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Experiential avoidance mediates the link between maternal attachment style and theory of mind

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Abstract

Theoretical and empirical models suggest a relation between attachment style and theory of mind (ToM) in childhood and adulthood; however, this link has not been evaluated to the same extent in adolescence. Additionally, these models typically fail to consider mechanisms by which attachment style affects ToM abilities. The present study sought to test a mediational model in which experiential avoidance mediates the relation between maternal attachment style and ToM. A sample of 282 adolescents (M_{age} = 15.42 years, SD = 1.44, 62.8% female) was recruited from an inpatient psychiatric hospital. Findings revealed that maternal attachment style in females was related to ToM, through experiential avoidance. Specifically, those with a disorganized maternal attachment were most likely to engage in experiential avoidant cognitive and emotional strategies, which in turn related to lower levels of ToM ability. Implications and areas for future research are discussed.

1. Introduction

Theory of mind (ToM), as first defined by Premack and Woodruff [1], refers to the understanding that internal mental states such as beliefs, intentions, and desires drive observable behaviors. Mentalizing, a related construct, goes one step further to refer to the reflection on others' minds as well as one's own mind [2]. This is distinct from ToM, which usually refers to the reflection on the mind of others only [3]. These two constructs, along with other social cognitive processes, facilitate social competence and, consequentially, successful navigation of social interactions [4]. Both mentalizing and ToM are subsumed under the umbrella construct of social cognition, which refers to the mental processes involved in perceiving, attending to, remembering, thinking about, and making sense of the people in our social world [5], or the ability to understand ourselves and others as individuals with beliefs, feelings and personality [6]. Deficits in ToM have been shown to correlate with interpersonal problems in both psychiatric populations [7–9] as well as healthy populations [10,11]. Previous literature has shown the emergence of ToM to begin within the first year of life manifesting in joint attention, social referencing, and the perception of incongruity between the infant's emotional state and another's [12,13], but that variability in ToM abilities is present through the lifespan.

It is important to study ToM in adolescence as this developmental period is marked by changes in social behavior and cognitions including greater self-consciousness and increased complexity of peer relationships [14]. Additionally, cortical regions related to ToM functioning, specifically prefrontal regions (e.g. medial prefrontal cortex, superior temporal sulcus, and right dorsolateral prefrontal cortex), are still developing during adolescence [15,16]. Changes in these neural structures coupled with more complex social environments act to influence adolescents' social cognitive abilities. Moreover, because ToM is a central process in navigating the social world [10], it is crucial to understand psychological processes that may relate to individual differences in ToM performance, especially those that may account for atypical development of ToM.

One such process is attachment security. Specifically, in a model introduced by Fonagy [17], the capacity for ToM (also referred to as mentalizing) develops in the context of a secure early parent-child relationship. Building on Bowlby's [18]

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attachment theory, Fonagy and colleagues [19] suggested that in infancy, secure attachment relationships facilitate the capacity to tolerate and regulate negative emotional states and that mental states in others are independent from one's own.

The notion that attachment security may relate to individual differences in ToM is also underscored by Dykas and Cassidy [20] who posit that individuals with insecure working models of attachment defensively fail to process social information that has the potential of causing psychological pain. An insecure working model of attachment is developed over time when a caregiver repeatedly ignores or invalidates an infant's distress [21]. At this time, an infant develops an insecure representation of their caregiver, which generalizes to their future interactions with that caregiver. For instance, Main and colleagues [21] found that infant behavior in the strange situation task reflected the internal working model of attachment of that caregiver—secure infants sought out interactions with their caregiver when uncomfortable whereas infants with insecure working models of attachment did not. Additionally, disorganized attachment was found to be related to specific interaction patterns in a conflict discussion task between adolescents and their mothers [22]. Eventually, these representations generalize into a filter used in the processing of all social information; [20] specifically, when a child encounters potentially negative social information that previously led to suffering because of unmet needs (invalidation of distress by caregiver), their working model will provide a defense against this information by limiting cognitive access. Obsuth and colleagues [22] termed this process defensive exclusion. In these situations, an individual fails to fully process the emotional components of a situation that may cause distress. This is in contrast to an individual with a secure attachment representation who is able to process negative emotions in a more cognitively open manner because of previous experiences facilitated by their caregiver. Experiential avoidance or "an unwillingness to remain in contact with uncomfortable private events by escaping or avoiding these experiences" [23], (p1154) may represent one of these defensive mechanisms described by Dykas and Cassidy [20].

Experiential avoidance has never been tested as a mechanism in the relation between attachment and ToM. However, research has shown it to be a key construct in various forms of psychopathology including anxiety, borderline personality disorder, and eating disorders [24–26]. Experiential avoidance has been conceptualized as an emotion regulation strategy aimed at modifying the experience of overwhelming emotional states. Research shows that, despite the intent to reduce experience of negative emotional states, reduction in the experience of positive emotional states also occurs [27]. We found it important to integrate this construct into our model of relations between attachment and ToM due to its general effect of attenuating emotional experience. Therefore, the aim of the current study was to test a mediational model in which experiential avoidance mediated the relation between attachment style and ToM. We hypothesized that certain attachment styles would be related to greater levels of experiential avoidance and subsequently, poorer ToM ability.

Our theorized relation between experiential avoidance and ToM is in line with research on neural representations of ToM processes. Research has shown that there are two separate ToM pathways: one utilized for affective state attribution and a separate, higher-order pathway to represent intention and beliefs [28]. Frith and Happe [29] showed that this second, higher-order pathway requires an individual to construct the mental experience of another by reflecting on their own similar experiences. If an individual lacks integrated memories of negative states due to a pattern of experiential avoidance, it is likely that their higher-order ToM pathway may be impaired. This is in line with behavioral research that has shown that the ability to reflect on the minds of others is assumed to partially depend on the ability to recognize and accept mental states in the self [30,31]. Without the proper use and reflection of mental states within one's own mind, this same reflection of others' mental states can similarly be impaired.

In sum, we sought to examine the relations between attachment, experiential avoidance and ToM. Based on the literature reviewed, we expected that experiential avoidance would have a mediational effect on the relation between attachment and ToM. An individual who, based on early attachment experiences, defensively excluded the processing of negative emotions would develop a cognitive schema that filtered the way social information was processed. Specifically, experiential avoidance would be utilized by this individual as a defense mechanism against unpleasant internal states. Subsequently, this would impair the processing and reflection of one's own and other's negative states leading to deficits in ToM functioning. This dynamic may be especially pronounced in adolescents who are undergoing a period of psychological and social transition.

In addressing this aim, we used the Movie for the Assessment of Social Cognition (MASC) [32] to specifically test higher-order ToM processes. This measure was developed as a naturalistic, video-based instrument that requires an individual to consider multiple dynamic indicators to infer a wide range of mental states. We tested these links in a clinical sample where we would be assured to find variability in attachment security, experiential avoidance, and ToM capacity. Demonstrating a mediational role for experiential avoidance in the relation between attachment security and ToM would provide a more fine-grained understanding of components of social-cognition in the attachment context.

2. Methods

2.1. Subjects

Adolescents were recruited from a 16-bed inpatient psychiatric unit that usually serves individuals with severe

behavioral and emotional disorders who have not responded to previous interventions. The inclusion criterion was sufficient proficiency in English to consent to research and complete the necessary assessments, and exclusion criteria were a diagnosis of schizophrenia or another psychotic disorder, an autism spectrum diagnosis, or an IQ of less than 70. Of $n = 411$ adolescents and their parents who were approached for consent, 26 declined participation, 2 revoked consent, and 40 were excluded on the basis of the aforementioned criteria. Additionally, 61 participants were excluded due to missing data on main study variables. These data were missing at random due to adolescents refusing to complete assessments or discharging from the hospital before assessments were completed. Therefore, the final sample consisted of $n = 282$ adolescents (ages 12–17; $M_{age} = 15.42$; $SD = 1.44$), including 177 (63%) females and 105 (37%) males, and had the following ethnic breakdown: 75.2% White ($n = 212$), 4.3% Hispanic ($n = 12$), 3.9% Asian ($n = 11$), 2.8% Black ($n = 8$), and 13.8% mixed or other ($n = 39$). At admission, 20.1% met diagnostic criteria for ADHD, 21.9% for conduct disorder, 15.7% for generalized anxiety disorder, 45% for major depressive disorder, 25.4% for obsessive compulsive disorder, 24.1% for oppositional defiant disorder, 15.1 for panic disorder and 22.1% for social phobia. The study was approved by a human subjects review committee, and subjects participated after signing a written voluntary informed consent form. Adolescents were collectively assessed by doctoral-level clinical psychology students and/or trained clinical research assistants. The assessments were conducted independently and in private within the first two weeks following admission. The average length of stay in this program is 4–6 weeks.

2.2. Measures

2.2.1. Attachment

The Child Attachment Interview (CAI) [33] is a semi-structured interview based measure of attachment. The interview was originally designed to be used with children ages 8–13; however, recently this interview has been used in adolescent populations [34]. The interview consists of 19 questions concerning the adolescent's experiences with primary caregivers with prompts for the adolescent to reflect upon each experience. The interview is videotaped and transcribed for coding on eight scales (e.g. coherence, idealization, resolution of conflict) as well as a categorical measure of attachment style with each of the adolescent's primary caregivers. The adolescent's narrative as well as non-verbal behavior is taken into account in the coding process. The final attachment style is coded as secure, dismissing, preoccupied, or disorganized. For the purpose of this paper, we utilized this four-way categorization of attachment style. Interrater agreement for the four-way classification has been computed based on approximately 13% of the sample (38 randomly selected interviews), as rated by two independent coders. With regard to mother, interrater agreement was $\kappa = .59$ [35].

2.2.2. Experiential avoidance

The Avoidance and Fusion Questionnaire for Youth (AFQ-Y) [36] is a 17-item self-report measure assessing psychological inflexibility. Adapted from the Acceptance and Action Questionnaire for adults, it assesses both cognitive fusion and experiential avoidance. Sample items include "I push away thoughts and feelings that I don't like" and "My life won't be good until I feel happy". Responses are scored on a 5-point Likert scale from 0 (*not at all true*) to 4 (*very true*). Higher scores indicate higher experiential avoidance. Internal consistency in our sample was good ($\alpha = .90$) and has ranged from .87 to .90 in other studies with adolescents [36,37].

2.3. Theory of mind

The MASC [32] is a computerized test for the assessment of ToM that approximates the demands of everyday life [38]. Examples of test stimuli are included in the online supplemental material provided in Hayes and colleagues [39]. Subjects were asked to watch a 15-minute film about four characters getting together for a dinner party. Themes of each segment covered friendship and dating issues. During administration of the task, the film is stopped at 45 points and questions referring to the characters' mental states (feelings, thoughts, and intentions) are, asked (e.g., "What is Betty feeling?", "What is Cliff thinking?"). Participants are provided with four response options: (a) an excessive ToM (hypermentalizing) response, (b) a less ToM (undermentalizing) response, (c) a no ToM (no mentalizing) response, and (d) an accurate ToM (mentalizing) response. For the purposes of this study, we looked at the total score, which is the sum of all accurate ToM responses. The MASC is a reliable instrument that has proven sensitive in detecting subtle mindreading difficulties in adults of normal IQ [32] and in young adults [38].

3. Results

3.1. Descriptive results and bivariate relations between main study variables

Table 1 displays the means and standard deviations of age, AFQ-Y and MASC as well as frequencies for maternal attachment styles. Independent samples t-tests were run to test differences between genders on the AFQ-Y and MASC. Results showed that females scored higher than males on the AFQ-Y, our measure of experiential avoidance ($t = 3.83$, $p \leq .001$) and on the MASC, our measure of ToM ($t = 2.67$, $p = .01$).

3.2. Group differences based on maternal attachment style

Next, we ran a one-way ANOVA with maternal attachment style as the independent variable and ToM as the dependent variable (Table 2 & Fig. 1). We utilized maternal attachment ratings on the CAI as there were

Table 1
Descriptive information for main study variables.

Variable		Males	Females	Total
		n = 105	n = 177	n = 282
Age	*M*	15.50	15.37	15.42
	SD	1.39	1.46	1.44
MASC total score	*M*	31.09	32.73	32.12
	SD	4.93	5.13	5.11
AFQ-Y total score	*M*	23.53	30.21	27.73
	SD	12.80	14.69	14.36
%^{age} Preoccupied		12.4%	19.2%	16.7%
%^{age} Dismissing		41%	33.9%	36.5%
%^{age} Secure		28.6%	26%	27%
%^{age} Disorganized		18.1%	20.9%	19.9%

AFQ-Y = Avoidance and Fusion Questionnaire for Youth; MASC = Movie for the Assessment of Social Cognition.

missing data (n = 6) with paternal attachment due to either single custody agreements or death of a father. Results showed that CAI maternal attachment style significantly predicted differences in MASC total score. Given significant differences between males and females on the AFQ-Y, we re-ran the ANOVA for each gender separately. In males, there were no significant differences in MASC scores based on maternal attachment style. However, in females, there were significant differences in MASC scores based on maternal attachment style; Games–Howell post-hoc tests showed that females with a preoccupied maternal attachment style scored significantly higher on the MASC than females with a disorganized or dismissing maternal attachment style. Females with secure maternal attachment styles scored similarly to those with preoccupied maternal attachments, although these scores were not significantly different from other attachment categorizations.

We also ran a one-way ANOVA with maternal attachment style as the independent variable and AFQ-Y as the dependent variable (Table 2 & Fig. 2). CAI maternal attachment style did not predict differences on the AFQ-Y in neither the full sample, nor males alone. However, in females, those with a disorganized maternal attachment style scored significantly higher on the AFQ-Y than females with a secure or preoccupied maternal attachment style.

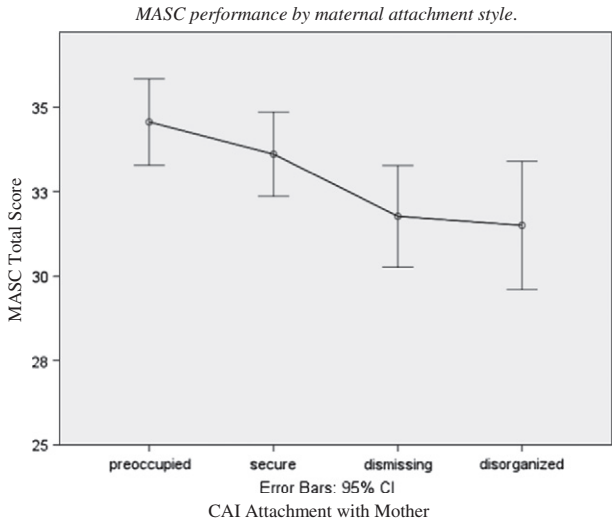

Fig. 1. MASC performance by maternal attachment style.

3.3. Mediational analysis

Given the lack of findings of differences between males with different attachment styles and in line with our main study aim, we sought to determine whether the observed differences in ToM performance between attachment styles in females could be explained by experiential avoidance. We selected the females in the sample (n = 177) and conducted a mediational analysis [40] to test this hypothesis using SPSS (Chicago, IL) in which the four way categorization of maternal attachment (secure, insecure, preoccupied, or disorganized) from the CAI served as a categorical independent variable. We used a simple indicator coding method to compare each group with the preoccupied category because this group showed the highest scores in MASC performance in the above ANOVA. AFQ-Y score was used as the mediator and MASC total score was used as the dependent variable. Mediational analyses based on 1000

Table 2
Differences on AFQ-Y and MASC based on maternal attachment style.

	Total sample			Boys			Girls		
Attachment style	n	AFQ-Y	MASC	n	AFQ-Y	MASC	n	AFQ-Y	MASC
Preoccupied	47	27.15 (15.80)	33.62 (4.14)[a]	13	29.15 (13.91)	31.15 (4.41)	34	26.38 (16.60)[b]	34.56 (3.67)[a]
Dismissing	103	27.95 (14.55)	31.75 (5.50)[b]	43	23.10 (12.19)	31.72 (5.05)	60	31.35 (15.19)	31.77 (5.84)[b]
Secure	76	26.01 (12.58)	32.76 (4.25)	30	22.55 (11.84)	31.47 (4.03)	46	28.24 (12.66)	33.61 (4.21)
Disorganized	55	30.17 (15.02)	30.64 (5.82)[b]	19	22.53 (14.71)	29.00 (6.00)	36	34.51 (13.49)[a]	31.50 (5.61)[b]
Test statistic		F(3,273) = .903	F(3,277) = 3.56*		F(3,99) = .981	F(3,101) = 1.45		F(3,170) = 2.21	F(3,172) = 2.62*
η^2		.010	.037		.029	.041		.037	.056

Maternal attachment was measured by the Child Attachment Interview; AFQ-Y = Avoidance and Fusion Questionnaire for Youth; MASC = Movie for the Assessment of Social Cognition.

* = $p \leq .05$.

[a] = $p \leq .05$ Games–Howell from [b].

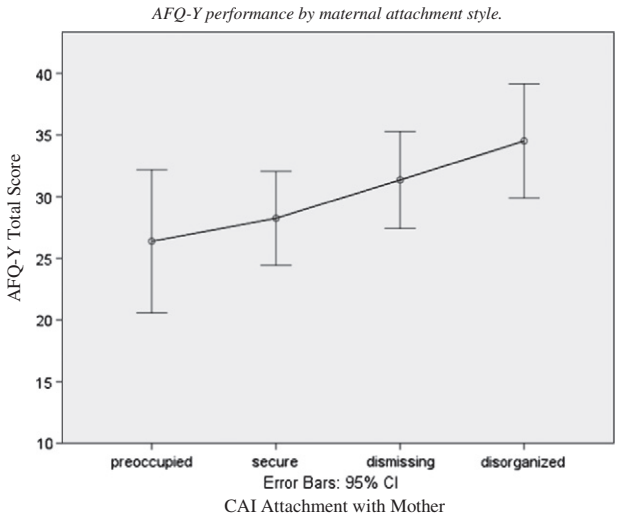

Fig. 2. AFQ-Y performance by maternal attachment style.

bootstrapped samples using bias-corrected and accelerated 95% confidence intervals [41] showed that maternal attachment style had a significant indirect effect on ToM (*CI* = −1.32 to −.05) supporting our model. Model coefficients (Fig. 3) showed that the AFQ-Y mediated differences between disorganized maternal attachment and MASC scores.

4. Discussion

The goal of this study was to examine the relations between attachment, experiential avoidance, and ToM. In a sample of inpatient adolescents, we examined the influence of maternal attachment style on ToM in a mediational model to determine whether the relation between ToM and maternal attachment style could be explained by a tendency to experientially avoid unpleasant internal states. Our findings supported this model. Specifically, we demonstrated that in inpatient adolescent females, maternal attachment style predicted a tendency to avoid unpleasant internal states. More specifically, those with a disorganized attachment had the highest levels of experiential avoidance, which related to poorer performance on a higher-order task of ToM. Individual pathways of this model demonstrated that disorganized females differed significantly from the rest of the sample in both ToM ability and experiential avoidance levels.

While there is a large body of existing research examining the effects of attachment on ToM, this is only the second study to our knowledge that demonstrates the relation in adolescence. Additionally, by considering the role of experiential avoidance in the relation between attachment and ToM, this study represents the first to introduce a mechanism by which attachment may affect ToM. Theoretical perspectives introduced by Dykas and Cassidy [20] and Fonagy and colleagues [19] provide a strong foundation to examine these relations. Specifically, Fonagy and colleagues [19] theorized that secure attachment relationships give infants a second-order representation of their own mental states that is able to be manipulated, regulated, and separated from their parents'. An attuned caregiver tends to an infant's negative affective state by a) showing sensitivity toward their emotional expression; b) mirroring and labeling the infant's emotional states; and c) remaining regulated. Over time, these interactions teach an infant to self-soothe; negative emotional states are seen as temporary and manageable. Additionally, because emotional expressions of the caregiver and infant are independent, but related, infants generalize this knowledge to their future social interactions. This supports proper acquisition and use of ToM as well as lessens the likelihood of experiential avoidance, as emotional states are more easily managed by the individual.

Experiential avoidance can be conceptualized as cognitive inflexibility that works to protect an individual from negative mental states. This mechanism of defensive exclusion has been presented in attachment literature as arising during infancy from early caregiver interactions [18]. In the Dykas and Cassidy [20] model, defensive exclusion is characterized as a cognitive schema in which social information that may cause psychological pain is not processed in a cognitively open manner [20]. Their model details how an internal working model of attachment generalizes to the processing of social information through the lifespan. Specifically, methods used to filter out potentially painful stimuli include directing attention away from, limiting memory, or cognitively suppressing access to these components [42]. While research in adolescence exists supporting the theory that insecure attachment is associated with limited attention to and memory for social information [42–44], no research has

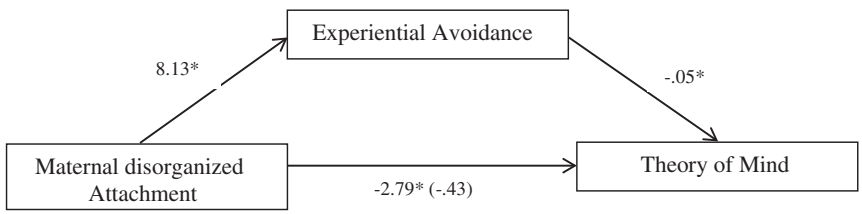

Fig. 3. Experiential avoidance as a mediator of the relation between maternal disorganized attachment and theory of mind. *Note*. Maternal attachment was measured with the Child Attachment Interview; experiential avoidance was measured by the total score on the Avoidance and Fusion Questionnaire for Youth; theory of mind was measured by the total score on the movie assessment of social cognition; values on each path are standardized β values (path coefficients). The coefficient inside parentheses is the standardized regression coefficients. * = $p \leq .05$.

tested the association between cognitive suppression and insecure attachment styles. Identifying a factor, in our case experiential avoidance, and testing it as a mechanism to affect other social cognitive paradigms have large implications for targeting interventions to facilitate and foster ToM function.

Our study also has implications for developing thinking about the relation between self-and other-reflection, which is in line with previous research that shows that reflection on mental states in the self is linked to the reflection of mental states in others [30]. This suggests that an individual who has had a tendency to experientially avoid due to the attachment relationship developed through caregiver interactions has trouble attributing mental states to others. This difficulty is likely coupled with difficulties in reflecting on mental states within themselves, particularly negative or unpleasant emotional states. These findings are also in line with Walker's research [45], which identified four polarities along which mentalization can be characterized. One of these is the distinction between attributing cognitive and affective content, which interact leading to "genuine social understanding" [45].(p1360) According to this theory, the affective system is constrained so that emotions attributed to others are parallel to those being experienced in the self. It is likely that the construct of experiential avoidance coincides with this affective system so that if negative emotions in the self are avoided, the attribution of these emotions in others would be disabled. Future research should examine the relation between self-other reflection more explicitly to further explicate these ideas.

An interesting finding was the presence of gender differences in the effect of attachment style on ToM. Although there were significant differences among females between those with different maternal attachment styles, group differences were absent among the males in our sample. While the relative superiority of innate ToM and other social cognitive skills has been documented in females versus males [46–48], these findings point to the possibility of different developmental trajectories between genders in acquiring these skills. Research has shown that mothers engage in a greater amount of supportive and emotion talk with female offspring compared to their male offspring [49], suggesting more opportunities to learn and develop social cognitive skills for females in childhood, especially in the context of secure attachment. Therefore, the relative increases in social learning opportunities for females with their parents may be compounded in those with secure versus insecure attachment styles, leading to greater group differences in late childhood and adolescence. Further research should investigate the gender differences in developmental acquisition of social cognitive abilities to parse out the mechanisms in both genders.

A few limitations of the current study should be acknowledged. First, the present study was conducted in a sample of inpatient adolescents. As discussed previously, severe psychopathology could have acted as a confounding factor by affecting the level of ToM functioning in the sample. Specifically, we found that females with preoccupied and secure attachment style performed equally high on our measure of ToM. It is possible that due to the psychiatric severity of our sample, even adolescents with secure attachment style have limited ToM capacity that makes it difficult to differentiate their performance from those with insecure attachment styles. In fact, research has demonstrated relations between psychiatric problems and ToM [50]. Alternatively, the group of adolescent females with preoccupied maternal attachment styles may have shown inflated ToM abilities on this task due to hyperactive strategies leading to increased vigilance for social and emotional material at a conscious processing stage [51,52]. It is likely that this hypervigilance for social cues facilitated performance for the group of preoccupied females, especially when in comparison to a severe group of securely attached females. Second, this study was conducted within a cross-sectional design, therefore excluding the possibility of drawing conclusions of causality from the findings. To fully understand causal and mechanistic factors, the model should be tested using a longitudinal design looking at change of ToM over time as a function of experiential avoidance and attachment style. Third, our measure of experiential avoidance was a self-report questionnaire and was therefore subject to the effects of social desirability bias, especially among adolescents who display a tendency to underrepresent or mask negative qualities about themselves. Future studies would benefit from the use of laboratory measures of experiential avoidance. Lastly, although we utilized a measure of ToM that more closely parallels social cognitive demands of real life settings compared to other ToM tasks, such as facial emotion recognition, the measure targeted non self-referential ToM (i.e., a fabricated storyline involving fabricated characters). This may limit the generalizability of our findings to the use of ToM abilities within interactions relevant to an individual's own life. It is important that future research employ tasks with higher self-referential relevance.

Despite the aforementioned limitations, there were several strengths of the current study design. First, the use of an interview-based measure of attachment, rather than a self-report questionnaire, minimizes response bias. Though the administration of the interview is a time and cost-extensive process, interview-based measures of attachment are considered superior as they assess the representation of an attachment relationship through careful analysis of the narrative. Additionally, we used a naturalistic, video-based assessment of ToM, which represents ToM demands of everyday life. By utilizing a multi-method approach, we strengthen the validity of the findings and limit the effects of shared-method bias. Through these strengths, this study provides the first empirical evidence that experiential avoidance acts as a mechanism through which attachment influences higher-order ToM functioning.

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