristics of the Sample

Characteristic	Demographic	<i>n</i>	%
Ethnicity	White (Eastern European, etc.)	99	55.0
	Asian (Chinese, Japanese, etc.)	44	24.4
	East Indian	13	7.2
	Latino/Hispanic	3	1.7
	Aboriginal (Native, Inuit, Metis, etc.)	2	1.1
	Black (African, Caribbean, etc.)	1	0.6
	Other	18	10.0
Country of Residence	Canada	124	68.9
	Other	56	31.1
Education	Attended High School	2	1.1
	Completed High School	51	28.3
	Attended College, University, or Technical School	102	56.7
	Completed University Degree	16	8.9
	Attended Graduate School	3	1.7
	Completed Graduate Degree	6	3.3
Familial Income	> \$100,000	40	22.2
	\$40,000 to \$99,999	94	52.2
	< \$40,000	46	25.6
Primary Caregiver	Biological mother	155	86.1
	Biological father	13	7.2
	Other (Foster Parent, Adoptive Parent, Extended Family, etc.)	12	6.7
Employment Status	Unemployed or Retired	25	13.9
	Employed Part-Time (1-30 Hours Per Week)	58	32.2
	Employed Full-Time (>30 Hours Per Week)	25	13.9
	Full-Time Student	65	36.1
	Part-Time Student	7	3.9
Sexual Orientation	Gay, Lesbian, Bisexual	14	7.8
	Heterosexual	161	89.4
	Other (Asexual, Pansexual)	5	2.8
Relationship Status	Dating (Not Living Together)	138	76.7
	Living With Partner (Not Married)	22	12.2
	Married	20	11.1

2.2. Procedure

In response to an advertisement, a potential participant would email the study requesting to participate. Participants were then screened to ensure they met the inclusion criteria of being at least 19 years of age and in a romantic relationship. Each participant was then emailed an online link, along with a unique participant number and password, for accessing the study. Once participants followed the link, they were directed to a webpage where they entered their assigned participant number and password. At this point, they were directed to an informed consent page. To participate in the study, participants had to select a checkbox indicating their consent and then correctly answer three questions regarding the content of the informed consent to confirm they had read and understood the consent information. Participants were not permitted to complete the study if they failed to answer the questions correctly or if they did not consent to participate. Participants were also provided with contact information in case they wished to ask additional questions regarding the study before participating. Simon Fraser University student participants received course credit through the Research Participation System (RPS). Students who completed the study through the RPS earned a 3% credit to the final grade of one of their psychology courses. All Simon Fraser University student participants who did not receive course credit and all other participants were entered into a draw to win 1 of 2 prizes of \$250. All participants either received course credit or were entered into the prize draw, including those that did not consent to participate.

Participants completed a battery of self-report questionnaires that they were allowed to complete at their leisure anywhere they had access to an Internet-connected computer. Specifically, participants completed questionnaire measures of perceived childhood experiences of invalidation with their primary caregiver, perceived adulthood experiences of invalidation with their romantic partner, perceived attachment security to the childhood primary caregiver, perceived attachment security in the adulthood romantic relationship, and severity of BPD characteristics. Participants also completed a number of other measures not used directly in the current study including measures of emotion regulation, distress tolerance, dysfunctional patterns in interpersonal interactions, social problem solving, direct self-harm behaviors, satisfaction in their current romantic relationship, and commitment to their current romantic relationship.

Completion of the questionnaires took approximately ninety minutes and all participants completed the questionnaires in a single sitting. To manage any psychological risks that may have resulted from participation in the study, participants were provided the contact information for local, national, and international support lines.

Online data collection and administration of the questionnaires was completed using the Remark Web Survey software (Remark Web Survey 5.0). Data collected from participants is securely stored on Simon Fraser University computing servers.

2.3. Measures

2.3.1. Demographics

Participants were asked to report their gender, age, ethnicity, country of residence, education level, familial income, primary caregiver, employment status, sexual orientation, and relationship status. Demographics were used to describe the nature of the sample.

2.3.2. Perceived Childhood Primary Caregiver Relationship Invalidation

The Socialization of Emotion Scale (SES; Krause, Mendelson, & Lynch, 2003) is a measure of *perceived childhood invalidation* based on an adult participant's memory of his or her primary caregivers' responses to the participant's emotional displays as a child. The SES was adapted from the Coping with Children's Negative Emotions Scale (CCNES; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002), which measured the primary caregiver's thoughts and behaviours in response to his or her child's display of negative emotions, by rewording the questionnaire to ask participants to provide a retrospective recall of their self-identified primary caregiver's attitudes and behaviours (Krause et al., 2003). Additionally, it was noted that the SES did not appear to capture one of the defined components of invalidation, namely ignoring (Linehan, 1993). In the current study, the SES was modified to include an additional caregiver response that represents the perception of being ignored by the caregiver. This 84-item inventory presents 12 emotional childhood scenarios (e.g., "*If I became angry because I was sick*

or hurt and couldn't go to my friend's birthday party my caregiver would:”), each with seven potential caregiver responses (e.g., “send me to my room to cool off”). Participants were asked to identify their primary childhood caregiver and then respond to the questionnaire items in the context of the identified relationship. Participants rate each response as to how likely his or her primary caregiver was to give the response on a scale of 0 (*Very unlikely*) to 6 (*Very likely*). This modified SES is composed of four subscales, Distress Reactions (12 items), Punitive Reactions (12 items), Minimization (12 items), and Being Ignored (12 items), that correspond to the concept of invalidation. In this study, the subscales were averaged to determine a total SES score. The total score has a potential range of 0 to 6, with higher scores indicating a greater perceived experience of invalidating responses from the caregiver.

Krause et al. (2003) reported a good internal consistency (mean $\alpha = .81$) of the SES. Sauer and Baer (2010) have demonstrated that the invalidation scores for adults correlate with expected measures of BPD symptoms ($r = .30, p < .01$), thought suppression ($r = .22, p < .01$), and fear of emotion ($r = .34, p < .01$). The invalidation scores have also been determined to provide discriminant validity between schizotypal and BPD symptomatology suggesting that the SES is a valid measure for predicted types of psychopathology (Sauer & Baer, 2010). The SES total invalidation score demonstrated excellent internal consistency ($\alpha = .95$) in the current sample. Internal consistencies for the subscales, Distress Reactions ($\alpha = .79$), Punitive Reactions ($\alpha = .85$), Minimization ($\alpha = .85$), and Being Ignored ($\alpha = .96$), were acceptable to excellent.

2.3.3. Perceived Adulthood Romantic Relationship Invalidation

The Invalidation in Romantic Relationships scale (IRR) was developed for this study and is a measure of *perceived adulthood invalidation within a romantic relationship* based on a participant's experience of the responses of a romantic partner (e.g., boyfriend, girlfriend, or spouse) to the participant's emotional displays as an adult. This measure was modeled after the SES (Krause et al., 2003) by rewording the SES so that individuals were asked to report on their romantic partner's responses to the individuals displays of negative emotion. Participants were asked to identify their romantic partner and then respond to the questionnaire items in the context of the identified relationship. As with the SES above, the questionnaire was modified to incorporate an additional

partner response that represents the perception of being ignored by the partner. This 84-item inventory presents 12 emotional adulthood scenarios (e.g., “*If I damaged my car in an accident and then got upset and cried, my partner would:*”), each with seven potential partner responses (e.g., “*comfort me and try to get me to forget about the accident*”). The participant rates each response as to how likely his or her partner was to give the response on a scale of 0 (*Very unlikely*) to 6 (*Very likely*). The IRR is composed of four subscales, Distress Reactions (12 items), Punitive Reactions (12 items), Minimization (12 items), and Being Ignored (12 items) that correspond to the concept of invalidation. In this study the subscales were averaged to determine a total IRR score. The total score has a potential range of 0 to 6, with higher scores indicating a greater perceived experience of invalidating responses from the partner. As the IRR is a novel measure, psychometric properties of reliability and validity have not been assessed in previous studies. The IRR total score demonstrated excellent internal consistency ($\alpha = .95$) in the current sample. Internal consistencies for the subscales, Distress Reactions ($\alpha = .73$), Punitive Reactions ($\alpha = .90$), Minimization ($\alpha = .86$), and Being Ignored ($\alpha = .97$), were acceptable to excellent.

2.3.4. Perceived Adulthood Attachment-Related Anxiety and Avoidance

The Experiences in Close Relationships-Revised questionnaire (ECR-R; Fraley, Waller, & Brennan, 2000) is a 36-item scale that measures *attachment-related anxiety* (i.e., the extent to which people are insecure versus secure about the availability and responsiveness of another individual; 18 items) and *attachment-related avoidance* (i.e., the extent to which people are uncomfortable being close to others versus secure in depending on others; 18 items) that a participant perceives in romantic relationships. Participants were asked to identify their romantic partner and then respond to the questionnaire items in the context of the identified relationship. The participant rates each response (e.g., “*I often worry that my partner doesn’t really love me*”) as to how much they agree or disagree that the response reflects how they felt in their romantic relationship on a scale of 0 (*Strongly disagree*) to 6 (*Strong agree*). In this study, the subscales were averaged to determine a total ECR-R score that represents the level of security the participant perceives in the romantic relationship (Fraley, 2012). The total

score has a potential range of 0 to 6, with higher scores indicating a greater perceived insecurity in the romantic relationship.

Fraley (2012) reported an excellent internal consistency (mean $\alpha = .90$) of the ECR-R scales of attachment-related anxiety and attachment-related avoidance but item response theory (IRT) analyses suggested that the reliability might be a bit less at the secure end of the dimension compared to the insecure end (Fraley et al., 2000). They have also reported a test-retest correlation of .94 based on the average results of 500 simulations (Fraley et al., 2000). Sibley and Liu (2004) have further demonstrated that the ECR-R has good construct validity and good temporal stability over a 6-week assessment period (86% shared variance over time). The ECR-R total score demonstrated excellent internal consistency ($\alpha = .95$) in the current sample. Internal consistencies for the subscales, Attachment-Related Anxiety ($\alpha = .94$) and Attachment-Related Avoidance ($\alpha = .95$), were excellent.

2.3.5. Perceived Childhood Attachment-Related Anxiety and Avoidance

The Security in the Primary Caregiver Relationship questionnaire (SPCR) was developed for this study and is a measure of *attachment-related anxiety* (i.e., the extent to which people are insecure versus secure about the availability and responsiveness of another individual; 18 items) and *attachment-related avoidance* (i.e., the extent to which people are uncomfortable being close to others versus secure in depending on others; 18 items) that a participant perceived in his or her relationship with his or her primary caregiver. This measure was modeled after the ECR-R (Fraley et al., 2000) by rewording the ECR-R so that responses emphasized attachment-related anxiety and avoidance experiences in the primary caregiver relationship. Participants were asked to identify their primary childhood caregiver and then respond to the questionnaire items in the context of the identified relationship. The participant rates each response (e.g., “*My caregiver made me doubt myself*”) as to how much they agree or disagree that the response reflects how they felt in the relationship with his or her primary caregiver during childhood on a scale of 0 (*Strongly disagree*) to 6 (*Strong agree*). In this study, the subscales were averaged to determine a total SPCR score that represents the level of security the participant perceives in the relationship with his or her primary caregiver.

The total score has a potential range of 0 to 6, with higher scores indicating a greater perceived insecurity in the primary caregiver relationship. As the SPCR is a novel measure, psychometric properties of reliability and validity have not been assessed in previous studies. The SPCR total score demonstrated excellent internal consistency ($\alpha = .97$) in the current sample. Internal consistencies for the subscales, Attachment-Related Anxiety ($\alpha = .94$) and Attachment-Related Avoidance ($\alpha = .97$), were excellent.

2.3.6. BPD Features

The Borderline Features subscale of the Personality Assessment Inventory (PAI-BOR; Morey, 2007) is a 24-item scale that measures *core features of BPD*: affective instability (6 items), identity problems (6 items), negative relationships (6 items) and self-harm (6 items). For each item (e.g., “*I have little control over my anger*”), participants rate how much a statement applies to them on a scale of 0 (*False, not at all true*) to 3 (*Very true*). In this study, all items were summed to determine a total PAI-BOR score. The total score has a potential range of 0 to 72, with higher scores indicating a greater presence of BP features.

The PAI-BOR has demonstrated a good to excellent total scale internal consistency of $\alpha = .84 - .91$ (Trull, 2001). A number of studies have demonstrated good construct validity of the PAI-BOR. The PAI-BOR has been shown to accurately classify BPD patients 81.8% of the time and students 77.3% of the time (Bell-Pringle, Pate, & Brown, 1997). Jacobo, Blais, Baity, and Harley (2007) demonstrated within community and clinical samples that total scores of 38 and higher are associated with very good predictive power of .97 when compared to BPD diagnosis using the Structured Clinical Interview for DSM-IV Personality Disorders (First, Gibbon, Spitzer, Williams, & Benjamin, 1997). The PAI-BOR total score demonstrated good internal consistency ($\alpha = .89$) in the current sample. Internal consistencies for the subscales, Affect Instability ($\alpha = .84$), Identity Problems ($\alpha = .65$), Negative Relationships ($\alpha = .71$), and Self-Harm ($\alpha = .80$), were questionable to good.

3. Data Analytic Approach

3.1. Data Preparation

Descriptive statistics of all variables (i.e. perceived childhood invalidation, perceived adulthood invalidation, perceived childhood attachment security, perceived adulthood attachment security, BP features) were evaluated prior to analysis. Specifically, means, 5% trimmed means, medians, minimum and maximum data values, kurtosis, and skewness were reviewed. Outliers that were greater than 3 standard deviations from the mean were assessed for their degree of influence on the variables using Cook's distance (D_i) calculation (Cook, 1977). Any outliers, with $D_i > 1$, were Winsorized (i.e. the outlier would be replaced by the most extreme non-outlier score in the data). Multicollinearity was assessed via the variance inflation factor (*VIF*; acceptable values < 10 ; Cohen, Cohen, West, & Aiken, 2003, pp. 422-424) of each predictor. Independence of observations was tested using the Durbin-Watson lag1 autocorrelation statistic at $\alpha = .05$ (Durbin & Watson, 1950, 1951). Assumptions of normality of the data were assessed by inspection of q-q plots and 95% confidence intervals of skewness and kurtosis of each variable. If non-normality was detected, data transformations were considered.

The linear relationship between predictors (i.e. perceived childhood invalidation, perceived adulthood invalidation, perceived childhood attachment security, perceived adulthood attachment security) and the outcome variable (i.e. BP features) was assessed by examination of plots of expected value residuals against each predictor and outcome variable with a Lowess fit line projected. If non-linearity was detected, power transformations were considered. The expected value residuals plots were assessed to detect inclusion of all relevant predictors. If additional predictors were suggested, demographics or power transformations were considered. The expected value residuals plots were extended to include Lowess plus one and minus one standard deviation fit lines, and used to assess homoscedasticity of errors. Measurement error was controlled

for by the selection or adaptation of psychometrically sound measures with good internal consistencies. Index plots of expected value residuals against ordered numeric values of cases were created with a Lowess fit line projected to assess independence of errors. Finally, skewness, kurtosis, and q-q plots of expected value residuals were used to assess normality of the errors. Power transformations were considered if non-normality was detected.

3.2. Data Analysis

The R^2 statistic was examined for overall fit of the statistical model. T-tests on the partial regression coefficients were conducted to examine the regression coefficients and to determine if each predictor accounted for a significant amount of the variance when the other predictor was controlled. It was expected that the partial regression coefficients would be significant. This would support the hypothesis that perceived childhood invalidation and perceived adulthood invalidation would each positively correlate with BP features.

The partial regression coefficients were compared by employing a 1-tailed Williams (1959) T-test to assess whether one predictor had a more significant correlation to the outcome variable than the other predictor. The 1-tailed Williams T-test was used to compare the partial regression coefficients to explore any potential relationship between the perceived adulthood invalidation and BP features association and the perceived childhood invalidation and BP features association.

Perceived attachment security (i.e., perceived childhood attachment security, perceived adulthood attachment security) was examined as a potential mediator of the association between perceived invalidation (i.e., perceived childhood invalidation, perceived adulthood invalidation) and BP features. To test the role of perceived attachment security as a mediator, the Bootstrap Method was employed (Bollen & Stine, 1990; Preacher & Hayes, 2004; Shrout & Bolger, 2002). Bootstrapping involves taking a large number of samples of size n from the data, sampling with replacement, and computing the indirect effect of the mediator under investigation within each sample (Preacher & Hayes, 2004). Mediation analyses were conducted using the Bootstrapping Method with bias-corrected confidence estimates (Preacher & Hayes, 2004). The 95%

confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). The point estimate of the indirect effect of the mediator was calculated as the mean of the indirect effects determined from each sample. It was expected that perceived attachment security would have a significant mediation effect in both relationship types with the association between invalidation and BP features strengthening with more negative attachments and weakening with more positive attachments.

3.3. Additional Analysis

Additional analyses were considered based on the outcome of the planned analyses. Facets of the primary constructs of perceived invalidation (i.e., distress reactions, punitive reactions, minimization reactions), perceived attachment security (i.e., anxiety, avoidance), and BP features (i.e., affective instability, identity problems, negative relationships, self-harm) were considered to refine the understanding of significant findings.

3.4. Power Analysis

An a priori power analysis was conducted using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). Sauer and Baer (2010) reported a correlation between childhood invalidation and BP features of $r = .30$. Choi-Kain, Fitzmaurice, Zanarini, Laverdière, and Gunderson (2009) reported a correlation between self-reported attachment styles and interpersonal features of BPD of $r = .27$. An a priori power analysis suggested that to have 80% power to detect correlations of $r = .27$ at $\alpha = 0.025$ (i.e., Bonferroni correction of $\alpha = 0.5/2$), approximately 120 participants were required to complete the study.

4. Results

4.1. Preliminary Data Analysis

All cases were included in the analysis as none were missing data and there were no influential outliers (i.e., $D_i > 1$). Multicollinearity (i.e., $VIF \geq 10$) was not detected amongst the predictors. Independence of observations was not violated. Inspection of the q-q plots and 95% confidence intervals of skewness and kurtosis suggested some violations of normality amongst the variables. Distributions were markedly positively skewed and leptokurtotic for perceived childhood invalidation ($sk = 1.54$; $\eta = 3.52$) and perceived adulthood invalidation ($sk = 1.77$; $\eta = 3.83$). Distributions were mildly positively skewed and mildly platykurtotic for perceived childhood attachment security ($sk = 0.72$; $\eta = -0.43$), perceived adulthood attachment security ($sk = 0.58$; $\eta = -0.42$), and BP features ($sk = 0.47$; $\eta = -0.31$). \log_{10} data transformations were conducted, but the transformed data continued to suggest some violation of normality. Analyses were conducted using both the transformed and non-transformed variables to compare the results, but the results did not differ substantially. Further, it has been suggested that given the robustness of the planned statistical tests, the violation of normality may have little influence on the statistical outcomes (Glass, Peckham, & Sanders, 1972; van Belle, 2002). As such, results of analyses of the non-transformed variables were reported.

Examination of the plots of expected value residuals against each predictor and outcome variable suggested that the relationship between predictors and outcome variable was linear and that errors were homoscedastic. Internal consistencies of all variables were good to excellent ($\alpha = .89-.97$). Index plots of expected value residuals against ordered numeric values of cases suggested the assumption of independence of errors was not violated.

4.2. Descriptive Statistics

Descriptive statistics for the distributions of each of the predictors (i.e., invalidation and attachment security) and the outcome variable (i.e., BP features) are provided in Table 4.1. Differences in study variables by demographics were inspected.

Table 4.1. Descriptive Statistics of Study Variables

	Childhood Invalidation (SES)	Childhood Attachment Security (SPCR)	Adulthood Invalidation (IRR)	Adulthood Attachment Security (ECR-R)	Borderline Severity (PAI-BOR)
Mean	1.65	1.73	1.25	1.71	28.35
Std. Deviation	0.95	1.38	0.85	1.18	12.93
5% Trim Mean	1.57	1.64	1.16	1.66	27.96
Median	1.50	1.44	0.97	1.49	27.00
Min. Value	0.25	0.00	0.17	0.00	3.00
Max. Value	5.56	5.22	5.27	5.00	68.00

$n = 180$

Note. Socialization of Emotion Scale (SES)
 Security in the Primary Caregiver Relationship (SPCR)
 Invalidation in Romantic Relationships (IRR)
 Experiences in Close Relationships-Revised (ECR-R)
 Personality Assessment Inventory – Borderline Features (PAI-BOR).

A factorial ANOVA revealed significant main effects of country of birth on childhood attachment security ($F(1,178) = 4.63, p = .033$), adulthood invalidation ($F(1,178) = 6.29, p = .013$), and adulthood attachment security ($F(1,178) = 12.75, p < .001$). Non-Canadian born participants reported a higher level of perceived childhood attachment security ($M = 2.05$), perceived adulthood invalidation ($M = 1.48$), and perceived adulthood attachment security ($M = 2.16$) compared to Canadian born participants ($M = 1.58, M = 1.14, M = 1.51$, respectively). There were no statistically significant differences between Canadian born and non-Canadian born participants for perceived childhood invalidation ($M = 1.58, M = 1.80$, respectively), $F(1,178) = 2.04, p = .155$, and BP features ($M = 27.18, M = 30.95$, respectively), $F(1,178) = 3.32, p = .070$.

A factorial ANOVA revealed significant main effects of family income on adulthood invalidation, $F(1,178) = 4.06, p = .045$. Participants with a family income less than \$50,000 reported a higher level of perceived adulthood invalidation ($M = 1.44$) compared to participants with a family income greater than or equal to \$50,000 ($M = 1.16$). There were no statistically significant differences between participants with family

incomes less than \$50,000 and participants with family incomes greater than or equal to \$50,000 for perceived childhood invalidation ($M = 1.73$, $M = 1.61$, respectively), $F(1,178) = 0.67$, $p = .414$, perceived childhood attachment security ($M = 1.93$, $M = 1.63$, respectively), $F(1,178) = 1.84$, $p = .177$, adulthood attachment security ($M = 1.96$, $M = 1.60$, respectively), $F(1,178) = 3.63$, $p = .058$, and BP features ($M = 30.13$, $M = 27.55$, respectively), $F(1,178) = 1.54$, $p = .217$.

Main effects of ethnicity, employment status, sexual orientation, relationship status, gender, education level, primary caregiver type, and romantic partner type were evaluated. These demographic variables did not demonstrate a statistically significant main effect on perceived childhood invalidation, perceived child attachment security, perceived adulthood invalidation, perceived adulthood attachment security, or BP features.

4.3. Multivariate Assumption Checking and Diagnostics

The Durbin-Watson lag1 autocorrelation statistic at $\alpha = .05$ (Durbin & Watson, 1950, 1951) did not suggest that the assumption of independence of observations had been violated in the multivariate groupings, $D = 1.83$ - 2.09 . Some violations of normality were suggested by residual plots for BP features for each of the multivariate groupings. Distributions of residuals showed some violation of normality with skewness in the range of 0.32 to 0.59 and kurtosis in the range of -0.27 to 1.04. Log_{10} data transformations were conducted but the transformed data continued to suggest some violation of normality with skewness in the range of -0.85 to 0.17 and kurtosis in the range of -1.14 to 1.21. Given the robustness of the planned statistical tests, the violation of normality was expected to have little influence on the statistical outcomes (Glass et al., 1972; van Belle, 2002). It was assumed that the linear model was correctly specified, all relevant predictors had been included, and the assumption of homoscedasticity of errors had not been violated. Index plots and q-q plots of residuals were inspected and there was no suggestion that the assumptions of independence and normality of errors had been violated. No influential outliers were detected. Models excluding and including non-influential outliers were compared with no notable difference in the analyses. VIFs for the predictors ranged from 1.08 to 2.12 suggesting no multicollinearity. All predictors were kept in the model.

4.4. Multivariate Analysis

4.4.1. Hypothesis 1

Consistent with Hypothesis 1, perceived childhood invalidation and perceived adulthood invalidation were positively correlated with BP features, $r = .38$, $p < .001$, and $r = .34$, $p < .001$, respectively (see Table 4.2). Perceived childhood invalidation and perceived adulthood invalidation accounted for a significant proportion of the variance in BP features, ($R^2 = .18$), $F(2,177) = 20.01$, $p < .001$ (see Table 4.3). Perceived childhood invalidation accounted for a significant proportion of the variance in BP features when controlling for perceived adulthood invalidation, $t(177) = 3.80$, $p < .001$, $\beta = .28$. In addition, perceived adulthood invalidation accounted for a significant proportion of the variance in BP features when controlling for perceived childhood invalidation, $t(177) = 3.10$, $p = .002$, $\beta = .23$.

Table 4.2. Correlations between Perceived Invalidation and Borderline Features

	Borderline Severity (PAI-BOR)	Perceived Childhood Invalidation (SES)
	<i>r</i>	<i>r</i>
Perceived Childhood Invalidation (SES)	.38*	-
Perceived Adulthood Invalidation (IRR)	.34*	.40*

* Significant at $p < .001$

Note. Socialization of Emotion Scale (SES)

Invalidation in Romantic Relationships (IRR)

Personality Assessment Inventory – Borderline Features (PAI-BOR).

Table 4.3. Regression Model Predicting Borderline Severity from Perceived Invalidation

Model	Unstandardised Coefficients		Standardised Coefficients		<i>t</i> (177)	<i>p</i>	<i>F</i> (2, 177)	<i>R</i>	<i>R</i> ²
	<i>B</i>	<i>SE B</i>	β	<i>SE</i> β					
Step 1					-	-	20.01	.43	.18
(Constant)	17.63	1.91	-	-	9.23	<.001	-	-	-
Childhood Invalidation (SES)	3.85	1.01	.28	.07	3.80	<.001	-	-	-
Adulthood Invalidation (IRR)	3.50	1.13	.23	.07	3.10	.002	-	-	-

Note. Socialization of Emotion Scale (SES)

Invalidation in Romantic Relationships (IRR).

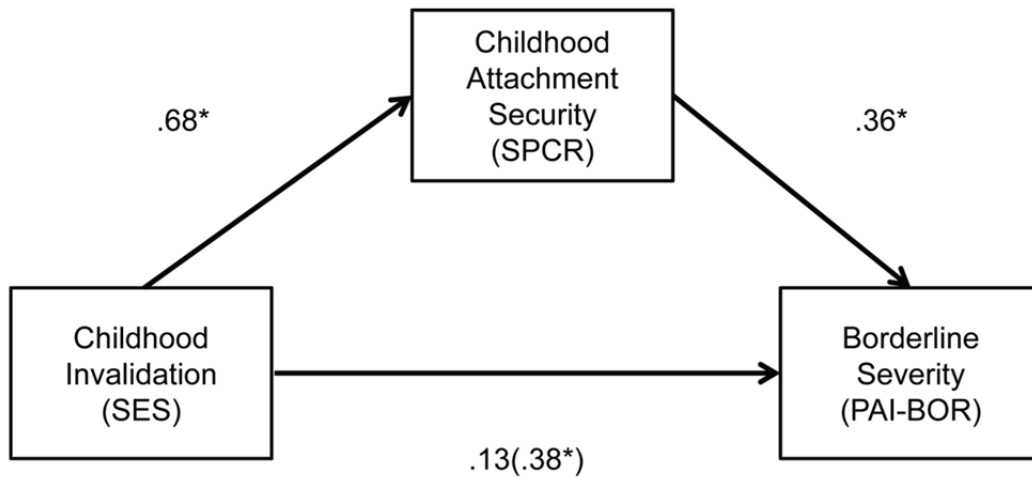
4.4.2. Hypothesis 2

Contrary to Hypothesis 2, a 1-tailed Williams (1959) *t*-test suggested there was not a statistically significant difference between the magnitude of the correlation of perceived childhood invalidation with BP features and the magnitude of the correlation of perceived adulthood invalidation with BP features, $t(177) = 0.53$, $p = .595$. Correlations between invalidation and BP features appear consistent between the relationships with an individual's primary caregiver and an individual's romantic partner.

4.4.3. Hypothesis 3

Multiple regression analyses were conducted to assess each component of the two proposed mediation models (i.e., perceived attachment security mediating the relationship between perceived invalidation and BP features). In the model for perceived childhood invalidation, perceived childhood attachment security, and BP features, perceived childhood invalidation was positively associated with BP features, $\beta = .38$, $t(178) = 5.39$, $p < .001$ and with perceived childhood attachment security, $\beta = .68$, $t(178) = 12.19$, $p < .001$. Further, the potential mediator, perceived childhood attachment security, was positively associated with BP features, $\beta = .36$, $t(178) = 4.02$, $p < .001$. Results of the mediation analysis confirmed the mediating role of perceived childhood attachment security in the relation between perceived childhood invalidation and BP features ($\beta = .24$; CI = .10 to .40). In addition, results indicated that the direct effect of perceived childhood invalidation on BP features became non-significant, $\beta = .13$, $t(178) = 1.43$, $p = .154$, when controlling for perceived childhood attachment security. This result suggests full mediation (see Figure 4.1).

Figure 4.1. Indirect Effect of Childhood Invalidation on Borderline Severity through Childhood Attachment Security

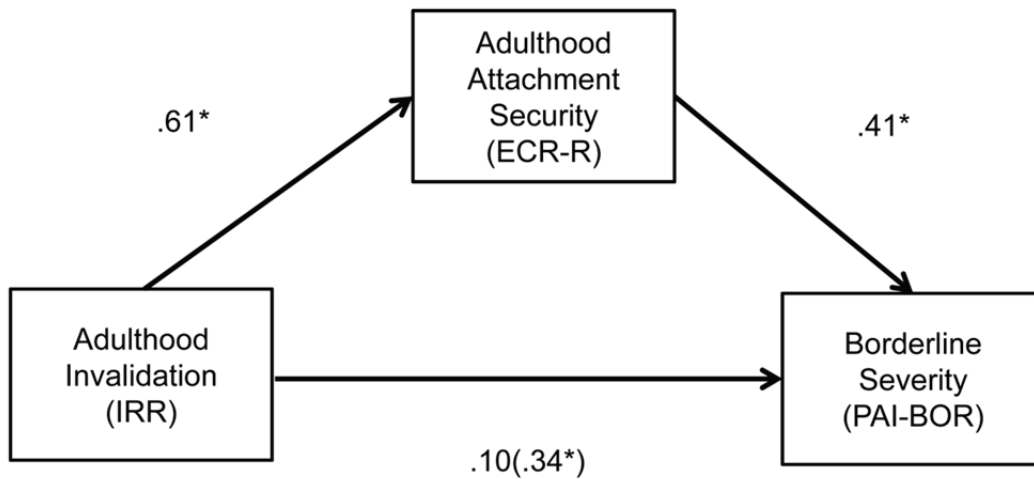


* $p < .001$

Note. Standardized betas (β) displayed.

In the model for perceived adulthood invalidation, perceived adulthood attachment security, and BP features, perceived adulthood invalidation was positively associated with BP features, $\beta = .34$, $t(178) = 4.88$, $p < .001$ and perceived adulthood attachment security, $\beta = .61$, $t(178) = 10.29$, $p < .001$. Further, the potential mediator, perceived adulthood attachment security, was positively associated with BP features, $\beta = .41$, $t(178) = 4.82$, $p < .001$. Results of the mediation analysis confirmed the mediating role of perceived adulthood attachment security in the relation between perceived adulthood invalidation and BP features ($\beta = .25$; CI = .13 to .39). In addition, results indicated that the direct effect of perceived adulthood invalidation on BP features became non-significant, $\beta = .10$, $t(178) = 1.15$, $p = .251$, when controlling for perceived adulthood attachment security. This result suggests full mediation (see Figure 4.2).

Figure 4.2. Indirect Effect of Adulthood Invalidation on Borderline Severity through Adulthood Attachment Security



* $p < .001$

Note. Standardized betas (β) displayed.

4.5. Subscale Analysis

Additional analyses were performed with the subscales of each of the primary scales (i.e., SES, IRR, PAI-BOR, SPCR, ECR-R; see Table 4.4). With the exception of the ignoring reactions subscale of the IRR, the childhood attachment-related anxiety and avoidance subscales of the SPCR, and attachment-related avoidance subscale of the ECR-R, all bivariate pairs of subscales scores were significant at either the $p < .01$ or $p < .05$ level. Adulthood ignoring reactions as indicated on the IRR was not significantly associated with affective instability ($r = .14, p = .062$) or identity problems ($r = .14, p < .062$) as indicated on the PAI-BOR. Childhood attachment-related anxiety as indicated on the SPCR was not significantly associated with adulthood minimization reactions as indicated on the IRR ($r = .08, p = .296$). Childhood attachment-related avoidance as indicated on the SPCR was not significantly associated with adulthood punitive reactions ($r = .14, p = .059$) and adulthood minimization reactions ($r = .07, p = .329$) as indicated on the IRR. Adulthood attachment-related avoidance as indicated on the ECR-R was not significantly associated with identity problems ($r = .14, p = .055$) as indicated on the PAI-BOR.

Table 4.4. Correlations between Subscales of Perceived Invalidation, Perceived Attachment Security, and Borderline Severity

	Borderline Severity				Perceived Childhood Invalidation				Perceived Adulthood Invalidation				Perceived Childhood Attachment Security		Perceived Adulthood Attachment Security	
	AI	IP	NR	SH	CDR	CPR	CMR	CIR	ADR	APR	AMR	AIR	CANX	CAVD	AANX	AAVD
Borderline Severity (PAI-BOR)																
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP	.61*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NR	.60*	.56*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SH	.52*	.43*	.37*	-	-	-	-	-	-	-	-	-	-	-	-	-
Perceived Childhood Invalidation (SES)																
CDR	.37*	.32*	.38*	.31*	-	-	-	-	-	-	-	-	-	-	-	-
CPR	.21*	.19*	.23*	.19*	.70*	-	-	-	-	-	-	-	-	-	-	-
CMR	.25*	.29*	.28*	.31*	.67*	.74*	-	-	-	-	-	-	-	-	-	-
CIR	.20*	.18**	.26*	.17**	.59*	.59*	.56*	-	-	-	-	-	-	-	-	-
Perceived Adulthood Invalidation (IRR)																
ADR	.26*	.35*	.37*	.25*	.38*	.22*	.19*	.23*	-	-	-	-	-	-	-	-
APR	.18**	.25*	.32*	.28*	.30*	.35*	.22*	.35*	.69*	-	-	-	-	-	-	-
AMR	.15**	.22*	.21*	.25*	.22*	.36*	.24*	.23*	.53*	.72*	-	-	-	-	-	-
AIR	.14	.14	.29*	.18**	.27*	.29*	.19*	.48*	.48*	.76*	.49*	-	-	-	-	-
Perceived Childhood Attachment Security (SPCR)																
CANX	.39*	.38*	.41*	.24*	.60*	.46*	.50*	.63*	.23*	.17**	.08	.28*	-	-	-	-
CAVD	.36*	.29*	.41*	.23*	.59*	.48*	.48*	.62*	.16**	.14	.07	.21*	.78*	-	-	-
Perceived Adulthood Attachment Security (ECR-R)																
AANX	.38*	.47*	.50*	.35*	.17**	.16**	.15**	.20*	.45*	.46*	.37*	.41*	.24*	.27*	-	-
AAVD	.20*	.14	.29*	.24*	.15**	.18**	.16**	.24*	.47*	.54*	.40*	.51*	.20*	.18**	.51*	-

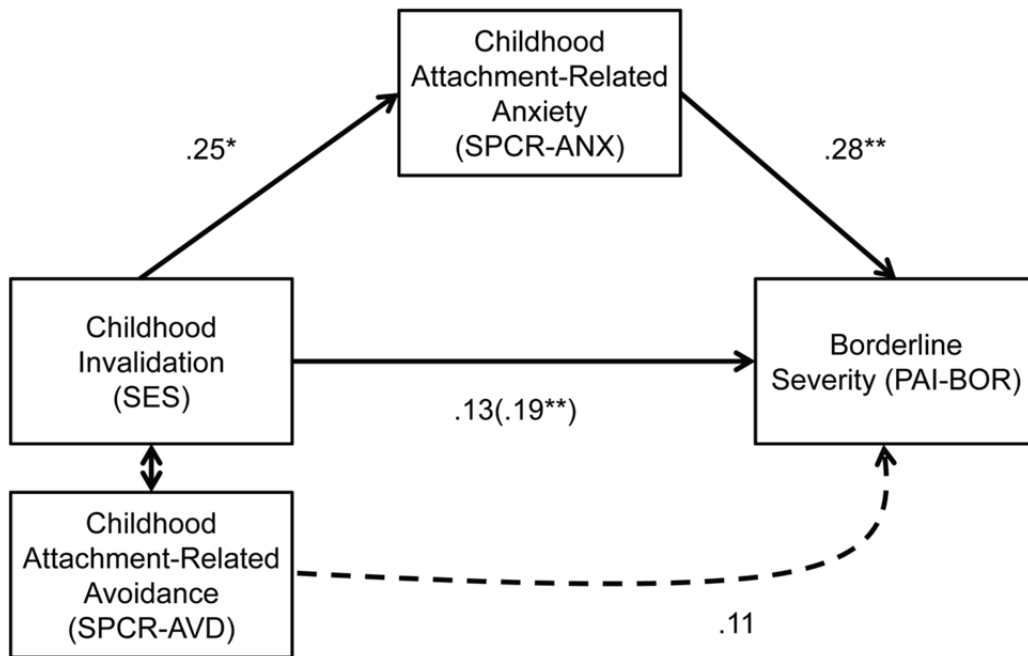
* $p < .01$, ** $p < .05$

Note. Affective Instability (AI), Identity Problems (IP), Negative Relationships (NR), Self-Harm (SH), Childhood Distress Reactions (CDR), Childhood Punitive Reactions (CPR), Childhood Minimization Reactions (CMR), Childhood Ignoring Reactions (CIR); Adulthood Distress Reactions (ADR), Adulthood Punitive Reactions (APR), Adulthood Minimization Reactions (AMR); Adulthood Ignoring Reactions (AIR); Childhood Attachment Related Anxiety (CANX); Childhood Attachment Related Avoidance (CAVD); Adulthood Attachment Related Anxiety (AANX); Adulthood Attachment Related Avoidance (AAVD).

Mediation analyses were performed with the subscales of each of the perceived attachment security scales (i.e., SPCR, ECR-R). In the model for perceived childhood invalidation, perceived childhood attachment-related anxiety, and BP features, while controlling for childhood attachment-related avoidance, perceived childhood invalidation was positively associated with BP features, $\beta = .19$, $t(178) = 2.21$, $p = .028$ and perceived childhood attachment-related anxiety, $\beta = .25$, $t(178) = 4.24$, $p < .001$.

Further, the potential mediator, perceived childhood attachment-related anxiety, was positively associated with BP features, $\beta = .28$, $t(178) = 2.50$, $p = .013$. Results of the mediation analysis confirmed the mediating role of perceived childhood attachment-related anxiety in the relation between perceived childhood invalidation and BP features ($\beta = .07$; CI = .01 to .16). In addition, the direct effect of perceived childhood invalidation on BP features became non-significant, $\beta = .13$, $t(178) = 1.38$, $p = .169$, when controlling for perceived childhood attachment-related anxiety. The partial effect of childhood attachment-related avoidance on BP features was not significant, $\beta = .11$, $t(178) = 1.02$, $p = .310$. This result suggests perceived attachment-related anxiety full mediates the relationship between perceived childhood invalidation and BP features (see Figure 4.3). Further, in the model for perceived childhood invalidation, perceived childhood attachment-related avoidance, and BP features, while controlling for childhood attachment-related anxiety, perceived childhood invalidation was not positively associated with BP features, $\beta = .15$, $t(178) = 1.73$, $p = .085$. This suggests that childhood attachment-related avoidance does not play a mediating role in the relationship between perceived childhood invalidation and BP features

Figure 4.3. Indirect Effect of Childhood Invalidation on Borderline Severity through Childhood Attachment-Related Anxiety



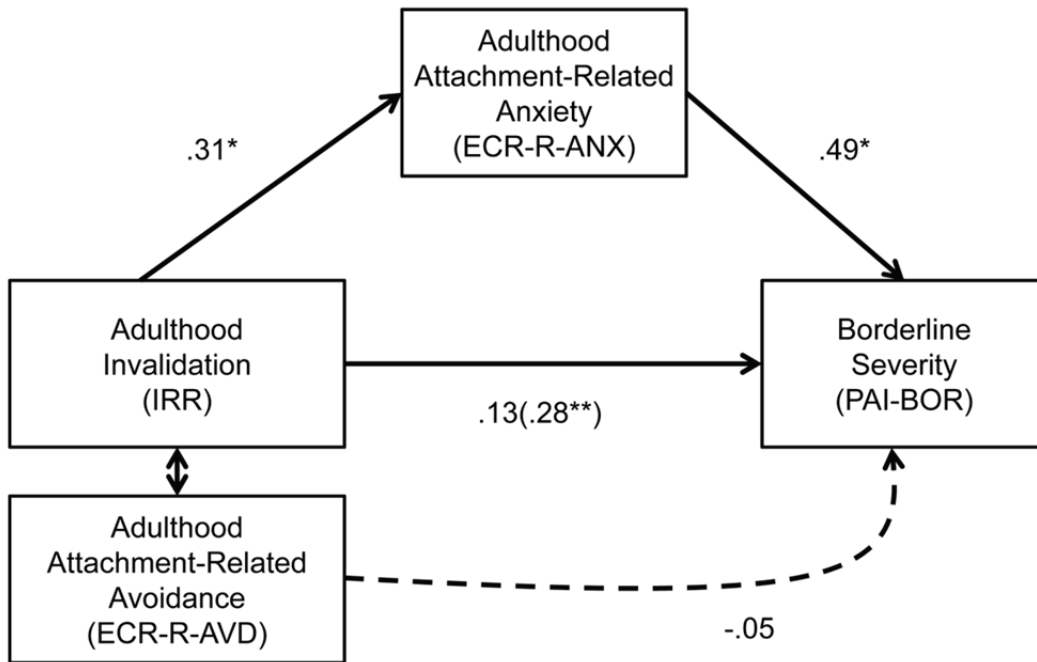
* $p < .001$; ** $p < .05$

Note. Standardized betas (β) displayed.

In the model for perceived adulthood invalidation, perceived adulthood attachment-related anxiety, and BP features, while controlling for adulthood attachment-related avoidance, perceived adulthood invalidation was positively associated with BP features, $\beta = .28$, $t(178) = 3.27$, $p = .001$ and perceived adulthood attachment-related anxiety, $\beta = .31$, $t(178) = 4.10$, $p < .001$. Further, the potential mediator, perceived adulthood attachment-related anxiety, was positively associated with BP features, $\beta = .49$, $t(178) = 6.35$, $p < .001$. Results of the mediation analysis confirmed the mediating role of perceived adulthood attachment-related anxiety in the relation between perceived adulthood invalidation and BP features ($\beta = .15$; CI = .08 to .25). In addition, the direct effect of perceived adulthood invalidation on BP features became non-significant, $\beta = .13$, $t(178) = 1.58$, $p = .116$, when controlling for perceived adulthood attachment-related anxiety. The partial effect of adulthood attachment-related avoidance on BP features was not significant, $\beta = -.05$, $t(178) = -.60$, $p = .547$. This result suggests full mediation (see Figure 4.4). Further, in the model for perceived adulthood invalidation, perceived adulthood attachment-related avoidance, and BP features, while controlling for

adulthood attachment-related anxiety, perceived adulthood invalidation was not positively associated with BP features, $\beta = .11$, $t(178) = 1.47$, $p = .144$. This suggests that adulthood attachment-related avoidance does not play a mediating role in the relationship between perceived adulthood invalidation and BP features

Figure 4.4. Indirect Effect of Adulthood Invalidation on Borderline Severity through Adulthood Attachment-Related Anxiety



* $p < .001$; ** $p < .05$

Note. Standardized betas (β) displayed.

5. Discussion

This study was designed to investigate the associations between perceived invalidating environments and BP features in childhood caregiver relationships and adulthood romantic relationships. The study also examined whether perceived attachment security played a role in mediating the association between perceived invalidating environments and BP features in those relationships. The study examined the role of perceived invalidation in BP features generally but it was also a novel study of perceived attachment security and its relation to perceived invalidation and BP features.

Results of the current study suggested that perceived invalidation in childhood caregiver and adulthood romantic relationships was associated with BP features. In fact, each of perceived childhood invalidation and perceived adulthood invalidation appeared to be associated with BP features on their own while controlling for the other form of perceived invalidation. The results regarding perceived childhood invalidation generally support Linehan's (1993) hypothesis that childhood invalidation is a risk factor for BP features. Findings also suggested that perceived invalidation may play a role in BP features in adulthood with there being no significant difference between the magnitude of the correlation of perceived childhood invalidation with BP features and the magnitude of the correlation of perceived adulthood invalidation with BP features

Additionally, findings also suggested that perceived attachment security may explain why the association between perceived invalidation and BP features exists. Perceived childhood and adulthood invalidation were no longer associated with BP features when the effects of perceived attachment security were controlled. Upon closer examination, the findings suggested that the extent to which one perceived the other person to be unavailable or unresponsive (i.e., attachment-related anxiety in the primary caregiver or romantic partner relationship) explained the link between perceived invalidation and BP features. Findings also suggested that the extent to which one is uncomfortable being close to the other person (i.e., attachment-related avoidance in the

primary caregiver or romantic partner relationship) did not contribute to the link between perceived invalidation and BP features

The findings of this study are important because current theories of BPD point to emotional invalidation as an important cause of BP features (Linehan, 1993), but findings in previous studies of the association between invalidation and BP features have been inconsistent. Notably, these previous studies have focused on capturing participants' experience of invalidation rather than evaluating the impact invalidation may have had on the degree of attachment security an individual experiences in their relationships. Previous studies have examined invalidating experiences including, but not limited to, parental criticism (Cheavens et al., 2005), sexual abuse (Rosenthal et al. 2005), invalidating responses (Shenk & Fruzzetti, 2011), and expressed emotion of others (Hooley et al., 1999). The findings of the current study suggest that impairment of attachment security between the individual and their primary caregiver (or romantic partner) may be a contributing factor to the presence of BP features. This is consistent with attachment based models that suggest BP features arise through the interaction of caregiving and biological vulnerabilities (Cole et al., 2009) and emotionally restricted environments (Gilliom et al., 2002; Fonagy et al., 2002; Smith et al., 2006) resulting in impaired attachment security.

With respect to the implications of these findings, this study suggests a potentially important role for the assessment of perceived attachment security, specifically attachment-related anxiety, within clients' past primary caregiver and current romantic partner relationships in the treatment of BPD. The function of perceived attachment security in these relationships may inform therapeutic approaches. For example, it has been suggested that romantic partners with high attachment-related anxiety tend to over-react to negative interpersonal experiences (i.e., emotional reactivity). Given the role of perceived attachment-related anxiety in the experience of BP features suggested by the current study, use of interventions that target attachment related difficulties may aid individuals that experience emotional reactivity in romantic relationships. Additionally, children who experience emotional reactivity in their primary caregiver relationships may benefit from attachment focused interventions. One therapeutic approach that has demonstrated some efficacy in targeting impaired attachment in individuals with BP features is Mentalization-Based Treatment (MBT;

Bateman & Fonagy, 2004, 2008). MBT aims to improve an individual's capacity to think about mental states of oneself and others as separate from, yet potentially causing, behaviours (Bateman & Fonagy, 2004).

There are several limitations to this study. First, a primary concern was the use of retrospective self-report measures that have inherent weaknesses in reporting accuracy due to recall limitations and biases. The study did not include collateral reports to verify participants' perceptions of invalidation. Even if collateral reports were included, the reports of invalidation would have been subject to reporting biases such as the misinterpretation of past experiences or unwillingness to acknowledge negative experiences. It is also possible that individuals higher in BP features perceive more invalidation. Secondly, the results were limited in that they were cross-sectional and could not address the question of causality between historical and present perceived invalidation and perceived attachment security, and BP features. The cross sectional nature of the design did not permit the evaluation of long-term exposure to validation levels and how that exposure may affect BP features. Further, the cross-sectional data render tentative any interpretations regarding the potential mediational role of attachment related variables. Although self-reports are used in an attempt to capture temporally accurate data, it is unclear how much a past event or current state influences a participant's responses. A third limitation was that characteristics of participants' partners were not considered. One partner's attachment functioning and interactional styles (e.g., conflict resolution) within the relationship, may affect the other partner's perception of invalidation and attachment security. To address these limitations, future research should employ a longitudinal prospective study and include factors related to characteristics of the romantic partner.

A more notable concern is the possibility that the roles of perceived emotional invalidation and perceived attachment security may be confounded by construct-related overlap. Attachment security is defined by the extent to which people are anxious about the availability and responsiveness of others and the extent to which people are uncomfortable being close to others (Fraley & Shaver, 2000). Emotional invalidation occurs when the individual experiences criticisms, trivializations, and punishment for attempting to communicate their internal thoughts and feelings, intermittent reinforcement of emotional escalation, and oversimplification of the ease of problem

solving and meeting one's needs (Linehan, 1993; Wagner & Linehan, 1997). Intuitively, perceptions of emotional invalidation are likely to increase attachment anxiety and avoidance. Factor analysis and exploration of convergent and divergent validities of the measures of perceived emotional invalidation and perceived attachment security are needed to explore this possible overlap.

Further study into the associations of attachment security, invalidation, and BP features in relationships beyond romantic relationships is warranted. It has been suggested that romantic relationships may be the most significant attachment relationship for those who are coupled (Trinke & Bartholomew, 1997), and for this reason, it is reasonable to focus studies of attachment security, invalidation, and BP features on the romantic relationship. Given individuals expand their hierarchy of relationships that offer attachment-related functions (Trinke & Bartholomew, 1997), it is important to also consider the interaction of attachment security, invalidation, and BP features in other relationships within the hierarchy as well (e.g., with best friends). Future studies should assess the degree of perceived invalidation, perceived attachment security, and BP feature expression amongst relationships in participants' attachment hierarchies. Mapping these characteristics in attachment hierarchies would refine the understanding of the role of attachment security and invalidation, and might expose other relational characteristics that maintain or mitigate BP features.

Future research is also needed to explore the psychometric properties of the new measures (i.e., IRR and SPCR) and the additional response item (i.e. ignoring reactions) in the SES and IRR. Replication studies should evaluate divergent and convergent validity of the IRR and SPCR to assess each of the measure's value in measuring invalidation and attachment. Furthermore, samples with varying levels of BP features should be included to examine the extent of applicability of the measures. The ignoring reactions response item should be examined for validity, reliability, and utility. Additionally, assuming there is utility in the ignoring reactions response item, the variance in its function between primary caregiver and romantic relationships should be explored. These future studies should be developed with the goal of assessing the utility of the measures in Linehan's (1993) biosocial theory.

The aim of the current research was to build and refine theory on the factors influencing BP features, specifically regarding emotional invalidation. The current study only provides a preliminary look at the role of perceived invalidation and perceived attachment security in BP features. Future research should employ experimental methods to further examine the effects of invalidation and attachment security on BP features. One approach would be to vary validating and invalidating responses from romantic partners to participants within pre-existing relationships with established attachment security functions. By monitoring emotional reactivity to validating and invalidating responses and comparing the emotional reactivity to the degree of attachment security and the degree of presence of BP features, further insight may be gained on the roles that invalidation and attachment security have as contributing factors to BP features.

Despite its limitations, this study provides an important step in the evaluation of one component of Linehan's (1993) biosocial theory, namely, invalidation. Findings highlight the potential contribution of invalidation and attachment security to BP features in adulthood relationships. A more thorough understanding of the effects of invalidation and attachment security on BP features will inform and improve existing research and treatment practices, and it will help refine theories of BPD. The current study also provides a source for hypotheses for future research.

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