Mentalizing Mediates the Relation Between Attachment and Peer Problems Among Inpatient Adolescents

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Mentalizing Mediates the Relation Between Attachment and Peer Problems Among Inpatient Adolescents

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Evidence suggests that insecure attachment operates on daily life through anomalies in social cognitive processing. This study sought to evaluate the relation between one type of social-cognitive processing, mentalizing, and attachment insecurity in inpatient adolescents, examining how both relate to peer problems. The aims were to examine (1) attachment-based differences in mentalizing, (2) attachment-based differences in peer functioning, and (3) whether attachment-based differences in peer functioning are explained by differences in mentalizing. Two-hundred and seventy-one adolescents (M_{age} = 15.95 years, SD = 1.43, 62.0% female) were recruited from an inpatient psychiatric hospital. Attachment was evaluated using an interview-based measure, mentalizing was assessed with an experimental task, and peer problems were assessed using two measures. Findings revealed attachment-related group differences in mentalizing and peer problems. Mentalizing mediated the relation between disorganized attachment and peer problems. This study contributes to knowledge of how attachment relates to mentalizing and interpersonal functioning.

In 2011, more than four decades after the initial publication of major works in attachment theory (Bowlby, 1969, 1973), Dykas and Cassidy (2011) extended Bowlby's model of attachment by reviewing and synthesizing literature that connects the notion of the internal working model of attachment to the processing of social information in everyday life. Their review indicates that internal working models of attachment (i.e., secure or insecure caregiver attachments) produce anomalies in social-cognitive processing (Dykas & Cassidy, 2011), which, in turn, may affect social functioning (e.g., peer relations). Dykas and Cassidy's review builds upon links between attachment and social-cognitive processing that have long been theorized by psychodynamic authors (see Fonagy & Moran, 1991), who posit that social-cognitive processing develops within early attachment relationships and is crucially linked to parental sensitivity and social-cognitive capacity (Arnott & Meins, 2007; Fonagy et al., 1995; Shai & Fonagy, 2014). In the

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Dykas and Cassidy (2011) review, a variety of social-cognitive constructs are discussed as relating to the quality of attachment, including mentalizing. Broadly, mentalizing, sometimes referred to as theory of mind (Premack & Woodruff, 1978), refers to the capacity to ascribe mental states to others and acknowledge the relation between underlying mental states and others' behavior (Fonagy, Gergely, & Target, 2007). In essence, mentalizing involves acknowledging that others have mental states independent from his/her own.

Many studies show that children with insecure attachments have difficulty processing the mental states of others and, relatedly, struggle to understand behavior as influenced by underlying mental states. Specifically, children with insecure attachments display deficits in mentalizing both concurrently (e.g., De Rosnay & Harris, 2002; Raikes & Thompson, 2006; Fonagy, Redfern, & Charman, 1997) and in longitudinal studies tying insecure infant attachments to later difficulty with mentalizing (e.g., McElwain & Volling, 2004). Moreover, reduced attachment coherence in children has been associated with limited understanding of how the behavior of story characters is influenced by mental states (Humfress, O'Connor, Slaughter, Target, & Fonagy, 2002). Finally, Dykas and Cassidy (2011) assert that deficits in mentalizing are even more profound when children with insecure attachments are asked to identify the mental states of their attachment figures (Repacholi & Trapolini, 2004).

However, links between mentalizing and attachment security have only recently been made in adolescents, with only one study tying anomalous mental state reasoning (specifically hypermentalizing) to decreased attachment coherence (Sharp et al., in press). While there clearly exists a dearth of studies to link mentalizing to attachment security in adolescents, anomalies in *other* aspects of social information processing have been shown to relate to attachment insecurity in adolescence (Dykas & Cassidy, 2011). For instance, studies have shown that securely attached adolescents attend to positive feedback about the self and seek it out from non-attachment related targets (Cassidy, Ziv, Mehta, & Feeney, 2003) and perceive attachment experiences and reconstruct memories of these interactions more favorably than insecure adolescents over a 6 week period (Dykas, Woodhouse, Ehrlich, & Cassidy, 2010). There is also mounting evidence that insecurely attached adolescents process social information in a negatively biased way, expecting rejection more readily (Dykas, Cassidy, & Woodhouse, 2009), expecting negative outcomes in hypothetical peer situations (Zimmermann, 1999), and making less positive attributions about peers (Zimmerman, 2004).

Together these studies point to the importance of examining adolescent attachment security in the processing of social types of information. However, more research is needed to demonstrate these relations with regard to mentalizing in adolescence specifically. Adolescence is a period of change in social processing (Crone & Dahl, 2012) and in attachment needs and relationships (Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006; Kobak, Cassidy, & Ziv, 2004), making adolescence an important stage in which to examine attachment and mentalizing, rather than assuming outright that relations between attachment and mentalizing will echo findings from studies with children or adults. Against this background, the first aim of this study was to examine attachment-based group differences in mentalizing, using an experimental task designed to assess complex mental state reasoning. In light of substantial evidence linking insecure attachments to deficits in mentalizing among children, we expected that adolescents with insecure attachments would demonstrate poorer mentalizing than adolescents with secure attachments. A sample of inpatient adolescents was sought in order to replicate and build upon the only previous study exploring mentalizing and attachment in adolescents (which was conducted in an inpatient sample) and in

order to examine insecure attachment and anomalous mentalizing in a group in which both are highly prevalent (Venta, Shmueli-Goetz, & Sharp, 2013; Sharp & Venta, 2012).

Insecure attachment should not only relate to the processing of social types of information but should also relate to actual social functioning. Indeed, Dykas and Cassidy (2011) review literature showing that internal working models of attachment generalize, such that they influence the processing of social information even for non-attachment-related information. That is, individuals use internal working models of attachment as cognitive schemas with which to understand unfamiliar people, peers, and romantic partners, suggesting that attachment ought to be considered in the study of all types of interpersonal processes, including peer problems. The broad link between attachment security and interpersonal functioning in children is well established (Berlin et al., 2008; Dykas, Ziv, & Cassidy, 2008). Specifically, there is evidence that childhood attachment to parents is mirrored in attachment to friends throughout adolescence (Berlin et al., 2008) and that attachment security relates to friendships characterized by greater responsiveness (Pierrehumbert, Iannotti, Cummings, & Zahn-Waxler, 1989), more positive interactions (Kerns, 1994), and less negative interactions (Youngblade & Belsky, 1992). Moreover, children securely attached to their mothers during childhood are more likely to make friends with other securely attached children (Elicker, Englund, & Sroufe, 1992), establish close friendships (Freitag, Belsky, Grossmann, Grossmann, & Scheuerer-Englisch, 1996), have more friends (Elicker et al., 1992; Grossmann & Grossmann, 1991; Lewis & Feiring, 1989), and display greater peer- (Englund, Levy, Hyson, & Sroufe, 2000) and social-competence in adolescence (Sroufe, Egeland, & Carlson, 1999). When studied concurrently in healthy adolescents, attachment insecurity has been tied to delinquency, aggression, and withdrawal (Yang, Cai, & He, 2010; Dykas, Ziv, & Cassidy, 2008) and security has been associated with less peer and conduct problems (Keskin & Cam, 2010; Dykas, Ziv, & Cassidy, 2008) and high quality friendships (Markiewicz, Doyle, & Brendgen, 2001).

However, only one study has examined the relation between attachment insecurity and peer problems among adolescents with psychiatric illness (Roelofs, Onckels, & Muris, 2012), finding that attachment insecurity (i.e., lower scores on parental trust and communication on the self-report Inventory of Parent and Peer Attachment; Armsden & Greenberg, 1987) was significantly correlated with self-reported peer problems. Demonstrating relations between peer problems and attachment in clinical samples is important because it implies that peer functioning can be clinically conceptualized in the context of attachment security when working with parents and their adolescents. Moreover, given high rates of psychopathology in inpatient populations, established links between attachment and peer problems in community adolescents should not be assumed to be identical in inpatients without further examination. However, replication is needed with only one previous study. Additionally, Roelofs, Onckels, and Muris (2012) stated that future research could improve upon their findings by making use of methodologies other than self-report questionnaires. Indeed, Roelofs, Onckels, and Mirus (2012) used a self-report measure of attachment security, which is known to provide a different assessment of attachment security than typical measures (i.e., separation paradigms and interviews) because it taps into a different level of attachment representation (Venta, Shmueli-Goetz, & Sharp, 2013; Crowel, Fraley, & Shaver, 2008). To that end, the second aim of this study was to examine attachment-based group differences in peer functioning, while making use of varied methodologies including an attachment interview and both parent- and self-reported peer problems. We expected that, as in children and healthy adolescents, insecure attachments would relate to increased peer problems.

The third and final aim of this study was to examine all three of the aforementioned constructs (attachment, mentalizing, and peer problems) *together*, for the first time in adolescents, again making use of a group in whom attachment insecurity, significant peer problems, and anomalies in mentalizing are expected to be highly prevalent. Implied but not explicitly stated in Dykas and Cassidy's review is that the link between attachment security and mentalizing would have consequences for interpersonal functioning, thereby suggesting a mediational model in which attachment insecurity is linked to anomalous mentalizing, which then relates to interpersonal problems. This hypothesis is supported by evidence linking deficits in interpersonal functioning to biased or deficient mentalizing among adolescents (Sharp et al., 2008; Sharp & Venta, 2012). Further, mentalizing has played a key role in conceptualizations of healthy children's peer relationships, being linked to bullying (Sutton, 2003) and social competence (Astington, 2003). Moreover, mentalizing and related constructs have been linked to interpersonal problems in children with varied psychiatric disorders including Autism (Baron-Cohen, Leslie, & Frith, 1985), Conduct Disorder and antisocial behavior (see Mize & Pettit, 2008; Dodge & Coie, 1987; Dodge & Crick, 1990; Dodge, 1993), depression (Kyte & Goodyer, 2008), anxiety disorder (Banerjee, 2008), and Borderline Personality Disorder (Sharp & Fonagy, 2008; Sharp et al., 2011). Taken together, this research shows that mentalizing is a key factor in interpersonal functioning in youth—across both community and patient samples. Because no study has explored attachment insecurity, mentalizing, and peer problems concurrently among adolescents, the third aim of this study was to extend previous work by connecting this literature to aforementioned studies relating attachment insecurity to mentalizing.

In sum, the aims of this study were three-fold: (1) examine attachment-based group differences in mentalizing through interview-based assessment of attachment security and an experimental assessment of mentalizing, (2) examine attachment-based group differences in peer problems, and (3) examine whether attachment-based differences in peer problems are explained by differences in mentalizing in a concurrent mediational model. In achieving these aims, we considered attachment to father and mother separately, given the dearth of studies that focus on attachment to fathers (Freeman, Newland, & Coyl, 2010). We also controlled for general psychopathology given the clinical nature of the sample. Together, the aims of the current study represent an important extension to the work reviewed by Dykas and Cassidy (2011) and conducted by Roelofs et al. (2012), by increasing understanding of how attachment insecurity relates to problems in mentalizing and peer functioning among psychiatrically ill adolescents. The use of a clinical sample allows for first replication of previous work as well as a first opportunity to examine interrelations between these three constructs, with potential implications for the clinical conceptualization of peer problems or other interpersonal difficulties. This line of research stands to potentially impact clinical treatment in two ways: (1) by increasing support for early family-based interventions among adolescents who display risk factors for disorders typically associated with anomalous mentalizing (e.g., Borderline Personality Disorder or Conduct Disorder) and (2) improving preventative efforts or treatments for peer problems by increasing knowledge of distal risk factors (i.e., attachment insecurity and mentalizing). Indeed, better understanding the factors contributing to peer problems among adolescents is paramount given evidence showing that nonconventional social behavior during adolescence can lead to many other problem behaviors (Doornwaard, Branje, Meeus, & ter Bogt, 2012).

METHODS

Participants

Three-hundred and sixteen consecutive admissions to the adolescent unit of an inpatient psychiatric hospital were approached for consent. Of those approached, 19 declined, 3 were discharged prior to completion of the assessments, 2 began assessments and then revoked consent, and 21 were excluded from the study, leaving a sample of 271 adolescents. The inclusion criteria adopted were between ages 12 and 17 and English fluency. Additionally, adolescents were excluded from study participation if clinicians conducting the admission evaluation noted psychosis or intellectual deficiency. Five adolescents did not have a father figure and therefore analyses related to fathers are based on a sample size of 266 adolescents. 62.0% of the sample ($n = 168$) was female and the average age was 15.95 years ($SD = 1.43$). 6.1% of the sample was Hispanic and the racial breakdown was as follows: 86.8% Caucasian, 4.1% Asian, 2.5% African-American, and 6.2% Multiracial. The sample was largely high income, with 65.4% of parents reporting a household income greater than or equal to $100,000 and 74.1% of parents having completed a bachelor's degree. The adolescent unit from which adolescents were recruited is typically populated by adolescents with a history of treatment refractory emotional and behavioral symptoms. Broadly, approximately 80% of adolescents take psychiatric medications, and approximately 50% have been admitted previously to a psychiatric hospital. The modal number of psychiatric diagnosis in this sample is 2 with the most common psychiatric diagnoses being Major Depressive Disorder (44.7%), Obsessive Compulsive Disorder (24.8%), and Oppositional Defiant Disorder (23.9%).

Procedures

This study was approved by the appropriate institutional review board. All adolescents admitted to an inpatient psychiatric unit were approached on the day of admission about participation in this study. Informed consent from the parents was collected first, and if granted, assent from the adolescent was obtained in person. Adolescents were then consecutively assessed by doctoral level clinical psychology students, licensed clinicians, and/or trained clinical research assistants. Interviews were conducted independently and in private. The order of assessments was random. All adolescents were assessed within the first two weeks following admission and the average length of stay in this sample 32.85 days ($SD = 12.38$).

Measures

Attachment security

The Child Attachment Interview (CAI; Target, Fonagy, Shmueli-Goetz, Datta, & Schneider, 2007) is an interview-based measure assessing internal working models of attachment by accessing youths' mental representations of their attachment figures. The CAI accomplishes this by isolating attachment figures of particular importance to the child and then asking about the affective qualities of the relationship described. To that end, the interviewer asks the child to describe each attachment figure by choosing three words and then probes further for episodic

examples of what happens when the attachment figure is angry or the child needs help. The latter serves to elicit information about the responsiveness of attachment figures and the child's valuing of attachment experiences by asking questions regarding illness, loss, abuse, and separation.

All CAIs were completed in private, videotaped, transcribed, and coded by clinical research assistants or doctoral students who have completed training on this measure and achieved 85% reliability with the measure's authors. Coders were blind to reason for admission, diagnosis, and other clinical information about participants. Interrater reliability analyses were conducted on a subset of 38 randomly selected interviews, based on two independent coders who had completed the reliability training with the measure's authors. With regard to mother, interrater agreement was substantial (according to Viera & Garrett, 2005) with $\kappa = .59$ for the four-way classification. With regard to father, interrater agreement was moderate (Viera & Garrett, 2005) with $\kappa = .52$ for the four-way classification. These statistics translate to agreement 73.7% of the time in attachment classification for mother and 65.8% of the time for father.

Interviews are rated on the basis of 11 subscales: emotional openness, balance of positive and negative reference to attachment figures, use of examples, preoccupied anger (separate for each parent), idealization (separate for each parent), dismissal (separate for each parent), resolution of conflicts, and overall coherence. In the present study, these ratings were used to assign adolescents to one of four groups: secure, dismissing, preoccupied, and disorganized. Consistent with standard attachment classifications, the secure adolescent is characterized as collaborative and coherent in his or her presentation of both positive and negative aspects of attachment figures and expresses a clear valuing of attachment relationships. For the dismissing adolescent, attachment is de-activated such that independence and self-sufficiency are emphasized and feelings of need and dependency are downplayed. The preoccupied classification relates to cases in which the adolescent is excessively focused on the caregiver and the attachment relationship, as is the case for adolescents repeatedly discussing past conflicts accompanied by preoccupying anger. Finally, disorganization is indicated by controlling-withholding behavior during the interview, bizarre or incoherent responses, unstable affect, incompatible affect, and dissociative episodes.

Adequate reliability and validity for this measure was demonstrated by the measure's authors with a sample of children (Shmueli-Goetz, Target, Fonagy, & Datta, 2008) as well with an inpatient sample of adolescents (Venta, Shmueli-Goetz, & Sharp, 2013).

Mentalizing

The Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006) is a computer-based measure of mentalizing that assesses emotion and mental state recognition abilities needed to navigate social situations in daily life. This task presents social stimuli (in the form of a movie) and asks questions which require the respondent to make attributions about the intentions and mental states of the characters, thereby processing the social stimuli presented. To that end, each adolescent is asked to watch a short film (15 minutes) about four characters planning and getting together for a dinner party. As in daily life, this experience elicits emotions and mental states including anger, affection, gratefulness, jealousy, fear, ambition, embarrassment, and disgust from the characters. At 45 points throughout the film, an interviewer pauses to ask questions concerning the characters' mental states (e.g., "What is Betty feeling?", "What is Cliff thinking?"). Correct responses are scored as one point and added to an overall score reflecting accuracy in mentalizing or mental state reasoning (Montag et al., 2009). A subscale of control

items is also included in order to detect respondents who are not paying attention or are unable to meet the cognitive demands of this task. This task has proven a reliable and sensitive means of detecting subtle mentalizing difficulties in adults (Dziobek et al., 2006), adolescents (Sharp et al., 2011), young adults (Smeets, Dziobek, & Wolf, 2009), and a variety of inpatient groups (Dziobek, Fleck, Rogers, Wolf, & Convit, 2006; Montag et al., 2009).

Peer problems

One parent- and one self-report based measure of adolescent peer problems were used in order to make use of a multi-informant approach to measurement of this key study variable and in light of evidence that parent-report is a valuable index of externalizing behavior problems in youth (Wichers et al., 2013).

The Social Problems subscale of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), a parent-report based questionnaire for use with adolescents between the ages of 12 and 17, was used as a broadband rating of pathological interpersonal functioning. In total, this measure contains 112 problem items, each scored on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, or 2 = very or often true) and yields 8 symptom subscales. For the present study, only the Social Problems scale was used as a key study variable. This scale contains 11 items including: "Doesn't get along with other kids," and "Not liked by other kids." Psychometric evaluation of the CBCL was conducted by the measures' authors and demonstrated adequate reliability and validity (Achenbach & Rescorla, 2001). Internal consistency of this measure cannot be computed because it is administered and scored electronically.

The Social Problems subscale of the Youth Self Report (Achenbach & Rescorla, 2001) was used to assess self-reported peer problems. Like its parent-report equivalent, this 112-item questionnaire provides a broadband rating of pathological interpersonal functioning for adolescents between the ages of 11 and 18. This scale contains self-report versions of the CBCL items including "I don't get along with other kids" and "I don't get along with other kids." Psychometric evaluation has indicated adequate reliability and validity for this measure (Achenbach & Rescorla, 2001). Internal consistency of this measure cannot be computed because it is administered and scored electronically.

Psychopathology

The Total Problems symptom scales of the CBCL and YSR were used in preliminary analyses to explore attachment-based group differences in overall psychopathology that ought to be controlled for in subsequent analyses. Internal consistency of these measure could not be computed because it is administered and scored electronically, however both the CBCL and YSR are well validated measures (Achenbach & Rescorla, 2001).

RESULTS

Descriptive Analyses

Based upon the CAI, adolescents were classified into one of four groups, separately for mother and father. With regard to maternal attachment, 26.2% (n = 71) were classified as secure, 17.0%

TABLE 1
Descriptive information for all key study variables

| | Maternal Attachment Classification | | | | |
	Dismissing	Preoccupied	Secure	Disorganized	Total
MASC Total Score					
M	31.66	33.70	32.97	30.55	32.13
SD	5.55	4.22	4.27	6.22	5.27
MASC Control Items					
M	4.48	4.57	4.58	4.30	4.49
SD	1.06	1.13	1.17	1.20	1.13
YSR Social Problems					
M	60.13	61.52	59.73	62.74	60.79
SD	8.95	8.94	8.59	8.42	8.78
CBCL Social Problems					
M	62.01	62.59	61.66	66.15	62.86
SD	8.85	9.12	7.29	10.64	9.03

Note. MASC = Movie for the Assessment of Social Cognition, CBCL = Child Behavior Checklist, YSR = Youth Self Report, M = Mean, SD = Standard Deviation. Descriptive information is only provided for maternal attachment classifications as classifications were identical in 87.6% of cases. With regard to maternal attachment, 26.2% (n = 71) were classified as secure, 17.0% (n = 46) as preoccupied, 36.9% (n = 100) as dismissing, and 19.9% (n = 54) as disorganized.

(n = 46) as preoccupied, 36.9% (n = 100) as dismissing, and 19.9% (n = 54) as disorganized. The breakdown was similar with regard to paternal attachment— 25.9% (n = 69) were classified as secure, 14.3% (n = 38) as preoccupied, 39.5% (n = 105) as dismissing, and 20.3% (n = 54) as disorganized. Neither maternal nor paternal attachment group differences were noted with regard to sex, age, or total level of self- or parent-reported psychopathology and therefore these variables were not included as covariates in subsequent analyses. Descriptive information for all key study variables is presented in Table 1.

Attachment-Based Differences in Mentalizing

The first aim of this study was to explore attachment-based group differences in mentalizing. Analyses were first conducted using maternal attachment classifications and then paternal attachment classifications. Analyses of variance revealed significant differences between maternal attachment groups for MASC Total score (F = 3.75, p = .01), with no group differences noted for the control items. However, unequal between group variances were noted (*Levene* = 3.41, p = .02). Therefore, post-hoc group comparisons were made using the Games-Howell procedure, which is accurate when sample sizes are unequal and the homogeneity of variance assumption is not met. These pairwise comparisons revealed a significant difference in MASC Total score between the lowest mentalizing scoring attachment group (disorganized; $M_{disorganized}$ = 30.55) and the highest mentalizing scoring attachment group (preoccupied, $M_{preoccupied}$ = 33.70, p = .02), with no significant differences between secure, preoccupied, and dismissing groups. A means plot illustrating this difference is presented in Figure 1.
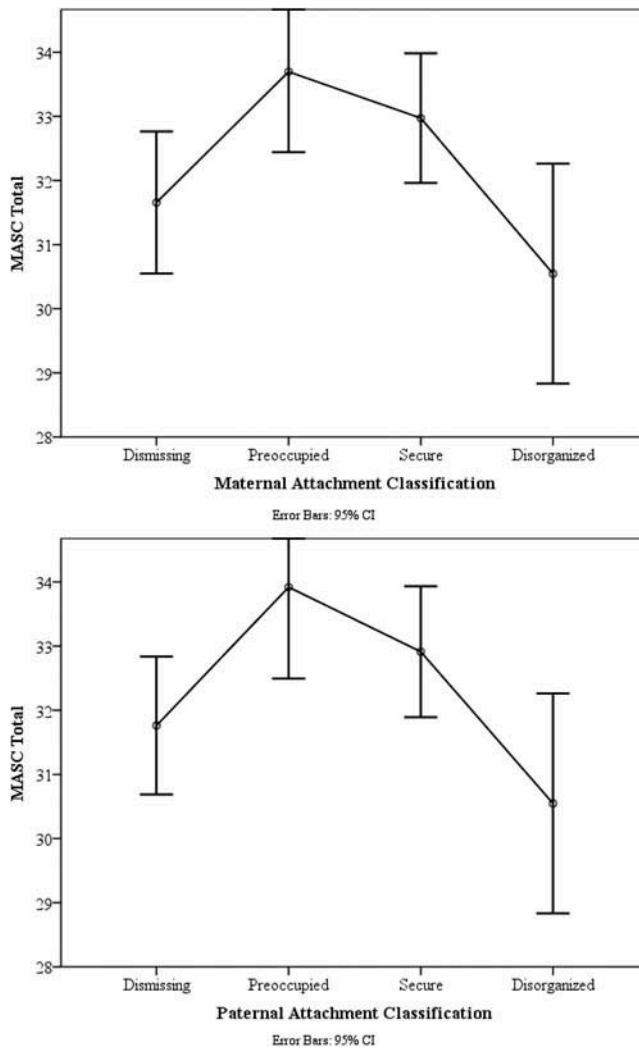
FIGURE 1   Mean levels of mentalizing by attachment classification.

All aforementioned findings were replicated when paternal attachment classifications were used, and findings are presented graphically in Figure 1. Specifically, analyses of variance revealed significant differences between paternal attachment groups with regard to MASC Total score ($F = 3.75$, $p = .01$), with no group differences noted for the control items. Pairwise comparisons revealed a significant difference in MASC Total score between disorganized and preoccupied adolescents ($M_{disorganized} = 30.55$, $M_{preoccupied} = 33.92$, $p = .02$).

Attachment-Based Differences in Peer Problems

The second aim of this study was to use analyses of variance to evaluate attachment-based group differences in peer problems. Due to a significant correlation between parent- and adolescent-reported social problems ($r = .39$, $p < .0001$) and the similarity in item wording across both measures, Principle Component Analyses was used to extract a shared composite score. As expected given the similarity of these two measures, analyses produced one component that accounted for approximately 70% of the variance of both measures. Parent- and self-reported social problems both loaded highly onto this component, 0.83 in both cases. This composite therefore served as the outcome variable in all subsequent analyses.

With regard to maternal attachment classifications, group differences were noted with regard to peer problems ($F = 3.10$, $p = .03$). Games-Howell post-hoc comparisons revealed a significant difference between disorganized and secure adolescents in peer problems ($M_{secure} = -0.22$, $M_{disorganized} = 0.28$, $p = .04$), with no significant differences between secure, preoccupied, and dismissing groups. These findings are presented graphically in Figure 2.

These findings were perfectly replicated when paternal attachment classifications were utilized and are presented in Figure 2. Specifically, group differences were noted with regard to peer problems ($F = 3.07$, $p = .03$). Games-Howell post-hoc comparisons revealed a significant difference between disorganized and secure adolescents in peer problems ($M_{secure} = -0.20$, $M_{disorganized} = 0.28$, $p = .05$), with no significant differences between secure, preoccupied, and dismissing groups.

Attachment-Based Differences in Peer Problems Are Explained by Differences in Mentalizing

The third aim of this study was to determine whether the relations identified between attachment insecurity and peer problems were explained by mentalizing. Before formally testing for mediation, 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 in all cases, centering the predictor variables was not necessary (Aiken & West, 1991; Holmbeck, 2002).

Specifically, we sought to determine whether the relations identified between a disorganized attachment classification and peer problems were mediated by limited mentalizing (MASC). Two binary disorganization variables, one relating to maternal attachment classification and one relating to paternal attachment classification, were created and used as the independent variables. These variables were coded such that adolescents in the disorganized classification were being compared with all others. First, MASC Total score was used as the mediator, maternal disorganization served as the independent variable, and peer problems served as the outcome variable. The test of the indirect effect indicated the presence of a significant mediational model, with the mean of the indirect effect across all bootstrap samples estimated at .08 and a resulting confidence interval that did not include 0 ($CI = .006$ to $.191$; Preacher & Hayes, 2008). This mediational model also proved significant when paternal disorganization was entered as the independent variable instead, with the mean of the indirect effect across all bootstrap samples estimated at .08 and a resulting confidence interval that did not include 0 ($CI = .009$ to $.192$; Preacher & Hayes, 2008). Unstandardized path coefficients for all significant mediational models are presented in Table 2.
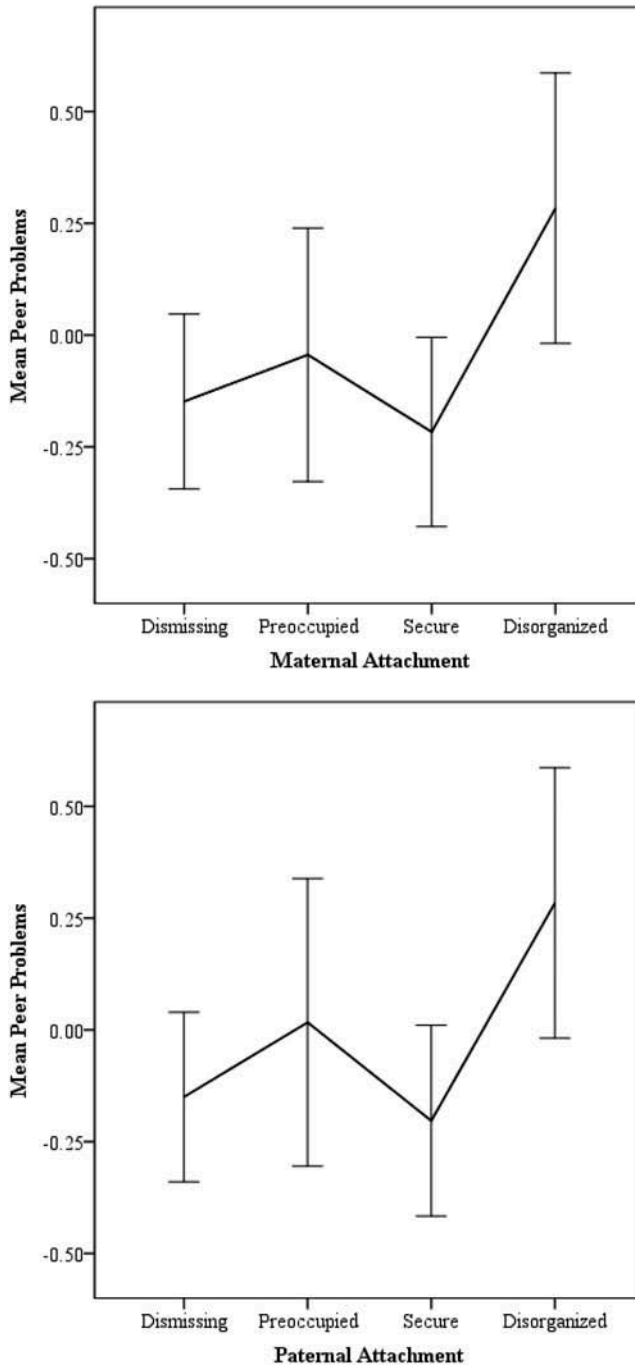
FIGURE 2 Mean levels of peer problems by attachment classification.

TABLE 2
Significant mediational models of the effect of disorganization on peer problems through total social cognitive capacity

Path	Coefficient	SE	p
Model 1			
A. IV Maternal Disorganization to Mediator MASC Total	−1.81	.81	.03
B. Mediator MASC Total to DV Peer Problems	−.05	.01	.0001
C. Total Effect: Maternal Disorganization to Peer Problems	.39	.15	.009
C'. Direct Effect: Maternal Disorganization to Peer Problems	.72	.32	.04
Model 2			
A. IV Paternal Disorganization to Mediator MASC Total	−182	.82	.03
B. Mediator MASC Total to DV Peer Problems	−.04	.01	.0001
C. Total Effect: Paternal Disorganization to Peer Problems	.37	.15	.01
C'. Direct Effect: Paternal Disorganization to Peer Problems	.29	.15	.05

Note. IV = Independent Variable, DV = Dependent Variable, Coefficient = Unstandardized path coefficient, SE = Standard error, MASC = Movie for the Assessment of Social Cognition.

DISCUSSION

The overarching goal of this study was to examine concurrent relations between attachment insecurity, mentalizing, and peer problems among inpatient adolescents and thereby extend current knowledge about the interrelations between these constructs to inpatient adolescents. Inpatient adolescents were examined in an effort to evaluate relations between these constructs in a group in which attachment insecurity is prevalent and known to relate to pathological social and interpersonal functioning. The specific aims of this study were to (1) examine attachment-based differences in mentalizing through interview-based assessment of attachment and an experimental assessment of mentalizing, (2) examine attachment-based differences in peer problems, and (3) examine whether attachment-based differences in peer problems are explained by differences in mentalizing.

With regard to the first aim, plotting mean overall mentalizing revealed a pattern such that preoccupied adolescents had highest scores followed by the secure, dismissing, and disorganized groups. This pattern was consistent across maternal and paternal attachment. Although, the only pairwise comparisons that were statistically significant were between the most extreme groups—the preoccupied and disorganized classifications—Figure 1 illustrates that, broadly, dismissing, preoccupied, and secure adolescents were relatively similar with regard to mentalizing, with disorganized adolescents demonstrating impaired mentalizing. These findings expand upon the literature in Dykas and Cassidy's (2011) review by pointing to the important role of attachment disorganization in the processing of social information. That is, the disorganized group in this study processed social information presented in the MASC differently—specifically, they made more errors indicative of a failure to consider the mental states of others than even other insecure attachment groups (with a significant difference detected between disorganized and preoccupied adolescents). This finding echoes some previous research in children which indicated that disorganized children process social information differently even from other insecurely attached children (see Main, Kaplan, & Cassidy, 1985). Moreover, this finding suggest that future research

exploring mentalizing in adolescents should specifically consider the role of disorganization—in addition to the broader issue of attachment security.

Related to the second aim, findings revealed that adolescents classified as disorganized experienced more peer problems than the secure group. This finding held across both maternal and paternal attachment classifications. This finding extends a great deal of literature on this relation in pre-adolescent children (see Lyons-Ruth & Jacobvitz, 2008) to adolescents. Indeed, disorganization is linked to parent-reported social problems in infancy (Hazen, Jacobvitz, Higgins, Allen, & Jin, 2011), aggression in toddlers (Jacobvitz & Hazen, 1999), externalizing behavior during early and middle childhood (Moss, Bureau, Cyr, Mongeau, & St. Laurent, 2004; Moss Rousseau, Parent, St. Laurent, & Saintonge, 1998), and antisocial social-information processing during middle childhood (Granot & Mayseless, 2012). Importantly, the findings of this study suggest that the relation between disorganization and peer problems identified in children manifests in adolescents as well. Future research should explore this relation using more fine-grained measures of interpersonal behavior in order to identify continuities and discontinuities in the way that disorganization affects social functioning. Moreover, it should be cautioned that the association between disorganization and peer problems identified in the current study does not indicate a causal relationship, may not generalize to non-psychiatric samples, and cannot speak to the relation between disorganization and social functioning more generally (e.g., functioning in romantic relationships or familial interactions).

In the third aim, mediational models revealed that the relation between disorganization, with regard to both maternal and paternal attachment, and peer problems was accounted for by poorer mentalizing ability. This suggests that the peer problems of disorganized adolescents are partially explained by anomalies in the processing of social information (specifically mentalizing). This finding has implications for the treatment of social problems among adolescents. No doubt, peer relations are a major factor in adolescent functioning and well-being, and, by the same token, peer problems can be a major source of stress and contributor to psychopathology and problem behavior. Bearing this in mind, mentalization-based treatments, aimed at training adolescents in accurately reading and reflecting on the mental states of others, have begun to gain popularity for the treatment of adolescents with severe behavior and mood disorders (Sharp et al., 2013), partially because of the hypothesized relation between mentalizing and peer problems. The findings of this study suggest that treatments like these may mitigate peer problems among adolescents by directly targeting mentalizing deficits associated with disorganized attachments and peer problems. Future research should examine this hypothesis directly in order to provide robust, longitudinal evidence.

Of particular importance in the current study is the fact that we deliberately focused on peer problems as an outcome irrespective of disorder-specific symptomology. Recent research in adult and child psychopathology has begun to recognize the value of moving away from disorder-specific studies to examine cross-cutting clinical outcomes associated with common or shared underlying processes (Insel et al., 2010). This approach is especially important in child and adolescent psychopathology where comorbidity between disorders is the rule rather than the exception and is also consistent with the new NIMH Research Domain Criteria (RDoC) approach to psychopathology. Here, we suggest that mentalizing dysfunction may serve as a common factor in multiple forms of psychopathology with peer problems as a cross-cutting outcome at the level of the behavioral phenotype. That we demonstrated a role for disorganized attachment in relation to mentalizing dysfunction in a sample of adolescents suffering from disorders across the

internalizing-externalizing spectrum suggests potential for these processes to be explored across different levels of explanation, consistent not only with an RDoC approach, but also a developmental psychopathology approach. Still, future research may build upon the approach of the present study by exploring mentalizing and social dysfunction as they relate to specific diagnostic categories in order to increase the applicability of this work for individualized treatment planning and psychoeducation.

Many directions for future research have already been noted as ways to improve upon limitations of this study. Additionally, it should be noted that the present study fails to assess two aspects of social information processing that are likely highly relevant: *attachment*-related social information processing and positive or negative biases in social information processing. Including these variables in future research is an essential component of further investigating these constructs adolescents. For instance, tasks that assess mentalizing relating specifically to the mental states of attachment figures, such as the one used by Repacholi and Trapolini (2004), have yet to be extended to adolescents or explored in the context of attachment security, psychopathology, or peer problems. Similarly, tasks that have been used to identify negative biases regarding expectations and attributions about others in association with attachment insecurity in adolescents (e.g., Dykas, Cassidy, & Woodhouse, 2009) do not assess mentalizing. That is, no data currently exists that can speak to whether adolescents who are insecurely attached have systematically negative biases about others' behavior because of negative biases in mentalizing. The latter would require complex mentalizing tasks, like the Movie for the Assessment of Social Cognition used in this study, to be used in unconventional ways such that positive and negative mentalizing biases can be detected (rather than correct or incorrect mentalizing as in the present study). Another limitation of this study was its reliance on questionnaire based measures of peer problems in place of observational methods, other objective measures, or multi-informant reports. Further research using a variety of methods like peer nomination (as done by Ehrlich, Dykas, & Cassidy, 2012), observations of social interactions, and review of school records regarding social difficulties is needed. Moreover, data collection occurred at only one concurrent timepoint and, therefore, the present study cannot speak to causal or developmental links between attachment, mentalizing, and peer problems. Indeed, evaluating mediational models in which mentalizing, peer problems, and attachment were all measured concurrently cannot speak to temporal relations between these three variables. The findings of this study should not be interpreted causally, rather may be used to bolster rationale for examining these links longitudinally in future research. Finally, a measure of mentalizing was used in this study despite being only one of the many social-cognitive processes included in Dykas and Cassidy's (2011) model. Indeed, the relation between mentalizing and other social-cognitive processes remains completely uninvestigated among inpatient adolescents.

Still, the present study provides the first empirical support for the relations between mentalizing, attachment, and interpersonal functioning in a clinical sample of adolescents. The findings of this study are strengthened by a multimethod approach making use of varied measurement techniques (i.e., parent-report, interview, and experimental task) and different sources of information. Specifically, this study used a psychometrically sound attachment interview which provided information about the adolescent's representation of both maternal and paternal caregivers. Additionally, mentalizing was operationalized using an experimental task that assesses mental state reasoning in a more ecologically valid fashion than more static mentalizing tasks, and peer problems were rated using both self- and parent-report based measures. This approach to measurement across multiple methodologies and informants enriches the value of this study

as the first to concurrently explore attachment, mentalizing, and interpersonal functioning among adolescents.

In sum, this study sought to evaluate the relation between one type of social-cognitive processing, mentalizing, and attachment insecurity in inpatient adolescents, examining how both relate to peer problems. Findings revealed attachment-related group differences in mentalizing and peer problems, with adolescents with a disorganized attachment style displaying greater peer problems and deficits in mentalizing. Additionally, mentalizing mediated the relation between disorganized attachment and peer problems, indicating that the peer problems of disorganized adolescents are partially explained by mentalizing deficits. This study contributes to knowledge of how attachment relates to mentalizing and interpersonal functioning, as the first to concurrently explore these variables among adolescents.

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