

ABSTRACT

Title of Thesis:

ADOLESCENT ATTRIBUTIONS ABOUT AND
RESPONSES TO IMAGINED FUTURE
ROMANTIC PARTNERS' BEHAVIORS: LINKS
TO ADOLESCENT ATTACHMENT TO
PARENTS

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Attachment theory states that experiences with primary caregivers influence other close relationships throughout the lifespan (Bowlby, 1969/1982). The quality of early caregiving experiences influences children's mental representations of how others will treat them. These representations guide social information processing, the way that individuals remember, perceive, hold expectations, and make attributions about their social world. The present study is the first to examine how young adolescents' attachment to parents influences their attribution biases about future romantic relationships. Attachment insecurity with mothers and fathers predicted negative attribution biases about hypothetical future romantic partners. Insecurity to fathers marginally predicted negative attributions above those predicted by insecurity to mothers. Negative attributions, in turn, predicted adolescents' forecasting their own negative behaviors in a future relationship. Further, adolescents' attachment avoidance (discomfort with closeness) across both parents predicted negative attributions. Results suggest that attribution biases could explain relations between attachment to caregivers and later romantic relationship functioning.

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ROMANTIC PARTNERS' BEHAVIORS: LINKS TO ADOLESCENT ATTACHMENT TO
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by

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Table of Contents

Table of Contents	ii
List of Tables	iv
List of Figures	v
List of Appendices	vi
Chapter 1: Introduction	1
Internal Working Models of Attachment and Social Information Processing Biases	3
Attachment and Hostile Attribution Biases in Peer Relations.....	5
Attribution Biases in Romantic Relationships.....	8
Adult Attachment Style as a Predictor of Attribution Biases in Romantic Relationships.....	10
Limitations of Research on Relations Between Attachment and Attributions	12
Conceptualizing Attachment in Adolescence	15
The Present Study	16
Chapter 2: Method	19
Participants	19
Procedure	19
Measures	20
Chapter 3: Results	27
Missing Data.....	27
Data Reduction	27
Preliminary Analyses.....	28
Principal Analyses	29
Chapter 4: Discussion	37
Contributions to the Literature.....	39
Negative Attributions and Adolescents' Security with Mothers and Fathers.....	40
Negative Attributions and Adolescents' Attachment Avoidance and Anxiety	43
Considering the Dimensional and the Relationship-Specific Approaches	45
The Outcomes of Negative Attributions.....	52
Limitations and Future Directions.....	53
Conclusion	56
Appendices.....	58
Tables	121
Figures.....	126

References.....	135
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List of Tables

Table 1. Descriptive Statistics and Correlations Among Main Study Variables

Table 2. Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from Total Insecurity with Both Parents Combined

Table 3. Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from Attachment Insecurity with Each Individual Parent

Table 4. Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from the Two Attachment Dimensions (Avoidance Across Both Parents Combined and Anxiety Across Both Parents Combined)

Table 5. Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from the Attachment Dimensions for Each Parent

List of Figures

Figure 1. Overarching Theoretical Model

Figure 2. Four Conceptualizations of Attachment

Figure 3. Structural Total Insecurity Model

Figure 4. Structural Mother Model

Figure 5. Structural Father Model

Figure 6. Structural Both Parents Model

Figure 7. Structural Two Attachment Dimensions Model

Figure 8. Structural Attachment Dimensions for Each Parent Model

Figure 9. Proposed Developmental Cascade

List of Appendices

Appendix A. Modified Vignettes and Possible Explanations for Partner Behavior

Appendix B. Modified Relationship Attributions Measure

Appendix C. Explicit Responses to Partners' Behaviors

Appendix D. Conflict Responses Go/No-Go Association Task (CR-GNAT) Word List

Appendix E. Relationship Structures Questionnaire (ECR-RS)

Appendix F. Early Adolescent Romantic Relationship Experiences Questionnaire (EA-RREQ)

Appendix G. Original Vignettes and Possible Explanations for Partners' Behaviors

Appendix H. Original Relationship Attributions Measure

Appendix I. Original Explicit Responses to Partners' Behaviors'

Appendix J. Open Science Foundation Pre-Registration 1

Appendix K. Open Science Foundation Pre-Registration 2

Appendix L. Open Science Foundation Pre-Registration 3

Appendix M. Distributions and Descriptive Statistics for Key Study Variables

Chapter 1: Introduction

Imagine opening a text message from a significant other, seeing the words “won’t be home until late,” and trying to decipher what this means. This could be an innocuous statement about being stuck in the office, or a warning sign that this person is behaving unfaithfully. The meaning attributed to the message will often influence the reply, which could range from a kind “Ok, I’ll see you later” to an aggressive “Why? Where are you?” Even though the input is the same, the attribution is biased as a function of the recipient’s mental representations.

The claim that early mental representations of relationships with primary caregivers influence other close relationships throughout the lifespan is integral to attachment theory (Bowlby, 1969/1982). The quality of these early caregiving experiences influences children’s representations of how others will treat them, and how worthy they are of love and care. These representations guide social information processing (SIP) -- the way individuals attend to, remember, perceive, and make expectations and attributions about their social world.

Children interpret social behavior through a negative lens when they hold a mental representation of others as untrustworthy and the self as unlovable. SIP theory (Crick & Dodge, 1994; Lemerise & Arsenio, 2000) claims that children’s biases contribute to a cascade of events. For instance, negative representations of others predict hostile attributions about social cues, informing hostile behavior, resulting in negative reactions from peers, therefore strengthening the negative representations and SIP biases they hold and worsening future peer relations.

Longitudinal research has demonstrated the role of children’s attachment security with parents in initiating this developmental cascade driven by social information processing in peer relationships (Lansford et al., 2011). However, no research (to my knowledge) has examined the

role of young adolescents' attachment to parents in predicting a similar developmental cascade driven by social information processing in romantic relationships.

Without a repertoire of experiences with romantic partners, young adolescents must process incoming information through the lens of previous close relationships, such as those with parents. Indeed, longitudinal work has revealed that adolescents' attachment insecurity with parents predicts insecurity (Furman & Collibee, 2018), poor relationship quality (Holland & Roisman, 2010), and hostile behavior (Roisman et al., 2001) in their later romantic relationships. However, more research is needed to identify mechanisms through which this occurs. In order to begin examining SIP biases as mechanisms, research must first explore these biases in early adolescence before romantic relationship trajectories have begun. In the present study, I plan to examine one key component of SIP: *attributions about hypothetical future romantic partners' behavior*.

In this thesis, I will first discuss the connections between internal working models of attachment and the ways in which individuals process social information. Second, I will review findings on insecure attachment and hostile attribution biases in children and adolescents' peer relationships. Third, I will review the literature on links between attribution biases in adult romantic relationships and maladaptive relationship dynamics. Fourth, I will review findings on links between attachment and attribution biases in adults' romantic relationships, and research on these biases as a possible mechanism between attachment style and maladaptive relationship dynamics. Next, I will discuss limitations and gaps in the present research on attachment and attributions throughout the lifespan. Finally, I will describe a novel study that addresses these limitations and gaps by testing a model wherein young adolescents' attachment to their parents

predicts responses toward imagined future romantic partners' behaviors in hypothetical situations, mediated by negative attributions about these behaviors.

Internal Working Models of Attachment and Social Information Processing Biases

Early experiences with caregivers shape internal working models (IWMs) of the extent to which others are trustworthy and well intentioned, and the extent to which one is worthy of love and care (Bowlby, 1969/1982). When a caregiver is insensitive and rejecting, the child quickly learns that this person cannot be depended upon and does not have their best intentions at heart, whereas when a caregiver is sensitive and responsive, the child learns the opposite.

IWMs encompass script-like representations (Bretherton, 1985) characterized by a series of “if, then” contingencies about how others will behave. For example, an insecure individual might hold the following attachment script about their mother: “If I am upset and call my mother, she will reject me and say that I am overreacting.” Attachment scripts are reinforced through repeated experiences with caregivers. Over time, scripts generalize to include “if, then” contingencies of not only how their parents will behave, but also how others in general will behave (Dykas et al., 2006). These scripts then become the means through which individuals process social information in the world around them.

Empirical research supports the importance of attachment representations in predicting how individuals process social information (Dykas & Cassidy, 2011). Social information processing is multifaceted, encompassing expectations, memory, attention, perception, and attributions. An important component of IWMs themselves are a person's expectations of how others will behave. Therefore, it is unsurprising that researchers find security predicts positive expectations of others. Experimental evidence suggests that inducing feelings of security increases positive expectations of others (Rowe & Carnelley, 2003). There are also links between dispositional attachment security and expectations of others. For example, insecure individuals hold expectations that romantic

partners will behave negatively in situations that elicit anger (Mikulincer, 1998). Representations of present relationships can even impact expectations of future relationships. One study found that low quality relationships between fathers and daughters predicted the daughters' negative expectations for future male romantic partners (DePriore, et al., 2019). Another demonstrated that the extent to which adolescents felt they could rely on their parents in times of need predicted expectations of whether they would be able to rely on a future romantic partner (Fitter et al., 2019). These findings are troubling, as negative expectations in adolescents are predictive of poor social functioning (Loeb, et al., 2015) and selection of hostile partners (Loeb et al., 2016), phenomena that illustrate the importance of further studying precursors to SIP biases.

Another important facet of social information processing is memory of relational events. Memories are stored in line with preexisting cognitive schemas because these schemas are the framework with which individuals organize our knowledge. Indeed, secure individuals tend to remember information in a schematically biased way, such that they have an easier time recalling positive relational events than negative relational events (Belsky et al., 1996). Memories are not only selectively recalled as a function of IWMs, but also reconstructed as a function of these models. Dykas and colleagues (2010) observed adolescents and their parents during a conflict task, and they asked the adolescents to report their emotional experience of the discussion. Researchers asked adolescents to recall this information immediately after the conflict task, and again six weeks later. Secure participants remembered the discussion as more positive than they had reported it six weeks prior, and insecure participants showed the opposite pattern. These results demonstrate that adolescents reconstruct memories in a schematically biased manner as a function of attachment representations.

Individuals allocate attention differently as a function of their IWMs; there is, however, conflicting evidence as to how this works. Some studies suggest that attachment avoidance and anxiety are associated with averting attention away from socially threatening information, such as negative attachment related words (Dewitte et al., 2007), as well as both negative and threatening facial expressions (Dewitte & De Houwer, 2008). In contrast, some studies indicate that both types of insecurity predict more attention towards threatening words (Edelstein & Gillath, 2008) and negative facial expressions (Maier et al., 2015).

The perception of others' emotions and behavior is also biased as a function of attachment style. Overall and colleagues (2015) asked participants to report the intensity of theirs and their partners' negative emotions during a conflict task. They found that avoidant participants perceived their partners as feeling more upset during the task than the partners actually reported feeling. Attachment style also predicts differences in perceptions of partners' behaviors. One noteworthy study asked participants' partners to write the participant a supportive letter before they underwent a stressful lab task. Participants and neutral coders rated their perceptions of the supportiveness of the letter. Attachment insecurity predicted a discrepancy in the two reports, such that the insecure participants perceived the letters as less supportive than did the neutral coders. (Collins, & Feeney, 2004). Research supports the theory that individuals differ across many domains of their social information processing as a function of attachment style. In the present study, I aim to expand the field's knowledge of social information processing by examining one domain more closely: *attribution biases*.

Attachment and Hostile Attribution Biases in Peer Relations

An influential model of children's attributions in peer relationships is Crick and Dodge's (1994) model of social information processing, expanded by Lemerise and Arsenio (2000). This

model begins by addressing that children come into social situations with a database of past memories, then receive a series of cues as input, and their behavior depends on how they process these cues.

A crucial step in this model is when a child makes attributions about social cues, as the meaning attributed to a peer's behavior is the basis for the child's response. Researchers assess hostile attribution biases (HAB), tendencies to attribute an underlying negative intent to peers (Nasby et al., 1980), by having participants watch videos or read stories about a peer's ambiguous behavior, then asking about that peer's intentions. Much research has demonstrated that these hostile attribution biases are associated with both physical and relational aggression in childhood and adolescence (e.g., Bailey & Ostrov, 2008; Crick et al., 2002; Dodge & Newman, 1981).

One particularly notable longitudinal study following participants from kindergarten to third grade revealed a cascade effect (Lansford et al., 2011). Maladaptive SIP (a composite of HAB and three other domains of SIP) predicted low likability scores among peers, which predicted an increase in negative SIP and aggression, which in turn predicted even lower likeability scores over time. This study highlights the dangers of maladaptive SIP. However, more research is needed on the specific effects of children's attribution biases over time.

Much research demonstrates links between HAB throughout childhood and insecure representations of parents. Longitudinal research revealed that insecurity in Ainsworth's Strange Situation procedure (Ainsworth et al., 1978) predicts hostile attributions of a peer's ambiguous behavior in first graders (Raikes & Thompson, 2008), and attributions of negative intent to characters in videotaped interactions in both five and seven-year-olds (Suess et al., 1992; Ziv, Oppenheim, & Sagi-Schwartz, 2004).

To my knowledge, only three studies examine the aforementioned links in adolescents. One study found that young adolescents' attachment to mothers, but not fathers, predicted hostile attributions in situations with unspecified peers (Simons et al., 2001). Another demonstrated that 6th grade boys' insecure attachment with fathers predicted negative attributions of intent to hypothetical scenarios with specific close friends (Dwyer et al., 2010). The final study demonstrated that insecure attachment with mothers predicted maladaptive social information processing, although they did not analyze the direct link between attachment and HAB (Granot & Mayseless, 2012).

The highly replicated links between attachment and HAB described above, and between HAB and aggression (e.g. Crick et al., 2002; Lansford et al., 2011) indicate that these attributions could partially explain the relation between representations of parents and negative social outcomes. Indeed, one study found that HAB mediated the link between attachment to parents and aggression (Simons et al., 2001), a characteristic associated with peer rejection (Lansford et al., 2011). Further, one study demonstrated that negative attributions of a peer's intentions mediated the link between attachment insecurity and peer rejection (Cassidy et al., 1996). The mediating role of HAB in explaining the relations between representations of early caregiving relationships and childhood social outcomes demonstrates the importance of understanding attribution processes further.

In sum, research indicates that early representations of parents generalize to encompass representations of actual (Dwyer et al., 2010) and imagined peers (e.g., Simons et al., 2001), and that this in turn predicts negative social outcomes (Cassidy et al., 1996). More research is needed to examine whether representations of parents generalize to encompass representations of future

romantic partners and whether this manifests through attribution biases, in turn predicting negative relationship outcomes.

Attribution Biases in Romantic Relationships

The cognitive processes behind relationship functioning have been of interest to researchers since the 1980s. The early literature about attributions and relationship satisfaction lacked coherence due to the broad range of attribution dimensions and lack of standardized measures. Early research indicated that marital satisfaction was negatively associated with globality attributions (beliefs that a partner's behavior affects many aspects of the relationship) and stability attributions (beliefs that a partner's behavior is not going to change). Further, satisfaction was negatively associated with attributing the behavior to an internal locus of control (beliefs that the behavior reflects something about the partner's personality), a partner's negative attitude towards the respondent, and a partner's selfishness. Finally, participants reported low satisfaction when they attributed a behavior to mal intent and believed that the partner should be blamed for their behavior (see Bradbury & Fincham, 1990 for a review).

To create a more cohesive literature, researchers Fincham and Bradbury (1992) created a standardized measure for attributions (The Relationship Attributions Measure; RAM). This six-item self-report measure asks participants to read vignettes about their partners engaging in various hypothetical behaviors, and answer questions about why their partners might have behaved as they did. The RAM yields indices for causal attributions (locus, stability, globality), and responsibility attributions (intentionality, motivation, and blameworthiness). Oftentimes, researchers reduce the dimensions into a general attributions index (e.g., Hazelwood, 2012; Pearce & Halford, 2018; Sumer & Cozzarelli, 2004) because the dimensions are often correlated with each other and predict similar outcomes (Bradbury & Fincham, 1990).

After this move towards cohesion, researchers continued to examine the links between attributions and various relationship outcomes. Chatav and Whisman (2009) found that negative causal attributions predicted relationship dissatisfaction even when controlling for the influence of depressive symptoms. Fincham and Bradbury (1992) found that negative attributions predicted self-reported feelings of anger in response to hypothetical events. Further, Karney and Bradbury (2000) determined that changes in attributions were associated with changes in marital satisfaction over the course of 8 years. This link was unidirectional, such that initial levels of attributions predicted changes in marital satisfaction more than initial levels of satisfaction predicted changes in attributions.

These studies indicate that negative attributions have implications for relationship satisfaction, yet it is important to note that attributions can be confounded with true negative characteristics of the partner. When this is true, the partner's true personality could be to blame for the dissatisfaction because the attributions may be accurate. One particularly notable study acknowledged this limitation and asked participants to report on their own and their partners' intentions in particularly negative moments during a conflict task (Waldinger & Schultz, 2006). Relationship satisfaction was negatively associated with discrepancies between one's attributions about their partner's intentions and the partner's self-reported intentions in the conflict task.

Early attributions researchers had strong interests in the topic because they speculated that negative attributions would be a strong precursor to negative behaviors (Berley & Jacobson, 1984; Fincham 1985). Indeed, evidence supports this notion. Fincham and Bradbury (1992) discovered that negative attributions on the responsibility index of the RAM (but not the causal index) predicted whining and anger during a conflict task. Similarly, Bradbury and colleagues (1996) found that wives who made negative attributions were less emotionally expressive and

more critical in a conflict task. An additional study indicated that negative attributions on the responsibility index predicted negative behavior not only when partners were discussing a marital problem, but also when one partner was discussing a personal problem (Miller & Bradbury, 1995).

One possible limitation of these studies is that attributions were measured from participants' responses to hypothetical vignettes. Schaefer-Porter and Hendrick (2000) addressed this limitation by asking participants to recall how they behaved in response to a specific negative incident with their romantic partners. Next, participants reported why they thought that incident occurred. Negative attributions about the incident were associated with behaviors that harmed the relationship, thus demonstrating that the link between attributions and behavior is similar regardless of whether participants are responding about real or hypothetical events. This evidence provides support that results from studies using vignette-based measures generalize to represent true harmful relationship dynamics in the home. The harmful effects of negative attributions make it crucial to understand more about their origins.

Adult Attachment Style as a Predictor of Attribution Biases in Romantic Relationships

Attachment theory states that individuals' mental representations of close relationships guide how they make sense of interactions with partners. Thus, attachment theory is an excellent framework for understanding individual differences in attribution processes. In adolescence and adulthood, individual differences in IWMs of attachment are conceptualized along two dimensions: attachment avoidance and attachment anxiety. The anxiety dimension reflects one's fear of rejection and abandonment by relationship partners, and the avoidance dimension reflects discomfort with closeness and discomfort relying on relationship partners for support. Low levels of anxiety and avoidance indicate attachment security, feelings that one is worthy of love and care, and that

relationship partners are trustworthy (Mikulincer & Shaver, 2007). Where individuals fall on these dimensions indicates their attachment style (Hazan & Shaver 1987).

Insecure adult attachment is related to a large array of negative romantic relationship outcomes (see Feeney, 2016, for a review). Attributions research is useful in explaining why these relations might occur. Research demonstrates that adult attachment avoidance and anxiety are associated with negative attributions about a partner's behaviors (e.g., Hazelwood, 2012; Pearce, & Halford, 2008; Sumer & Cozzareli, 2004), even when controlling for the impact of depressed mood and self-esteem (Collins et al., 2006). Further, attributions mediate links between both dimensions of insecure attachment and various relationship outcomes. For example, in one study, links between insecure attachment dimensions and couple communication were mediated by attributions about partners' behaviors. Specifically, insecurity predicted negative attributions, and these in turn predicted maladaptive self-reported communication styles. Surprisingly, negative attributions did not predict communication styles observed in a lab conflict task (Pearce, & Halford, 2008).

Two studies demonstrate the interplay of attachment and two different SIP processes, attributions and perceptions. One study found that the link between insecurity and perceptions of partners was mediated by attributions (Hazelwood, 2012). More specifically, both avoidance and anxiety predicted negative attributions about partners' behaviors, and this in turn predicted perceptions that partners were not putting effort into the relationship. Similarly, another study found that the association between men's attachment avoidance and perceptions of support was mediated by attributions. Husbands' attachment avoidance predicted negative attributions about their wives' behavior, which predicted husbands' perceptions that they were not getting adequate support from their wives (Gallo, & Smith, 2001). These results are strikingly similar to Collins and Feeney's (2004) findings wherein insecure participants had negatively biased perceptions of

partners' supportive efforts. Gallo and Smith's (2001) results lead to a deeper understanding of the potential processes behind Collins and Feeney's (2004) findings, thus illustrating how considering attributions can give the field a richer understanding of attachment theory.

One particularly notable study demonstrated an indirect effect of attachment anxiety on participants' predictions of their own hostile behavior through two mechanisms. Collins and colleagues (2006) found that attachment anxiety predicted participants' negative attributions in response to hypothetical situations with their partners. This in turn predicted participants forecasting high levels of emotional distress if they encountered these situations, which in turn predicted participants' imagined negative responses to the hypothetical situations. This study replicates the findings that negative attributions are associated with negative relationship behaviors. In addition, the study expands on previous findings by providing a broader context of the cognitive and emotional processes involved in the associations between negative attributions and negative behaviors. This study demonstrates how the attachment framework can enrich the field's understanding of attribution processes in relationships. Further integrating these lines of research can deepen our understanding of the complex interplay among working models, attributions, and behavior.

Limitations of Research on Relations Between Attachment and Attributions

As described above, a large body of research shows that attachment to parents predicts attribution biases in children's peer relationships, and global attachment style predicts attribution biases in adult romantic relationships. The literature, however, is missing research exploring how specifically *attachment to parents* predicts attribution biases about romantic partners in young adolescents. Although the foundation of one's adult attachment style is often based on representations developed in childhood, it is also impacted by experiences with specific romantic

partners. Thus, previous studies demonstrating the impact of *adult* attachment style on attributions are not identifying the impact of *caregiving experiences* on attributions. It is necessary to identify this impact to empirically support the theory that SIP biases are mechanisms that promote the continuity of attachment style from that with parents to that with romantic partners.

Although there are two studies, to my knowledge, that examines how attachment styles with mothers and fathers differentially influence adolescent hostile attributions about peers (Dwyer et al., 2010; Simons et al., 2001), there are no studies that examine how attachment styles with mothers and fathers differentially influence adolescent negative attributions about romantic partners. It is likely that differences exist, because mothers are often the primary attachment figure in adolescence (Rosenthal & Kobak, 2010), therefore representations of mothers might generalize to influence representations of all future relationships. Further, it is possible that representations of secondary attachment figures (often fathers; Rosenthal & Kobak, 2010) only generalize to influence representations of other men. Therefore, if individuals are not making attributions about a male partner, then representations of their fathers may be less influential. Some evidence supports both of these notions (e.g., Fitter et al., 2019), yet it is important to probe these differences further to learn more about which mental representations have the strongest associations with negative attributions, and for whom.

It is important to note that attribution biases are considered harmful because they lead individuals to interpret ambiguous benign behaviors as if the actor had mal intent (Crick & Dodge, 1994). However, limited research (e.g., Waldinger & Schultz, 2006) in the adult attributions literature isolates the impact of the cognitive bias. In previous research, attribution biases are confounded in experience-based representations of partners. It is difficult to conclude

that the bias is predictive of outcomes using current methods, because negative attributions may be accurate, and not a function of bias at all. For example, imagine a participant has had repeated experiences of their partner acting insensitively and is asked to imagine that their partner is behaving insensitively. If the participant makes a stability attribution, they would be accurate. Thus, it could be the partner's stable insensitivity that causes the problem, not the negative attribution itself. It is important to study the impact of the bias itself, as it could be a key mechanism in explaining how early insecurity with parents influences insecurity with romantic partners later in life.

Limited research examines young adolescents' cognitive biases about future romantic relationships. It is essential to study these biases at this age because adolescence marks the potential starting point of a developmental cascade. When adolescents hold a negative attribution bias, a cascade may be set in motion wherein biases that others have negative intentions lead to defensive or aggressive relationship behaviors. These behaviors can elicit aggression or rejection from partners, thus reinforcing biases and contributing to problems in future relationships. This can lead to a lifetime of poor relationship outcomes. Empirically identifying that attachment insecurity with parents predicts negative attribution biases, and that these biases predict tendencies towards negative responses to conflict, would provide evidence for this developmental cascade. This evidence could be an essential step in informing interventions to interrupt similar cascades.

Finally, studies that provide evidence for attributions as a mediator between attachment and negative relationship behaviors use self-report measures of responses to conflict (Collins et al., 2006; Pearce & Halford, 2008). Questions about how an individual responds to their partner in times of stress are susceptible to the social desirability bias, as well as participants' own

cognitive dissonance about engaging in harmful behaviors towards their partners. Including implicit measures along with self-report could help validate these links.

In sum, there is more to learn about how, when, and for whom experiences with caregivers guide experiences in future attachment relationships. Research can employ new methods to further examine attribution biases in adolescence as a mechanism behind the continuity of insecurity from childhood through adulthood that longitudinal work demonstrates (e.g., Furman & Collibee, 2018). The negative outcomes associated with insecurity in romantic relationships (Feeney, 2016) make it crucial to understand attribution biases in young adolescents. This is because early adolescence is when adolescent attachment to parents can generalize and impact future attachment to romantic partners.

Conceptualizing Attachment in Adolescence

Adolescence is a particularly interesting time to study attachment processes because individuals' cognitive capacities are growing to more closely resemble those of adults. Improvements in cognition enable adolescents to integrate previous experiences across multiple relationships, create more generalized IWMs, and develop a generalized attachment style (Allen & Tan, 2016). In addition, peers and romantic partners are transitioning to serve more attachment functions than they served in the past (Rosenthal & Kobak, 2010). This transition facilitates adolescents in forming a generalized attachment style beyond that of specific relationships with specific parents. The present study examines young adolescents; their cognitive capacities are improving but do not yet match those of older adolescents. Although peers are starting to serve attachment functions, parents are still overwhelmingly at the top of the attachment hierarchy (Rosenthal & Kobak, 2010). These adolescents are in the very early stages of developing a generalized attachment style.

Attachment styles in adolescence and adulthood are reflected in the extent that two attachment dimensions (avoidance [discomfort with closeness] and anxiety [fear of abandonment and rejection]) characterize general thoughts, feelings, and behavior related to close relationships (Hazan & Shaver, 1987). In contrast, attachment in childhood is conceptualized as reflecting the quality of specific attachment relationships (Ainsworth et al., 1978). The present study captures young adolescents in the beginning of this transition. Thus, it is important to examine adolescents' attachment to specific parents, and adolescents' overall levels of avoidance and anxiety.

The Present Study

The goals of the present study are fourfold. The first aim is to study young adolescents, the age range that is missing from the attributions literature. The second aim is to address the lack of research on the associations between caregiving experiences and attribution biases by measuring adolescents' attachment avoidance and anxiety with their mothers and fathers. Third, the study aims to study attribution biases that are not confounded by experience-based representations of partners by studying young adolescents without much relationship experience (I will statistically account for differences in previous relationship experience) who are imagining future partners' behaviors. The final aim is to mitigate the social desirability bias when reporting responses to partner behavior by including an implicit measure of these responses. The overarching model is presented in Figure 1, and specific hypotheses are listed below.

Hypothesis 1: Adolescents' attachment avoidance and anxiety with both mothers and fathers will be associated with negative attribution biases (path a).

1a. Adolescent attachment avoidance with mothers will be associated with negative attribution biases

1b. Adolescent attachment anxiety with mothers will be associated with negative attribution biases

1c. Adolescent attachment avoidance with fathers will be associated with negative attribution biases

1d. Adolescent attachment anxiety with fathers will be associated with negative attribution biases

Hypothesis 2: Preferred partner gender will moderate links between attachment avoidance and anxiety with fathers and attribution biases, such that this association will be stronger for participants imagining a male future partner (moderated path a).

2a. The association between adolescent attachment *avoidance with fathers* and negative attribution biases will be stronger for participants imagining a male future partner.

2b. The association between adolescent attachment *anxiety with fathers* and negative attribution biases will be stronger for participants imagining a male future partner.

Hypothesis 3: Attribution biases will mediate links between attachment anxiety and avoidance with both mothers and fathers, and negative *explicit* responses to partner behavior (path ab).¹

¹ If an interaction from hypothesis 2 is significant, I will test *moderated* mediation for the corresponding mediation models in hypotheses 3 and 4.

3a. Negative attribution biases will mediate a link between adolescent attachment *avoidance with mothers* and negative explicit responses to partners' behaviors.

3b. Negative attribution biases will mediate a link between adolescent attachment *anxiety with mothers* and negative explicit responses to partners' behaviors.

3c. Negative attribution biases will mediate a link between adolescent attachment *avoidance with fathers* and negative explicit responses to partners' behaviors.

3d. Negative attribution biases will mediate a link between adolescent attachment *anxiety with fathers* and negative explicit responses to partners' behaviors.

Hypothesis 4: Attribution biases will mediate links between attachment anxiety and avoidance with both mothers and fathers, and negative *implicit* responses to partner behavior (path ab).

4a. Negative attribution biases will mediate a link between adolescent attachment *avoidance with mothers* and negative implicit responses to partners' behaviors.

4b. Negative attribution biases will mediate a link between adolescent attachment *anxiety with mothers* and negative implicit responses to partners' behaviors.

4c. Negative attribution biases will mediate a link between adolescent attachment *avoidance with fathers* and negative implicit responses to partners' behaviors.

4d. Negative attribution biases will mediate a link between adolescent attachment *anxiety with fathers* and negative implicit responses to partners' behaviors.

Chapter 2: Method

Participants

Participants were 250 eighth graders (61.9% male, 36.9% female, 1.2% other) ranging in age from 11 to 15 years ($M_{\text{age}} = 13.49$, $SD = .54$) from private and public charter middle schools in Maryland, Washington D.C., and Delaware. The sole inclusion criterion was that participants must be proficient at reading English. The sample was racially diverse, with 49.4% of adolescents identifying as White, 30.2% as African American, 5.7% as Asian, 4.1% as Hispanic, 2% as Middle Eastern, 1.6% as Native American, and 6.9% as Other. Of the adolescents who provided information on parent education, 86.8% had a parent with at least a college degree, and 52.7% had a parent with a master's or doctoral degree. Most participants endorsed being raised by both parents equally (59.6%), 23.7% endorsed being primarily raised by their moms, 5.7% by their dads, and 11% by someone other than a parent. The majority of participants reported that have not been in a romantic relationship yet (56%), 13% reported that they have been in one, and 31% reported that they have been in two or more. Only 15% reported being in a relationship at the time of data collection.

Procedure

The data were collected in participants' eighth grade classrooms. Prior to data collection, opt-out consent forms were sent to the parents. During the visit, students were seated at individual laptops. An experimenter described the study, and participants provided informed assent. Next, the experimenter guided adolescents through a series of computer tasks displayed through the web-based experiment platform Gorilla (Gorilla.sc; Anwyl-Irvine et al., 2018)

Adolescents began the study by reading a series of three short vignettes about hypothetical future romantic partners' potentially negative behaviors. Following each vignette,

adolescents answered questionnaires regarding their attributions about why this person behaved as they did, and the adolescent reported on how they would respond in that situation. Next, adolescents completed a novel go/no-go association task wherein they were asked to quickly categorize words that represent positive (e.g., “sympathize”) and negative (e.g., “yell”) responses to partners’ behaviors. Finally, adolescents completed a series of questionnaires about attachment style, romantic relationship experience, and demographics. The procedure took about 35 minutes total. After the study procedures concluded, teachers of participating classrooms were compensated \$20 each.

Measures²

Demographics. Adolescents answered questions about age, race and ethnicity, parent education, family structure (participants were asked who they were primarily raised by), and gender.

Relationship experience. Adolescents completed the Early Adolescent Romantic Relationship Experiences Questionnaire (EA-RREQ; Fitter & Cassidy, in preparation). Adolescents answered questions about whether they have been in a relationship, whether they are currently in a relationship, how many relationships they have been in, and how happy they were in their most serious relationship. Adolescents also rated four statements about why they were in a relationship with that person (e.g., “I was in a relationship with this person because I liked spending time with them,” “I was in a relationship with this person because my friends told me I should date them.”)

Attachment style with parents. The Relationship Structures Questionnaire (ECR-RS; Fraley, et al., 2011) is a 36-item self-report questionnaire assessing attachment avoidance

² Copies of adapted and original questionnaires are located in the appendices

(discomfort with closeness and depending on others; e.g., “I find it easy to depend on this person”) and anxiety (fears of rejection and abandonment; e.g., “I often worry that this person doesn't really care for me”) with specific targets. Adolescents rated the extent to which they agree with the 36 statements on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*).

Adolescents completed the scale about their mother and father. The ECR-RS demonstrates high internal consistency with adults (Fraley et al., 2011), and adolescents (Donbaek & Elklit, 2014; Hünefeldt et al., 2013), and demonstrates good reliability and construct validity cross culturally (Moreira et al., 2015). The ECR-RS demonstrated strong reliability in the present sample (anxiety with mothers, $\omega = 0.89$, avoidance with mothers, $\omega = 0.82$, anxiety with fathers, $\omega = 0.82$, avoidance with fathers, $\omega = 0.87$).

Attributions about partner behavior. Adolescents read three vignettes, adapted from Collins and colleagues (2006), about hypothetical future romantic partners’ potentially negative behaviors (e.g., “Imagine this person left you standing alone at a party where you didn’t know anyone”). Following each vignette, adolescents answered two sets of questions regarding their attributions about why the person behaved that way. To ensure developmental appropriateness for a sample of young adolescents, the following adaptations were made to the original vignettes: (a) the words “your partner” were replaced with “this person” for all vignettes and items; (b) some vignettes were modified to be developmentally appropriate for 13-14 year olds. For example, the vignette “Your partner didn’t comfort you when you were feeling down” was changed to “You texted this person that you were feeling upset and this person didn’t answer you all day”; (c) the measure was shortened such that adolescents responded to three vignettes instead of Collins and colleagues’ (2006) original five.

The first set of questions about attributions is an adapted version of Collins and

colleagues' (2006) explanations for potentially negative partners' behaviors. Adolescents will rate how likely each of six possible explanations are for the behavior in the vignettes. For each vignette, participants will rate three negative explanations (e.g., "This person is bored of talking to me," "This person went to talk to someone they thought was more attractive") and three neutral explanations (e.g., "This person went to get some food," "This person thinks I don't mind being on my own at parties") on a scale from 1 (*not at all likely*) to 7 (*extremely likely*). Some items were modified to be developmentally appropriate for a sample of young adolescents. For example, "My partner may be seeing someone else or doing something behind my back" was changed to "this person is secretly hanging out with friends." In Collins and colleagues' (2006) study, negative explanations for partners' behaviors showed good convergent validity with negative attributions on the Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992), a well-validated measure of attributions for partners' behaviors. The adapted version of this measure in the present study demonstrated strong reliability ($\omega = 0.83$).

The second set of questions about attributions is an adapted version of the Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992). Participants completed this measure in response to Collins and colleagues' (2006) vignettes. The original RAM presents four vignettes about negative situations that are likely to occur in a romantic relationship (e.g., "Your husband criticizes something you say"), and then asks participants to rate their agreement on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*) on statements that reflect six dimensions of attributions. The causal attributions subscale encompasses attributions of locus, stability, and globality (e.g., "My husband's behavior is due to something about him") and the responsibility attributions subscale encompasses attributions of intentionality, motivation, and blameworthiness (e.g., "My husband criticized me on purpose rather than unintentionally"). The original

validation study (Fincham & Bradbury, 1992) demonstrated adequate internal consistency across three samples with Cronbach's α ranging from .55 to .88 for the subscales. The measure also demonstrated moderate to high test-retest reliability over three weeks.

For the purposes of this study, the following adaptations were made: (a) the words "your husband/wife" were replaced with "this person" for all items; (b) participants were asked to rate these attribution statements in response to the vignettes modified from Collins and colleagues (2006) instead of the four traditional RAM vignettes; (c) some items were modified to be developmentally appropriate for young adolescents. For example, "My husband's behavior was motivated by selfish rather than unselfish concerns" was changed to "This person behaved this way because they were selfish." The adapted version of the measure demonstrated good reliability ($\omega = 0.80$).

Explicit responses to partners' behaviors. Following rating attributions about the event depicted in the vignette, adolescents rated how likely they were to react in various ways on a 7-pt Likert-type scale from 1 (*not at all likely*) to 7 (*extremely likely*) using a procedure adapted from Collins and colleagues (2006). Adolescents rated items on the hostile/punishing responses subscale (e.g., "Snap or yell," "Ignore your partner," "Criticize or complain"). This subscale shows strong internal consistency (hostile/punishing $\alpha = .93$; Collins et al., 2006).

To ensure that the measure is developmentally appropriate for a sample of young adolescents, the following modifications were made: (a) the words "your partner" were replaced with "this person" for all items; (b) the item "Ignore your partner or give him/her the "cold shoulder" was changed to "Ignore this person." The modified version demonstrated excellent reliability in the present sample ($\omega = 0.91$).

Implicit responses to partners' behaviors. The Conflict Responses Go/No-Go Association Task (CR-GNAT; Fitter & Cassidy, in preparation) is a novel go/no-go association task (GNAT; Nosek & Banaji, 2001). Go/no-go association tasks measure implicit associations between a target stimulus (e.g., children) and an attribute (e.g., good). Researchers assess the strength of the association between the target and the attribute by measuring the degree to which distracter items (e.g., “annoying”) can be quickly discriminated from items that belong to the target category (e.g., “my child”) and the attribute category (e.g., “joyful”). Variations of the GNAT are frequently used to measure implicit associations (e.g., Anderson & Kaufmann, 2011; Kaufmann & Haslam, 2007; Sturge-Apple, Rogge, Skibo, Peltz, & Suor, 2015). A variant of the GNAT has also been employed to test implicit responses toward one’s future child (Jones et al., in preparation). GNATs can achieve good reliability with 40 or more trials per block (see Williams, Kaufmann, 2012, for a review).

First, adolescents completed two short practice blocks of the CR-GNAT (procedure described below). Next, they were asked to imagine that they were in a romantic/dating relationship with someone in the future and to imagine “you texted this person that you were feeling upset and this person didn’t answer you all day”. After 30 seconds, the adolescents were asked to think about how they would respond. Finally, adolescents will complete the CR-GNAT.

Three types of word stimuli appeared one at a time on adolescents’ computer screens for 650ms each (stimulus time following Sturge-Apple et al., 2015). Words belonged to either one of two attribute categories (positive and negative) or the target category (the words “my behavior”). Words in the positive attribute category were be positive responses to the imagined upsetting behavior (e.g., “forgive,” “respect”), and words in the negative attribute category were negative responses to the imagined upsetting behavior (e.g., “accuse,” “yell”). The target category

consisted solely of the words “my behavior” to simplify the task for a young adolescent sample (see Appendix D for full word list). The word lengths between the positive list ($M = 6.71$, $SD = 1.59$) and the negative list ($M = 5.86$, $SD = 1.3$) did not significantly differ. $t = 1.56$, $p = .13$.

Adolescents participated in two positive blocks (one practice round with 14 trials and one real round with 42 trials for each) and two negative blocks with the same number of trials as the positive blocks. In the positive blocks, participants were asked to press the space bar when they saw positive words, or the words “my behavior” and to do nothing for negative words. In the negative block, participants were asked to press the space bar when they saw negative words, or the words “my behavior” and to do nothing for positive words.

D' from signal detection theory (SDT) was used to indicate performance on the GNAT. . This task yields two d' scores, one for the positive block and one for the negative block. Before calculating d' scores, hit rates and false alarm rates were standardized using the standard normal $N(0,1)$ function. D' was calculated with the following formula: $d' = Z(\text{hit rate}) - Z(\text{false alarm rate})$. Higher d' values for negative trials reflect an implicit negative response to partners' behaviors, because it indicates that participants are effective at distinguishing signal from noise when associating negative behaviors (e.g., “yell”) with the target (“my partner”) (Nosek & Banaji, 2001).

To handle extreme values that cannot be standardized (0s and 1s), the loglinear transformation approach was used (Stanislaw & Todorov, 1999). Prior to calculating the hit rate, 0.5 was added to the number of hits and false alarms, and 1 was added to the number of signal trials and the number of noise trials. Negative d' values were treated as missing data, as a negative d' values indicate performance lower than chance.

To remove method variance and control for general performance on the GNAT, following previous researchers (e.g., Boldero, Rawlings, & Haslam, 2007; Sturge-Apple et al., 2015), residual scores were utilized. A residualized index of d' scores for negative trials was calculated by regressing d' scores for positive trials on d' scores for negative trials and saving the residualized scores. These scores reflect participants' performance on the negative GNAT trials, controlling for overall performance on the GNAT.

Chapter 3: Results

Missing Data

Full information maximum likelihood estimation (FIML) was used to estimate scale level missingness. Participant mean imputation was used to estimate scale scores for participants with some missing item responses on a given scale, a statistically sound technique when less than 10% of item scores are missing (Parent, 2013, Schafer & Graham, 2002). None of the scales surpassed this limit (missing items ranged from 1.55% – 2.56% per scale). When participants had 50% or more items missing on a scale (this was rare and applied to a maximum of 1.2% of participants per scale), that participant's score for the scale was treated as missing.

All 250 participants had data on explicit responses to imagined future romantic partners' negative behaviors. Due to nonresponse and technical problems, one was missing data for negative attributions ($n = 249$), six were missing data for attachment anxiety with mothers ($n = 244$), seven were missing data for attachment avoidance with mothers ($n=243$), 11 were missing data for attachment anxiety with fathers ($n = 239$), seven were missing data for attachment avoidance with fathers ($n = 243$), and five were missing demographic information ($n = 245$). Eight participants were missing data for implicit responses to future partners' behaviors and eight more participants were considered missing because of below chance performance on the task. Sixteen participants in total were missing data for implicit responses ($n = 234$).

Data Reduction

First, separate scores for each of the two measures of negative attributions (the modified Relationships Attributions Measure [RAM; adapted from Fincham & Bradbury, 1992] and the modified version of Collins and colleagues' (2006) possible explanations for partner behavior) were calculated by taking the average of all items, recoded such that higher numbers represent

more negative attributions. Following previous research (Hazelwood, 2012), the two subscales of the modified RAM were reduced into one index of negative attributions. Following previous research (Collins et al., 2006), a combined index of negative attributions from participant scores on the modified RAM and the modified version of Collins and colleagues' (2006) possible explanations for partner's behavior measure was used for all analyses. These two scales displayed a moderate correlation ($r = .60, p < .001$). To create the composite score, scale scores were standardized and then summed.

Five additional attachment indices were created, first examining measures about attachment with parents: total insecurity across both parents combined (the average of anxiety with moms, anxiety with dads, avoidance with moms, and avoidance with dads), insecurity with mothers (the average of anxiety with mothers and avoidance with mothers), insecurity with fathers (the average of anxiety with fathers and avoidance with fathers)³. Second, indices examining the two dimensions of attachment were created: anxiety (the average of anxiety with mothers and anxiety with fathers) and avoidance (the average of avoidance with mothers and avoidance with fathers).

Preliminary Analyses

Preliminary analyses were conducted in R version 3.51 (R Core Team, 2018). Means, standard deviations, and correlations among study variables are displayed in Table 1. Skewness, ranges, and distributions of key study variables are displayed in Appendix M.

³ Following Woodhouse and colleagues (2009) I created insecurity scores by averaging across anxiety and avoidance. Averaging across these two dimensions rotates them to create a new dimension. Scores on one end are characterized by security (low avoidance and low anxiety) and scores on the other end are characterized by fearfulness (high anxiety and high avoidance). For ease of interpretation, I refer to high scores on this new variable as insecurity.

The correlations among the four measures of attachment (anxiety and avoidance with mothers, anxiety and avoidance with fathers) were all significant (all $ps < .05$; see Table 1). Attachment *anxiety* with mothers and fathers were both highly positively skewed (anxiety with mothers $SE = 1.88$, anxiety with fathers $SE = 1.32$) indicating that most participants endorsed low attachment anxiety. This is common in adolescent samples (e.g., Hünefeldt et al., 2013). Skewness improved after applying a logarithmic transformation to the attachment anxiety variables (log transformed attachment anxiety with mothers $SE = 1.14$, log transformed attachment anxiety with fathers $SE = 0.85$).

Non-white participants displayed significantly more negative explicit responses than white participants ($t(243) = -2.27, p = .02$). White and non-white participants did not differ in their negative attributions ($t(242) = -1.08, p = 0.33$) implicit responses ($t(232) = -1.41, p = .16$), or any of the four attachment measures (all p 's $> .05$). Boys displayed significantly more negative explicit responses than girls ($t(239) = 3.50, p < .001$), but boys and girls did not differ in their negative attributions ($t(238) = 1.21, p = .23$) or their negative implicit responses ($t(229) = -.94, p = .35$). Girls had significantly more attachment avoidance ($t(238) = 5.00, p < .001$) and anxiety ($t(234) = 2.32, p = .02$) with fathers than boys did. Highest obtained parents' education coded from 1 (some high school) to 5 (graduate degree) was examined as a possible covariate using Kendall's Tau. Parent education was not significantly associated with any of the three outcome variables, so it was not controlled for in principal analyses (all p 's $< .05$).

Principal Analyses

First, I tested the hypothesized model examining attachment dimensions for each parent (anxiety with mothers, anxiety with fathers, avoidance with mothers, avoidance with fathers) None of these attachment predictors explained significant variance above and beyond the others

(although avoidance with fathers trended, $p = .058$), so I decided to examine the links between attachment and study variables on three more levels (see open science pre-registration for more details: <https://osf.io/bk6rn>). In the following section, I first discuss my findings examining total insecurity (across both parents combined). Second, I discuss my findings on the level of insecurity with each individual parent (with mothers and with fathers). Third, I discuss my findings on the level of the two attachment dimensions (avoidance [across both parents, combined] and anxiety across both parents combined]). Finally, I discuss my findings on the level of attachment dimensions for each parent (anxiety with mothers, anxiety with fathers, avoidance with mothers, avoidance with fathers). These four sections test the same overarching set of four initial hypotheses (see Figure 1 for overarching model, see Chapter 1 for specific hypotheses) each with different ways to conceptualize the predictor of adolescent attachment (see Figure 2 for a graphical depiction of the four ways I conceptualize attachment in the present study).

Total insecurity (with both parents combined) predicting negative attributions and responses to partners' behaviors. I used measured variable path modeling for all principal analyses (conducted in Mplus version 5.2; Muthén & Muthén, 1998-2007). To examine the impact of total insecurity with both parents combined (see Data Reduction for information on how this index was calculated). The following variables were included in the total insecurity with parents model: Total attachment insecurity with parents, and a priori covariates (gender [coded 1 = girl, 2 = boy], race [coded 1 = white, 2 = non-white] romantic relationship experience [coded 1 = has been in a relationship, 0 = has not been in a relationship], age, and four dummy variables to represent the five schools [coded 1 = belongs to the school, 0 = does not belong to

the school], see Figure 3 for the structural model and Table 2 for all path coefficients). The model fit the data well (CFI = 1, RMSEA = .000, SRMR = .005, $\chi^2 = .69$, $p = .71$).

Adolescents' total insecurity with parents significantly predicted their negative attributions ($\beta = .18$, $p < .01$). In addition, adolescents with more negative attributions displayed more negative explicit responses to these behaviors ($\beta = .54$, $p < .001$) but did not display more negative implicit responses ($\beta = -.05$, $p = .46$). To examine the indirect effect of total insecurity on implicit and explicit responses to partners' behaviors, a mediation analysis was conducted using the Model Indirect Mplus Procedure (Stride et al., 2015). This procedure uses bootstrapping methods to estimate confidence intervals around the indirect effect. There was a significant indirect effect of total insecurity with parents on explicit negative responses through negative attributions (95% CI [0.02 - 0.22], $p = .02$), but not on negative implicit responses (95% CI [-0.03 - 0.01], $p = .54$).

Attachment insecurity with each individual parent (with mothers and fathers) predicting negative attributions and responses to partners' behaviors. To examine the impact of insecurity with mothers and insecurity with fathers separately (see Data Reduction for information on how these two indices were calculated), three measured variable path models were conducted, a mother model, a father model, and a both parents model.

The following variables were included in the mother model: Attachment insecurity with mothers and a priori covariates (gender, race, romantic relationship experience, age, and dummy variables to represent which schools participants belonged to, see Figure 4 for the structural model, see Table 3 for all path coefficients).⁴ I allowed all predictors to covary and allowed the

⁴ An insignificant interaction terms between insecurity with mothers and preferred partner gender was removed from the model, allowing me to include participant gender as a covariate instead of preferred partner gender.

error terms of implicit and explicit responses to covary. The model demonstrated good fit (CFI = 1, RMSEA = .000, SRMR = .008, $\chi^2 = 1.47$, $p = .48$). Adolescents with greater insecurity with mothers demonstrated more negative attributions ($\beta = 0.13$, $p = 0.04$). There was a marginally significant indirect effect of insecurity with mothers on negative explicit responses to partners' behaviors through negative attributions (95%CI [-0.01 – 0.17], $p = .08$). There was no significant indirect effect of insecurity with mothers on negative implicit responses (95%CI [-0.02 – 0.01], $p = 0.57$).

The following variables were included in the father model: Attachment insecurity with fathers, an interaction term between insecurity with fathers and preferred partner gender, and all covariates from the mother model. The interaction term was not significant ($\beta = -0.03$, $p = 0.64$) and was removed from the final model. This allowed me to include participant gender as a covariate, instead of preferred partner gender (see Figure 5 for the structural model, see Table 3 for all path coefficients). I allowed all predictors to covary and allowed the error terms of implicit and explicit responses to covary. The model demonstrated good fit (CFI = 1, RMSEA = .000, SRMR = .003, $\chi^2 = .295$, $p = .86$). Adolescents with greater insecurity with fathers demonstrated more negative attributions ($\beta = 0.17$, $p = 0.01$). There was a significant indirect effect of insecurity with fathers on explicit responses (95%CI [0.01– 0.17], $p = .04$) but not implicit responses (95%CI [-0.02 – 0.01], $p = 0.55$).

The both parents model included insecurity with fathers, insecurity with mothers, and all covariates from the mother and father models. When insecurity with mothers and fathers were both in the model, neither explained a significant portion of the variance above and beyond the other, although insecurity with fathers was trending (insecurity with moms, $\beta = 0.07$, $p = 0.28$,

insecurity with dads, $\beta = 0.13$, $p = 0.07$, see Figure 6 for the structural model, see Table 3 for all path coefficients).

Two attachment dimensions (avoidance across both parents combined and anxiety across both parents combined) predicting negative attributions and responses to partners' behaviors. A measured variable path model examining attachment avoidance with parents and attachment anxiety with parents (see Data Reduction for information on how these indices were calculated) was conducted. The parent attachment anxiety composite was highly positively skewed ($SE = 1.63$), so I used a log transformed version of the variable. This log transformation improved the skewness; however, the variable was still moderately positively skewed ($SE = .78$). The following variables were included in the model: Attachment avoidance across both parents combined, log transformed attachment anxiety across both parents combined, and a priori covariates (see Figure 7 for the structural model, see Table 4 for all path coefficients). I allowed all predictors to covary and allowed the error terms of implicit and explicit responses to covary. The model demonstrated good fit ($CFI = 1$, $RMSEA = .000$, $SRMR = .007$, $\chi^2 = 3.65$, $p = .45$).

Adolescents with high attachment avoidance with parents displayed more negative attributions about future romantic partners' behaviors ($\beta = 0.14$, $p = .052$)⁵. Those with higher attachment anxiety with parents did not ($\beta = .05$, $p = .45$). To examine the indirect effect of attachment avoidance and anxiety on implicit and explicit responses to partners' behaviors, four mediation analyses were conducted. There was a marginally significant indirect effect of *avoidance* with parents on negative explicit responses to partners' behaviors through negative attributions (95%CI [-.004 - 0.17], $p = .06$). The same did not hold for attachment *anxiety*

⁵ Although .052 is greater than the Fisher's recommended benchmark of .05, I will discuss this finding as evidence for my hypotheses, given the arbitrary nature of this cut-off (Dahiru, 2008) and the difference of less than half a percent.

(95%CI [-0.25 - 0.58], $p = .46$). There were no significant indirect effects of attachment avoidance (95%CI [-0.02 - 0.01], $p = .56$) or anxiety (95%CI [-0.06 - 0.03], $p = .72$) on negative implicit responses to partners' behaviors through negative attributions.

Attachment dimensions for each parent (anxiety with mothers, anxiety with fathers, avoidance with mothers, and avoidance with fathers) predicting negative attributions and responses to partners' behaviors. The following variables were included in the model:

Attachment avoidance with mothers, attachment anxiety with mothers, attachment avoidance with fathers, attachment anxiety with fathers, an interaction term between anxiety with fathers and preferred partner gender, an interaction term between avoidance with fathers and preferred partner gender, and a priori covariates (see Figure 8 for the structural model, see Table 5 for all path coefficients).

The model demonstrated good fit (CFI = .97, RMSEA = .04, SRMR = .018, $\chi^2 = 19.83$, $p = .135$), however, none of the attachment predictors or interaction terms in this model reached statistical significance, although anxiety with fathers trended towards significance (anxiety with mothers, $\beta = 0.09$, $p = 0.35$, anxiety with fathers, $\beta = -0.01$, $p = 0.94$, avoidance with mothers, $\beta = 0.01$, $p = 0.84$, avoidance with fathers, $\beta = 0.15$, $p = 0.058$, anxiety with fathers and preferred partner gender interaction, $\beta = -0.05$, $p = 0.85$, avoidance with fathers and preferred partner gender interaction, $\beta = 0.01$, $p = 0.49$). The insignificant interaction terms were removed from the final model. This allowed me to include participant gender as a covariate, instead of preferred partner gender. There were no significant indirect effects of any of the attachment predictors on negative explicit or implicit responses to partners' behaviors through the mechanism of negative attributions (all $ps > .05$).

Exploratory Analyses

When examining security on the level of the two attachment dimensions (avoidance across both parents combined and anxiety across both parents combined), there was no direct effect of attachment anxiety on negative attributions. This is inconsistent with previous literature (e.g., Collins et al., 2006; Hazelwood, 2012). I decided to explore why I did not find this relation. One possibility is that avoidance could have been suppressing the relation between anxiety and negative attributions because avoidance with parents significantly correlates with anxiety with parents in the present sample ($r = .44, p < .001$). When a version of the model without avoidance was tested, anxiety trended towards significance in predicting negative attributions ($\beta = .12, p = .063$).

To test whether security with mothers buffered against the impact of insecurity with fathers on negative attributions, a two-way interaction term between insecurity with mothers and insecurity with fathers was added to the both parents model. Security with mothers did not significantly buffer against insecurity with fathers in predicting negative attributions ($\beta = 0.09, p = 0.21$). To test whether this buffering effect may depend on the gender of the partner an adolescent was picturing, a three-way interaction term between insecurity with mothers, insecurity with fathers, and preferred partner gender was added to the both parents model. There was no significant three-way interaction, indicating that security with one parent did not significantly buffer against insecurity with another parent as a function of the gender of the partner the adolescent was picturing ($\beta = -0.01, p = 0.89$).

To examine the predictive validity of the two measures of responses to partner's behaviors, I tested the correlation between the two. I examined this correlation because previous research has demonstrated that high correlations between implicit and explicit measures indicate

that the measures predict behaviors (Greenwald, Poehlman, Uhlmann, Banaji, 2009). The two measures displayed a marginally significant negative correlation ($r = -0.12, p = 0.08$).

Chapter 4: Discussion

In this chapter, I will first summarize my findings across all four of the conceptual levels considered in the thesis. Second, I will describe the contributions that the present study makes to the literature. Third, I will discuss how the findings fit in with previous knowledge about both attachment with mothers and fathers, and the two attachment dimensions. Following this discussion, I will address the relative utility of examining both relationship specific attachment and the two attachment dimensions in adolescence. Next, I will discuss the outcomes of negative attributions and the broader implications for the findings. Finally, I will discuss study limitations and future directions.

The present study is the first to examine how young adolescents' attachment to parents predicts social information processing (SIP) biases about the nature of their future romantic relationships. To extend the literature on attachment and SIP, I tested how adolescents' attachment predicted their attributions about why future romantic partners might behave in certain ways. I also tested how these attribution biases predicted implicit and explicit responses to hypothetical situations with future romantic partners.

Due to the transitional nature of adolescents' attachment organization, I examined attachment on four conceptual levels. These levels are not meant to be hierarchical; the levels represent *qualitatively* different ways to conceptualize adolescent attachment: First, I examined adolescents' total security (across both parents combined). Second, I examined security with each individual parent (with mothers and with fathers). Next, I examined the two attachment dimensions (avoidance [across both parents, combined] and anxiety [across both parents combined]). Finally, I examined the attachment dimensions for each parent (anxiety with

mothers, anxiety with fathers, avoidance with mothers, and avoidance with fathers). See Figure 2 for a graphic depiction of these four levels.

Overall, findings suggest that adolescent attachment predicts negative attributions about hypothetical future romantic partners' behaviors. More specifically, links between attachment and negative attributions were significant on the levels of total security and security with each individual parent. On the level of the two attachment dimensions avoidance predicted negative attributions. Surprisingly, attachment anxiety did not. On the level of attachment dimensions for each parent, only avoidance with fathers trended ($p = .058$) towards predicting negative attributions. In addition, exploratory analyses demonstrated that security with one parent did not buffer against insecurity with the other parent in predicting negative attributions. More specifically, insecurity with one parent predicted negative attributions regardless of how secure adolescents were with the other parent.

Findings also suggest that negative attributions predict adolescents forecasting their own negative responses (e.g., yelling, stonewalling) towards the imagined future romantic partner. I will refer to these negative responses as “negative explicit responses.” Negative attributions did not predict adolescents' implicit tendencies towards negative responses on the Conflict Responses Go/No-Go Association Task (CR-GNAT). I will refer to these implicit response tendencies as “negative implicit responses.” Through the mechanism of negative attributions, there was an indirect effect of adolescents' attachment on negative explicit responses. Specifically, there was a significant indirect effect on the level of total security. On the level of adolescents' security with each individual parent, there was an indirect effect for security with fathers (the indirect effect for mothers only trended, $p = .08$). On the level of the two attachment dimensions, there was a marginally significant indirect effect for attachment avoidance ($p = .06$),

but not anxiety. On the level of attachment dimensions for each parent, there was only a marginally significant indirect effect for avoidance with fathers ($p = .08$). There were no significant indirect effects of attachment on negative implicit responses to future romantic partners' behaviors at any of the conceptual levels of attachment.

Contributions to the literature

These results converge with previous research demonstrating links between attachment with parents and negative attributions in children's (Lansford et al., 2011) and adolescents' (e.g., Simons et al., 2001) peer relationships. In addition, the present results mirror findings that negative attributions predict negative behaviors (e.g. Crick et al., 2002; Lansford et al., 2011) in peer relationships. The present study makes an important contribution to the literature on parental attachment and children and adolescents' attributions; it demonstrates that attachment to parents also predicts attribution biases about *future romantic relationships*.

These results mirror previous findings stating that adults' insecure attachment predicts negative attributions about romantic partners, and that negative attributions predict negative behaviors (e.g., Fincham & Bradbury, 1992; Miller & Bradbury, 1995). The present study makes important contributions to the body of literature about attachment and attributions in romantic relationships in three ways. First, previous studies about attachment and attributions are comprised of adult couples. The present study demonstrates that links between attachment and attributions exist as early as young adolescence, before individuals have had substantial relationship experience. Second, previous literature is limited in its ability to fully examine attribution *biases* because participants are making attributions about their own romantic partners. In these studies, participants' attribution biases are confounded in experience-based representations of their partners. The present study asks adolescents to imagine a person they

may date in the future, capturing the true attribution bias.⁶ Third, previous literature demonstrates links between dispositional adult attachment style (considered within a broad range of relationships over time) and negative attributions and behaviors. The present study examines the role that attachment style in relation to *parents* plays in predicting negative attributions and behaviors. This study is an important first step in building a developmental model of how attachment with parents contributes to romantic relationship difficulties and insecure attachment later in life.

Negative Attributions and Adolescents' Security with Mothers and Fathers

Attachment theory states that insecure mental representations of parents develop through repeated experiences of insensitive caregiving (Bowlby, 1969/82). When caregivers fail to meet individuals' needs, it provides evidence to individuals that others may not have their best intentions at heart. Additionally, adolescents may question the extent to which they themselves are worthy of care. When young adolescents who hold these beliefs begin to explore romantic relationships, (relationships akin to ambiguity, especially early ones), they process romantic partners' behaviors through a negatively biased lens. This negative lens places teens at risk for attributing a partner's behavior (e.g., ignoring a text message for a couple of hours) to a negative cause (e.g., they are not interested in me anymore) instead of a benign cause (e.g., my partner's phone was dead). Indeed, the present study suggests that insecurity to parents puts young adolescents at risk for developing negative attribution biases. Moreover, this link holds regardless of whether the insecure relationship is with mothers or fathers.

⁶ It is possible that an adolescent currently in a relationship may have been imagining that person, but only 15% of adolescents reported being in a current relationship.

Interestingly, security with one parent did not buffer against insecurity to another parent in predicting negative attributions. More specifically, insecurity to one parent predicted negative attributions regardless of how secure adolescents were to the other parent. This lack of a buffering effect suggests that both parents play an important role in shaping biases about future relationships. However, it is important to note that when security with mothers and fathers were both in the same model, only fathers explained a marginally significant ($p = .07$) proportion of the variance above and beyond that of mothers.

The unique effect of attachment to fathers (but not mothers) on negative attributions contrasts previous findings with other socioemotional outcomes in adolescence. Other studies demonstrate that attachment to mothers (but not fathers) explains unique variance in outcomes such as externalizing (Woodhouse et al., 2009) and internalizing (Duchense & Ratelle, 2014; Woodhouse et al., 2010). Regarding adolescents' negative attributions about peers, one study only found an effect of security with fathers (Dwyer et al., 2010) and one only found an effect of security with mothers (Simons et al., 2001). To my knowledge, these are the only two studies examining differential effects of mothers and fathers in predicting adolescents' negative attributions. Thus, researchers need to continue examining unique effects of mothers and fathers in predicting attribution biases, especially due to changing social roles.

One possible explanation for why older research demonstrates that security with mothers is a stronger predictor of socioemotional outcomes than security with fathers is that mothers tended to be primary caregivers (Rosenthal & Kobak, 2010). However, fathers' caregiving roles are changing; the proportion of families with stay at home fathers has been steadily increasing since the 1990s (Pew Research Center, 2017). About 60% of adolescents in the present sample endorsed that both parents raised them equally, 7% reported that they were raised primarily by

their fathers, and only 24% reported that they were raised primarily by their mothers. It is possible that the previous finding stating that attachment with mothers was predominant to attachment with fathers in predicting negative attributions (Simons et al., 2001) was simply because mothers were the primary attachment figures in that sample. Perhaps with a more equal split between primary and secondary caregiver status, it is possible to see the unique role fathers have in shaping adolescents' social cognitive biases. However, it is important to interpret these preliminary findings with caution; more research is needed to make meaningful claims about the ways in which attachment with mothers and fathers differentially affect attribution biases.

Regardless of the differential effects of mothers and fathers on predicting negative attributions, this study demonstrates that insecurity to parents is related to negative attribution biases. Previous research demonstrating that adult attachment insecurity predicts negative attribution biases (e.g., Hazelwood et al., 2012) is unable to parse apart the effect of early experiences with parents from the effect of previous romantic relationships. Although early experiences with caregivers can be influential “from the cradle to the grave” (Bowlby, 1969/82) adult attachment is also influenced by experiences in adults' close relationships. The present study demonstrates that 13 and 14 year-olds' attachment to their *parents* is associated with attribution biases about romantic partners. These adolescents have had limited relationship experience (56% report they were never in a relationship) and the relationships they had were likely not attachment relationships (Rosenthal & Kobak, 2010). Therefore, the present study provides evidence that these biases are truly predicted by insecurity to parents. Although this is a correlational study, it is unlikely that negative attributions about future romantic partners are causing adolescents' insecure attachment with parents. This study provides a considerable

contribution to the literature because it is the first to demonstrate that representations of parents are affecting early SIP biases about romantic relationships.

Negative Attributions and Adolescents' Attachment Avoidance and Anxiety

Although insecurity to specific parents plays a role in shaping adolescents' attributions about future romantic partners, it is also important to note the specific roles of adolescents' avoidance and anxiety. Attachment avoidance and anxiety predict social functioning because these two dimensions guide adolescents' strategies for navigating close relationships.

Adolescents with high attachment avoidance display a dismissing strategy. They dismiss the importance of close relationships, distance themselves from others, and attempt to rely only on themselves. This strategy is motivated by a desire to prevent the pain of rejection. In contrast, adolescents with high attachment anxiety display a hyperactivating strategy. They expend much energy trying to stay close to relationship partners, are vigilant to any cues indicating relationship threats, and express heightened distress in response to these threat cues. This strategy is motivated by a desire for closeness, care, and reassurance of the partner's love and commitment (Mikulincer & Shaver, 2007). These strategies and motivations may help to explain why there was only an effect of avoidance (and not anxiety) on negative attributions about hypothetical future romantic partners' behaviors.

When avoidant individuals are motivated to protect themselves by dismissing the importance of relationships, it is natural for them to make negative attributions. If relationships are insignificant, then giving a partner the benefit of the doubt serves no purpose. Further, any wishful thinking could be detrimental to their goal of protecting themselves from rejection. In addition, avoidant adolescents are motivated to view partners negatively because this protects them from the feelings of closeness and intimacy that they fear. Thus, it is likely an avoidant

individual would attribute a partner's behavior to internal characteristics (e.g., my partner is a mean person) instead of external benign causes (e.g., my partner's phone died).

It is initially counterintuitive to think that attachment anxiety would not predict negative attributions in the present sample. To my knowledge, the pattern that only avoidance (and not anxiety) predicts negative attributions only parallels one study in adult couples (Gallo & Smith, 2011). The majority of research in adults demonstrates that this link exists either solely in anxious individuals (e.g., Collins et al., 2006), or in both anxious and avoidant individuals (e.g., Hazelwood et al., 2012). However, there is an important distinction between previous research around anxious individuals' relationship dynamics and the present study; the current sample was comprised of individuals *imagining a future partner*.

Asking participants to imagine a future partner as opposed to a current partner allowed me to achieve one of my most important study aims: examining whether attachment led to a true *bias*. When participants in previous studies made attributions about a current partner, biases were confounded in real experiences with that partner. Those experiences tend to be negative when one has high avoidance or anxiety (Feeney, 2016). For example, imagine an individual's partner frequently acts insensitively when the individual is upset. If researchers were to ask the participant why their partner did not comfort them when they were upset, the participant may logically deduce that it is because their partner does not care about their emotions. This cognition is not necessarily an attribution bias, it could be a logical interpretation based on knowledge of the partner's intentions. In contrast, if an adolescent imagining someone they have never met thinks that this person did not respond because they do not care about the participants' emotions, this would be an attribution bias.

Perhaps attribution biases do not begin for anxious individuals until other harmful relationship processes unfold. For example, perhaps other SIP processes precede negative attributions. It is possible that anxious individuals' high vigilance to threat (Mikulincer & Shaver, 2007) causes them to first selectively attend to and remember the negative things their partners do, then use this information to form negative attribution biases. If real experiences with partners are necessary for anxious individuals to form attribution biases, it would explain why anxious adolescents in the present sample did not display biases about partners they have never met.

Anxious individuals are intensely motivated to be close to and cared for by their partners. It is possible that anxious individuals' intense desire for closeness allows some room for wishful thinking before negative dynamics within a real relationship begin to unfold. In contrast, avoidant individuals' extreme attempts to block any opportunity for rejection leaves little room for optimism. This is perhaps why specifically avoidant strategies, and not anxious strategies, are enough to generate negative attribution biases about partners that adolescents have yet to meet. These findings warrant further investigation about the differential effects of attachment anxiety and avoidance on attributional processes.

Considering the Dimensional and the Relationship-Specific Approaches

Attachment can be conceptualized in many ways. Attachment in childhood is often conceptualized as reflecting the quality of specific relationships (Ainsworth et al., 1978). Attachment in adulthood is often conceptualized as the extent to which the two attachment dimensions (attachment avoidance and attachment anxiety) characterize thoughts and feelings in close relationships (Hazan & Shaver, 1987). Thus, adolescence is a transitional period, and it is important to take both a dimensional and a relationship specific approach. In the following

section, I discuss the knowledge the present study contributes about each, the extent of my confidence in the findings, ways to strengthen confidence in these findings, and the value in examining both the dimensional and the relationship-specific approaches.

The dimensional approach. The dimensional approach to the present study demonstrated that avoidance, but not anxiety, is associated with young adolescents' negative attributions about future romantic partners. This pattern is different from that in the adult literature, wherein both are associated with negative attributions. This contrasting finding reveals that the influence of attachment on attribution processes differs between adults imagining current partners and adolescents imagining future partners.

I am confident in the finding that attachment avoidance and negative attributions are related. However, I am not confident in the lack of an association between attachment anxiety and negative attributions. My confidence in the avoidance finding is strengthened by research in adults supporting the link between avoidance and negative attributions (e.g., Gallo & Smith, 2011). Further, attachment theory states that avoidance is associated with dismissing the importance of relationships in order to prevent feelings of rejection. It is natural for adolescents employing this strategy to view others negatively and make negative attributions about others' actions. In regard to the data in the present study, avoidance was normally distributed (see Appendix M for distributions of all study variables). Avoidance meeting this assumption increases my confidence in the reliability of the estimates.

The null findings about attachment anxiety could reflect attachment processes functioning differently in adults making attributions about their partner and adolescents making attributions about a future partner. However, the counterintuitive nature of this null result leads me to question the findings. The lack of an association between attachment anxiety and negative

attributions conflicts with previous research (e.g., Collins et al., 2006). Further, attachment theory states that anxiety is associated with heightened vigilance to threat cues (Mikulincer & Shaver, 2007). It is intuitive that this vigilance would lead anxious individuals to attend to the threatening information in ambiguous situations, and therefore make negative attributions in these situations. The claim that anxiety doesn't relate to negative attributions in young adolescents imagining a future partner must be considered in the context of one factor: adolescents in the current sample did not display much attachment anxiety. The skewed distribution of attachment anxiety (see Appendix M) could reflect young adolescents' lack of fear that their parents will reject or abandon them, or it could reflect a measurement problem. Without much variation in adolescents' anxiety, it is difficult to statistically demonstrate a relation between anxiety and attributions.

I would have more confidence in this null finding if it was replicated with a revised version of the anxiety subscale of the ECR-RS. The ECR-RS was validated in adolescent samples (Donbaek & Elklit, 2014), yet was originally tested in adults (Fraley et al., 2011). It is possible that this measure is not sensitive to differences on the lower end of the anxiety subscale. Before concluding that anxiety has no effect, researchers could revise the anxiety items to capture more variation within low levels of attachment anxiety. For example, the item "I'm afraid [my mother] will abandon me" could be softened to "I'm afraid my mother won't answer me when I call her." Refining measures of attachment anxiety towards parents in young adolescents will help researchers tease apart the differential effects of anxiety and avoidance in predicting SIP biases.

Regardless of the limitations of the present study, there is value in examining links between attachment and attributions on a dimensional level. Attachment anxiety and avoidance

are associated with different thoughts, feelings, and behaviors in romantic relationships. For example, avoidant individuals tend to dismiss threat cues, whereas anxious individuals tend to amplify threat cues. It is possible that the different cognitive and behavioral patterns between these individuals yield differences in how they make attributions. Researchers can miss this qualitative distinction when differentiating individuals by their quantitative levels of insecurity only. Thus, researchers risk incorrectly interpreting differences in attributional processes in anxious and avoidant individuals as noise or measurement error in the data. Further, specificity in understanding who is at risk for developing a negative attribution bias can help clinicians prevent and treat relationship problems.

The relationship-specific approach. The relationship-specific approach to the present study demonstrated that both attachment to mothers and fathers relate to adolescents' negative attributions. In addition, insecure attachment to fathers was marginally associated with negative attributions when controlling for insecure attachment to mothers. These findings suggest that fathers could be particularly influential (relative to mothers) in predicting their children's cognitions about future relationships.

I have confidence in the findings that insecurity to both mothers and fathers relate to negative attributions. My confidence partially stems from similarities between present findings and previous literature demonstrating that attachment to parents relates to adolescents' attributions about peers (e.g., Dwyer et al., 2010; Simons et al., 2001). Further, these findings fit well with a core principle of attachment theory that states experiences with caregivers influence thoughts and feelings in future relationships (Bowlby, 1969/82). Finally, the study was well powered to detect these effects.

One aspect that hinders my confidence in these findings is the positive skew of the insecurity variables in the present sample (see Appendix M). The insecurity variables were comprised of average scores across anxiety and avoidance, and anxiety was highly skewed. However, there was still enough variation in insecurity with mothers and fathers to detect effects. Further, although the ECR-RS was validated in adolescents (Donbaek & Elklit, 2014), there are other measures of relationship-specific attachment (e.g., the Kerns Security Scale; Kerns et al., 1996) that are more widely used in adolescents than the ECR-RS (e.g., Van Ryzin & Leve, 2011). I would have more confidence in these findings if they were replicated using a different measure of relationship-specific attachment security. Other measures may be more sensitive to differences in adolescents' security with specific parents than the ECR-RS, due to the limitations of using the anxiety subscale with adolescents.

I have some confidence in the finding that attachment to fathers relates to negative attributions above and beyond its shared variance with attachment to mothers. Some studies demonstrate that insecurity to fathers is a stronger predictor than insecurity to mothers in predicting poor peer relations (e.g., Lieberman et al., 1999). In addition, one study demonstrated that insecure attachment to fathers (but not to mothers) predicted negative attributions about peers (Dwyer et al., 2010). Further, the present study was well powered to detect this effect.

On the other hand, several factors hinder my confidence in the finding that attachment to fathers was marginally associated with attributions when controlling for attachment to mothers, yet attachment to mothers was not a significant predictor when controlling for attachment to fathers. There are previous findings that demonstrate a unique effect of attachment to mothers above and beyond that of attachment to fathers on other socioemotional outcomes in adolescence, such as internalizing (Duchense & Ratelle, 2014; Woodhouse et al., 2010) and

externalizing (Woodhouse et al., 2009). Further, the effect was only marginally significant. In addition, the present sample was 62% male, and it is possible that the effects of attachment to mothers and fathers may be different in a predominantly female sample (although gender did not moderate links between attachment to mothers and fathers and attributions in the present sample). I would have more confidence in this finding if the present sample had an equal gender split, and if future studies replicate the finding using a different relationship-specific attachment measure.

Regardless of the limitations of the present study, there is value in examining links between attachment and attributions on a relationship-specific level. Examining attachment on this level allows researchers to discover the differential effects security with mothers and fathers have on adolescents' SIP biases. In addition, if adolescents haven't yet developed a generalized anxious or avoidant style across relationships, utilizing relationship-specific measures would be the most accurate way to capture the true relations between attachment and attributions. Further, there is a strong need for more research on the role of relationships with fathers in predicting socioemotional outcomes (Cabrera et al., 2018). Examining attachment on the relationship specific level allows for this type of research. Finally, information on the differential effects of attachment to mothers and fathers in predicting socioemotional outcomes will help clinicians treat adolescents who are at risk for problems in future relationships.

Two additional levels. It is also important to acknowledge the levels of total insecurity across both parents combined (*average* of anxiety with mothers, anxiety with fathers, avoidance with mothers, and avoidance with fathers), and specific dimensions for specific parents (anxiety with mothers, anxiety with fathers, avoidance with mothers, avoidance with fathers). The level of total insecurity provides broad evidence that an adolescent's overall level of insecurity is related

to negative attributions. A strength in examining this level is that this measure was an aggregate of all attachment items, making it a more reliable attachment index than others with fewer items in the present study. A limitation in examining this level is the lack of specificity. From this analysis, there is no way to infer whether security matters regardless of which parent it comes from, or whether security with mothers or fathers specifically drives this effect. In contrast, the biggest strength of examining each dimension for each parent is specificity. Examining attachment on this level demonstrated that only attachment avoidance with fathers marginally predicted negative attributions when controlling for all other attachment indices. However, the aforementioned limitations of the measure of adolescent anxiety still stand, and these limit the interpretability of the differential effects of anxiety with mothers and anxiety with fathers.

Conclusions of considering the dimensional and relationship-specific approaches.

Utilizing both the dimensional and the relationship specific approaches is useful, such that each approach contributes to the field's knowledge of attachment theory and SIP in unique ways. The dimensional approach answers the question of how an adolescent's attachment style across relationships influences SIP, whereas the relationship-specific approach answers the question of how attachment to mothers and fathers influence adolescents' SIP. Researchers could examine these two levels even further by conducting a confirmatory factor analysis (CFA). A CFA would allow researchers to conclude whether the data best fit a relationship-specific factor model, or a two attachment dimensions factor model. Further, researchers could conduct longitudinal studies to test the factor structure of adolescent attachment over time. Researchers could use this type of work to enhance the field's understanding of how to represent attachment at different time points in adolescence most accurately. Thus, this work could help strengthen confidence in future and past research about adolescent attachment as it relates to a wide array of outcomes.

The Outcomes of Negative Attributions

Negative attributions and negative behaviors. Negative attributions are important to examine because they put individuals at risk for negative relationship dynamics (e.g., Collins et al., 2006; Miller & Bradbury, 1995; Schaefer-Porter & Hendrick, 2000). However, the studies examining the relations between adults' attributions and behaviors examined relationship dynamics in the context of participants' own current relationships. Therefore, it is possible that the negative relationship dynamics were causing the negative attributions. The present study, comprised of adolescents imagining a future relationship, also indicates that negative attributions relate to negative relationship dynamics. More specifically, adolescents with more negative attributions forecast that they would behave in negative ways in response to the ambiguous situations with imagined future partners.

Although this correlational study does not allow for definitive causal claims, it is unlikely that adolescents' forecasted behaviors (e.g., snap or yell, ignore this person) in response to these ambiguous situations caused the attribution. Additional evidence against reverse causality is that participants rated attributions about the event *prior* to rating how they would respond. The reason they believe their future partners engaged in the given behaviors was salient in their minds when answering questions about how they would respond. In addition, negative attributions in the present study could not have been caused by negative relationship dynamics themselves because the adolescent was imagining a hypothetical partner, and thus did not have any negative experiences with that person from which to draw upon. In fact, they had nothing to draw upon besides their representations of what close relationships are like. These findings are consistent with attribution researchers' claims that negative attributions have consequences for relationship functioning (Fincham & Bradbury, 1992).

The mediating role of attributions in explaining the continuity of attachment

insecurity. Some longitudinal research indicates that early attachment insecurity to parents can predict later insecurity to romantic partners (e.g., Furman & Collibee, 2018). The present study provides preliminary evidence suggesting that adolescents' SIP in early romantic relationships could be a mechanism through which this occurs, as negative attributions were a mechanism through which attachment with parents related to negative reported responses to their imagined partners. This study fits into a broader developmental cascade model wherein early insecurity to parents predicts SIP biases in early romantic relationships. SIP biases can then lead to negative behaviors in early relationships, and these behaviors can elicit negative responses and rejection from partners. Negative experiences in early relationships can then reinforce biases and contribute to poor functioning in future relationships. If nothing stops the cascade, it can lead to a lifetime of poor relationship outcomes and insecure attachment with romantic partners as adults (see Figure 9).

Limitations and Future Directions:

Although the present study has many strengths (including its diverse sample, large sample size, and novel research questions) it is important to discuss limitations that can be addressed in future studies. The present study was correlational, so readers cannot infer with confidence that it is the insecure attachment that *caused* the negative attributions. Future studies could utilize experimental security priming methods to assess the causal effects of security on attributions and other SIP processes. Given that this work was correlational, it is difficult to rule out alternative explanations as to why attachment related to negative attribution biases. It is possible that adolescents' general negative biases or trait aggression could influence both their attachment security and their attribution processes. Future studies could include more

dispositional covariates, such as depressive symptoms and aggression, to rule out alternative explanations.

The present study was unable to detect an effect of negative attributions on negative implicit responses to future partners' behaviors, measured using a novel go/no-go association task (the Conflict Responses Go/No-Go Association Task; CR-GNAT). This task was included for two reasons. First, the task was included to prevent a misrepresentative null result from adolescents underreporting negative behaviors in the explicit measure. This was a concern because of the social desirability bias. Second, the task was included to strengthen the claim that attributions would lead to negative behaviors in a real relationship, as high correlations between explicit and implicit measures indicate that the measures predict behaviors (Cameron, et al., 2012).

It is possible that the limitations of the CR-GNAT caused this null result, as participants who had more negative attributions explicitly endorsed that they would engage in more negative behaviors. In addition, the measure assessing explicit negative responses demonstrated construct validity and strong psychometric properties in previous research (Collins et al., 2006) and this implicit measure is new.

It is possible that this task is not sensitive to the implicit tendencies it was created to assess. The original GNAT was developed to assess strength of associations between a target (e.g., bug) and an attribute (e.g., good) (Nosek & Banaji, 2001). It is possible that this task is only effective at measuring implicit *attitudes* about a target, and not implicit *response tendencies*. Further, participants completed the study in large groups in classrooms, and there tended to be some disruption during this part of the procedure. Perhaps the CR-GNAT would be a more sensitive measure in a controlled and quiet lab setting. Further, the task was cognitively

demanding. Although only 3.3% of participants displayed below chance performance, it is still possible that the task was too difficult to capture the tendencies it was trying to measure. This measure needs to be further validated and refined, perhaps in samples comprised of older participants.

An alternative explanation for this null result is that the task was sensitive to implicit response tendencies, but young adolescents may not have implicit response tendencies when thinking about future romantic partners. It is possible that *experiences* with romantic partners are necessary to form implicit tendencies because predictions of the future may involve higher levels of cognition when the adolescent has nothing to draw on. In the future, researchers could validate and refine this task by examining whether it works differently as a function of a participant's previous relationship experience.

Two additional measures premiered in the present study, the modified version of the Relationship Attributions Measure (RAM; Original measure by Fincham & Bradbury, 1992) and the modified version of Collins and colleagues (2006) vignette-based measure about possible explanations for romantic partners' behaviors. The established measures demonstrated strong psychometric properties in past research but were modified to be appropriate for a sample of young adolescents. Although both modified versions of the measures demonstrated strong psychometric properties in the current sample, it is still important to further examine the reliability and validity of these measures in adolescents.

Another limitation of the present study is that attribution ratings were averaged across three vignettes. These scenarios could be meaningfully different from each other, and ratings for each could vary in the extent to which they describe the underlying construct of negative attributional tendencies. Future studies using vignette-based measures to assess negative

attributions should model attributions as latent and use scenario scores as indicators, instead of giving each scenario the same weight.

Although a classroom setting allows for more efficient data collection than a lab setting, it is important to note that classrooms allow for more disruption and distraction than the lab. This distraction contributes to measurement error. Modeling attributions as latent could help parse out measurement error from the underlying construct to better understand relations between negative attributions and other study variables.

In regard to the attachment measures, participants reported very low levels of attachment anxiety with both mothers and fathers. Although the ECR-RS was validated in adolescent samples (Donbaek & Elklit, 2014), the items might not be sensitive enough to capture the subtle differences between participants who are low on attachment anxiety, as is common in adolescent samples (e.g., Donbaek & Elklit, 2014; Hünefeldt et al., 2013). Future research needs to revisit established measures to examine how to best capture attachment during young adolescence. Re-evaluating how we measure attachment in this developmental stage is crucial, because young adolescents are transitioning between holding only specific representations of specific parents and developing a generalized attachment style (Allen & Tan, 2016).

It is crucial that future work examine attributions and other SIP processes (e.g., attention, memory, expectations) as mechanisms through which insecurity can persist throughout the lifespan. Longitudinal work is needed to test models wherein SIP processes mediate links between early attachment quality with caregivers and later attachment and relationship dynamics with romantic partners. Through further examination of SIP mechanisms, we can inform interventions to interrupt harmful developmental cascades.

Conclusion

The present study demonstrates that adolescents with insecure attachment representations of their parents make negative attributions about hypothetical future romantic partners' behaviors. Further, adolescents who make negative attributions are more likely to respond to future partners in negative ways. A crucial aspect of these findings is that these adolescents have never met the people they are making attributions about, yet the adolescents believe it is likely those people have mal intent. This phenomenon demonstrates the great power of mental representations to color interactions and shape future social functioning. This study paves the way for future research examining how adolescents' attachment to parents shapes their functioning in future romantic relationships. Research such as this can help us find answers to attachment theory's overarching question of how attachment influences our lives from the cradle to the grave.

Appendix A: Vignettes and Possible Explanations for Partners' Behaviors (Adapted from Collins et al., 2006)

Relationship Stories

Story #1

Imagine that you are in a romantic/dating relationship with someone **in the future**. Now, picture the following situation.

This person left you standing alone at a party where you didn't know anyone.

Below, there are several reasons for why this might have happened.
How likely do you think each reason is for why this person did this?

	Very Unlikely		Neutral				Very Likely
	1	2	3	4	5	6	7
1. *This person went to get some food							
2. This person is bored of talking to me							
3. *This person had to go to the bathroom							

4. This person is selfish and not thinking about my needs.	1	2	3	4	5	6	7
5. *This person got asked to help in the kitchen.	1	2	3	4	5	6	7
6. This person went to talk to someone they thought was more attractive.	1	2	3	4	5	6	7

**Indicates reverse-scored item*

Story #2

Imagine that you are in a romantic/dating relationship with someone **in the future**. Now, picture the following situation.

You texted this person that you were feeling upset and this person didn't answer you all day.

Below, there are several reasons for why this might have happened.
How likely do you think each reason is for why this person did this?

	Very Unlikely		Neutral		Very Likely		
	1	2	3	4	5	6	7
1. *This person is trying to think of how to respond							
2. This person doesn't care enough about me or my feelings							
3. *This person's phone ran out of battery							
4. This person doesn't want to deal with my emotions.							

5. *This person did not have their phone on them	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

6. This person is mad at me	1	2	3	4	5	6	7
-----------------------------	---	---	---	---	---	---	---

**Indicates reverse-scored item*

Story #3

Imagine that you are in a romantic/dating relationship with someone **in the future**. Now, picture the following situation.

You asked this person to hang out on a Saturday night and this person said they wanted to spend the evening by themselves.

Below, there are several reasons for why this might have happened.
How likely do you think each reason is for why this person did this?

	Very Unlikely		Neutral				Very Likely
	1	2	3	4	5	6	7
1. *This person is tired and just needs some time to relax at home							
2. This person is secretly hanging out with friends							
3. *This person likes being on his/her own sometimes							
4. This person is losing interest in me							

5. *This person has important things to do such as homework or studying	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

6. This person is cheating on me	1	2	3	4	5	6	7
----------------------------------	---	---	---	---	---	---	---

**Indicates reverse-scored item*

Appendix B: Modified Relationship Attributions Measure (Adapted from Fincham & Bradbury, 1992)

How much do you agree or disagree with each statement about the situation you read about?

	Strongly Disagree			Strongly Agree		
	1	2	3	4	5	6
1. This person 's behavior was due to something about them (e.g., their personality)						
2. The reason this person behaved this way is not likely to change						
3. The reason this person behaved this way affects other areas of our relationship						
4. This person behaved this way on purpose						

- | | | | | | | |
|--|---|---|---|---|---|---|
| 5. This person behaved this way
because they were selfish | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. This person deserved to be
blamed for their behavior. | 1 | 2 | 3 | 4 | 5 | 6 |

Appendix C: Explicit Responses to Partners' Behaviors (Adapted from Collins et al., 2006)

Next are several ways to respond to the situation you read about. How likely is it that you would respond in each of these ways?

	Very Unlikely		Neutral		Very Likely		
<hr/>							
<i>Hostile / Punishing Subscale</i>							
1. Snap or yell at this person	1	2	3	4	5	6	7
2. Criticize or complain to this person	1	2	3	4	5	6	7
3. Give this person the “silent treatment”	1	2	3	4	5	6	7
4. Do something you know will annoy or irritate this person	1	2	3	4	5	6	7
5. Ignore this person	1	2	3	4	5	6	7

(Following the final explicit response scale for the final vignette)

Please circle who you were picturing:

A boy A girl Other

Appendix D: Conflict Responses Go/No-Go Association Task (CR-GNAT, Fitter & Cassidy, in preparation) Word List.
Implicit Responses to Conflict

Positive words:

Trust
Forgive
Accept
Listen
Respect
Sympathize
Care
Support
Empathize
Connect
Cuddle
Embrace
Reassure
Smile

Negative words:

Yell
Scream
Fight
Ignore
Punish
Attack
Criticize
Reject
Shout
Scold
Insult
Blame
Distrust
Avoid
Belittle

Target words:

My partner

Appendix E: Relationship Structures Questionnaire (ECR-RS; Fraley, Heffernan, Vicary, & Brumbaugh, 2011)

My Parents, Friends, and Future Dating/Romantic Partner

This questionnaire asks how you think about important people in your life. How much do you agree or disagree with the following statements about your **mother or a mother-like figure**?

	Strongly Disagree		Neutral				Strongly Agree
1. It helps to turn to her in times of need.	1	2	3	4	5	6	7
2. I usually discuss my problems and concerns with her.	1	2	3	4	5	6	7
3. I talk things over with her	1	2	3	4	5	6	7
4. I find it easy to depend on her.	1	2	3	4	5	6	7

5. I don't feel comfortable opening up to her.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

6. I prefer not to show her how I feel deep down.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

7. I often worry that she doesn't really care for me.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

8. I'm afraid that she may abandon me.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

9. I worry that she won't care about me as much as I care about her.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

How much do you agree or disagree with the following statements about your **father or a father-like figure**?

	Strongly Disagree		Neutral				Strongly Agree
	<hr/>						
1. It helps to turn to him in times of need.	1	2	3	4	5	6	7
2. I usually discuss my problems and concerns with him.	1	2	3	4	5	6	7
3. I talk things over with him.	1	2	3	4	5	6	7
4. I find it easy to depend on him.	1	2	3	4	5	6	7
5. I don't feel comfortable opening up to him.	1	2	3	4	5	6	7

6. I prefer not to show him how I feel deep down.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

7. I often worry that he doesn't really care for me.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

8. I'm afraid that he may abandon me.	1	2	3	4	5	6	7
---------------------------------------	---	---	---	---	---	---	---

9. I worry that he won't care about me as much as I care about him.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

Please imagine you are in a **romantic / dating relationship with someone in the future**. How much do you agree or disagree with the following statements about the person you are imagining? (*Adapted from “Please answer the following questions about your dating or marital partner”*)

	Strongly Disagree		Neutral			Strongly Agree	
	1	2	3	4	5	6	7
1. It helps to turn to this person in times of need.	1	2	3	4	5	6	7
2. I usually discuss my problems and concerns with this person.	1	2	3	4	5	6	7
3. I talk things over with this person.	1	2	3	4	5	6	7
4. I find it easy to depend on this person.	1	2	3	4	5	6	7

5. I don't feel comfortable opening up to this person.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

6. I prefer not to show this person how I feel deep down.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

7. I often worry that this person doesn't really care for me.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

8. I'm afraid that this person may abandon me.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

9. I worry that this person won't care about me as much as I care about him or her.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

How much do you agree or disagree with the following statements about your best friend?

	Strongly Disagree		Neutral				Strongly Agree
	1	2	3	4	5	6	7
1. It helps to turn to this person in times of need.	1	2	3	4	5	6	7
2. I usually discuss my problems and concerns with this person.	1	2	3	4	5	6	7
3. I talk things over with this person.	1	2	3	4	5	6	7
4. I find it easy to depend on this person.	1	2	3	4	5	6	7
5. I don't feel comfortable opening up to this person.	1	2	3	4	5	6	7

6. I prefer not to show this person how I feel deep down.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

7. I often worry that this person doesn't really care for me.	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

8. I'm afraid that this person may abandon me.	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

9. I worry that this person won't care about me as much as I care about him or her.	1	2	3	4	5	6	7
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Appendix F: Early Adolescent Romantic Relationship Experiences Questionnaire (EA-RREQ; Fitter & Cassidy, in preparation).

My Relationships

Please answer the following questions.

1. Have you ever been in a romantic relationship? Please circle Yes or No

Yes No

2. Are you in a romantic relationship right now? Please circle Yes or No

Yes No

3. How many romantic relationships have you been in?

4. How happy were you in your most serious relationship. Please circle your answer

Not at All Happy A Little Bit Happy Happy Half the Time Mostly Happy Extremely Happy.

If you have been in a relationship, how much do you agree with these statements about your **most serious relationship**? If you have not been in a relationship, you can move to the next question.

Strongly
Disagree

Neutral

Strongly
Agree

1. I am/was in a relationship with this person because I like/liked spending time with them

1 2 3 4 5 6 7

2. I am/was in a relationship with this person because my friends told me I should date them.

1 2 3 4 5 6 7

3. I am/was in a relationship with this person because I think/thought they are/were attractive

1 2 3 4 5 6 7

4. I am/was in a relationship with this person because I thought/think it would make/made me look good in front of my friends and classmates.

1 2 3 4 5 6 7

Appendix G: Original Vignettes and Possible Explanations for Partners' Behaviors

Appendix A includes the version revised for the current study.

Here is the original versions of the vignettes and possible explanations before I adapted the items to ensure developmental appropriateness for young adolescents. Five vignettes were used in the study (Collins et al., 2006) however I was only able to gain access to four.

The **bolded items and instructions** are used in the present study. The non-bolded items and instructions are not used in the present study.

Vignettes and Possible Explanations for Partner Behavior (Collins et al., 2006)

Next are several explanations that people may give for this event. Please read each one and rate how likely it is to explain why your partner didn't respond when you tried to cuddle. Please use the scale to select a number between 1 and 7 for each item.

	Very Unlikely			Neutral			Very Likely	
	1	2	3	4	5	6	7	
1. My partner doesn't want to be close to me.								
2. My partner just didn't realize I was trying to cuddle								

3. My partner may be feeling less attracted to me	1	2	3	4	5	6	7
4. My partner is just preoccupied with other things.	1	2	3	4	5	6	7
5. My partner is angry with me and is trying to get back at me	1	2	3	4	5	6	7
6. My partner just isn't in a cuddling mood	1	2	3	4	5	6	7

Next are several explanations that people may give for this event. Please read each one and rate how likely it is to explain why your partner didn't comfort you when you were feeling down. Please use the scale to select a number between 1 and 7 for each item.

	Very Unlikely		Neutral			Very Likely	
1. My partner just wasn't sure how to help	1	2	3	4	5	6	7

2. My partner is too caught up in his/her own life to be concerned about mine	1	2	3	4	5	6	7
3. My partner didn't realize I was feeling so down	1	2	3	4	5	6	7
4. My partner doesn't care enough about me or my feelings	1	2	3	4	5	6	7
5. My partner just thought I needed a little space or some time alone.	1	2	3	4	5	6	7
6. My partner is not a very sympathetic person	1	2	3	4	5	6	7

Next are several explanations that people may give for this event. Please read each one and rate how likely it is to explain why your partner wanted to spend the evening by himself/herself. Please use the scale to select a number between 1 and 7 for each item.

Very
Unlikely

Neutral

Very
Likely

1. My partner is tired and just needs some time to relax at home	1	2	3	4	5	6	7
2. My partner may be losing interest in me	1	2	3	4	5	6	7
3. My partner just needs time to hang out with his/her friends	1	2	3	4	5	6	7
4. My partner may be seeing someone else or doing something behind my back	1	2	3	4	5	6	7
5. My partner has important things to do such as homework or studying	1	2	3	4	5	6	7
6. My partner would rather be with his/her friends than me	1	2	3	4	5	6	7

Next are several explanations that people may give for this event. Please read each one and rate how likely it is to explain why **your partner left you standing alone at a party where you didn't know anyone**. Please use the scale to select a number between 1 and 7 for each item.

	Very Unlikely		Neutral		Very Likely		
	1	2	3	4	5	6	7
1. My partner just needed to get a drink or some munchies							
2. My partner may be tired or bored with me							
3. My partner may be attracted to someone else at the party							
4. My partner is selfish and not thinking about my needs.							

5. My partner knows I don't mind being on my own at parties	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

6. My partner just wants to mingle and talk to some friends	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

Appendix H: Original Relationship Attributions Measure

Appendix B includes the version revised for the current study.

Here is the original versions of the Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992) before I adapted the items to ensure developmental appropriateness for young adolescents.

The **bolded items and instructions** are used in the present study. The non-bolded items and instructions are not used in the present study.

Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992)

This questionnaire describes several things that your spouse might do. Imagine your spouse performing each behavior and then read the statements that follow it. Please circle the number that indicates how much you agree or disagree with each statement, using the rating scale below.

Four RAM Vignettes:

1. Your husband criticizes something you say.
2. Your husband begins to spend less time with you.
3. Your husband is cool and distant.
4. Your husband does not pay attention to what you are saying.

	Strongly Disagree						Strongly Agree
1. My husband's behavior was due to something about him (e.g., the type of person he is, the mood he was in)	1	2	3	4	5	6	

2. The reason my husband criticized me is not likely to change	1	2	3	4	5	6
3. The reason my husband criticized me affects other areas of our marriage	1	2	3	4	5	6
4. My husband criticized me on purpose rather than unintentionally.	1	2	3	4	5	6
5. My husband's behavior was motivated by selfish rather than unselfish concerns.	1	2	3	4	5	6
6. My husband deserved to be blamed for criticizing me.	1	2	3	4	5	6

Appendix I: Original Explicit Responses to Partners' Behaviors.

Appendix C includes the version revised for the current study.

Here is the original versions of the Explicit Responses to Partner Behavior measure (Collins et al., 2006) before I adapted the items to ensure developmental appropriateness for young adolescents.

The **bolded items and instructions** are used in the present study. The non-bolded items and instructions are not used in the present study.

Explicit Responses to Partner Behavior (Collins et al., 2006).

Next are possible responses that people might have to the situation described above. Please use the scale provided to rate how you would behave if [insert vignette they are answering about] How likely would you be to...

	Very Unlikely		Neutral				Very Likely
	<hr/>						
1. Snap or yell at your partner	1	2	3	4	5	6	7
2. Criticize or complain to your partner	1	2	3	4	5	6	7
3. Give your partner the “silent treatment”	1	2	3	4	5	6	7
4. Do something you know will annoy or irritate your partner	1	2	3	4	5	6	7

5. Ignore your partner or give him/her the “cold shoulder”	1	2	3	4	5	6	7
6. Discuss the issue with your partner to explain how you feel	1	2	3	4	5	6	7
7. Go out of your way to be nice to your partner	1	2	3	4	5	6	7
8. Do nothing in order to avoid an argument	1	2	3	4	5	6	7
9. Do nothing because the event would not even bother you	1	2	3	4	5	6	7
10. Try to lighten up the situation by teasing your partner or making a joke.	1	2	3	4	5	6	7
11. Act especially affectionate towards your partner	1	2	3	4	5	6	7

12. Seek reassurance that your partner still loves and cares about you

1 2 3 4 5 6 7

Appendix J: Open Science Foundation Pre-Registration 1

OSF project page: <https://osf.io/awpnr/>

Title

Adolescent Attributions About and Responses to Imagined Future Romantic Partners' Behaviors: Links to Adolescent Attachment to Parents

Authors

Megan H. Fitter, Jude Cassidy.

Description

The claim that early experiences with primary caregivers influence other close relationships throughout the lifespan is integral to the foundation of attachment theory (Bowlby, 1969/1982). The quality of these early caregiving experiences influences a child's mental representations of how others will treat them, as well as how worthy they are of love and care. These representations guide social information processing (SIP), i.e., the way that individuals remember, perceive, hold expectations, and make attributions about their social world.

Research has demonstrated that attachment security with parents influences children's SIP biases in peer relationships (Lansford, Malone, Dodge, & Bates, 2011). Surprisingly little research has examined the role of attachment to parents in predicting young adolescents' SIP biases about romantic relationships.

Longitudinal work has revealed that adolescents' attachment insecurity with parents predicts insecurity in adult romantic relationships (Furman & Collibee, 2018), however, more research is needed to identify mechanisms through which this occurs. In order to begin examining SIP biases as mechanisms, research must first explore SIP biases in early adolescence before romantic relationship trajectories have begun. In the present study, we plan to examine how attachment to parents predicts one key component of SIP: *adolescents' attributions about hypothetical future romantic partners' behaviors*.

Hypotheses

Hypothesis 1: Adolescents' attachment avoidance and anxiety with both mothers and fathers will be associated with negative attribution biases

1a. Adolescent attachment avoidance with mothers will be associated with negative attribution biases

1b. Adolescent attachment anxiety with mothers will be associated with negative attribution biases

1c. Adolescent attachment avoidance with fathers will be associated with negative attribution biases

1d. Adolescent attachment anxiety with fathers will be associated with negative attribution biases

Hypothesis 2: Preferred partner gender will moderate links between attachment avoidance and anxiety with fathers and attribution biases, such that this association will be stronger for participants imagining a male future partner

- 2a.** The association between adolescent attachment *avoidance with fathers* and negative attribution biases will be stronger for participants imagining a male future partner.
- 2b.** The association between adolescent attachment *anxiety with fathers* and negative attribution biases will be stronger for participants imagining a male future partner.

Hypothesis 3: Attribution biases will mediate links between attachment anxiety and avoidance with both mothers and fathers, and negative *explicit* responses to partner behavior.

*If an interaction from hypothesis 2 is significant, we will test moderated mediation for the corresponding mediation models.

- 3a.** Negative attribution biases will mediate a link between adolescent attachment *avoidance with mothers* and negative explicit responses to partners' behaviors.
- 3b.** Negative attribution biases will mediate a link between adolescent attachment *anxiety with mothers* and negative explicit responses to partners' behaviors.
- 3c.** Negative attribution biases will mediate a link between adolescent attachment *avoidance with fathers* and negative explicit responses to partners' behaviors.
- 3d.** Negative attribution biases will mediate a link between adolescent attachment *anxiety with fathers* and negative explicit responses to partners' behaviors.

Hypothesis 4: Attribution biases will mediate links between attachment anxiety and avoidance with both mothers and fathers, and negative *implicit* responses to partner behavior.

*If an interaction from hypothesis 2 is significant, we will test moderated mediation for the corresponding mediation models.

- 4a.** Negative attribution biases will mediate a link between adolescent attachment *avoidance with mothers* and negative implicit responses to partners' behaviors.
- 4b.** Negative attribution biases will mediate a link between adolescent attachment *anxiety with mothers* and negative implicit responses to partners' behaviors.
- 4c.** Negative attribution biases will mediate a link between adolescent attachment *avoidance with fathers* and negative implicit responses to partners' behaviors.
- 4d.** Negative attribution biases will mediate a link between adolescent attachment *anxiety with fathers* and negative implicit responses to partners' behaviors.

Study type

Observational Study

Blinding

No blinding is involved in this study.

Study design

This is a correlational design. No observed variables will be manipulated.

Existing Data

Pilot data were collected from 13 eighth graders and 4 seventh graders. These data will not be used in answering any research questions (see Other: Pilot Data Collection and Analysis for more information about the piloting procedures).

Data collection procedures

Eighth graders will be recruited from ethnically diverse private and public charter schools in Washington D.C. and Maryland. The sole inclusion criterion is that participants must be proficient at reading English.

Data will be collected in schools in Washington D.C. and Maryland. Prior to data collection, opt-out consent forms will be sent to the parents, and adolescents will complete assent forms. During data collection, adolescents will each be seated at a computer in a school computer lab or at a laptop or another device in a classroom.

Adolescents will first read a series of three short vignettes about hypothetical future romantic partners' potentially negative behaviors. Following each vignette, adolescents will answer questionnaires regarding their attributions about why this person behaved as they did, and how they would respond in that situation. Next, adolescents will complete a novel go/no-go association task wherein they will be asked to quickly categorize words that represent positive (e.g., "sympathize") and negative (e.g., "yell") responses to partners' behaviors. Finally, adolescents will complete a series of questionnaires about attachment style, romantic relationship experience, and demographics. The procedure will take about 30 minutes total.

After the questionnaires are completed, teachers of participating classrooms will be paid \$20 each. We will provide an alternative form of compensation (e.g., gifts for the classroom or food for the teachers) if there is a special request from the school. When data collection is complete, all participating classrooms will be entered into a raffle to win one of three class pizza parties.

The questionnaires and go/no-go association task will be presented to participants through the web-based experiment platform Gorilla (Gorilla.sc; Anwyl-Irvine et al., 2018). Gorilla is a platform that allows researchers to collect data online for a variety of customizable tasks. Previous studies demonstrate that Gorilla is effective in collecting accuracy and questionnaire data (e.g., Anwyl-Irvine et al., 2018; Brown et al., 2018; Lavan, Knight, & McGettigan, 2018).

Sample size

200 students

Sample size rationale

We consulted researchers Fritz and MacKinnon's (2007) simulations of the necessary sample size to achieve adequate power to detect a mediated effect. The sample size large enough to detect a small/medium effect ($\beta=.26$ for both the a and b paths) at .80 power for percentile bootstrapped mediation is 162. In order to account for missing and unusable data, we plan to collect data from 200 participants.

Stopping rule

Due to the variable number of students in classrooms, we will not have full control over our exact sample size. In addition, if we reach our target sample size when still in correspondence with interested schools, we will allow those schools to participate. Thus, our final sample size may be greater than 200. We will not run any analyses before data collection is complete.

Manipulated variables

None

Measured variables

Demographics. Age, race/ethnicity, parent education, family structure, gender.

Relationship experience. The Early Adolescent Romantic Relationship Experiences Questionnaire (EA-RREQ; Fitter & Cassidy, in preparation) assesses young adolescents' relationship satisfaction and motivations for dating. Adolescents will answer questions about whether they have been in a relationship, whether they are currently in a relationship, how happy they are / were in their most serious relationship, and what their motivations are / were for being in their most serious relationship (e.g., "I am/was in a relationship with this person because my friends told me I should date them").

Attachment style with parents. The Relationship Structures Questionnaire (ECR-RS; Fraley et al., 2011) is a 36-item self-report questionnaire assessing attachment avoidance (discomfort with closeness and depending on others; e.g., "I find it easy to depend on this person") and anxiety (fears of rejection and abandonment; e.g., "I often worry that this person doesn't really care for me") with specific targets.

Attributions about partners' behaviors. Adolescents will read three vignettes, adapted from Collins and colleagues (2006) about hypothetical future romantic partners' potentially negative behaviors (e.g., "Imagine this person left you standing alone at a party where you didn't know anyone"). Following each vignette, adolescents will answer two sets of questions regarding their attributions about why the person behaved that way.

The first set of questions about attributions is an adapted version of Collins and colleagues' (2006) explanations for potentially negative partners' behaviors. Adolescents will rate how likely each of 6 possible explanations are for the behavior in the vignettes. For each vignette, participants will rate 3 negative explanations (e.g., "This person is bored of talking to me," "This person went to talk to someone they thought was more attractive") and 3 neutral explanations (e.g., "This person went to get some food," "This person thinks I don't mind being on my own at parties") on a scale from 1 (not at all likely) to 7 (extremely likely).

The second set of questions about attributions is an adapted version of the Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992). They will complete this measure in response to Collins and colleagues' (2006) vignettes. Participants rate their agreement on a scale from 1 (strongly disagree) to 6 (strongly agree) on statements that reflect six dimensions of attributions. The causal attributions subscale encompasses attributions of locus, stability, and globality (e.g., "This person's behavior was due to something about them") and the responsibility attributions subscale encompasses attributions of intentionality, motivation, and blameworthiness (e.g., "This person behaved this way on purpose").

Explicit responses to partners' behaviors. Following rating attributions about the event depicted in the vignette, adolescents will rate how likely they are to react in various ways on a 7-pt Likert-type scale from 1 (not at all likely) to 7 (extremely likely) using a procedure adapted from Collins and colleagues (2006). Adolescents will rate items about hostile/punishing responses (e.g., "Snap or yell," "Ignore your partner," "Criticize or complain").

Implicit responses to partners' behaviors. The Conflict Responses Go/No-Go Association Task (CR-GNAT; Fitter & Cassidy, in preparation) is a novel go/no-go association task (GNAT; Nosek & Banaji, 2001). Go/no-go association tasks measure implicit associations between a target stimulus (e.g., children) and an attribute (e.g., good). Researchers assess the strength of the association between the target and the attribute by measuring the degree to which distracter items (e.g., “annoying”) can be quickly discriminated from items that belong to the target category (e.g., “my child”) and the attribute category (e.g., “joyful”).

First, adolescents will complete two short practice blocks of the CR-GNAT (procedure described below). Next, they will be asked to imagine that they are in a romantic/dating relationship with someone in the future and to imagine “you texted this person that you were feeling upset and this person didn’t answer you all day” for 25 seconds. Next, the adolescents will be asked to think about how they would respond for 25 seconds. Finally, adolescents will complete the CR-GNAT.

Three types of word stimuli will appear one at a time on a computer screen for 650ms each (stimulus time following Sturge-Apple et al., 2015). Words will belong to either one of two attribute categories (positive and negative) or the target category (the words “my behavior”). Words in the positive attribute category will be positive responses to the imagined upsetting behavior (e.g., “forgive,” “respect”), and words in the negative attribute category will be negative responses to the imagined upsetting behavior (e.g., “accuse,” “yell”). The target category will consist solely of the words “my behavior” to simplify the task for a young adolescent sample. The word lengths between the positive list ($M = 6.71$, $SD = 1.59$) and the negative list ($M = 5.86$, $SD = 1.3$) do not significantly differ. $t = 1.56$, $p = .13$.

Adolescents will participate in two positive blocks (one practice round with 14 trials and one real round with 42 trials for each) and two negative blocks with the same number of trials as the positive blocks. In the positive blocks, participants will be asked to press the space bar when they see positive words, or the words “my behavior” and to do nothing for negative words. In the negative block, participants will be asked to press the space bar when they see negative words, or the words “my behavior” and to do nothing for positive words. This task will yield two d' scores, one for the positive block and one for the negative block (see analysis plan for details). Higher d' scores on the positive block reflect positive implicit responses, and higher d' scores on negative block reflect negative implicit responses.

Indices

Negative attributions. Previous research using the RAM has demonstrated the two subscales (causal attributions and responsibility attributions) to be highly correlated. Thus, following previous research (e.g., Hazelwood, 2012; Pearce & Halford, 2008), we will reduce the subscales of the RAM into one index of negative attributions.

Given that we use multiple measures of attributions (an adapted version of Collins and colleagues' (2006) possible explanations for partner behavior, and the more traditional RAM), it is possible that some variables will be highly correlated. Following Collins and colleagues (2006) we will combine scores on the RAM with participants' possible explanations for partners' behaviors to create one final index of negative attributions.

Statistical models

Given that data will be nested in schools, we will use least square dummy variable fixed effects modeling. This method is less susceptible to biased standard errors than traditional multilevel modeling when there are fewer than 30 clusters (McNeish & Kelley, 2018). All analyses will be conducted in R version 3.5.1 or higher.

We will examine gender, socioeconomic status, race, and romantic relationship experience as potential covariates. we will conduct independent samples t-tests to determine whether there are differences in the study variables between boys and girls, minority and non-minority adolescents, and adolescents with no relationship experience and those with relationship experience. we will use a Pearson product moment correlation to determine whether any study variables are correlated with age. If any of these possible covariates are significantly associated with study variables, we will control for them in all principal analyses.

Model 1: To test our first set of hypotheses, scores for negative attributions will be regressed on attachment avoidance with mothers, attachment anxiety with mothers, attachment avoidance with fathers, attachment anxiety with fathers, dummy variables representing school, and covariates.

Model 2: To test the moderating effect of preferred partner gender on the associations between attachment to fathers and negative attributions, two product terms will be added to Model 1. One product term will represent the interaction between adolescents' preferred partner gender and adolescents' attachment avoidance with fathers, and the other will represent the interaction between adolescents' preferred partner gender and attachment anxiety with fathers.

We will conduct percentile bootstrapped mediation models to test our third and fourth sets of hypotheses. Percentile bootstrapped mediation has a good balance between type 1 and type 2 error rates compared to the bias-corrected bootstrap and Monte Carlo approaches (Hayes & Scharkow, 2013; MacKinnon, Lockwood, & Williams, 2004).

Model 3. Adolescents' *attachment avoidance with mothers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and scores for explicit negative responses to partners' behaviors will be entered as the dependent variable.

Model 4. Adolescents' *attachment anxiety with mothers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and scores for explicit negative responses to partners' behaviors will be entered as the dependent variable.

Model 5. Adolescents' *attachment avoidance with fathers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and scores for explicit negative responses to partners' behaviors will be entered as the dependent variable.

Model 6. Adolescents' *attachment anxiety with fathers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and scores for explicit negative responses to partners' behaviors will be entered as the dependent variable.

To test our fourth set of hypotheses, we will use d' from signal detection theory (SDT) to indicate performance on the GNAT. Before calculating d' , we will standardize hit rates and false alarm rates using the standard normal $N(0,1)$ function. We will calculate d' with the following

formula: $d' = Z(\text{hit rate}) - Z(\text{false alarm rate})$. To handle extreme values that cannot be standardized (0s and 1s), we will use the loglinear transformation approach (Stanislaw & Todorov, 1999). Prior to calculating the hit rate, I'll add .5 to the number of hits and false alarms, and 1 to the number of signal trials and the number of noise trials. We will treat any negative d' values as missing data, as a negative d' values indicate performance lower than chance.

To remove common method variance and control for general performance on the GNAT, we will follow previous researchers (e.g., Boldero, Rawlings, & Haslam, 2007; Sturge-Apple et al., 2015) and utilize residual scores. We will calculate a residual index of d' scores for negative trials by regressing d' scores for positive trials on d' scores for negative trials and saving the residualized scores. These scores reflect participants' performance on the negative GNAT trials, controlling for performance on the GNAT in general.

Model 7. Adolescents' *attachment avoidance with mothers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and residualized d' scores for the negative trials of the GNAT will be entered as the dependent variable.

Model 8. Adolescents' *attachment anxiety with mothers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and residualized d' scores for the negative trials of the GNAT will be entered as the dependent variable.

Model 9. Adolescents' *attachment avoidance with fathers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and residualized d' scores for the negative trials of the GNAT will be entered as the dependent variable.

Model 10. Adolescents' *attachment anxiety with fathers* will be entered as the independent variable, negative attribution scores will be entered as the mediator, and residualized d' scores for the negative trials of the GNAT will be entered as the dependent variable.

Inference Criteria:

We will be using an alpha level of .05 as our criteria to make inferences.

Data Exclusion:

We will use a DFBETA of 2 as my cutoff for outlier removal (Belsley, Kuh, Welsch, 1980). We will treat any negative d' values in the implicit responses to partners' behaviors measure as missing data, as a negative d' values indicate performance lower than chance.

Missing Data:

We will use multiple imputation to address missing data.

Exploratory Analyses.

We will conduct three exploratory analyses. First, we will compute a Bayes factor to test whether preferred partner gender moderates the links between attachment anxiety and avoidance with mothers, and adolescent attributions. Following Kass and Raftery's (1995) recommendations, we will conclude that there is adequate support that this interaction does not

exist if the Bayes factor is 3 or greater. If there is adequate support that this interaction does exist, we will add it to the models above.

Next, we will test a three-way interaction to examine whether the moderated effect of preferred partner gender on the links between attachment and attributions depends on who the adolescent's primary caregiver is.

Finally, we will test the correlation between explicit responses to partners' behaviors, and implicit responses to partners' behaviors to examine the predictive validity of these measures. The more correlated implicit and explicit measures are, the more strongly they predict behavior (Cameron, Brown-Iannuzzi, & Payne, 2012; Greenwald, Poehlman, Uhlmann, Banaji, 2009).

Other

Pilot Data Collection and Analysis. In the summer of 2019, we piloted the study with 13 8th grade students. The study was presented through E-Prime (version 2) either in the lab or in a participant's home. Participants first completed the study, then were asked to provide feedback about study length, task difficulty, and instruction clarity. The study described above reflects any changes made to the procedures in response to pilot participant feedback.

We examined Cronbach's alpha for measures of attachment style with parents, attributions about partners' behaviors, and explicit responses to partners' behaviors. All these measures displayed Cronbach's alphas above .70. To improve internal consistency, we decided to modify two items in our adapted version of Collins and colleagues' (2006) measure of attributions about partners' behaviors.

We also examined whether d' scores for the go/no-go association task measuring implicit responses to partners' behaviors were greater than 0, indicating above chance performance. All d' scores were above 0, therefore no changes to stimulus time were made.

In the fall of 2019, we piloted the full study procedures in one small classroom setting. The study was presented through the web-based experiment platform Gorilla (Gorilla.sc; Anwyl-Irvine et al., 2018). This pilot did not result in a decision to make changes to the study protocol.

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Appendix K: Open Science Foundation Pre-Registration 2

We are writing this second pre-registration to amend some aspects of the pre-registered analysis plan. The overarching motivation of these changes stems from the first author's continued learning of best practices in statistics from her graduate coursework.

Change #1: Primary Analyses

We previously planned to run ten different models for our primary analyses. We have simplified this and will now be combining these models into one measured variable path analysis. We believe this will allow for a more accurate depiction of the relations among variables in the system. All predictors, covariates, and interaction terms will be set to covary. We will also allow the errors to covary for our two outcome measures of responses to conflict (explicit responses and implicit responses).

Change #2: Covariates

We previously planned to include only empirically derived covariates in our primary analyses (just including variables that are significantly correlated with our outcome variables as covariates). We have since decided to include the following a priori covariates: age, race (minority vs non-minority), preferred partner gender, romantic relationship experience (some or none), and school. In addition, we will test the correlations between the remaining demographic variables (e.g., maternal education level) and our outcome variables, and include variables with significant correlations as covariates. We are making this change to avoid omitting a covariate with a low bivariate correlation with an outcome variable, despite having a significant direct effect on that outcome variable.

We will not include participant gender as a covariate in the primary analyses due to possible multicollinearity issues with preferred partner gender. We may include participant gender in exploratory analyses.

Change #3: Missing Data

We had previously planned to use multiple imputation for missing data. We did not specify item level or scale level. We now plan on using Full Information Maximum Likelihood (FIML) for scale level missingness. This is because FIML is well integrated with path analysis statistical packages and yields similar estimates to multiple imputation (Graham et al., 2007). For item level missingness, we will use participant mean imputation (Parent, 2013) as it yields similar estimates to multiple imputation, while allowing us to use more of our available data.

Change #4: Statistical Software

We previously planned on conducting all analyses in R. We now may also conduct some analyses in Mplus, as Mplus can be very useful for path analyses.

Change #5: Psychometric Analysis

In my pilot analyses, we explored psychometric properties of the data with Cronbach's alpha. Moving forward, we will use McDonald's omega instead. This is because McDonald's omega is less biased than Cronbach's alpha when the assumption of tau equivalence is not met.

Current project status: We have completed data collection and data cleaning. We have not conducted any hypothesis testing.

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- Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science*, 8(3), 206–213.
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Appendix L: Open Science Foundation Pre-Registration 3

Section A: Introduction

I'm writing this pre-registration to a) give an update on analyses we conducted that were not pre-registered and b) register new hypotheses and analyses.

First, I'll discuss the pre-registered analyses I conducted, examining four measures of attachment (avoidance with mothers, avoidance with fathers, anxiety with mothers, and anxiety with fathers). Next, I'll discuss previously completed analyses that were not pre-registered, examining three indices of attachment (the average of avoidance with mothers and avoidance with fathers, which I will refer to as **"avoidance with parents"**, the average of anxiety with mothers and anxiety with fathers, which I will refer to as **"anxiety with parents"**, and a general index of security with parents, calculated by averaging avoidance with parents and anxiety with parents, which I will refer to as **"security with parents"**). Next, I'll discuss a new set of analyses we would like to conduct, with a new set of hypotheses, examining two different indices of attachment (the average of avoidance with mom and anxiety with mom, which I will refer to as **"security with mom"** and the average of avoidance with dad and anxiety with dad, which I will refer to as **"security with dad"**). Finally, I will discuss future directions for possible exploratory analyses.

Section B: Pre-Registered and Completed Analyses.

As planned, we began by running the pre-registered path model, including our four attachment predictors of interest (attachment anxiety with mothers, attachment avoidance with mothers, attachment anxiety with fathers, and attachment avoidance with fathers). When we ran this model, none of our four attachment predictors reached significance. As this starkly contrasted a body of previous work on the relations between attachment and social information processing (see Dykas & Cassidy, 2011 for a review) we thought about why this may have occurred.

All the correlations among the four attachment predictors were significant. However, when all the variables were entered into a multiple linear regression model, the VIFs of the attachment predictors did not reach our pre-registered cut-off of 10. Regardless, we were concerned that the attachment predictors were suppressing each other.

Section C: Non Pre-Registered Previously Completed Analyses:

Due to these suspected multicollinearity problems, we decided to create two index variables and use these to test our hypotheses. These two index variables are avoidance with parents (the average of avoidance with mom and avoidance with dad) and anxiety with parents (the average of anxiety with mom and anxiety with dad). We decided to keep the anxiety and avoidance dimensions separate, as the vast majority of the literature about attachment and negative attributions in adults uses these dimensions as predictors.

In the following section, I will describe how these new analyses map on to our old hypotheses:

Original Hypothesis 1: Adolescents' attachment avoidance with mothers, avoidance with fathers, anxiety with mothers, and anxiety with fathers will be associated with negative attribution biases
 Modified Hypothesis 1: Adolescents' attachment avoidance with parents, and attachment anxiety with parents (see Section A for how these were calculated) will be associated with negative attribution biases.

Original Hypothesis 2: Preferred partner gender will moderate links between attachment avoidance with fathers and attachment anxiety with fathers and attribution biases, such that these associations will be stronger for participants imagining a male future partner.
 Modification: We were not able to test this hypothesis, as we collapsed across parent gender.

Original Hypothesis 3: Attribution biases will mediate links between attachment anxiety with moms, attachment avoidance with moms, attachment anxiety with dads, attachment avoidance with dads, and negative explicit responses to partner behavior.

Modified Hypothesis 3: Attribution biases will mediate links between attachment anxiety and avoidance with parents (see Section A for how this was calculated), and negative explicit responses to partner behavior.

Original Hypothesis 4: Attribution biases will mediate links between attachment anxiety with moms, attachment avoidance with moms, attachment anxiety with dads, attachment avoidance with dads, and negative implicit responses to partner behavior.

Modified Hypothesis 4: Attribution biases will mediate links between attachment anxiety and avoidance with parents (see Section A for how this was calculated), and negative implicit responses to partner behavior.

When testing our modified hypotheses, we found that (modified hypothesis 1) avoidance with parents marginally predicted negative attributions and anxiety with parents did not, (modified hypothesis 3) there was a marginal indirect effect of avoidance with parents (but not anxiety) on negative explicit responses through negative attributions, and (modified hypothesis 4) there were no significant or marginally significant indirect effects of anxiety or avoidance on negative implicit responses through negative attributions.

Moving away from our original hypotheses, we also decided to test whether an index of adolescents' security across parents (the "security with parents" index, see section A for how this was calculated) might be influential in predicting negative attributions and implicit and explicit responses through negative attributions. We computed a security across parents score by averaging all four attachment measures. We found that security with parents significantly predicted negative attributions, and that there was a significant indirect effect of security with parents on explicit responses, through the mechanism of negative attributions.

Section D: Pre-registering new analyses

After presenting the work to colleagues and further discussion, we decided that there was value in keeping attachment with mothers and fathers as separate constructs in the model, as previous work has illustrated the ways in which attachment with mothers and fathers affect adolescent

well-being differently (e.g., Woodhouse et al., 2009; Woodhouse et al., 2010). We believe that although the adult literature focuses on the two attachment dimensions, the impact of attachment with specific parents could be more influential in adolescence.

Following previous research in adults using the ECR (e.g., Fraley & Shaver 1997, Mohr et al., 2005; Woodhouse et al., 2009) we will generate security scores by averaging across anxiety and avoidance. We will do this for security with mothers, and security with fathers.

We now propose new models to test modified versions of our original hypotheses, and some new hypotheses. Following previous research (Fraley et al., 2011; Woodhouse et al., 2009) I will first test models with mothers and fathers separately, and then test a model with both of them included to see if either has an effect above and beyond the other.

Proposed modified hypothesis 1: Security with mothers and fathers will predict negative attributions.

Proposed modified hypothesis 2: The link between security with fathers and negative attributions will be moderated by adolescents' preferred partner's gender, such that the link will be stronger when the adolescent is picturing a male future partner.

Proposed modified hypothesis 3: There will be an indirect effect of security with mothers and security with fathers on explicit responses to partners' behaviors through the mechanism of negative attributions.

Proposed modified hypothesis 4: There will be an indirect effect of security with mothers and security with fathers on implicit responses to partners' behaviors through the mechanism of negative attributions.

New hypothesis (hypothesis 5): Security with mothers will explain variance above and beyond security with fathers in predicting negative attributions.

New hypothesis (hypothesis 6): Security with mothers will be a buffer against the impact of insecurity with fathers on negative attributions.

New hypothesis (hypotheses 7): For those picturing a male partner only, security with fathers will be a buffer against the impact of insecurity with mom on negative attributions.

Models to test these modified versions of our hypotheses, and our new hypotheses.

Model 1: Pre-registered path analysis with all a-priori covariates, security with mothers, and an interaction term of security with mothers and preferred partner gender as predictors. This model is to test hypothesis 1. We do not hypothesize that the interaction will be significant, but we would like to keep it in the model for exploratory purposes.

We will use the Model Indirect Mplus procedure (Stride et al., 2015) to test the indirect effect of security with mothers on implicit and explicit responses to partners' behaviors. This is a test of modified hypotheses 3 and 4.

Model 2: Pre-registered path analysis with all a-priori covariates, security with fathers, and an interaction term of security with fathers and preferred partner gender as predictors. This model is to test hypotheses 1 and 2.

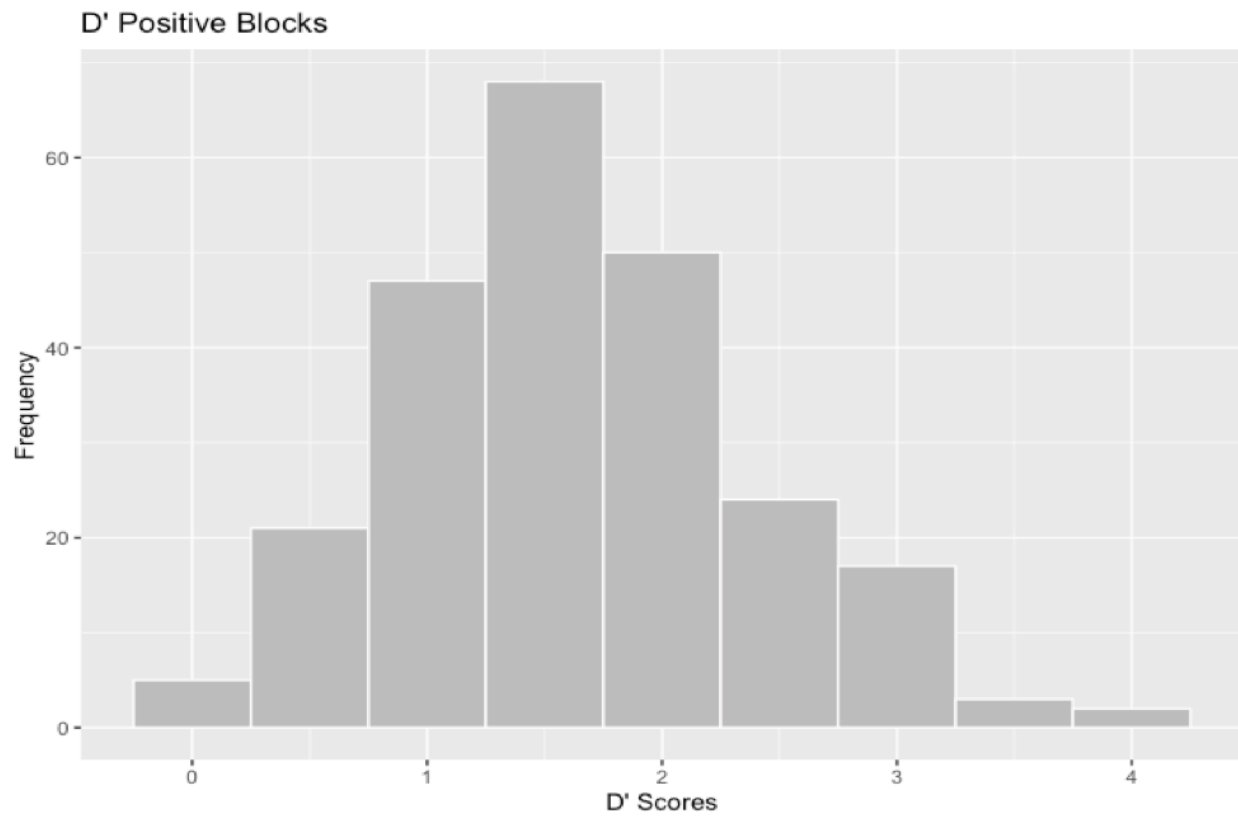
We will use the Model Indirect Mplus procedure (Stride et al., 2015) to test the indirect effect of security with fathers on implicit and explicit responses to partners' behaviors. This is to test hypotheses 3 and 4.

Model 3: Pre-registered path analysis with all a-priori covariates, security with fathers, and security with mothers. This model is to test hypothesis 5.

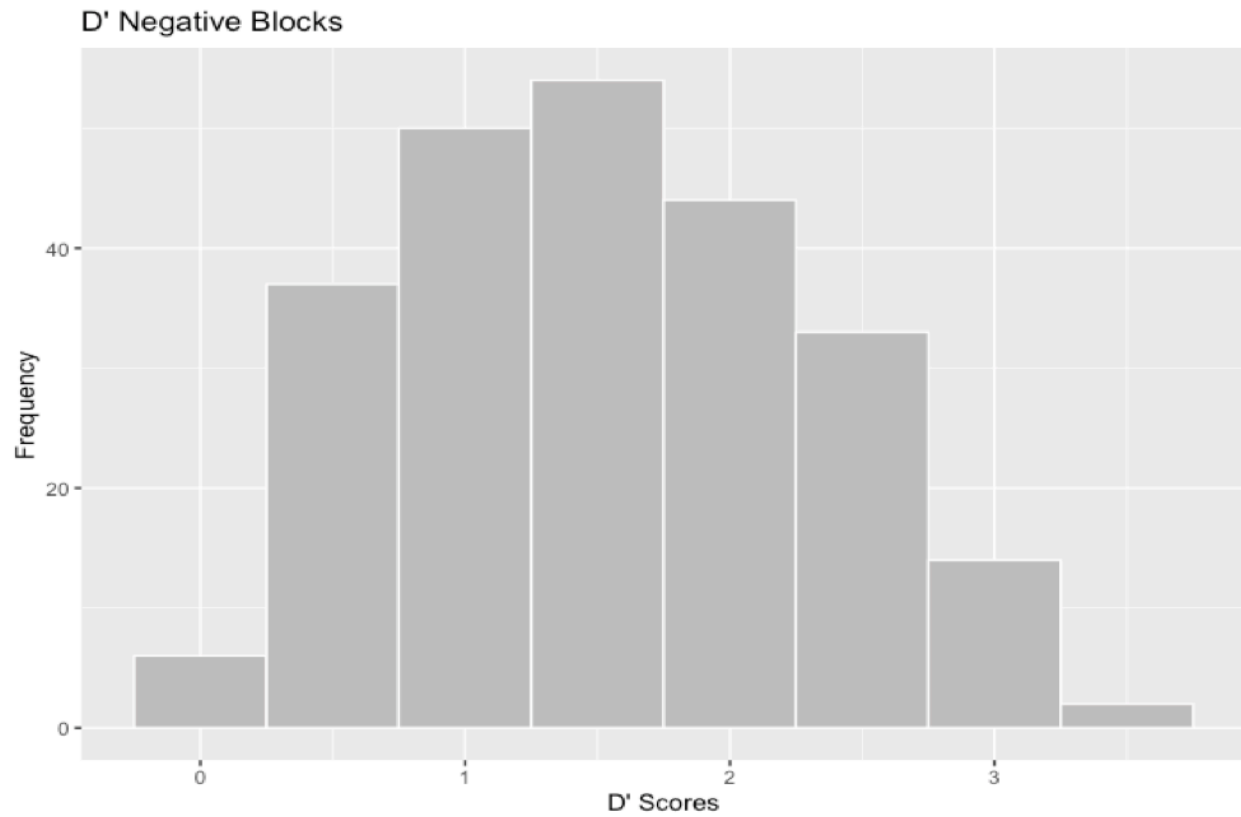
Model 4: We will include an interaction term to model 3 between security with dad and security with mom in predicting negative attributions. This will allow us to test hypothesis 6. We will also include a three-way interaction term between security with dad, security with mom, and preferred partner gender, to test whether security with fathers will be a buffer against the impact of insecurity with mom on negative attributions for those imagining a male future partner (hypothesis 7).

Section E: Future Directions

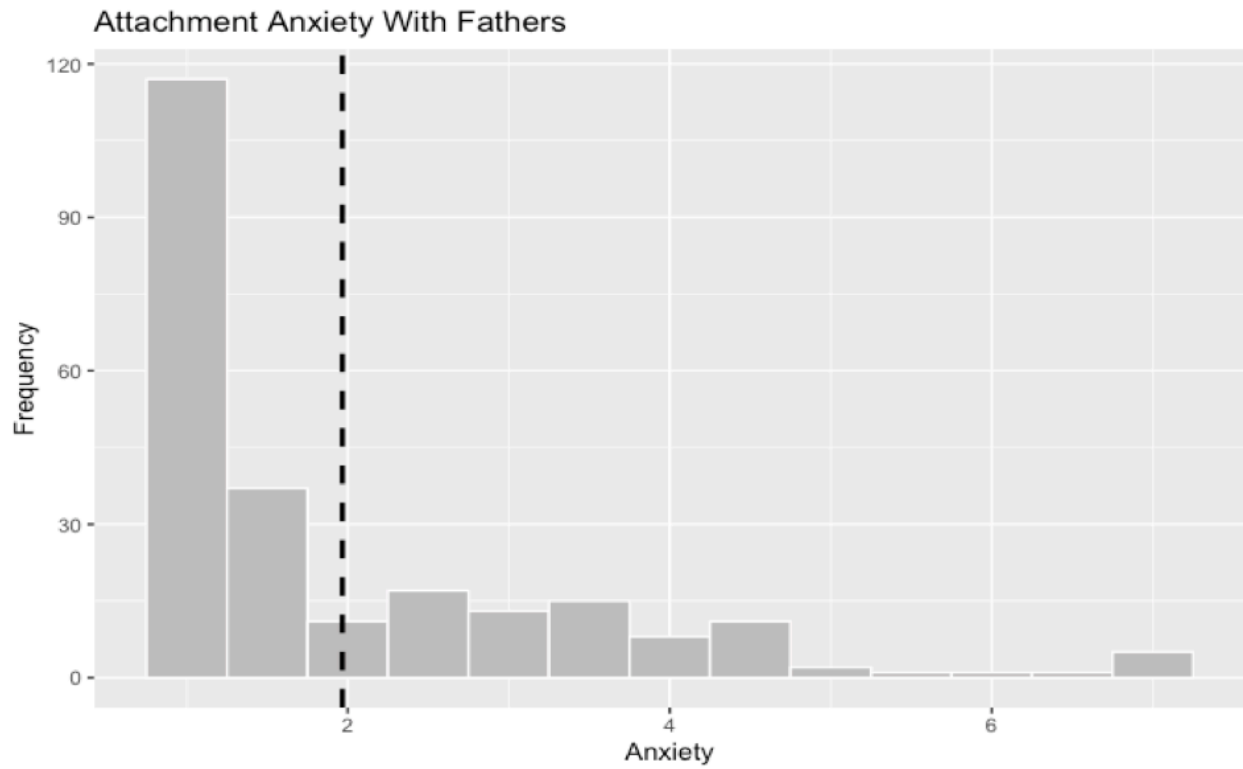
Possible future directions include further examining the impact of overall security with parents (average of security with mom and security with dad) on different study variables and examining whether adolescents high on attachment anxiety with mothers are more at risk than other adolescents.

Appendix M: Distributions and Descriptive Statistics for Key Study Variables

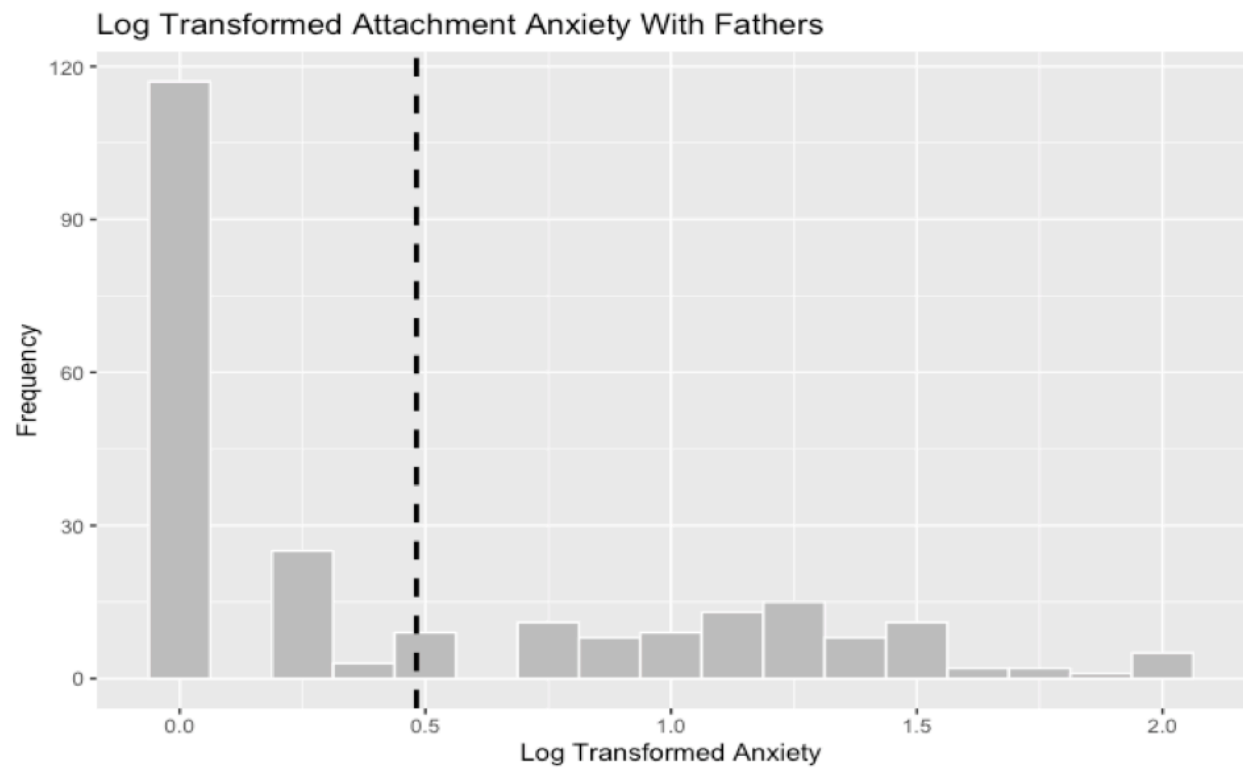
D' for positive trial blocks of the Conflict Responses Go/No-Go Association Task (Fitter & Cassidy, in preparation). $M = 1.64$, $SD = 0.77$, $SE = 0.37$, Range = 0.03 – 3.96.



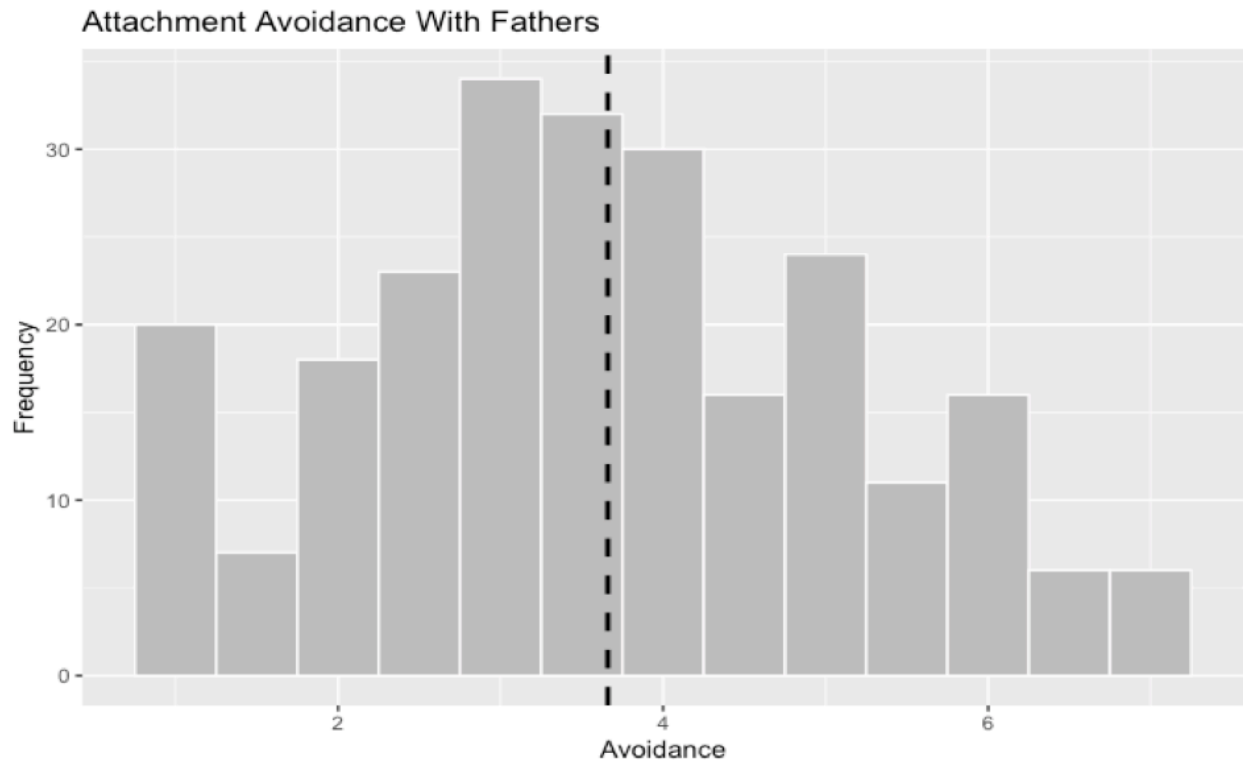
D' for negative trial blocks of the Conflict Responses Go/No-Go Association Task (Fitter & Cassidy, in preparation). $M = 1.52$, $SD = 0.77$, $SE = 0.20$, Range = 0.08 - 3.46.



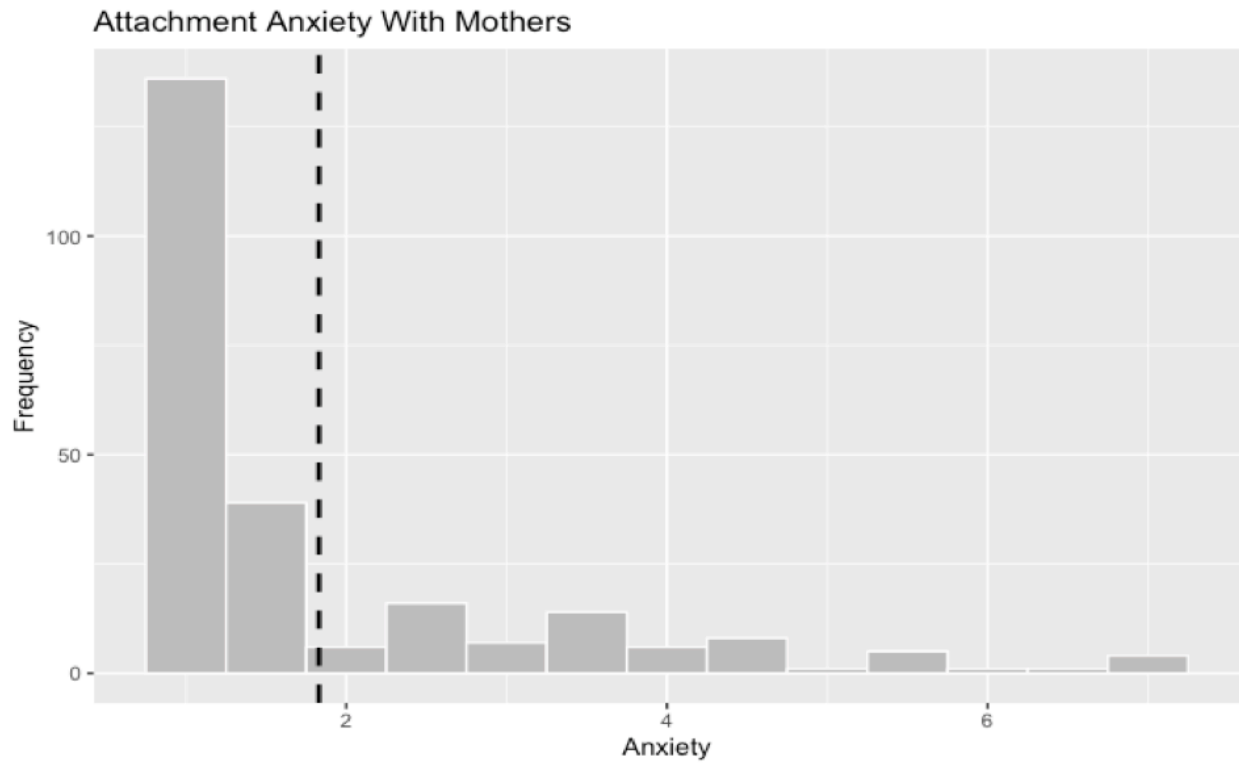
Attachment anxiety with fathers. $M = 1.97$, $SD = 1.41$, $SE = 1.66$, $Range = 1 - 7$.



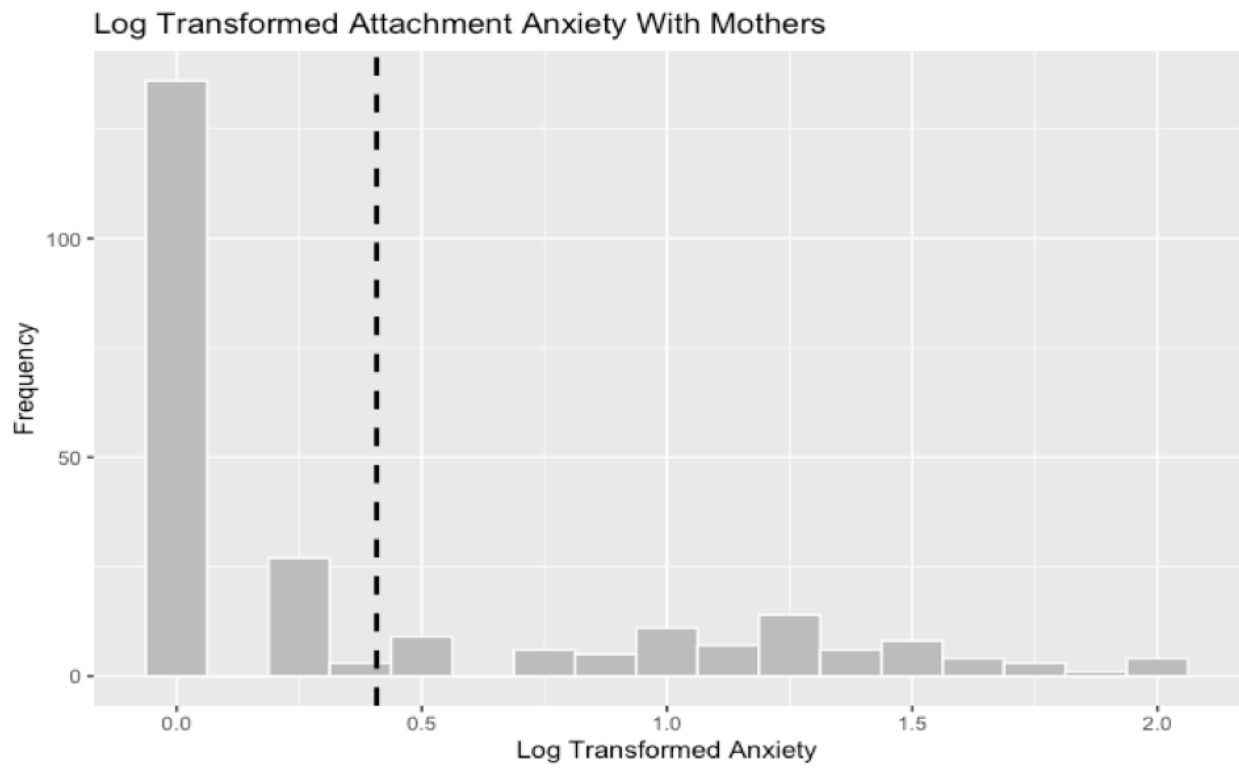
Log transformed attachment anxiety with fathers. $M = 0.48$, $SD = 0.59$, $SE = 0.85$, Range = 0 – 1.95.



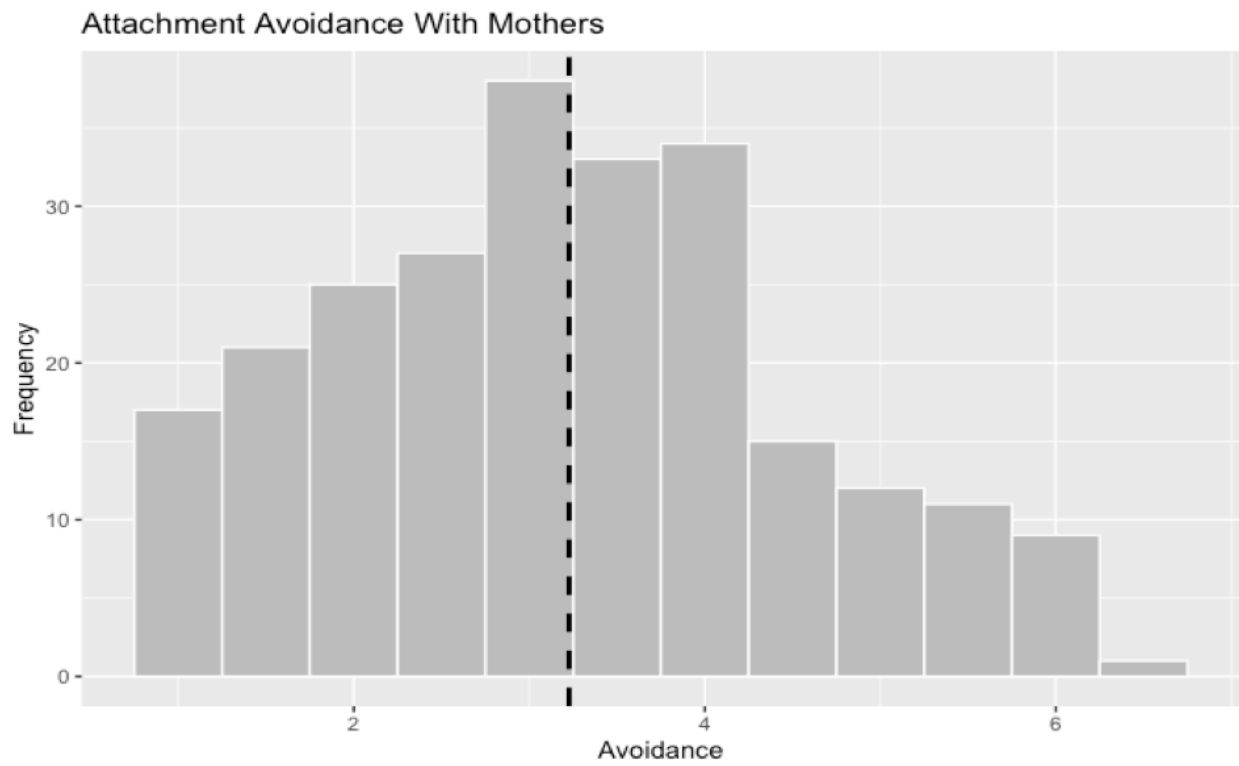
Attachment avoidance with fathers. $M = 3.66$, $SD = 1.53$, $SE = 0.17$, Range = 1 - 7.



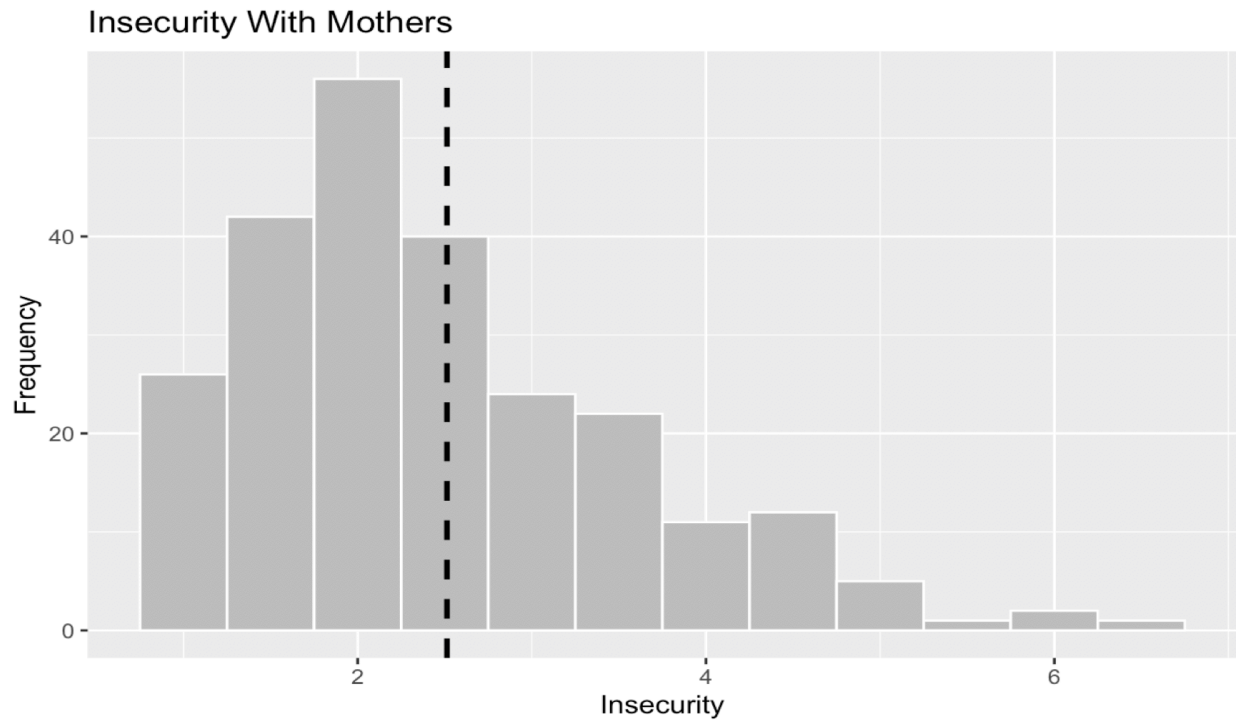
Attachment anxiety with mothers. $M = 1.83$, $SD = 1.38$, $SE = 1.88$, $Range = 1 - 7$.



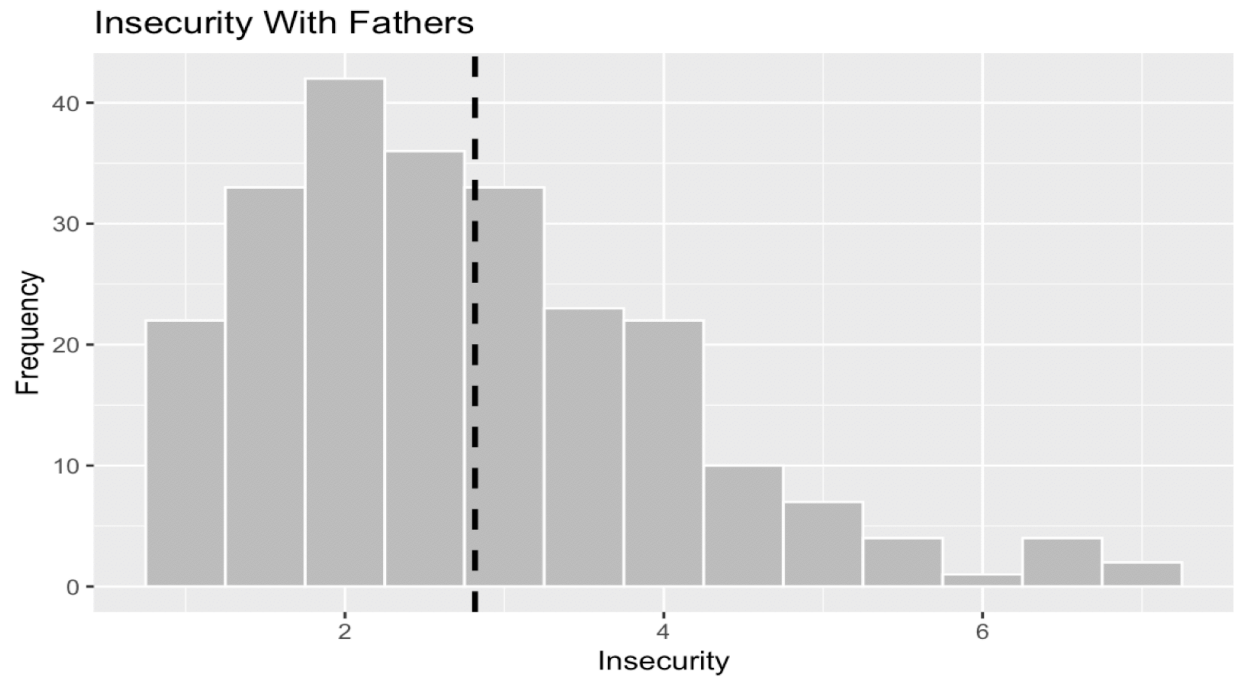
Log transformed attachment anxiety with mothers. $M = 0.41$, $SD = 0.57$, $SE = 1.14$, Range = 0 – 1.95.



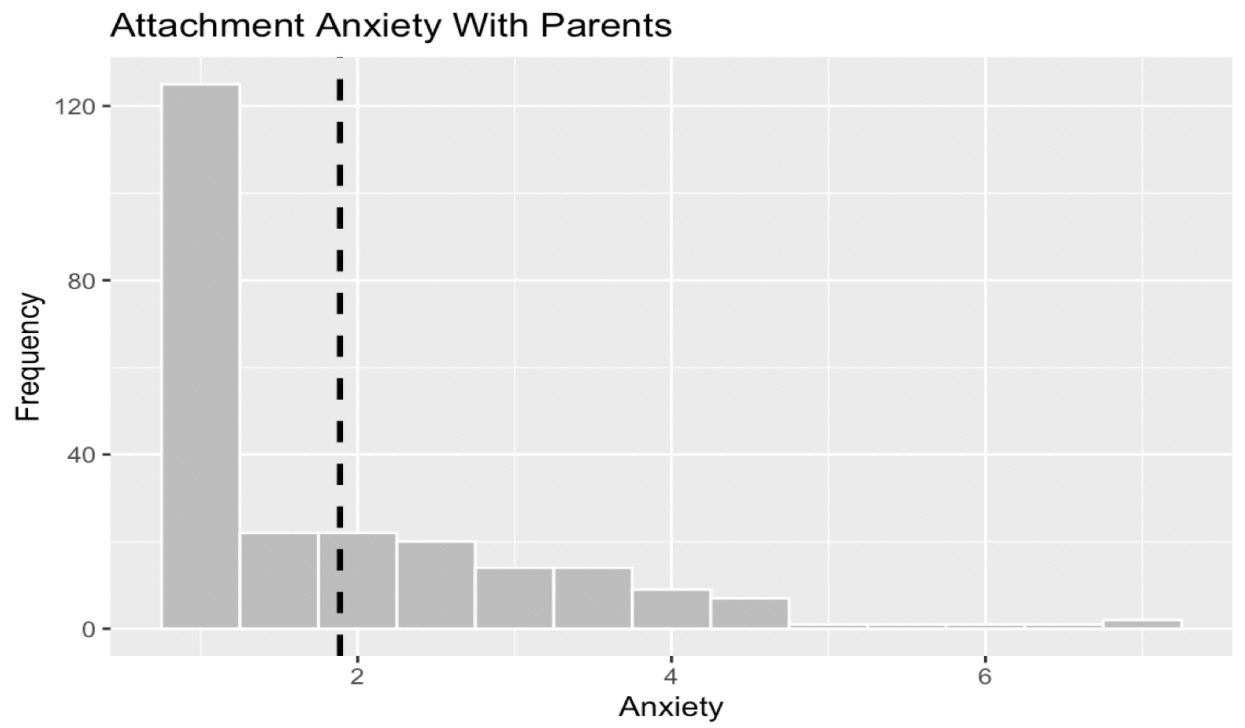
Attachment avoidance with mothers. $M = 3.22$, $SD = 1.32$, $SE = 0.27$, $Range = 1 - 6.67$.



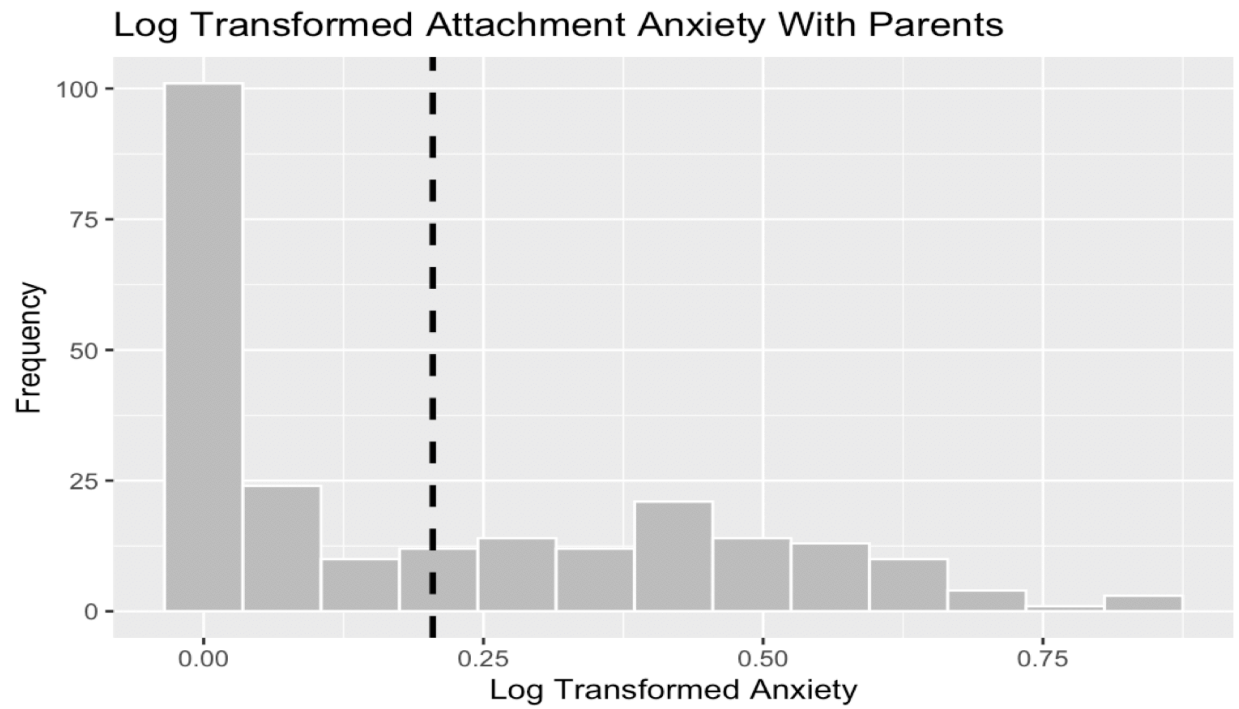
Attachment insecurity with mothers. $M = 2.51$, $SD = 1.11$, $SE = 0.93$, $Range = 1 - 6.50$.



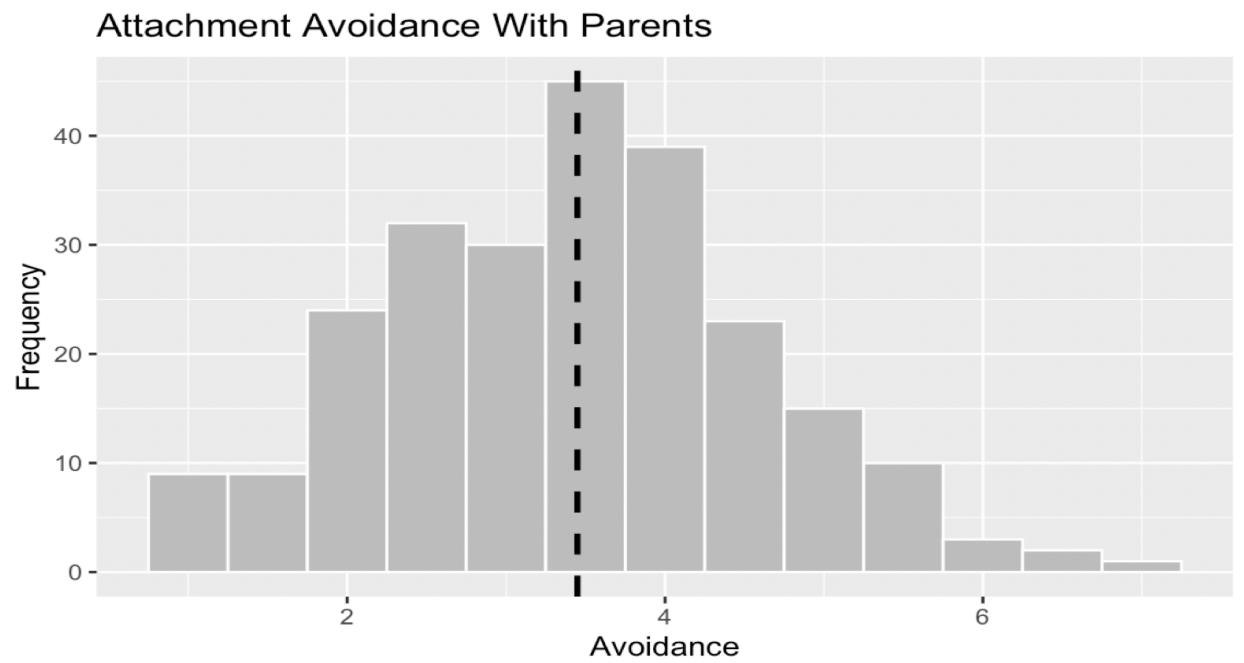
Attachment insecurity with fathers. $M = 2.82$, $SD = 1.27$, $SE = 0.89$, $Range = 1 - 7$.



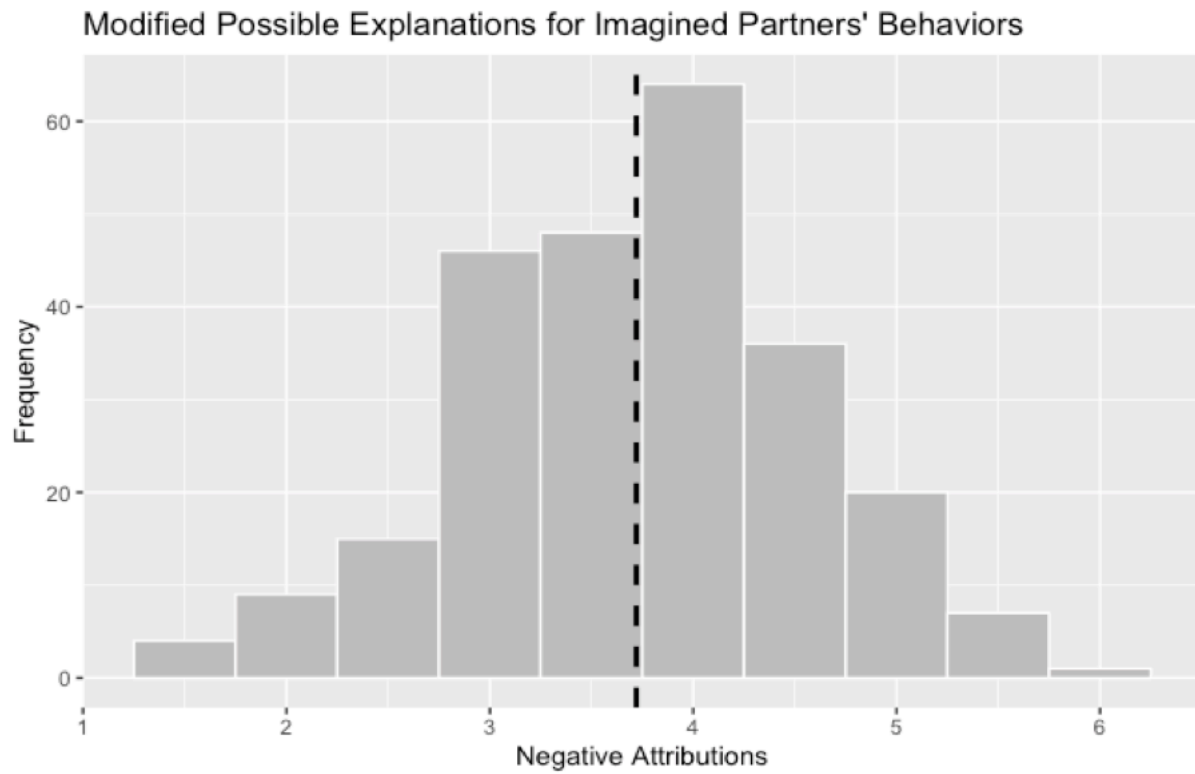
Attachment anxiety with parents. $M = 1.88$, $SD = 1.23$, $SE = 1.63$, $Range = 1 - 7$.



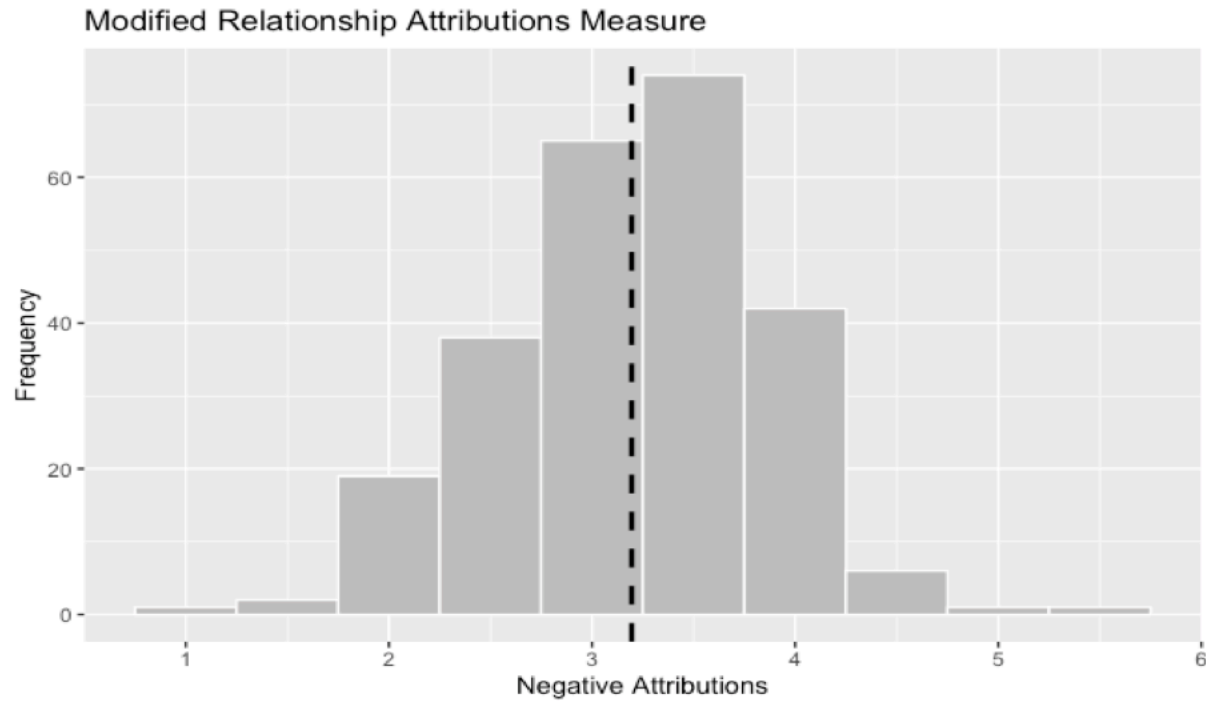
Log transformed attachment anxiety with parents. $M = 0.20$, $SD = 0.24$, $SE = 0.79$, Range = 0 – 0.85.



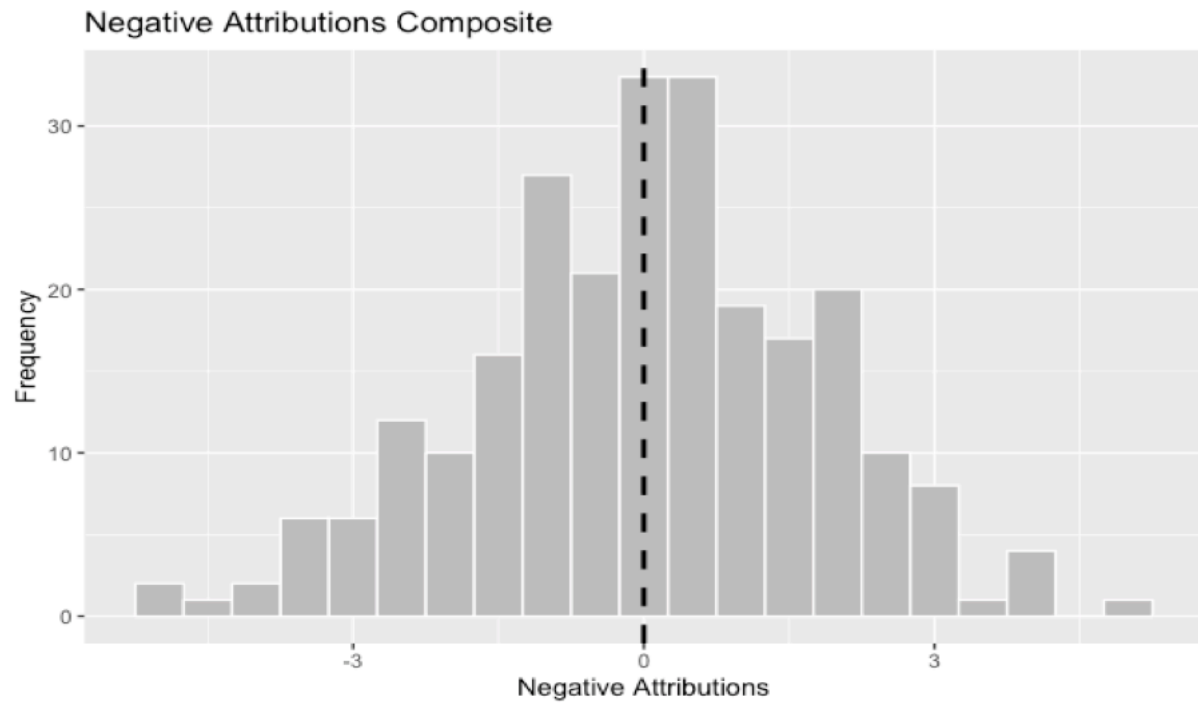
Attachment avoidance with parents. $M = 3.45$, $SD = 1.16$, $SE = 0.09$, $Range = 1 - 6.83$.



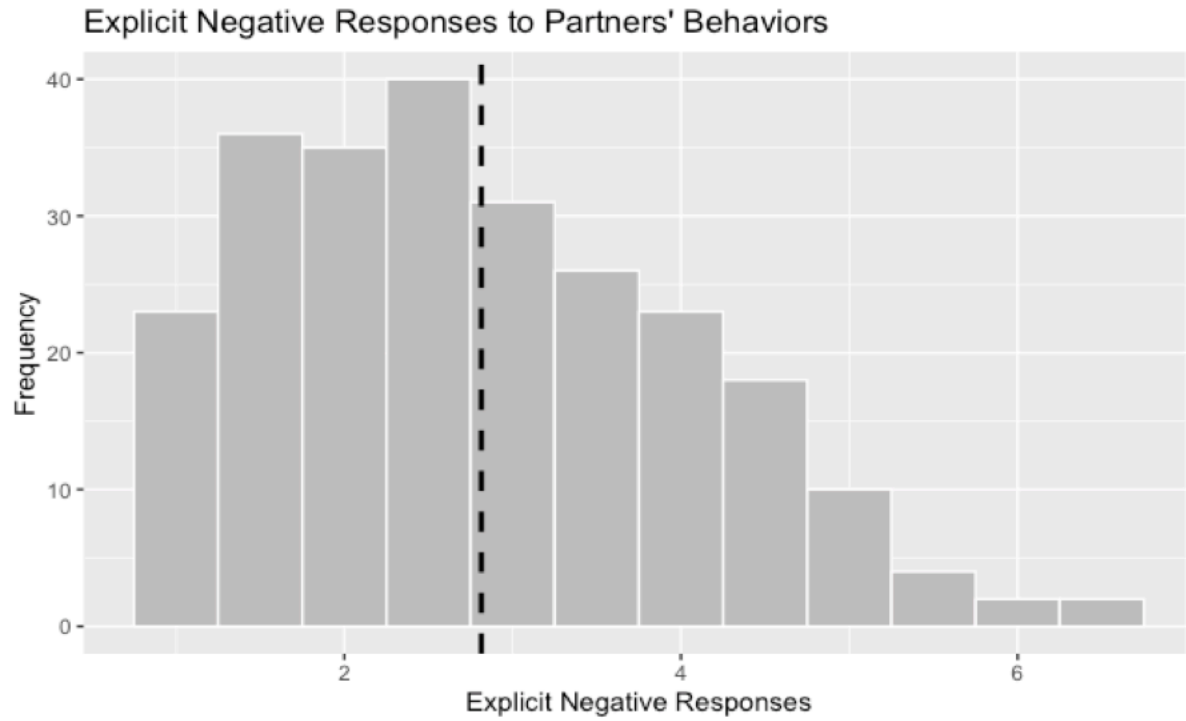
Modified Collins and colleagues (2006) possible explanations for imagined future romantic partners' behaviors. $M = 3.72$, $SD = 0.84$, $SE = .013$, $Range = 1.39 - 5.78$.



Modified Relationship Attributions Measure (RAM; Fincham & Bradbury, 1992). $M = 3.20$, $SD = 0.64$, $SE = .014$, $Range = 1.22 - 5.29$.



Negative attributions composite. $M = -0.001$, $SD = 1.79$, $SE = -.012$, $Range = -5.00 - 4.95$.



Explicit negative responses to partners' behaviors. $M = 2.81$, $SD = 1.24$, $SE = 0.54$, Range = 1 – 6.67.

Tables

Table 1

Descriptive Statistics and Correlations Among Main Study Variables

Variable			1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age <i>M</i> (<i>SD</i>)	13.49	(0.54)	-												
2. Implicit responses	0.003	(0.67)	-0.03	-											
3. Explicit responses	2.81	(1.24)	-0.1	-0.12	-										
4. Negative attributions	-0.001	(1.79)	0.05	-0.06	<u>0.6</u>	-									
5. Anxiety with mom	1.83	(1.38)	-0.11	-0.11	<u>0.19</u>	<u>0.13</u>	-								
6. Anxiety with dad	1.97	(1.41)	-0.09	-0.04	<u>0.15</u>	<u>0.13</u>	<u>0.58</u>	-							
7. Anxiety with parents	1.89	(1.23)	-0.10	-0.07	<u>0.2</u>	<u>0.15</u>	<u>0.88</u>	<u>0.9</u>	-						
8. Avoidance with mom	3.23	(1.32)	-0.02	-0.05	0.06	0.1	<u>0.39</u>	<u>0.21</u>	<u>0.33</u>	-					
9. Avoidance with dad	3.65	(1.52)	-0.09	-0.03	0.1	<u>0.17</u>	<u>0.16</u>	<u>0.49</u>	<u>0.38</u>	<u>0.34</u>	-				
10. Avoidance with parents	3.45	(1.16)	-0.07	-0.05	0.09	<u>0.17</u>	<u>0.33</u>	<u>0.44</u>	<u>0.44</u>	<u>0.79</u>	<u>0.84</u>	-			
11. Insecurity with mom	2.51	(1.11)	-0.07	-0.08	<u>0.14</u>	<u>0.15</u>	<u>0.83</u>	<u>0.48</u>	<u>0.73</u>	<u>0.83</u>	<u>0.31</u>	<u>0.67</u>	-		
12. Insecurity with dad	2.82	(1.27)	-0.11	-0.05	<u>0.15</u>	<u>0.17</u>	<u>0.43</u>	<u>0.85</u>	<u>0.73</u>	<u>0.32</u>	<u>0.87</u>	<u>0.75</u>	<u>0.45</u>	-	
13. Insecurity with parents	2.67	(1.01)	-0.10	-0.07	<u>0.17</u>	<u>0.19</u>	<u>0.73</u>	<u>0.79</u>	<u>0.86</u>	<u>0.66</u>	<u>0.72</u>	<u>0.84</u>	<u>0.83</u>	<u>0.87</u>	-

Note. Correlations underlined in bold are statistically significant ($p < .05$).

Table 2

Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from Total Insecurity With Both Parents Combined

	β	p
Negative Attributions		
Insecurity with parents	0.18	<.01
Age	0.12	0.06
Gender	0.03	0.67
Race	-0.01	0.89
Relationship Experience	-0.04	0.57
School A	0.01	0.836
School B	0.13	0.11
School C	0.11	0.17
School D	0.25	<.01
	β	p
Explicit Responses		
Negative attributions	0.54	<.001
Age	-0.02	0.68
Gender	-0.11	0.05
Race	-0.08	0.14
Relationship Experience	-0.02	0.75
School A	-0.05	0.32
School B	-0.03	0.61
School C	0.06	0.35
School D	0.35	<.001
	β	p
Implicit Responses		
Negative attributions	-0.05	0.46
Age	-0.02	0.80
Gender	0.05	0.53
Race	0.12	0.12
Relationship Experience	-0.03	0.67
School A	0.03	0.72
School B	-0.06	0.46
School C	-0.02	0.80
School D	-0.05	0.63

Table 3

Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from Attachment Insecurity with Each Individual Parent

	Mother Model		Father Model		Both Parents Model	
	β	p	β	p	β	p
Negative Attributions						
Insecurity with mother	0.13	0.04	-	-	0.07	0.28
Insecurity with father	-	-	0.17	0.01	0.13	0.07
Age	0.12	0.07	0.12	0.06	0.12	0.06
Gender	0.01	0.95	0.04	0.60	0.04	0.64
Race	-0.004	0.96	-0.01	0.85	-0.01	0.89
Relationship Experience	-0.02	0.75	-0.04	0.57	-0.04	0.55
School A	-0.07	0.29	-0.08	0.24	-0.08	0.27
School B	-0.15	0.13	-0.16	0.09	-0.16	-0.10
School C	-0.01	0.92	-0.02	0.81	-0.02	0.85
School D	0.24	0.01	0.26	0.01	0.25	0.01
Explicit Responses						
Negative attributions	0.54	<.001	0.54	<.001	0.54	<.001
Age	-0.02	0.67	-0.02	0.68	-0.02	0.68
Gender	-0.10	0.06	-0.11	0.05	-0.11	0.05
Race	-0.08	0.15	-0.08	0.14	-0.08	0.14
Relationship Experience	-0.02	0.75	-0.02	0.75	-0.02	0.75
School A	-0.03	0.56	-0.03	0.56	-0.03	0.56
School B	0.04	0.62	0.04	0.61	0.04	0.62
School C	0.08	0.14	0.08	0.14	0.08	0.14
School D	0.35	<.001	0.35	<.001	0.35	<.001
Implicit Responses						
Negative attributions	-0.05	0.46	-0.05	0.46	-0.05	0.46
Age	-0.02	0.80	-0.02	0.80	-0.02	0.80
Gender	0.05	0.53	0.05	0.53	0.05	0.53
Race	0.12	0.12	0.12	0.12	0.12	0.12
Relationship Experience	-0.03	0.67	-0.03	0.66	-0.03	0.66
School A	0.07	0.36	0.07	0.36	0.07	0.36
School B	0.07	0.46	0.07	0.46	0.07	0.46
School C	0.04	0.64	0.04	0.64	0.04	0.64
School D	-0.05	0.63	-0.05	0.63	-0.05	0.63

Table 4

Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from the Two Attachment Dimensions (Avoidance Across Both Parents Combined and Anxiety Across Both Parents Combined)

	β	p
Negative Attributions		
Avoidance with parents	0.14	0.05
Anxiety with parents	0.05	0.45
Age	0.12	0.06
Gender	0.04	0.63
Race	-0.01	0.88
Relationship Experience	-0.03	0.62
School A	0.01	0.927
School B	0.12	0.113
School C	0.12	0.19
School D	0.25	0.006
	β	p
Explicit Responses		
Negative attributions	0.54	<.001
Age	-0.02	0.80
Gender	-0.11	0.53
Race	-0.08	0.12
Relationship Experience	-0.02	0.66
School A	-0.05	0.32
School B	-0.03	0.62
School C	0.06	0.35
School D	0.35	<.001
	β	p
Implicit Responses		
Negative attributions	-0.05	0.46
Age	-0.02	0.80
Gender	0.05	0.53
Race	0.12	0.12
Relationship Experience	-0.03	0.67
School A	0.03	0.72
School B	-0.06	0.46
School C	-0.02	0.80
School D	-0.05	0.63

Table 5

Path Coefficients Predicting Attributions, Explicit Responses, and Implicit Responses from the Attachment Dimensions for Each Parent

	β	p
Negative Attributions		
Anxiety with mothers	0.09	0.35
Anxiety with fathers	-0.01	0.94
Avoidance with mothers	0.01	0.84
Avoidance with fathers	0.15	0.06
Age	0.13	0.05
Gender	0.05	0.55
Race	-0.01	0.89
Relationship Experience	-0.04	0.59
School A	-0.08	0.24
School B	-0.14	0.10
School C	-0.02	0.78
School D	0.123	0.17
	β	p
Explicit Responses		
Negative attributions	0.54	<.001
Age	-0.02	0.68
Gender	-0.10	0.06
Race	-0.08	0.14
Relationship Experience	-0.02	0.74
School A	-0.03	0.56
School B	0.03	0.63
School C	0.08	0.14
School D	0.38	<.001
	β	p
Implicit Responses		
Negative attributions	-0.05	0.46
Age	-0.02	-0.80
Gender	0.05	0.53
Race	0.12	0.12
Relationship Experience	-0.03	0.67
School A	0.07	0.36
School B	0.07	0.46
School C	0.04	0.64
School D	0.01	-0.90

Figures

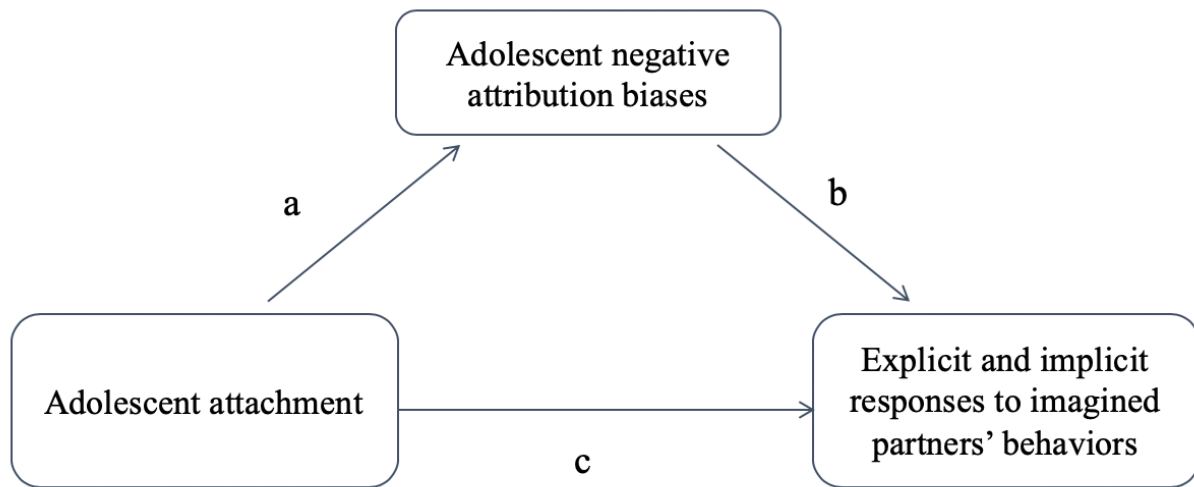


Figure 1. Proposed overarching model of adolescent attachment predicting responses to imagined partners' behaviors, mediated by adolescent negative attribution biases.

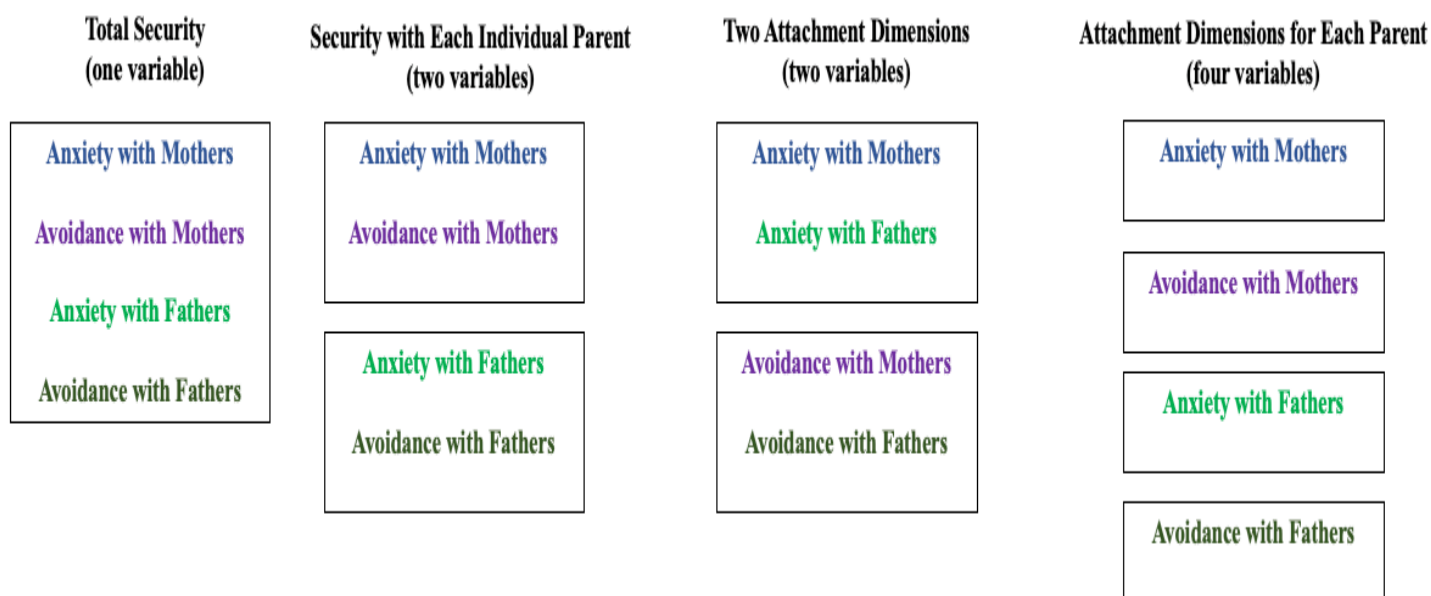


Figure 2. Adolescents answered questions about anxiety with mothers, avoidance with mothers, anxiety with fathers, and avoidance with fathers. A score was calculated for each. In the present study, we examined four conceptual levels of attachment to predict negative attributions and responses to imagined future romantic partners' behaviors: total security, security with each individual parent, two attachment dimensions, and attachment dimensions for each parent. Path models were analyzed at each of these four levels, and each box represents the variables entered in the corresponding path models.

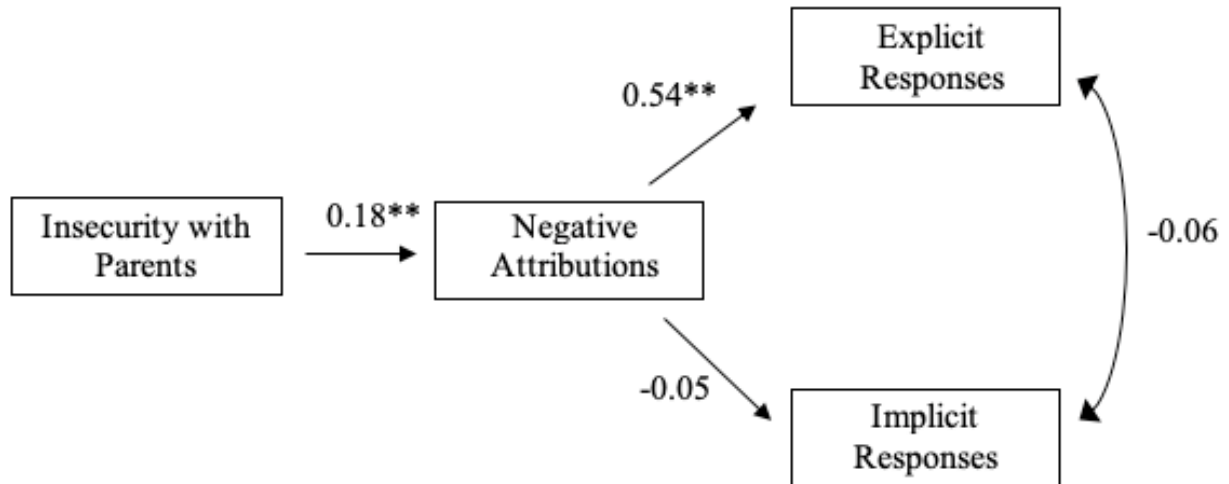


Figure 3. Structural total insecurity model with standardized path coefficients and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 2 for all path coefficients).

- . Significant at the .10 level
- * Significant at the .05 level
- **Significant at the .01 level

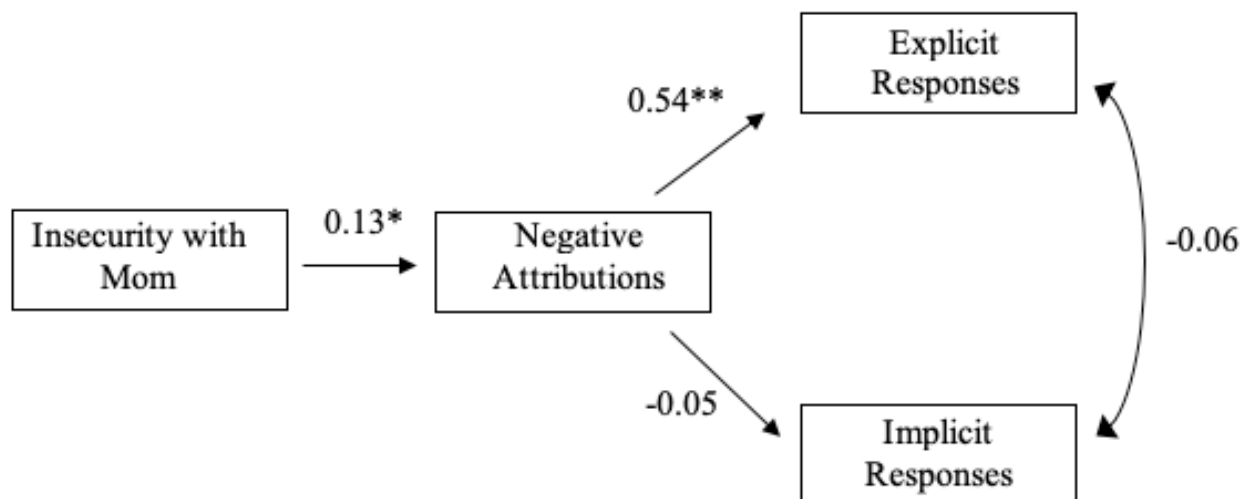


Figure 4. Structural mother model with standardized path coefficients and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 3 for all path coefficients).

. Significant at the .10 level

* Significant at the .05 level

**Significant at the .01 level

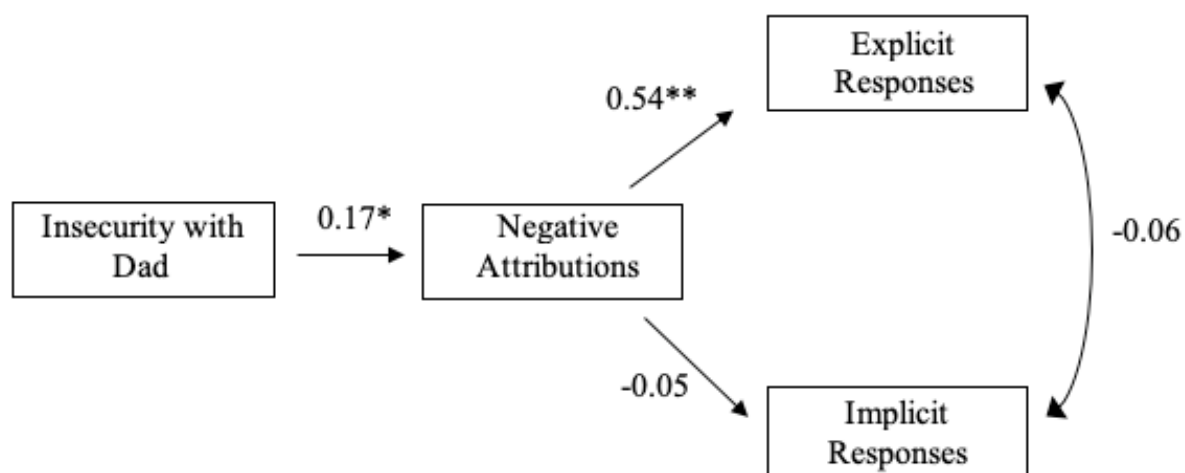


Figure 5. Structural father model with standardized path coefficients and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 3 for all path coefficients).

. Significant at the .10 level

* Significant at the .05 level

**Significant at the .01 level

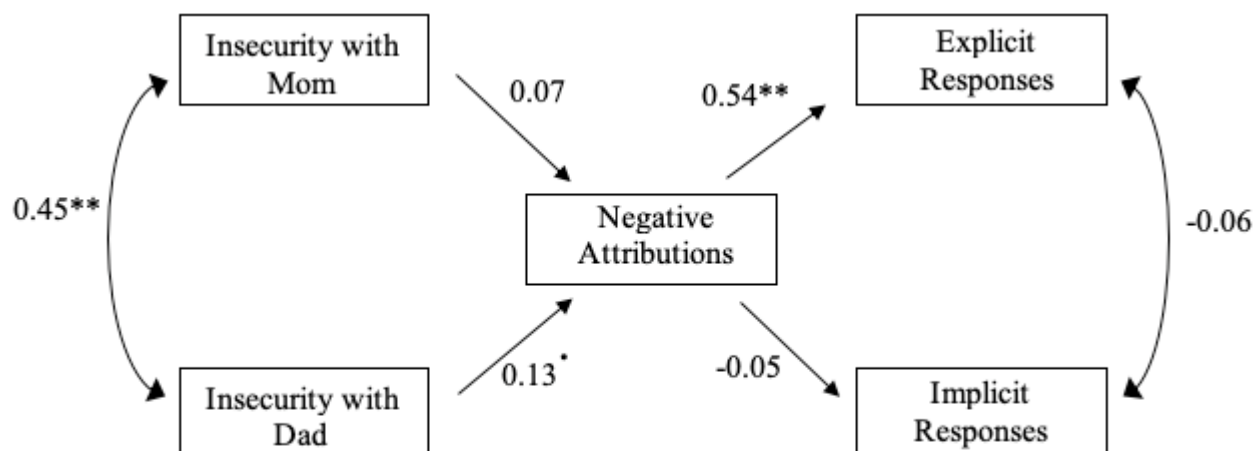


Figure 6. Structural both parents model with standardized path coefficients, correlation between security with mom and security with dad, and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 3 for all path coefficients).

. Significant at the .10 level

* Significant at the .05 level

**Significant at the .01 level

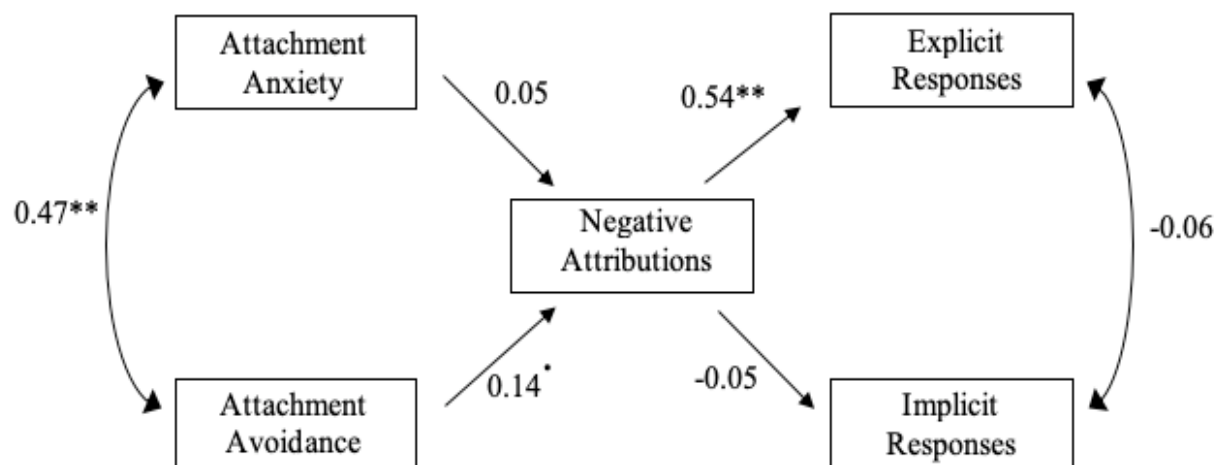


Figure 7. Structural two attachment dimensions model with standardized path coefficients, correlation between attachment anxiety and attachment avoidance, and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 4 for path coefficients)

. Significant at the .10 level

* Significant at the .05 level

**Significant at the .01 level

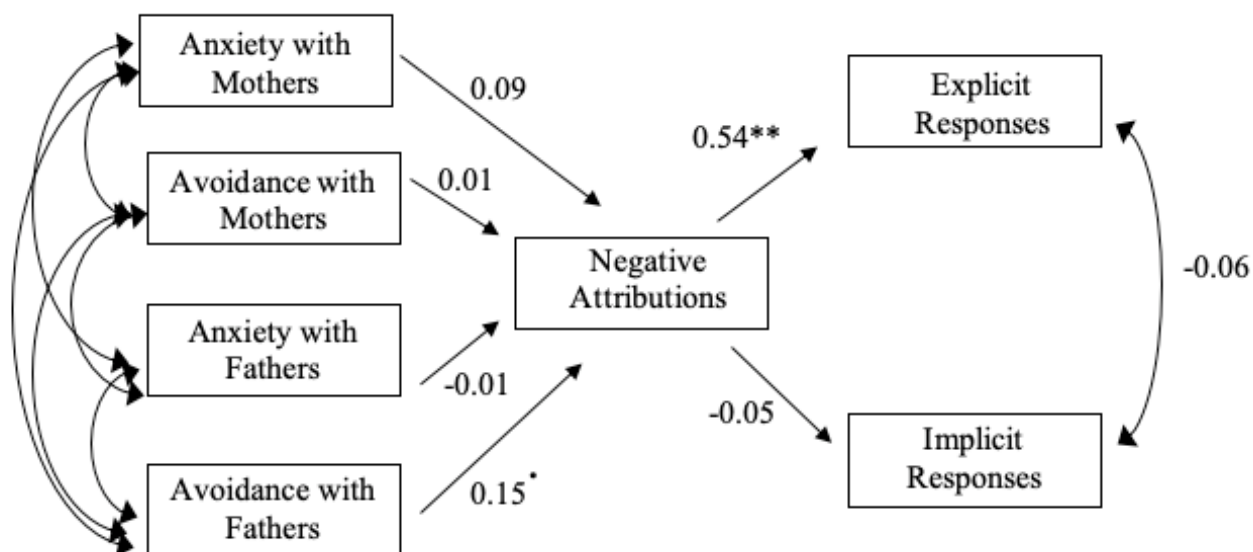


Figure 8. Structural attachment dimensions for each parent model with standardized path coefficients and error covariance between explicit responses and implicit responses. Covariates not displayed here include gender, race, relationship experience, age, and dummy variables to represent schools. Paths were modeled from each covariate to negative attributions, explicit responses, and implicit responses (see Table 1 for correlations between attachment variables, see Table 5 for path coefficients).

. Significant at the .10 level

* Significant at the .05 level

**Significant at the .01 level

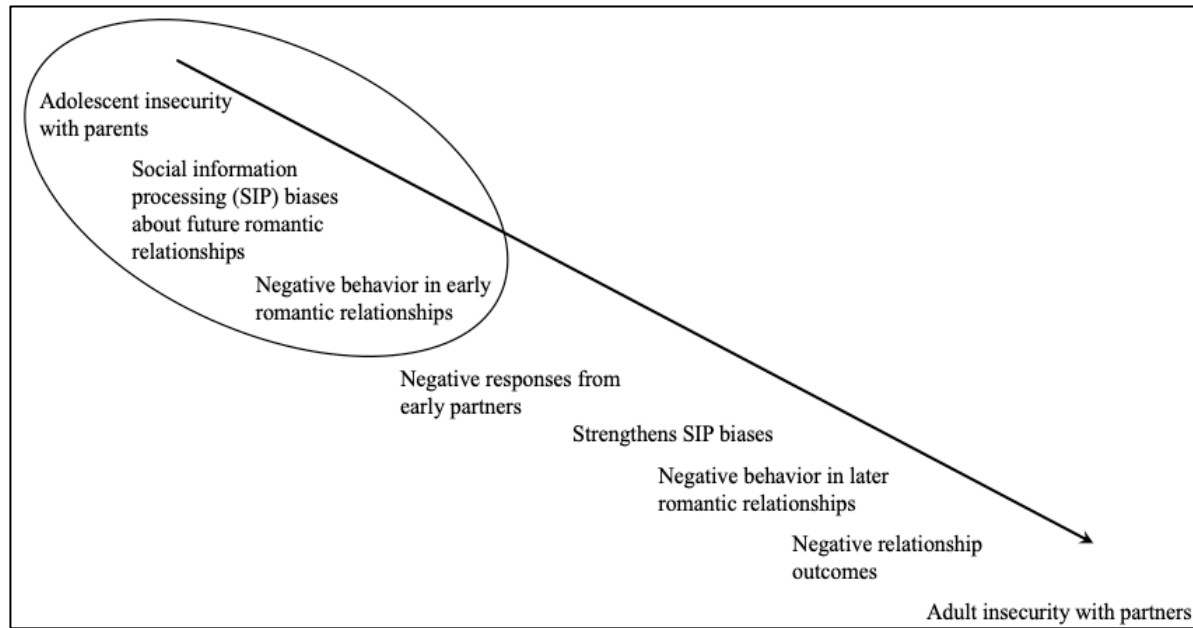


Figure 9: Proposed developmental cascade through which adolescent insecurity to parents predicts adult insecurity to romantic partners. Circled portion represents the steps of the cascade that the present study examined.

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