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First empirical evaluation of the link between attachment, social cognition and borderline features in adolescents

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Abstract

Objective: Several developmental models of borderline personality disorder (BPD) emphasize the role of disrupted interpersonal relationships or insecure attachment. As yet, attachment quality and the mechanisms by which insecure attachment relates to borderline features in adolescents have not been investigated. In this study, we used a multiple mediational approach to examine the cross-sectional interplay between attachment, social cognition (in particular hypermentalizing), emotion dysregulation, and borderline features in adolescence, controlling for internalizing and externalizing symptoms.

Methods: The sample included 259 consecutive admissions to an adolescent inpatient unit (M_{age} = 15.42, *SD* = 1.43; 63.1% female). The Child Attachment Interview (CAI) was used to obtain a dimensional index of overall coherence of the attachment narrative. An experimental task was used to assess hypermentalizing, alongside self-report measures of emotion dyregulation and BPD.

Results: Our findings suggested that, in a multiple mediation model, hypermentalizing and emotion dysregulation together mediated the relation between attachment coherence and borderline features, but that this effect was driven by hypermentalizing; that is, emotion dysregulation failed to mediate the link between attachment coherence and borderline features while hypermentalizing demonstrated mediational effects.

Conclusions: The study provides the first empirical evidence of well-established theoretical approaches to the development of BPD.

1. Introduction

Despite historical concerns about the validity of the construct of borderline personality disorder (BPD) in adolescence [1], there is now a general consensus that it constitutes a valid and reliable diagnosis [2,3]. Evidence in support of the diagnosis in adolescence includes longitudinal continuity, a genetic basis, overlap between adolescent and adult BPD in terms of the latent variables underlying symptoms and the risk factors associated with BPD, and evidence for marked separation of course and outcome of adolescent BPD and other psychiatric disorders [4]. In adolescence, BPD affects 11% of psychiatric outpatients [5] and 30%–49% of inpatients [2,6]. Populations diagnosed with BPD have increased rates of hospitalization [7], have poor clinical and psychosocial functioning [8], and remain a challenging group to treat [9]. Furthermore, a diagnosis of BPD may negatively impact an adolescent's ability to achieve important developmental milestones as they move into early adulthood [10]. Taken together, these observations strongly suggest that early intervention is important to prevent entrenchment of psychopathology over time.

The identification of factors that may contribute to the causation, maintenance or exacerbation of a disorder is important to advance treatment [11]. Disrupted interpersonal

Abbreviations: BPD, borderline personality disorder; BPFSC, Borderline Personality Disorder Features Scale for Children; CAI, Child Attachment Interview; DERS, Difficulties in Emotion Regulation Scale; MASC, Movie Assessment of Social Cognition; VIF, variance inflation factor.

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relationships and insecure attachment have long been described as important correlates and etiological factors of borderline pathology [12,13]. Empirical evidence has supported the link between insecure attachment and BPD cross-sectionally and retrospectively in adults [14,15], and prospective longitudinal studies have shown that attachment disturbance in infancy and adolescence predicts BPD symptoms in adulthood [16–18]. However, the cross-sectional relation between attachment and borderline features in adolescents is yet to be examined.

While examining the cross-sectional link between adolescent attachment and borderline features is in itself important, such an understanding would be incomplete without considering underlying mechanisms. Two of the most likely mechanisms by which attachment may affect the development of BPD are social cognition (or mentalization) and emotion dysregulation. Mentalizing is defined as a metacognitive capacity to think about one's own thoughts and feelings and those of others as one attempts to predict and understand behavior [19]. It involves attributing mental states (e.g. emotions, desires, beliefs) to self and others and forms the basis for attachment relationships and the development of self [20,21]. Mentalizing includes both interpersonal ("other") and intrapersonal ("self") processing and involves both cognitive and emotional processing. It may be seen as the end-result of optimal meta-cognitive processing, although the latter is conceived of as a broader construct [22]. Due to the multi-component nature of mentalization, it is thought that different components of mentalization may be uniquely affected in certain disorders [23,24]. The mentalization-based theory of BPD as described by Fonagy and colleagues [20,21,25,26] posits that impairment in all the facets of mentalizing capacity partly explains the interpersonal difficulties associated with BPD. Moreover, Fonagy and colleagues have argued that disruptions of early attachment experiences can derail social-cognitive (or mentalizing) development, thereby leading to BPD. While prior studies support the link between mentalizing and BPD in adults (see Sharp and Sieswerda [27] for a review) and, recently, adolescents [28,29], to our knowledge, no studies have directly tested a model in which attachment insecurity is associated with mentalizing impairment, thereby potentiating increases in levels of borderline features. Moreover, while evidence exists for the link between attachment security and mentalizing in infants [30,31] and pre-adolescent children [32,33], there is a lack of empirical evidence in adolescents [34].

The second likely mechanism by which attachment insecurity may affect the development of borderline features lies at the basis of Linehan's [35] developmental model of BPD. Linehan suggested that BPD is primarily a disorder of emotion dysregulation that emerges from transactions between biological vulnerabilities (heightened emotional intensity) and specific environmental influences (an invalidating developmental environment). Linehan's emphasis on the interaction between emotional processing and the attachment environment makes sense against the background of decades of developmental research supporting the link between attachment and emotion regulation [36,37]. These studies have shown that the proximity and responsiveness of attachment figures support a developing child's emotional stability, while suboptimal dyadic interactions elicit emotional disequilibrium, thereby disrupting the optimal development of the child's regulatory strategies. Intensified pursuits of proximity, non-acceptance of attachment needs, and contradictory oscillations between the two, as routinely seen in BPD, are understood as regulation strategies developed to preserve relationships with insufficiently sensitive caregivers and buffer against adverse emotional sequelae [38]. While a large literature now supports the link between emotion dysregulation and BPD in adults (see Putnam and Silk [39]), with emerging literature in adolescence [40], studies examining the interplay between attachment and emotion dysregulation in adolescents are almost non-existent.

In this study, we used a multiple mediational approach to examine the cross-sectional interplay between attachment, mentalizing, emotion dysregulation and borderline features in adolescence. In so doing, we extend prior studies in three important ways. First, we include an interview-based measure of attachment, and emphasize a focus on disorganization of attachment because prior studies have suggested this to be particularly relevant to BPD [14]. To retain a dimensional approach to attachment [41], we used the overall coherence of the attachment narrative, as assessed by the Child Attachment Interview (CAI) [42], as an index of attachment disorganization. The use of this scale is supported by psychometric studies on the CAI demonstrating that this scale represents a central dimension determining attachment classification with low scores indicative of a wide range of distortions in the narrative including idealization and anger [43].

Second, in selecting a social-cognitive construct that may be particularly relevant to BPD, we focus on the construct of hypermentalizing. This rationale is based on prior studies [29,44,45] using the Movie for the Assessment of Social Cognition (MASC) [55] in adolescents with borderline features to demonstrate an anomaly of mentalization—hypermentalizing. Hypermentalizing is a social-cognitive process that involves making assumptions about other people's mental states that go beyond observable data [46]. As such, it involves overattribution of mental states to others and their likely misinterpretation. Hypermentalizing is therefore by its very nature indicative of a metacognitive deficit since an individual engaging in hypermentalizing is failing to attain a higher-order representation from which to question his/her own belief in service of generating an alternative hypothesis regarding a distressing situation [24,47]. More specifically, hypermentalizing reflects a lack of metacognitive differentiation [47] because representation is conflated with reality.

Third, in assessing emotion dysregulation we make use of Gratz and Roemer's [48] conceptual model of emotion

dysregulation because of its previous use in borderline research. This model defines emotion regulation as "involving the (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and behave in accordance with desired goals when experiencing negative emotions, and (d) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands" (p. 42). Gratz and Roemer's definition of emotion regulation includes both the capacity to regulate emotional responses and the ability to experience and distinguish a broad spectrum of emotions. Therefore, in the Gratz and Roemer model, adaptive emotion regulation includes having both a repertoire of emotion regulation strategies and sufficient flexibility to use them.

In sum, the aim of the current paper was to examine the interplay between attachment (coherence), social cognition (hypermentalizing), and emotion dysregulation in its association with borderline features in adolescents. In the context of a multiple mediational approach, we expected both hypermentalizing and emotion dysregulation to mediate the relation between coherence and borderline features given that both mechanisms appear to be independent but related correlates of BPD. Given that previous studies have shown that being older and female [49] are both correlated with increased mentalizing ability and that gender [50], externalizing [51], and internalizing [52] problems are associated with BPD traits, we controlled for these confounds in the aforementioned analyses.

Despite the cross-sectional nature of this study, demonstrating these links would (a) provide preliminary evidence in support of the relations between distal vulnerability factors such as attachment and the proximal expression of these vulnerabilities in on-line social-cognitive reasoning as it relates to psychopathology and (b) provide justification for the focus on hypermentalizing and emotion dysregulation as intervention targets for adolescents with borderline features.

2. Methods

2.1. Participants

All consecutive admissions ($N = 259$; $M_{age} = 15.42$, $SD = 1.43$; 63.1% female) to a tertiary care inpatient treatment facility were approached to participate in the study. Inclusion criteria were ages between 12 and 17, English fluency, and admission to the unit. Exclusion criteria included active psychosis, IQ <70, diagnosis of autism spectrum disorder, and primary language not being English. This study was approved by the local ethics committee. All adolescent participants provided informed assent and their parents provided informed consent.

Based on data from clinician reports, 86.9% of participants were diagnosed with a mood disorder, 69.9% with an anxiety disorder, 28.6% with a disruptive behavior disorder, and 39.4% with a substance abuse or dependence disorder. The modal number of diagnoses was two and the mean number was between three and four. Twenty-three percent of the sample had made at least one suicide attempt in the last year and 27.6% had made at least one attempt during their lifetime. In addition, 37.8% of the sample reported cutting during the last year and 44.4% reported cutting during their lifetime. Based on the Youth Self-Report [53], 54% of the sample scored above the clinical cut-off (T-score of 65) for internalizing disorders and 43% for externalizing disorders. The ethnic breakdown of the sample was as follows: 91.8% white, 6.4% Hispanic, 4.5% Asian, 1.4% bi- or multi-racial, and 2.3% black.

3. Measures

3.1. The Child Attachment Interview

The Child Attachment Interview (CAI) [42] is an interview-based measure assessing attachment organization by accessing children's mental representations of their attachment figures. The CAI accomplishes this by asking children to describe and reflect on the relationship with each attachment figure separately. For instance, the child is asked to choose three words to describe their relationship with each parent, in addition to being asked to describe what happens when each of the attachment figures is angry with him or her. The interviewer also elicits information about the responsiveness of attachment figures during times of illness, loss, abuse, and separation. The interview is conducted in private and videotaped. Interviews are coded from videotapes on the basis of 11 scales: emotional openness, balance of positive and negative reference to attachment figures, use of examples, preoccupied anger (separate for mother and father), idealization (separate for mother and father), dismissal (separate for mother and father), resolution of conflicts, and overall coherence. The coherence scale, used in the present study, integrates other scales to determine overall interview quality, which most closely mirrors overall attachment quality. Indicators of high coherence include fresh speech and reflectiveness, whereas violations to coherence include lack of comprehensibility, inhibited narrative production, contradiction, inconsistency, perseveration, and dysfluency of discourse. Previously, this measure has demonstrated adequate reliability and validity [43]. Recently, the CAI was validated in a sample of adolescents, revealing adequate interrater reliability (e.g., significant correlation between raters on coherence subscale), concurrent validity, and convergent validity for the CAI [54]. Interclass correlations for the CAI subscale scores have been computed based on approximately 15% of the sample (38 randomly selected interviews), as rated by two independent coders. Significant correlations were found on all subscales ($p \leq .001$ in all cases) and ranged from .53 to .90. The average correlation was .66.

3.2. Hypermentalizing

Hypermentalizing was assessed through the MASC [55]. This is a computerized test for the assessment of implicit mentalizing abilities that approximates the demands of everyday life. Participants are asked to watch a 15-minute film about four characters getting together for a dinner party. During administration of the task, the film is stopped and questions referring to the characters' mental states (feelings, thoughts, and intentions) are asked (e.g., "What is Betty feeling?", "What is Cliff thinking?"). For each question, participants are provided with four response options, each of which reflects a type of mentalizing (hypermentalizing, undermentalizing, no mentalizing and accurate mentalizing). To derive a summary score for each of the subscales, 1 point per response is added, so that, for instance, a participant who chose mostly hypermentalizing response options would have a high hypermentalizing score relative to the other subscales. Hypermentalizing responses are characterized by attribution of emotions and mental states not justified by the scenario. For example, one scene in the film involves a character, Michael, complimenting another character, Sandra, on her hair, though Sandra appears somewhat reserved in her reaction. Response options reflect four levels of mentalizing: (1) a hypermentalizing response: "She is exasperated about Michael coming on too strong," (2) an undermentalizing response: "She is pleased about his compliment," (3) a nonmentalizing response: "Her hair does not look that nice," and (4) an accurate mentalizing response: "She is flattered but somewhat taken by surprise".

The MASC is a reliable instrument that has proven sensitive in detecting subtle mindreading difficulties in adults of normal IQ [55].

3.3. Emotion dysregulation

The Difficulties in Emotion Regulation Scale (DERS) [48] is a self-report questionnaire that assesses emotion dysregulation. It consists of 36 items that are scored on a 5-point Likert scale, ranging from 1 ('*almost never* (*0–10%*)') to 5 ('*almost always* (*91–100%*)'). A higher score indicates greater emotion dysregulation. The measure assesses six separate scales including: *nonacceptance*, *goals*, *impulse*, *awareness*, *strategies*, and *clarity*. In the measure's initial publication, the DERS displayed good internal consistency ($\alpha = .93$), construct and predictive validity, and test–retest reliability across 4–8 weeks ($p < .01$) [48]. Internal consistency in present study was good ($\alpha = .95$) for this measure.

3.4. Borderline Personality Disorder Features Scale for Children (BPFSC)

To examine BPD features, the BPFSC [56] was used. The BPFSC is a 24-item self-report measure based on the BPD scale of the Personality Assessment Inventory (PAI) [57]. This scale was created for use in children and contains items on four subscales reflective of core borderline personality disorder features: affective instability, identity problems, negative relationships, and self-harm. Items are rated on a 5-point Likert scale ranging from *not true at all* to *always true*. Sample items include "I want to let some people know how much they've hurt me," and "When I'm mad, I can't control what I do." In the present sample, Cronbach's alpha for this measure was .88.

3.5. Youth Self Report (YSR)

To examine internalizing and externalizing symptoms, the YSR [53] was used. The YSR is a 112-item self-report measure of psychopathology for use with adolescents between the ages of 11 and 18. Each item is scored on a 3-point scale (0 = *not true*, 1 = *somewhat or sometimes true*, or 2 = *very or often true*). For this study we utilized the Internalizing and Externalizing scale T-scores. The Internalizing scale is composed of the Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints subscales. The Externalizing scale is composed of the Aggressive Behavior and Rule-Breaking Behavior subscales. This questionnaire is scored electronically and therefore item level data were not available for the analysis of internal consistency. In a large normative sample, Cronbach's alpha ranged from .71 to .95 for all YSR subscales with an average of .83 [64].

4. Results

4.1. Descriptive results and bivariate relations between main study variables

Descriptive statistics are presented in Table 1. Pearson's correlations between key study variables are presented in Table 2. These analyses revealed that more severe borderline features were significantly associated with elevated hypermentalizing, emotion dysregulation, internalizing symptoms, and externalizing symptoms. Moreover, higher attachment coherence was associated with less hypermentalizing. Age was significantly correlated with attachment and hypermen-

Table 1
Descriptive information for each main study variable.

Variable	Mean	Standard deviation
Attachment (coherence)	4.22	1.90
Hypermentalizing (MASC)	7.91	3.94
Emotion dysregulation (DERS)	102.61	28.33
Borderline symptoms (BPFSC)	69.40	15.74
Internalizing (YSR)	63.67	12.51
Externalizing (YSR)	61.25	11.01

Attachment = overall coherence scale from the Child Attachment Interview; Hypermentalizing = hypermentalizing scale from the Movie for the Assessment of Social Cognition; DERS = total score of the Difficulties in Emotion Regulation Scale; BPFSC = total score of the Borderline Personality Features Scale for Children; Internalizing = internalizing t-score from the Youth Self Report; Externalizing = externalizing t-score from the Youth Self Report.

Table 2
Pearson correlations between key study variables.

	Attachment	Hypermentalizing	DERS	BPFSC	Int	Ext	Age
Attachment	–	–	–	–	–	–	–
Hypermentalizing	−.208**	–	–	–	–	–	–
DERS	−.097	.140*	–	–	–	–	–
BPFSC	−.112	.239***	.680***	–	–	–	–
Int	−.002	.108	.577***	.478***	–	–	–
Ext	−.084	.164**	.373***	.556***	.373***	–	–
Age	.170**	−.295***	−.005	−.077	.003	.052	–

Attachment = overall coherence scale from the Child Attachment Interview; Hypermentalizing = hypermentalizing scale from the Movie for the Assessment of Social Cognition; DERS = total score of the Difficulties in Emotion Regulation Scale; BPFSC = total score of the Borderline Personality Features Scale for Children; Int = internalizing t-score from the Youth Self Report; Ext = externalizing t-score from the Youth Self Report.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

talizing (but not internalizing or externalizing) and was therefore included as a covariate in subsequent analyses. Independent samples *t*-tests revealed that females scored significantly higher on emotion dysregulation than males (DERS; $t = 3.705$, $p > .001$, $df = 257$; $M_{male} = 94.19$, $SD_{male} = 25.60$; $M_{female} = 107.39$, $SD_{female} = 28.86$) and gender was therefore included as a covariate. Females also reported higher borderline features (BPFSC; $t = 3.93$, $p > .001$, df = 257; $M_{male} = 64.45$, $SD_{male} = 14.46$; $M_{female} = 72.19$, $SD_{female} = 15.82$). No significant gender differences were noted with regard to hypermentalizing, internalizing, or externalizing.

4.2. Mediational analyses

We expected that both hypermentalizing and emotion dysregulation would mediate the relation between attachment and borderline features. Preacher and Hayes' [68] test of the indirect effect was used to test this hypothesis because it permits exploration of multiple mediators concurrently and adjusts for covariates. Before testing for mediation, formal detection-tolerance and the variance inflation factor (VIF) were used to assess multicollinearity. Because multicollinearity was not a problem, with tolerance greater than .2 and a VIF less than 4 for all variables, centering the predictor variables was not necessary [69,70]. The test of the indirect effect (Fig. 1) provides a bootstrap test of the indirect effects of attachment (coherence) on borderline features (BPFSC) through the proposed mediators of emotion dysregulation (DERS) and hypermentalizing (MASC). Analyses were conducted with gender, age, internalizing, and externalizing symptoms treated as covariates. In our model, this test (a) confirmed the mediating effects of hypermentalizing and emotion dysregulation when considered together; (b) confirmed the role of hypermentalizing as a mediator independently, but (c) *did not* confirm the role of emotion dysregulation as a mediator independently. These results are presented in Table 3. Together, these predictors accounted for 58.85% of the variance in borderline features (adjusted $R^2 = .59$, $R^2 = .60$).

Given the cross-sectional nature of the data which precludes strong conclusions about causality, we tested directionality by examining two reversed models were in which the indirect effects of hypermentalizing and emotion dysregulation (separately) on borderline features were explored using attachment coherence as the mediator. Analyses were conducted with gender, age, internalizing, and externalizing symptoms treated as covariates. In the first model, hypermentalizing served as the independent variable. This model did not confirm the mediating effect of attachment coherence on the relation between hypermentalizing and borderline features, with a confidence interval that included 0 (CI: −.02 to .11). Together, these predictors accounted for 44.91% of the variance in borderline features (adjusted $R^2 = .45$, $R^2 = .46$). In the second model, emotion dysregulation served as the independent variable. This model did not confirm the mediating effect of attachment on the relation between emotion dysregulation and borderline features, with a confidence interval that included 0 (CI: −.005 to .009).

5. Discussion

The aim of the current study was to examine the interplay between attachment (coherence), social cognition (hypermentalizing), and emotion dysregulation in its association with borderline features in adolescents. We expected both hypermentalizing and emotion dysregulation to mediate the relation between coherence and borderline features given that both mechanisms appear to be independent, but related correlates of BPD. Our findings suggested that, in a multiple mediation model, hypermentalizing and emotion dysregulation together mediated the relation between attachment coherence and borderline features, but that this effect was driven by hypermentalizing. This may be due to the shared variability between hypermentalizing and emotion dysregulation as evidenced by the significant correlation between these two constructs, with hypermentalizing being the more all-encompassing construct relevant to BPD features.

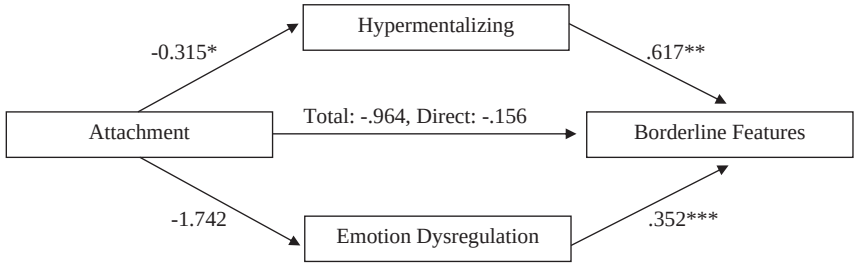

Fig. 1. Multiple mediational model exploring the effect of attachment on borderline features through the proposed mediators of hypermentalizing and emotion dysregulation. *Note*. Values are unstandardized path coefficients. Attachment = overall coherence scale from the Child Attachment Interview; Hypermentalizing = hypermentalizing scale from the Movie for the Assessment of Social Cognition; Emotion Dysregulation = total score of the Difficulties in Emotion Regulation Scale; Borderline Features = total score of the Borderline Personality Features Scale for Children. *$p < .05$. **$p < .01$. ***$p < .001$.

The current study impacts the literature in three important ways. This is the first study to empirically test a model examining the proposition that mentalizing should relate to attachment in adolescence (see, e.g., Dykas and Cassidy; [34] Sharp et al. [58]). While no research has tested these links in adolescents, attachment security has been shown to relate to attention to positive social feedback [59] and positive memories of social interactions with attachment figures [60] in adolescence. Insecure adolescents have been shown to perceive others in a negatively-biased schematic manner, whereas secure adolescents operate in a positively-biased manner [61]. The same negative bias has been demonstrated for adults' attention to [62] and memory for social information [63], as well as expectations of romantic partners [64] and offspring [65]. We add to this literature by showing that mentalizing relates to attachment insecurity and mediates links with psychopathology, in this case BPD.

Second, this is also the first study to explicitly test Fonagy's developmental model of BPD wherein attachment insecurity is proposed to derail the development of optimal mentalizing. The significance of attachment in the prediction of borderline features suggests that familial influences play an etiological role— consistent with Linehan's invalidation model [35], Young et al.'s schema-focused model; [66] and the psychodynamic models of Gunderson and Lyons-Ruth [67] and Fonagy [20]. However, while studies of infant [68] and early childhood attachment [69] suggest that attachment classification is primarily environmentally determined, studies of adolescent attachment using the CAI have recently painted a more nuanced picture suggesting a possibly genetic basis to attachment [70]. In considering the role of attachment in the fostering (or derailment) of mentalizing capacity, it is worth mentioning that other evolutionary processes have been identified that may also underpin the development of mentalizing capacity [71]. These may include successful competition for social rank [72], cooperation and alliance building [73] or the ability to relate to more than one caregiver [74]. As Liotti and Gilbert [71] put it, "the evolution of mentalization in human phylogeny may be developed through different types of social relating and in turn may influence a range of social relationship forming abilities" (p. 11). Therefore, it would be important for future research to go beyond the attachment relationship *per se*, to examine the role of other human motivations that may underpin mentalizing in the context of BPD.

Table 3
Mediational model of the effect of attachment on borderline features through hypermentalizing and emotion dysregulation.

	Point estimate	SE	Percentile 95% CI	
			Lower	Upper
Outcome: BPFSC				
Hypermentalizing	−.176	.087	−.374	−.027
Emotion Dysregulation	−.355	.200	−.764	.023
Total	−.531	.226	−.992	−.106

Hypermentalizing = hypermentalizing scale from the Movie for the Assessment of Social Cognition; Emotion Dysregulation = total score of the Difficulties in Emotion Regulation Scale. 10,000 bootstrap samples. Analyses were conducted with gender, age, internalizing, and externalizing symptoms treated as covariates.

The importance of the hypermentalizing finding should not be overlooked. For years, there has been controversy about whether individuals with BPD actually demonstrate mentalization failures (see Sharp [46]). Earlier accounts suggested failures or "suppression" of mentalizing in borderline patients [75]—although several studies have failed to demonstrate mentalizing failures in borderline patients. In the current study, the MASC suggested that a mentalizing dysfunction, not in the form of failure or suppression, but in the form of excess is present—providing a more parsimonious account of mentalizing dysfunction in BPD.

Third, the fact that emotion dysregulation failed to mediate the relation between attachment security and borderline features when hypermentalizing was considered concurrently may relate to the fact that emotion dysregulation was measured through self-report. It may be that self-report provides a weaker index of the shared variance of emotion dysregulation and attachment as high convergence of experimentally-based measures of emotion dysregulation and attachment measured by self-report instruments have been reported. Further, while the literature is strongly supportive of the suggestion that attachment experiences serve to organize interpersonal behavior via emotion regulation, this literature speaks largely to variation within

the normal range or in discriminating clinical from healthy populations [76]. It is possible that, in a clinical sample, the variance in emotion regulation is no longer captured by attachment, resulting in a weaker mediational role for the DERS.

Several limitations of the current study should be acknowledged. First, this study is cross-sectional and cannot draw conclusions about causation. Second, while research in clinical samples is valuable to ensure adequate base rates of disorder, replication of the mediational relationships demonstrated here in community samples is needed. Third, a major limitation of the current study is its exclusive focus on BPD. Future research should include assessment of other PDs, especially against the background of recent research that has found that metacognitive functions may differentially relate to different PDs, while overall metacognitive capacity associated with severity of PD [77]. Despite these limitations, the study provides the first empirical evidence of well-established theoretical approaches to the development of BPD, and provides a rationale for targeting hypermentalizing in treatment with adolescents with borderline features. Indeed, over the last 20 years there has been an increasing focus on integrating strategies that target mentalizing or metacognition in psychotherapeutic practice [19,22]. Providing empirical evidence for the theoretical rationale for doing so continues to be a priority.

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