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# Hostile Attribution Biases And Externalizing Behaviors: The Influence Of Parenting Practices

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HOSTILE ATTRIBUTION BIASES AND EXTERNALIZING BEHAVIORS: THE  
INFLUENCE OF PARENTING PRACTICES

by

EMILY RONKIN

Under the Direction of Erin B. Tone

ABSTRACT

Children's social information processing (SIP) encompasses cognitive and behavioral sequence that underlies social responses. SIP in peer interactions is well studied. Less is known about SIP in mother-child interchanges. Youth who show one SIP pattern a hostile attribution of intent (HAI) bias—in peer interactions consistently exhibit externalizing symptoms. This relationship is less consistently observed for HAI biases toward mothers. I hypothesized that this inconsistent association reflects moderating factors; specifically, engaging in foundational parenting practices (monitoring/supervision, consistent discipline) would weaken the relationship between HAI biases toward mothers and externalizing behaviors. Logistic regression yielded limited support for hypotheses. Consistent discipline predicted externalizing behaviors in some contexts; however, moderator effects were not detected. Isolated parenting practices thus may

not buffer against the risk of externalizing behaviors linked to HAI biases toward mothers.

Future research might examine how different HAI biases (peer, mother, etc.) related to each other and outcome variables.

**INDEX WORDS:** Children, Social information processing, Monitoring, Consistent discipline, Hostile attribution of intent biases, Parenting, Aggression, Rule-breaking

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EMILY RONKIN

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Masters of Arts

in the College of Arts and Sciences

Georgia State University

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INFLUENCE OF PARENTING PRACTICES

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## 1 INTRODUCTION

In the late 1960s and early 1970s, researchers became interested in exploring problem solving as a critical aspect of human behavior in a variety of contexts (Davis, 1966). Problem solving has been broadly defined as a process of approach and response to situations in which the most effective response is not immediately available or apparent (Hoffman, 1961). Some scholars focused on developing theories of problem solving in the contexts of laboratory tasks (e.g., Schultz, 1960) and academic learning (e.g., Jacobsen & Asher, 1963). In contrast, others examined problem solving, along with its precursors and sequelae, as a unified sequence of “social information processing” (SIP) that occurs in the context of social interactions (Newell & Simon, 1972).

Although definitions vary slightly, SIP considered broadly comprises individuals’ cognitive and behavioral responses to social situations (e.g., Flavell, 1974; McFall, 1982; Newell & Simon, 1972). Goldfried and D’Zurilla (1969) broke SIP down into a series of distinct stages and proposed that individuals solve social problems differently, some more effectively than others (D’Zurilla & Goldfried, 1971). They posited that ineffective problem solving can be both a necessary and sufficient condition for “abnormal behavior,” which can manifest in various ways that include aggression and withdrawal.

Crick and Dodge (1994) further clarified Goldfried and D’Zurilla’s (1969) propositions within a socially-oriented framework and illustrated how the principles of SIP related to social maladjustment in children. Additionally, Crick and Dodge (1994) defined six steps that describe how children approach problematic social situations: encoding the situation, interpreting social cues, selecting a goal or desired outcome, generating possible responses, selecting a response, and enacting that selected response.

Crick and Dodge's (1994) revision of the D'Zurilla and Goldfried (1969) model proposed that in novel social situations, children first attend to and focus on certain cues. For example, suppose that a boy and a girl are building with blocks, and the girl knocks over the boy's tower. According to the SIP steps that Crick and Dodge (1994) described, the boy initially attends to and focuses on situational cues, such as the girl having touched the tower. Next, he integrates these cues with his existing database of knowledge and interprets the cues. The boy may interpret the girl's act of knocking over his tower as deliberate, or he may interpret it as an accident. If, in the past, he had witnessed a classmate deliberately destroying other children's projects, he may be more likely to interpret the girl's action as similarly motivated. Once he interprets the girl's intentions, he formulates a goal that is compatible with his interpretation. If he interpreted the girl's action as deliberate, his goal might be to get revenge. If he interpreted the girl's action as an accident, his goal might be to preserve his social relationship with the girl. He then generates possible responses (e.g., knocking over the girl's block tower or reassuring her) depending on his goal and evaluates those responses based on their potential consequences. Finally, he chooses and enacts the response that he believes will most effectively help him achieve his goal.

The majority of the literature that has investigated SIP in children has focused on problem solving and responding in the context of peer interactions and relationships (e.g., at school). In fact, Crick and Dodge (1994) revised D'Zurilla and Goldfried's (1969) model with peer interactions primarily in mind. However, a smaller body of research has also examined SIP in the context of parent-child—primarily mother-child—interactions and relationships (e.g., Grace, Kelley, & McCain, 1993; MacKinnon-Lewis, Lamb, Hattie, & Baradaran, 2001; MacKinnon-Lewis, Lindsey, Frabutt, & Chambers, 2014). This distinction is important to note

because, according to the SIP model, children respond to ambiguous problems based on their learning histories and experiences (Heusmann, 1988). Children's learning histories and experiences differ, in turn, depending on whether they are interacting with peers or with parents. For example, conflict with a peer and conflict with a parent likely have very different consequences for the child, and each type of conflict also has its own optimal response. Therefore, children may call on different stores of knowledge to generate cognitive and behavioral responses when they face ambiguous social situations with peers and with parents.

Give the central role that parents play in their children's social and emotional development (e.g., Schnieder, Atkinson, & Tardif, 2001; Collins, Maccoby, Steinberg, Heherington, & Bornstein, 2000; Rothbaum & Weisz, 1994), the present study focuses on SIP in the context of the parent-child relationship. However, because the majority of the studies that have examined behavior at different SIP steps have focused on peer relationships, the following review of the literature focuses initially on research on SIP and its correlates, as well as potential moderators of these relationships, in the peer context. Attention then shifts to the small but growing body of work on SIP in the parent-child (particularly mother-child) context. This emerging area of focus is of particular interest, in light of evidence that parenting style may play an important role in modulating links between SIP and child behavior. The final section of the introduction presents the current study and hypotheses.

### **1.1 Atypical SIP and Externalizing Behavior**

Individual differences in how children process social information predict variations in their psychological health. Indeed, externalizing symptoms (e.g., aggression, rule breaking) have been associated with, and even predicted by, biases at the SIP steps that Crick and Dodge (1994) described (see Adrian, Lyon, Oti, & Tinenko, 2010 for a review). Notably, youths with

externalizing behaviors perform atypically at each step within the model when they are interacting with peers.

At the first step of SIP, children across various developmental levels who engage in frequent and intense externalizing behaviors differ in their patterns of attending to and encoding social cues. For example, school-aged children with high externalizing behavior levels selectively attend to hostile over neutral facial expressions, and preschoolers tend to have more difficulty looking away from puppets fighting than from puppets sharing a cookie relative to peers with less frequent and intense externalizing behaviors (e.g., Dodge & Tomlin, 1987; Wilson, 2003; Gouze, 1987). School-aged children and adolescents prone to frequent externalizing behaviors also tend to exhibit biases at the second step of the model, which involves interpreting social cues (Steinberg & Dodge, 1983; Cima, Vancleef, Lobbestael, Meesters, & Korebrits, 2014). At the third step, relative to controls, school-aged children are more likely to select aggressive rather than prosocial goals (e.g., Slaby & Guerra, 1988; Frey, Nolen, Van Schoiack Edstrom, & Hirschstein, 2005). At the fourth step, children ranging in age from elementary school to preadolescence who display externalizing behaviors are more likely to generate potential aggressive responses to social situations in order to achieve their goals (e.g., Dodge, Laird, Lochman, & Zelli, 2002; Dodge et al., 2003; Orobio de Castro, Merk, Koops, Veerman, Bosch, 2005). At the fifth step of SIP, children in elementary school, middle school, and high school with externalizing behaviors tend to evaluate hostile responses as more effective than prosocial responses (e.g., Dodge, Laird, Lochman, & Zelli, 2002; Fontaine, Burks, & Dodge, 2002). Finally, aggressive 7 to 13-year-old youth were found to be more likely to enact aggressive responses than are control youth (e.g., Orobio de Castro et al., 2005).

Aberrations at the second step—cue interpretation—are the focus of the present study because these biases have reliably played an essential role in predicting externalizing behaviors in many information processing theories, not just Crick and Dodge's (1994) reformulation of the SIP model (Guerra & Heusmann, 2004; Heusmann, 1988). Additionally, biased cue interpretation accounts for a sizeable proportion of individual differences in childhood externalizing behaviors, is common among youths with externalizing behaviors (e.g., aggression and rule-breaking), and puts children at risk for later aggression (e.g., Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). In particular, research has consistently demonstrated a relationship between a bias to attribute hostile intent to peers in novel social situations and children's externalizing behaviors (Dodge, 2006).

There is relatively little evidence demonstrating where and how HAI biases originate and the purposes they may serve. Initially, researchers believed that hostile attributions, potentially coupled with reactive aggression, were a response to feeling threatened (Crick & Dodge, 1994). More recently, Dodge (2006) proposed a variant on this theory, addressing the critique that because children show marked individual differences in their reactions to identical ambiguously threatening situations, hostile attributions cannot be normative or universal response to threat. Dodge (2006) posited instead that very young children attribute hostile intent to others in an overgeneralized way as a means of voiding harm. Most of them eventually learn to distinguish situations that are not threatening and thus should be approached with benign rather than hostile attributions.

Some evidence in the attachment literature indirectly suggests that presence of early attribution biases, although little is known about hostile intent attribution per se in infants. For instance, as early as 12 months of age, babies exhibit a preference for their primary caregivers



and hesitation around novel adults (Ainsworth, 1979). These findings align with the notion that they may make positive attributions about familiar adults and more negative attributions about strangers. As these babies grow and their cognitive skills mature, they appear to become better able to determine who is safe, or to whom they should attribute benign intent, and who is not safe, or to whom they should attribute hostile intent. Individual differences, however, develop, at least in part as a function of experience. Children who experience a normative range of positive and negative social interactions, for instance, generally learn to distinguish adaptively among threatening and benign situations. These children tend to develop what Fresco and colleagues have termed explanatory flexibility (Fresco, Rytwinski, & Craighead, 2007). Those who experience abusive or otherwise adverse environments, however, are at risk for failure to learn how to tell safe and dangerous situations and stimuli apart (e.g., Pollak, Cicchetti, Hornung, & Reed, 2000). They are thus at elevated risk for developing stable attributional styles that are either indiscriminately positive or indiscriminately negative (e.g., Albus & Dozier, 1999).

This relationship between HAI biases toward peers and externalizing behaviors has been routinely detected, even when different informants have provided data regarding externalizing behaviors and when different methods have been used to measure hostile attribution of intent (HAI) biases. Steinberg and Dodge (1983), for instance, instructed middle schoolers to build block structures, which a confederate child then knocked down. Children whom peers had rated as aggressive were more likely to attribute hostile intent to the confederate than were children rated as nonaggressive. The latter group tended to interpret the confederate's actions as accidental. Similarly, elementary school-aged children in another study read vignettes that described social situations in which individuals acted with ambiguous intent. Children whom teachers and peers had identified as aggressive were more likely to attribute hostile intent to the

protagonist in the vignette than were children identified as nonaggressive (Mathieson et al., 2011).

An association between HAI biases and externalizing behaviors is also apparent when the externalizing behaviors are self-reported. In samples of healthy controls, adolescents at risk for juvenile delinquency, and juvenile delinquents, Cima and colleagues (2014) compared associations between self-reported aggression and aggressive interpretation biases. Biases were measured using an ambiguous homograph priming task. In the task, participants ranging in age from 13 to 20 years were presented with an ambiguously aggressive prime (e.g., beat) that was rapidly followed by a target string of letters that form a word that was either aggressively related to the prime (e.g., hit), semantically related to the prime (e.g., music), unrelated, or nonsense. Participants were asked to determine whether each target string was a word or a nonsense word. Faster response times to aggressively-related targets than to semantically-related targets were considered to reflect stronger aggressive interpretation biases. Results indicated that although aggressive interpretation biases did not differ significantly among the three groups, bias scores were significantly associated with self-reported aggression among members of the at-risk and the delinquent groups.

Not only does the relationship between HAI biases and externalizing behaviors appear to be consistent across various informants and methods in undiagnosed samples, but the relationship is also evident in samples of youths with clinical diagnoses. MacBrayer and colleagues (2003) recruited preadolescents diagnosed with disruptive behavior disorders from outpatient mental health facilities. Each child read hypothetical vignettes depicting ambiguous social situations and described why he or she thought each situation occurred and how he or she would respond in that situation. Relative to disorder-free control children, clinically-diagnosed

youth more often attributed hostile intent to the protagonists in the social situations, which is consistent with findings from other studies examining this relationship (see Orobio de Castro et al., 2002).

Results of research examining the temporal relationship between HAI biases and externalizing behaviors suggest that the formation of HAI biases precedes the development of externalizing behavior. For example, Dodge, Bates, and Pettit (1990) found that preschoolers who attributed hostile intent to peers in neutral social situations were rated by kindergarten teachers six months later to be more aggressive than youth who did not attribute hostile intent to peers in preschool. However, interpretation of these findings is complicated by a lack of clarity about whether and how the authors accounted for baseline aggression in their examination of the association between HAI biases and later aggression. A large longitudinal study ( $N=1299$ ) conducted more recently addressed this issue by controlling for aggression at the time of the initial assessment. In this study, children who perceived protagonists in ambiguous situations as exhibiting more frequent and intense hostile attributions of intent were more likely to exhibit frequent parent-reported aggressive behavior one and two years later during elementary school. In contrast, children who less frequently and intensely evaluated the same protagonists' intents as hostile were less likely to exhibit parent-reported aggressive behavior one and two years later (Dodge et al., 2015).

The link between externalizing behaviors and HAI biases in the context of peer relationships has been extensively researched and is detected with relative consistency across the literature; however, most of the effects reported are small to medium (e.g., Dodge & Price, 1994). A meta-analysis exploring HAI biases in children aged 4 to 18 years and their associations with externalizing symptoms found a small but significant effect size across 41

studies ( $r = .17$ ). When clinic-referred samples were excluded from the analysis, leaving only community samples, the mean effect size decreased, but remained statistically significant ( $r = .13$ ; Orobio de Castro et al., 2002).

Notably, some studies have failed to find even weakly significant associations between HAI biases and externalizing behaviors such as aggression. For example, Pettit, Dodge, and Brown (1988) found no differences in HAI biases between preschoolers rated as aggressive or nonaggressive by teachers and peers. The researchers noted a restricted range of HAI biases (i.e., both aggressive and nonaggressive children attributed hostile intent to the protagonist in the majority of the vignettes) as a limitation of their data and a factor that might have attenuated observed associations. Further, the families in this study were from economically disadvantaged backgrounds and a sizeable subset of the children and their mothers may have been maltreated. It could be that exposure to these environmental stressors made the participating preschoolers more vulnerable to experiencing distrust, leading them to attribute hostility implicitly to others regardless of the situation.

The evidence suggests that the relationship between HAI biases toward peers and externalizing outcomes might vary depending on contextual variables, which include exposure to financial stress or violence. Given this suggestion, there may be value in exploring other contexts that could shape the association between child attributions regarding others' intentions and externalizing behaviors. Most of the attention in the literature has focused on HAI biases within peer relationships; only a few studies have examined HAI biases within other relationships. For example, middle school-aged children have meaningful relationships with adults, such as their parents, and HAI biases that occur in parent-child relationships may also link to externalizing behaviors (e.g., MacKinnon et al., 2014). Research consistently

demonstrates that parenting interacts with and shapes child behavior across development (e.g., Steinberg & Morris, 2001), indicating that child attributions about their parents' intentions may be worth examining. However, the extant literature has largely neglected to investigate how the ways in which children perceive and interpret social cues from their parents impact the ways in which they behave. Thus, there is clearly a need to further examine the association between HAI biases toward parents and externalizing behaviors.

## **1.2 Atypical SIP within Parent-Child Relationships and Externalizing Behaviors**

Studies consistently detect a link between atypical SIP, specifically HAI biases about peers, and children's externalizing behavior (see Orobio de Castro et al., 2002). Children's biases can, however, be directed toward many people beyond their peers, and such non-peer HAI biases may also be associated with externalizing behavior. In particular, children who are biased to believe that their parents are likely to act with hostility may be prone to show externalizing patterns of behavior. For example, across several studies, middle school and high school-aged youth who had more intense HAI biases toward their mothers tended to act more coercively, to be more argumentative, and to make more negative comments per mother and child report when interacting with their mothers than did children who had fewer and less intense HAI biases toward their mothers (MacKinnon-Lewis, Lamb, Arbuckle, Baradaran, & Volling, 1992; Grace, Kelley, & McCain, 1993; MacKinnon-Lewis, Lamb, Hattie, & Baradaran, 2001).

While the limited research points to a link between child attributions regarding maternal intent and hostility in the mother-child relationship, the link between concurrent child maternal attributions and externalizing behavior broadly is more varied. For instance, MacKinnon-Lewis and colleagues (2014) examined racial and ethnic differences in the context of preadolescents' attributions about their mothers. They found that when African-American ( $N = 114$ ) and

European-American mothers ( $N = 154$ ) reported externalizing behaviors, there were significant associations with child maternal attributions ( $r = .13$ ,  $r = .11$ , respectively). Surprisingly, however, the results varied by race when preadolescents reported their own externalizing behaviors. White youths' self-reports of externalizing behaviors were significantly and positively associated with their attributions toward mothers ( $r = .15$ ) whereas this relationship was not significant for Black youth ( $r = .11$ ); however, these correlations did not statistically differ.

In addition to the link between HAI biases toward parents and concurrent externalizing behavior, MacKinnon-Lewis et al. (2014) examined the temporal relationship between child HAI biases regarding their parents and later externalizing behavior in the same study. One year later, the researchers presented preadolescents with vignettes of ambiguous situations involving interactions with their mothers. Children who initially attributed hostile intent more frequently to their mothers also displayed more hostility (e.g., hostile, angry, disapproving, or rejecting behavior) toward their mothers during a laboratory task one year later, even when baseline mother-child hostility was taken into account. The magnitudes of these relationships were small, but comparable to the effect sizes observed in studies of aggression and HAI biases toward peers (see Orobio de Castro et al., 2002).

Moreover, research comparing youth with and without externalizing disorders with regard to parent-focused HAI biases has yielded similar patterns of results. Bickett, Milich, and Brown (1996), for instance, compared HAI biases between school-aged boys referred for outpatient treatment for externalizing disorders (e.g., aggression, ADHD, oppositional defiant disorder, and conduct disorder) and nonaggressive control boys. Boys diagnosed with

externalizing disorders in this study were more likely to attribute hostility to their mothers, as well as to their peers and teachers, than were boys in the diagnosis-free control group.

Notably, however, not all studies have found evidence of a significant relationship between HAI biases toward mothers and child externalizing behaviors. MacKinnon-Lewis and colleagues (1994), for instance, found that although elementary school-aged aggressive boys were more likely to attribute hostility to their mothers than were their nonaggressive male peers, HAI biases toward mothers were not significantly associated with peer ratings of aggression. Methodological inconsistencies among this and the two studies that obtained significant results (they varied, for instance, in terms of participant gender composition, participant age range, and child aggression informants) make it difficult to draw confident conclusions about the association between HAI biases directed toward mothers and child externalizing behaviors broadly.

The inconsistent association between HAI biases toward parents and child externalizing behaviors, in addition to the small effect sizes within studies that did find significant associations, raise the possibility that there may be value in examining other factors that may impact this relationship. Little to no research has examined moderators of the relationship between HAI biases toward parents and child externalizing behaviors. However, there are clues from the literature on HAI biases toward peers that potential moderators may be a valuable area for further investigation.

### **1.3 Possible Moderators of the Association between HAI Biases and Externalizing Behaviors**

Empirical evidence indicates that in the context of peer interactions, a range of variables may moderate the relationship between HAI biases and externalizing behaviors. These variables

are diverse and appear to affect the relationship in distinct ways. Some of these variables are centered within the child (e.g., emotion regulation strategies, belief in a just world, latency to respond, arousal); others are more broadly centered within the family (e.g., childhood maltreatment, parental guidance).

### **1.3.1 Child-centered variables.**

Studies of the relationship between HAI biases and child externalizing behaviors with child-centered variables—ranging from self-reported beliefs to objectively-measured behaviors—as putative moderators have yielded varying results. Variability among these child-centered factors and their roles as moderators is not surprising given that they are only weakly, if at all, related to each other. Despite these dissimilarities, it may be useful to review these factors concurrently due to their one common feature, which is the child.

Bègue & Müller (2006) examined the interaction of attribution biases and belief in a just world (the belief that people get that which they deserve; Lerner & Miller, 1978) to predict self-reported aggressive reactions in three distinct types of social situations—clearly benign, clearly hostile, and ambiguous. Within the sample of adolescents characterized as rule breakers by their teachers, findings revealed that when youth encountered the ambiguous social situation, there was a negative relationship between belief in a just world and aggression. However, this relationship was nonsignificant when the adolescents were in clearly hostile social situations, suggesting that belief in a just world may act a buffer against aggressive reactions to ambiguously hostile situations but not to clearly hostile situations. A similar pattern of results was revealed in a different study when researchers examined the time it took school-aged children to respond to questions about vignettes as a moderator of the relationship between HAI biases regarding protagonists' behavior in the same vignettes and aggression. Among children



who responded quickly, there was a positive association between aggression and HAI biases. However, slow responders tended to display lower levels of aggression, regardless of their HAI biases (Dodge & Newman, 1981).

In contrast, generation of emotion regulation strategies that researchers coded as adaptive responses to anger-provoking situations did not, in at least one study, significantly moderate the relationship between HAI biases and externalizing behaviors in adolescents (Calvete & Orue, 2012). Further, Cates and Shontz (1999) obtained nonsignificant results when they investigated the effects of time pressure to report attributions by 3<sup>rd</sup> and 4<sup>th</sup> graders, indicated by self- and observer-rated nervousness, as a potential moderator of the association between HAI biases and externalizing behavior. Despite overlaps in methodology, sampling, and informants, key differences among studies may help explain discrepant findings. In particular, it appears that the studies that yielded evidence of significant interactions (i.e., between attribution biases and both belief in a just world and time to respond; Bègue & Müller, 2006; Dodge & Newman, 1981) used aggression as the outcome variable, while the studies that yielded nonsignificant findings operationalized externalizing behaviors more broadly.

### **1.3.2 Family-centered variables.**

Although studying child-centered variables as potential moderators may enhance our understanding of links between child cognitions and behavior, such research also has limitations. Shifting focus to family-centered variables, such as parenting practices or behaviors, as potential moderators offers a viable alternative or complementary path for research. Family-centered variables may be particularly valuable to examine because they can serve as fruitful targets for behavioral interventions that involve changing environmental contingencies (Kaminski, Valle, Filene & Boyle, 2008). Additionally, interventions that involve families and target family factors

may be linked to better outcomes than are treatments that focus only on intra-individual targets (e.g., cognitions; Karver, Handelsman, Fields & Bickman, 2006). For example, treatments aimed at changing behavior by changing the family context spread the responsibility across family members to enact interventions at home. Individual treatments designed to change behavior by changing the child alone, in contrast, can unintentionally pathologize the child by implicitly placing disproportionate responsibility for family issues on him or her (e.g., Rea, Tompson, Miklowitz, Goldstein, Hwang, & Mintz, 2003; Kitzmann & Beech, 2011).

A small body of evidence suggests that, among possible family-centered moderators of the HAI bias-externalizing behavior association, those that involve parenting behavior could provide an especially useful focus. Given that research consistently demonstrates that parenting interacts with and shapes child behavior across development (e.g., Steinberg & Morris, 2001), there may be value in investigating how specific parenting practices interact with HAI biases to predict externalizing behaviors. Parenting practices are typically defined as specific goal-directed, parent-enacted behaviors that influence child development (Darling & Steinberg 1993). Identifying such practices could point researchers and clinicians toward specific intervention targets that could be modulated to indirectly decrease the frequency and intensity of externalizing behaviors.

Practices differ from another commonly discussed construct—parenting style—in that parenting style is broad and encompasses the overarching goals of child development and rearing, specific goal-directed practices, and the emotional climate or social context in which practices occur (Darling & Steinberg, 1993). For example, an authoritative parenting style, a prototypic parenting style identified by Baumrind (1971), is marked by the use of several parenting practices, including acceptance and warmth, limit setting and supervision, preventative

and nonpunitive disciplinary strategies, and overall consistency (Maccoby & Martin, 1983; Gray & Steinberg, 1999). Much research has also examined what is termed an authoritarian style, which is typically associated with parenting practices such as lack of acceptance and warmth and punitive disciplinary strategies (Maccoby & Martin, 1983).

The bulk of the research on parenting practices as they relate to HAI biases focuses on a parenting practices often associated with the authoritarian style, specifically harsh parenting (e.g., Chen, Coccaro, Lee, & Jacobson, 2012). This focus on harsh parenting may be because this type of parenting appears to have harmful effects on child outcomes, including elevated rates of child and adolescent disruptive behavior disorders, school disciplinary problems, and later criminal behavior (Knutson, DeGarmo, Koepl, & Reid, 2005). Harsh parenting encompasses a continuum of behaviors that range from relatively benign acts, such as scolding, to extreme and relatively uncommon behaviors that constitute child maltreatment (Socolar, Savage, & Evans, 2007; Knutson et al., 2005).

Childhood maltreatment has not only shown direct associations with externalizing behaviors, including aggression and conduct problems in childhood (e.g., Weiss, Dodge, Bates & Pettit, 1992; Lansford et al., 2006; Wang & Kenny, 2014), but it also, in one study, moderated the relationship between HAI biases and externalizing behavior. Chen et al., (2012) found that the relationship between HAI biases toward other adults and aggression varied among adults with different levels of exposure to childhood maltreatment, defined as abuse or neglect by caregivers. Unexpectedly, however, among individuals exposed to low levels of neglect and abuse in childhood, the relationship between HAI biases and aggression in adulthood was stronger than it was among those exposed to more frequent childhood maltreatment.

Chen and colleagues (2012) postulated that their unexpected pattern of findings suggests that people exposed to childhood maltreatment behave more aggressively, regardless of whether their attributions are hostile or benign, than do non-maltreated individuals. These speculations are consistent with evidence that adults and youth exposed to maltreatment are broadly at elevated risk for emotional over-reactivity, poor impulse control, and aggression for a variety of reasons, including HAI biases (e.g., Price & Glad, 2003; Shields & Cicchetti, 1998; Shackman & Pollak, 2014; Cicchetti & Manly, 2001). While existing studies within the context of HAI biases and externalizing behaviors have focused almost exclusively on maladaptive parenting practices, there is at least one study (Arsiwalla, 2009) that suggests that adaptive parenting practices may warrant further examination.

#### **1.4 Potentially Insulating Parenting Practices**

Arsiwalla (2009) was among the first to examine the interaction between adaptive parenting practices and attribution biases as a predictor of behavioral outcomes, in a study focused on kindergarteners. Findings suggest that adaptive parenting practices may modulate the relationship between HAI biases and externalizing behaviors in a useful way. Parental guidance, measured by parents' reports of their responses when their child misbehaves among peers, was found to interact with child HAI biases to predict teacher reports of aggression. Specifically, there was a positive association between HAI biases toward peers and aggression when guidance was low. However, in the presence of high guidance, this relationship was weaker and statistically nonsignificant. These results raise the interesting possibility that parental guidance, an adaptive parenting practice, may buffer against the risks of externalizing behaviors associated with HAI biases toward peers. While these are suggestive findings, the narrow scope of the study does not permit broad conclusions—parental guidance is only one adaptive parenting

practice. There are a multitude of other ways that parents help their children learn to regulate their emotions and behavior, and these practices warrant further investigation.

There is mounting evidence that many parenting practices that vary qualitatively (e.g., childhood maltreatment, parental guidance) may modulate the relationship between HAI biases toward peers and externalizing behaviors (Chen et al., 2012; Arsiwalla, 2009). However, within the small body of literature on HAI biases toward *parents* (typically mothers) and child externalizing behaviors, few to no studies have examined the possible moderating role of parenting practices. The small amount of evidence (e.g., MacKinnon et al., 2014) that links HAI biases toward parents to child externalizing behaviors in middle school suggests that this is an area to explore. For preadolescents biased to interpret their parents' behavior as hostile, it may be especially important that their parents engage with them in constructive and adaptive ways. Additional research is warranted to explore whether and how adaptive parenting practices, beyond parental guidance, reduce childhood externalizing behaviors by buffering against the effects of children's inflexible or maladaptive attributions, specifically in the context of parent-child interactions.

Parenting practices that may be particularly useful to examine in the context of HAI biases toward parents and child externalizing behaviors are those that form the groundwork for other constructive parenting practices. Patterson & Forgatch (1987) identified several of these foundational practices, proposing that they must be implemented effectively for any other parenting practices to be effective. Two key foundational practices are monitoring/supervision and maintaining consistent and predictable patterns of parent behavior.

Parental monitoring/supervision is a parenting practice typically defined as the extent to which parents seek information about their child's friends, activities, and whereabouts

(Patterson, Reid, & Dishion, 1992). The practice of monitoring/supervision encompasses a set of behaviors that include attending to and tracking child activities, maintaining and enforcing clear rules about quantity and quality of time spent in the absence of adults, and meeting children's friends and their parents (Dishion & McMahon, 1998; Patterson & Forgatch, 1987). Several of these parent behaviors have been associated, either directly or indirectly, with lower proclivity among children to maladaptive attribution biases, as well as with less frequent and intense externalizing behaviors in childhood. In fact, studies have found that monitoring/supervision is the parenting practice that is most strongly related to child externalizing behaviors (e.g., disruptive behavior disorders; Frick, 1994).

A small body of evidence suggests direct associations between parental monitoring/supervision and child cognitions and behaviors. Although little of this work has focused on social cognitions, adolescent functional attributions (e.g., attributing success to ability rather than luck) have been linked broadly and positively to a parenting style characterized by the practices of high supervision, acceptance, and involvement (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). Parental monitoring/supervision also exhibits direct negative associations with childhood and adolescent externalizing behaviors in community samples. These relationships are consistent whether the informants are children themselves, their parents, or teachers (e.g., Barber, Olsen, & Shagle, 1994; Bradley & Corwyn, 2013; Shaffer, Lindheim, Kolko, & Trentacosta, 2013; Fosco, Stormshak, Dishion, & Winter, 2012).

Some evidence indicates that parental monitoring/supervision may moderate a variety of associations between child characteristics and behavioral outcomes in youth who ranged from elementary schoolers to adolescents (e.g., Bates, Pettit, Dodge, & Ridge, 1998; Dick et al., 2007). In these studies, the strength of the associations between child characteristics (i.e.,

temperamental resistance, genetic factors) and externalizing outcomes is weakened under conditions of more frequent parental monitoring/supervision as reported by children and independent observers. These patterns of association are consistent with the idea that parental monitoring/supervision has the potential to buffer against existing risk factors for externalizing behaviors.

Acting in consistent and predictable ways is another parenting practice that Patterson and Forgatch (1987) considered to be foundational. In particular, consistent and predictable behavior seems especially important in the context of discipline. Consistent discipline encompasses parent resistance to giving in to the child, insistence that rules are followed, and provision of regular feedback regarding appropriate and inappropriate behaviors (Arnold, O'Leary, Wolff, & Acker, 1993). A small body of empirical research on consistent discipline and its correlates suggests the presence of direct links both to childhood cognitions and child behaviors. For instance, the experience of consistent discipline, as well as reward-based discipline, has been associated with the presence of less frequent and pervasive preadolescent HAI biases (e.g., Gomez, Gomez, DeMello, & Tallent, 2001). From elementary school to high school, those who received consistent discipline also tended to exhibit fewer externalizing behaviors, regardless of whether parents or the youth themselves served as informants (e.g., Goraya & Shamama-tus-Sabah, 2013; Ullsperger, Nigg, & Nikolas, 2015; Martin, Kim, Bruce, & Fisher, 2013).

A sparse body of work has also yielded evidence that consistent discipline, along with other parenting practices often considered to be adaptive (e.g., high warmth, more explanation of parent actions, use of rewards), can moderate the relationships between child characteristics (i.e., temperament, personality traits) and behavioral outcomes in kindergarteners and preadolescents (Patterson & Sanson, 1999; O'Connor & Dvorak, 2001). There appears to be a stronger positive

relationship between child temperamental and personality characteristics and externalizing behaviors in the absence of these typically adaptive parenting practices. In contrast, the HAI bias-externalizing behavior relationship is effectively neutralized when parents implement these practices. Taken together, the results of relevant studies suggest that a warm, consistent, and clear approach to discipline may protect children from risk factors for externalizing behaviors.

Research to date suggests that these foundational parenting practices (e.g., monitoring/supervision, consistent discipline) mitigate the potentially harmful impact of child characteristics that can serve as risk factors for externalizing behaviors (e.g., early temperament, genetics, personality traits). It is possible that by parenting in attentive and consistent ways, caregivers help to create an environment in which children with or without HAI biases learn to react to challenging social situations without resorting to externalizing behaviors. Additionally, attentive and consistent parenting practices may limit a child's access to risky situations that provide opportunities to act in externalizing ways.

Both parenting practices—monitoring/supervision and consistent discipline—appear to strongly relate to externalizing behaviors in childhood and adolescence (Frick, Christian, & Wootton, 1999; Frick, 1994); however, some studies have found the association between monitoring/supervision and externalizing behaviors to be significantly stronger than the association between consistent discipline and externalizing behaviors (e.g., Patterson & Stouthamer-Loeber, 1984). A next logical step, given evidence of both the direct and indirect relationships between parenting and child outcomes, is to examine how parental monitoring/supervision and consistent discipline might affect the relationship between child HAI biases and externalizing behaviors.



## 1.5 The Present Study and Research Aims

The aim of the present study was to examine patterns of associations among childhood HAI biases, externalizing behaviors, and foundational parenting practices (monitoring/supervision and consistent discipline) in a sample drawn from a community population. Based on data collected as part of a larger parent study, the present research was designed to examine whether and how parental monitoring/supervision and consistent discipline moderate the relationship between child HAI biases toward parents and externalizing outcomes. More specifically, the study tested the hypotheses that monitoring/supervision and consistent discipline attenuate the positive relationship between childhood HAI biases toward mothers and externalizing behaviors.

The present study has potential to increase our knowledge about parenting practices that could encourage positive behavioral outcomes in preadolescents who may be predisposed to externalizing behaviors, partly due to their HAI biases. It was expected that with regular exposure to monitoring/supervision and consistent discipline, children would be less likely to engage in externalizing behaviors than would peers who were not exposed to those parenting practices, regardless of the degree to which they exhibit HAI biases. Support for this hypothesis would suggest that parent management training could be effective in reducing externalizing behaviors for children displaying intractable hostile attributions; absence of support for this hypothesis would suggest that there is a subset of children who may require multi-modal interventions that extend beyond parent training to effectively decrease problem behaviors.

The present study focuses on interactions between child HAI biases toward parents and both parental monitoring/supervision and consistent discipline as potential predictors of externalizing behavior in a sample of preadolescents. Notably, the literature on which

hypotheses were based encompassed studies that sampled from a broad range of ages, from preschool through late adolescence and young adulthood. Given the importance of cognitive skills, processing speed, and learning histories for SIP (Crick & Dodge, 1994), findings regarding young children and teenagers may vary in their direct relevance to hypotheses for the current, more narrowly focused study of preadolescents. Because there is considerable consistency across findings despite sampling differences, however, the literature as a whole provides a useful foundation for research on samples from specific age periods, such as preadolescence.

Preadolescence, typically defined as the start of puberty (Corsaro, 2005), is marked by rapid and significant social and emotional changes, as well as increased cognitive flexibility (Kogan, 2013). In addition, the parent-child relationship undergoes dramatic changes in preadolescence. Parents begin to alter the frequency and intensity with which they monitor/supervise their children and to grant their preadolescents more independence (Smetana, Crean, & Campione-Barr, 2005). Both children and parents report diminished quality of their relationship from late elementary school to early middle school. Specifically, youth reported spending less time with their parents than they did when they were younger (Larson & Richards, 1991) and engaging in more frequent and intense conflicts with their parents (Laursen, 1995). Additionally, preadolescent children perceive their relationships with their mothers less positively than they did when they were younger (Lynch & Cicchetti, 1997). Further, both youth and parents report experiencing their relationship as less close in adolescence than earlier in development (Steinberg, 1988).

In the present study, I measured HAI biases in response to hypothetical vignettes about ambiguous situations that involve the child and his or her mother. The majority of research

investigating HAI biases in youth has examined responses to hypothetical vignettes containing ambiguous situations involving peers (see Orobio de Castro et al., 2002). This measurement approach offers potentially novel insight into how parenting may influence externalizing behaviors in children with and without HAI biases in the context of a mother-child relationship.

The present study also has the potential to enhance our understanding of the relationship between HAI biases and externalizing behavior. To date, most studies of HAI biases and externalizing behavior have relied on teacher-, peer-, or self-reported externalizing behavior, with surprisingly little attention to the relationship between child HAI biases and parent-reported child externalizing behaviors. Not only do parents tend to be more diagnostically accurate reporters of observable childhood externalizing behaviors than do children (Jensen et al., 1999), but children also tend to behave inconsistently across settings (e.g., home, school; De Los Reyes & Kazdin, 2005); thus, examining parent-reported externalizing behaviors offers a new perspective not often taken in the existing literature.

**Primary aim 1.** Explore associations among hostile attributions of maternal intent, externalizing behaviors, and parenting practices.

***Hypothesis 1a.*** Scores on a measure of hostile attributions of maternal intent would be positively associated with scores on parent- and child-report measures of externalizing behaviors.

***Hypothesis 1b.*** Scores on a measure of hostile attributions of maternal intent would be negatively associated with scores on measures of (a) monitoring/supervision and (b) consistent discipline.

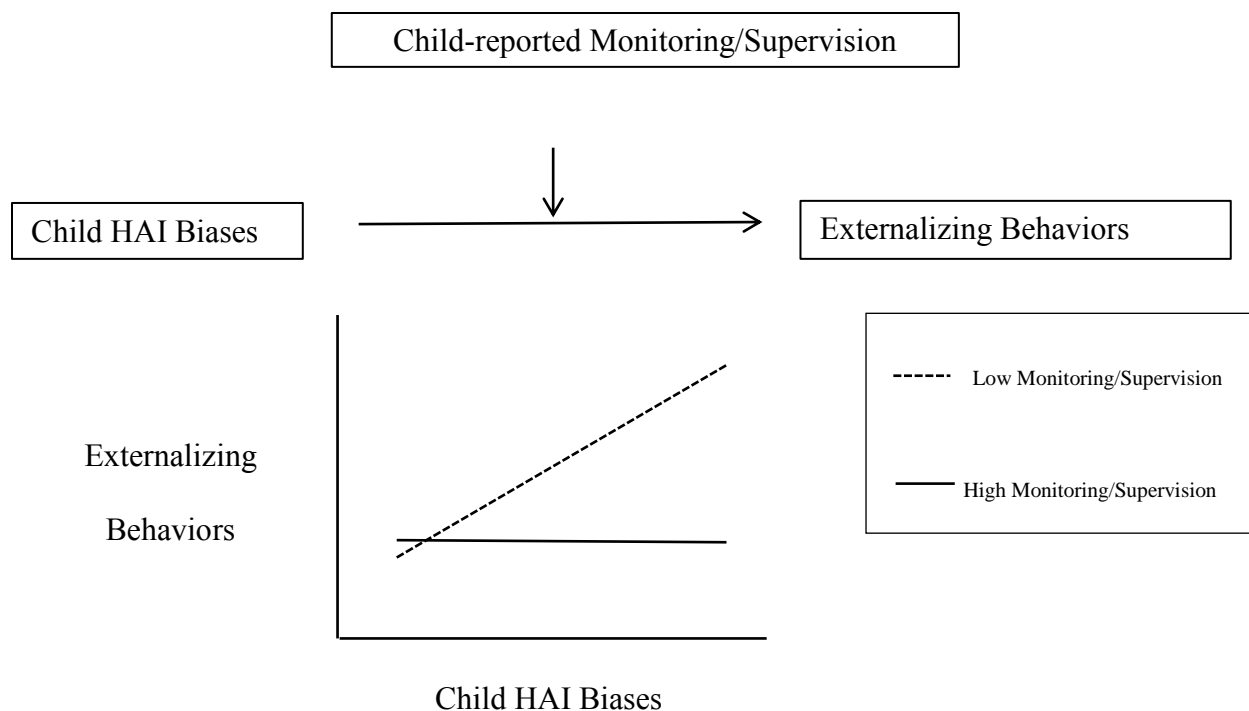
***Hypothesis 1c.*** Scores on measures of (a) monitoring/supervision and (b) consistent discipline would be negatively associated with externalizing behaviors.

**Primary aim 2.** Explore the potential moderating role of parenting practices on the relationship between hostile attributions of maternal intent and externalizing behaviors.

***Hypothesis 2a.*** There would be a main effect of HAI bias such that scores on a measure of mother-oriented HAI biases would be significantly and positively associated with fewer parent-and child-reported externalizing behaviors.

***Hypothesis 2b.*** There would be main effects of (a) monitoring/supervision and (b) consistent discipline such that the parenting practices would be negatively associated with parent- and child-reported externalizing behaviors.

***Hypothesis 2c.*** HAI biases and parenting practices would interact to predict parent-and child-reported externalizing behaviors, such that the relationship between HAI bias and externalizing behavior would be stronger in families with less monitoring/supervision and consistent discipline than in families with more monitoring/supervision and consistent discipline (see Figure 1).



**Figure 1. The hypothesized interaction of HAI bias regarding maternal intent and parenting practices to predict parent- and child-reported externalizing behaviors**

### 1.5.1 Exploratory aims.

Explore associations among hostile attributions of maternal intent, parenting practices, and both aggressive behaviors and rule-breaking behaviors. Additionally, explore the potential moderating role of parenting practices on the relationship between hostile attributions of maternal intent and both aggressive and rule-breaking behaviors.

## 2 METHOD

### 2.1 Participants

The data I used in the current project were drawn from a larger study focused on parenting, peer, and academic factors and their associations with child outcomes during the preadolescent transition to middle school. Seven waves of data were collected (6<sup>th</sup> grade through

8<sup>th</sup> grade); in the current study, I only used data from the first wave, which occurred the summer before the participants entered sixth grade.

Parents of fifth-grade students at 13 public schools in a metropolitan southeastern city were contacted by telephone the summer before their child began sixth grade. A total of 300 mother-youth dyads consented to participate in the study, and 268 dyads completed the first wave of data collection. There were no significant differences in child age, family income, or maternal education level between dyads that dropped out of the study and those that continued to participate ( $p > .05$ ). The sample for the current analyses comprised the 268 youths (131 female) and their mothers who completed the first wave. The youths' ages ranged from 10 to 14 years ( $M = 12.61$ ,  $SD = .87$ ). The majority of youth were White (57%,  $n = 153$ ), with the remaining youth identifying as African American (39%,  $n = 105$ ), American Indian (1%,  $n = 4$ ), or other (2%,  $n = 5$ ). Approximately 52% of participants reported a combined household income of less than \$40,000, 45% of families reported a combined income between \$40,000 and \$80,000, and 3% reported an income over \$80,000.

## **2.2 Procedure**

A university Institutional Review Board approved all study procedures. Mother-youth dyads presented to a university laboratory for data collection the summer before the child's entry into sixth grade. Mothers provided consent for their own participation and their child's participation, and children provided assent. Each visit lasted about three hours, during which mothers and youth completed interviews, questionnaires, and behavioral tasks.

## **2.3 Measures**

### **2.3.1 Family demographics.**

Mothers completed a questionnaire regarding family demographics, including race and total family income. Family income was reported in brackets: 1 = <\$10,000; 2 = \$10,000 – 19,999; 3 = \$20,000 – 29,999; 4 = \$30,000 – 39,999; 5 = \$40,000 – 49,999; 6 = \$50,000 – 59,999; 7 = \$60,000 – 69,999; 8 = \$70,000 – 79,999; 9 = \$80,000 – 89,999; 10 = ≥\$90,000.

### **2.3.2 Parenting Style Index.**

I used the 8-item Strictness/Supervision scale of the 36-item Parenting Style Index (Lamborn, Mounts, Steinberg & Dornbusch, 1991; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994; see Appendix A) to examine youths' perceptions of parental monitoring. Children rated the first two items on a 7-point Likert scale ranging from 1 (agree strongly) to 4 (disagree strongly) for items about how late they are permitted to stay out. Items include “In a typical week, what is the latest you can stay out on school nights?” and “In a typical week, what is the latest you can stay out on Friday and Saturday?” On the remaining six items, children rated how much their parents knew or tried to know about their lives on a 3-point Likert scale ranging from 1 (don't try/know) to 3 (really try/know). Sample items include, “How much do your parents try to know where you go at night?” and “How much do your parents really know what you do with your free time?”

Cronbach's alpha for the child-reported Strictness/Supervision scale has ranged from .76 to .84 in published studies (Gray & Steinberg, 1999; Aye, Lau, & Nie, 2008). In the current sample, Cronbach's alpha was .70 for child report. This subscale has been significantly associated with measures of behavior problems ( $r = -.30$ ) and not with measures of internalizing disorders or psychosocial development (Gray & Steinberg, 1999).

### **2.3.3 Parenting Scale.**

Mothers completed the 11-item Laxness Subscale of the 30-item Parenting Scale, which assesses the likelihood that parents are consistent in their disciplinary practices (Arnold et al.; see Appendix B). This measure has been validated for use with school-aged children (Collett, Gimpel, Greenson, & Gunderson, 2001). Each item assesses disciplinary practices by asking about the frequency with which the parent used a particular disciplinary practice in the past two months. Items are scored on an 8-point scale, which is anchored at one end by a consistent discipline strategy (e.g., “I stick to what I said”) and at the other end by an inconsistent disciplinary strategy (e.g., “When I say my child can’t do something, I let him do it anyways”). Total scores are the mean of all the items. Higher scores correspond to more consistent disciplinary practices. Cronbach’s alpha ranges from .74 to .88 (Arnold et al., 1993; Freeman & Decourcey, 2006; Collett et al., 2001). Cronbach’s alpha could not be calculated for the current study because I only had access to the summary scores. In support of the validity of this measure, consistent discipline has been significantly associated with measures of externalizing problems ( $r = .41$ ; Arnold et al., 1993) and disruptive behaviors ( $r = .33$ ; Freeman & Decourcey, 2006). In contrast, the measure has not been associated with measures of depression ( $r = .06$ ; Arnold et al., 1993).

### **2.3.4 Hostile attributions.**

Children were administered the Child Attribution Measure (CAM; MacKinnon-Lewis et al., 1992), which involves reading five hypothetical vignettes (see Appendix C). Each vignette describes the participating child being subjected to a negative outcome as a result of an ambiguous maternal behavior. For example, “Pretend that you and your mom are shopping at the grocery store and that you reach for a candy bar that you want to look at. Your mother tells



you that you cannot have it.” Following each story, the interviewer asked the child the open-ended question, “Why do you think your mother would do this?” Previous research with this measure indicated that children exhibited greater response variability when the question was posed as open-ended than they did when they were instructed to respond using a fixed rating scale to measure how hostile they perceived their mother’s response (MacKinnon-Lewis et al., 1992).

Open-ended responses were coded on a 5-point scale (5= hostile; meaning that the mother acted purposefully with negative intent, e.g., “She was being mean”, “She was punishing me”; 4 = moderately hostile, e.g., “She didn’t think I deserved it”, “Because she wanted all the money for herself”; 3 = neutral, the behavior was attributed to the mother acting in a harmless way or due to circumstances out of her control like an accident, e.g., “She was in a hurry”, “She didn’t have enough money”; 2 = moderately prosocial, e.g., “She knew we already had it at home”, “Because I already had a snack”; and 1=prosocial, the behavior was attributed to positive intentions, e.g., “She thought it wasn’t healthy”, “She didn’t want me to spoil my appetite”). Cronbach’s alpha in the current sample was .73. Two coders scored 20% of the vignettes for reliability,  $K = .86$ .

### **2.3.5 Child externalizing symptoms.**

Mothers completed the Child Behavior Checklist 6-18 (CBCL; Achenbach, 1991) and youth completed the Youth Self-Report (YSR; Achenbach, 1991). The CBCL and YSR measure a wide range of behavior problems in children over the past six months. The current study used the Externalizing Problems scale, which measures aggression (e.g., “My child is stubborn, sullen, or irritable” “My child demands a lot of attention”) and rule-breaking (e.g., “My child break

rules at home”, “My child swears or uses obscene language”) behaviors using a scale that ranges from 0 (not true) to 2 (very true or often true).

The CBCL Externalizing Problems scale has demonstrated internal consistency ( $\alpha = .94$ ) and retest reliability over a one-week interval ( $r = .92$ ; Achenbach & Rescorla, 2001). I did not have item-level data for parent report, so Cronbach’s alpha could not be calculated for the current sample. Additionally, the CBCL Externalizing Problems scale has been positively and significantly associated with other parent- and teacher-reported measures of aggressive and rule-breaking behaviors (Achenbach & Rescorla, 2001). In contrast, the CBCL Externalizing Problems scale has not been associated with measures of stress, anxiety, or somatic symptoms (Ruggiero & McLeer, 2000; Meesters, 2003)

The YSR Externalizing Problems scale has demonstrated internal consistency ( $\alpha = .89$ ) and retest reliability over a one-week interval ( $r = .90$ ; Achenbach & Rescorla, 2001). In the current sample, Cronbach’s alpha was .87 for child report. Additionally, the YSR Externalizing Problems scale has been significantly associated with other measures of behavior problems (Epstein, Mooney, Ryser, & Pierce, 2004). In contrast, the YSR Externalizing Problems scale has not been associated with measures of various types of anxiety symptoms (Essau, Muris, & Ederer, 2002). In the current study, I used T-scores because they served as the basis for the empirically-derived cut-off scores between the group within normal limits and the group at-risk for externalizing behaviors (Achenbach & Rescorla, 2001).

## **2.4 Data Analysis Approach**

Preliminary analyses were first conducted to make sure the data were entered correctly and to evaluate variable distributions for normality and collinearity. Descriptive statistics, including means and standard deviations of all variables were calculated and bivariate

correlations between all main study variables were examined. Standardized residuals were examined and one multivariate outlier was identified. For this participant, the next highest score in the distribution was substituted for each relevant variable (Field, 2013). Correlation analyses confirmed that multicollinearity was not a problem (variance inflation factors [VIF] < 10; tolerance > 0.2; Field, 2013). Visual inspection of frequency histograms revealed that the raw scores of the outcome variables (CBCL Externalizing, CBCL Aggression, CBCL Rule Breaking, CBCL Externalizing, CBCL Aggression, CBCL Rule Breaking scales) were positively skewed and not normally distributed. Additionally, visual inspection of plotted residuals against standardized predicted values confirmed that the residuals of the outcome variables were not normally distributed.

Linear regression was considered; however, to address non-normality of the data, I elected to test a model for which logistic regression provided a better fit.<sup>1</sup> I treated the outcome variables as dichotomous categorical variables rather than continuous variables.

Dichotomization is not a preferred method of analysis, because it can result in loss of information about individual differences and can also present challenges to interpretation of results by employing cut-off points that may be arbitrary (MacCallum, Zhang, Preacher, & Rucker, 2002). However, the CBCL and YSR scales have empirically-derived cutpoints, which can be used to dichotomize data in a meaningful way according to participants' T-scores (Achenbach & Rescorla, 2001). I recoded the CBCL Externalizing and YSR Externalizing scales into new dichotomous variables (0-within normal limits, 1-borderline clinical/at-risk or clinical).

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<sup>1</sup> Transformation of outcome variables was considered; however, there were no methods of transformation that altered the skewness, kurtosis, and distribution of the residuals to meet the assumption of normality of residuals to fit the data to a linear regression model. Despite non-normality of residuals, linear regression analyses with square-root transformed variables were conducted. Results did not differ drastically from results obtained via logistic regression analyses.

The CBCL YSR Aggression scales were dichotomized the same way (0-within normal limits, 1-borderline clinical/at-risk or clinical) in exploratory analyses due to the extreme positive skew of the distributions. I dichotomized the CBCL and YSR Rule-Breaking scales differently, dividing them in terms of zero responses and non-zero responses, because of the extreme positive skew of those distributions.

Prior to hypothesis testing, the data were also examined to check that all logistic regression assumptions were met (Tabachnick & Fidell, 2007). Parameter estimates and standard errors indicated that the ratio of cases to variables was acceptable. Correlation analyses conformed that multicollinearity was not a problem. Independence of errors was assumed, since the study design was between subjects and supported by the lack of multicollinearity.

I conducted logistic regression analyses to test the hypotheses that HAI biases interacted with monitoring/supervision and consistent discipline to predict various externalizing outcomes. Predictor variables were mean-centered to reduce multicollinearity. Sex was entered as a covariate in the first block, followed by the mean-centered predictor variables, and finally the interaction terms. Simple slopes analyses were conducted as needed to probe statistically significant interactions. I conducted analyses using IBM SPSS Statistics 21.

I conducted a post-hoc power analysis using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Alpha probability error was set at .05, the sample size was set at 268, and power was set at 80%. Two power analyses were completed to assess power for the current analyses. For Aim 1, a power analysis was completed based on Orobio de Castro and colleagues' (2002) findings for the correlational analyses, which yielded an effect size of  $r = .13$ . Results of this analyses suggested that there was adequate power to conduct analyses. For Aim 2, a power analysis was completed based on Ariswalla's (2009) findings, which yielded and

effect size of  $f^2 = .06$ . Results of this analysis also suggested there was adequate power to conduct regression analyses. Based on both power analyses, the sample size was large enough to maximize power and reduce the potential for Type II error.

### 3 RESULTS

#### 3.1 Preliminary Analyses

Prior to analyses, all study variables were examined for accuracy of data entry, missing values, and fit between their distributions and assumptions of logistic regression. There were no missing values. Descriptive statistics for all study variables are presented in Table 1.

**Table 1. Descriptive Statistics: Main Study Variables Raw Scores (n=268)**

Notes. HAI=Hostile Attribution Bias, CBCL=Child Behavioral Checklist, YSR=Youth Self-Report; Possible ranges of variables: HAI Bias (5-25), Child-report Monitoring (8-26), Parent-report Consistent Discipline (0-7), CBCL Externalizing (0-60), CBCL Aggression (0-32), CBCL Rule Breaking (0-28), YSR Externalizing (0-60), YSR Aggression (0-38), YSR Rule Breaking (0-22).

	<u>Range</u>	<u>Mean</u>	<u>Standard Deviation</u>
HAI Bias	5-21	14.73	2.56
Child-report Monitoring	15-34	26.54	3.30
Parent-report Consistent Discipline	0-7	4.01	1.35
CBCL Externalizing	0-41	8.35	7.21
CBCL Aggression	0-35	6.90	6.01
CBCL Rule Breaking	0-9	1.45	1.61
YSR Externalizing	0-32	9.08	6.67
YSR Aggression	0-35	7.28	5.61
YSR Rule Breaking	0-13	1.86	1.89

I also examined gender and income group differences. Scores on the CBCL Externalizing scale, CBCL Aggression scale, and CBCL Rule Breaking scale were higher for boys than girls (see Table 2). No other study variables differed by gender.

**Table 2. T-test of Gender Differences between Study Variables**

Notes. \* $p < .05$ ; HAI = Hostile Attribution of Intent, YSR = Youth Self-Report, CBCL = Child Behavior Checklist.

	Male ( $n = 136$ )		Female ( $n = 131$ )		<i>t</i> -test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
HAI Bias	14.58	2.33	14.89	2.79	-.97
Child-report Monitoring	26.31	3.35	26.78	3.23	-1.17
Parent-report Discipline	4.00	1.44	4.01	1.26	-.09
CBCL Externalizing	9.42	6.93	7.24	7.39	2.48*
CBCL Aggression	7.72	5.69	6.05	6.26	2.28*
CBCL Rule Breaking	1.70	1.73	1.19	1.46	2.59*
YSR Externalizing	9.01	6.41	9.15	7.00	-.18
YSR Aggression	7.26	5.61	7.31	5.64	-.07
YSR Rule Breaking	1.87	1.98	1.85	1.81	.09

Participants reported their annual income in \$10,000 brackets (from 1 = <\$10,000; to 10 = ≥\$90,000). However, the distribution was heavily skewed toward the lower end of the scale. I performed a median split to account for the uneven distribution and looked at group differences between low (<\$10,000 - 49,999) and high (\$50,000 - ≥\$90,000) income groups. There were no differences by income group across the study variables.

### 3.2 Hypothesis Testing: Primary Aims

#### 3.2.1 Primary aim 1.

I calculated zero-order correlations between all study variables. As shown in Table 4, HAI Bias scores were significantly and positively associated with scores on the YSR Externalizing scale, but not with scores on the CBCL Externalizing scale. HAI Bias scores were not associated with either monitoring/supervision or with consistent discipline. Parent-reported consistent discipline scores were significantly and negatively associated with scores on the YSR

Externalizing scale. However, none of the other associations between parenting practices and Externalizing scale scores were significant.

**Table 3. Zero-Order Correlations between Main Study Variables (n=268)**

Notes. \* $p < .05$ ; \*\* $p < .01$ ; HAI=Hostile Attribution Bias, CBCL=Child Behavioral Checklist, YSR=Youth Self-Report.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
1. HAI Bias	-							
2. Child-report Monitoring	.01	-						
3. Parent-Report Discipline	-.03	.07	-					
4. CBCL Externalizing	.07	-.01	.07	-				
5. CBCL Aggression	.07	.01	-.09	.99**	-			
6. CBCL Rule Breaking	.05	-.10	-.02	.80**	.69**	-		
7. YSR Externalizing	.14*	-.08	-.12*	.30**	.30**	.22**	-	
8. YSR Aggression	.14*	-.05	-.13*	.26**	.27**	.18**	.97**	-
9. YSR Rule Breaking	.13*	-.10	-.09	.26**	.24**	.27**	.76**	.63**

### 3.2.2 Primary aim 2.

I performed a binary logistic regression analysis with parent-reported externalizing behavior as the outcome (0-within normal limits, 1-borderline clinical/at-risk or clinical), sex as a covariate, and five predictors: HAI bias, monitoring/supervision, consistent discipline, and the interaction of HAI bias with (a) monitoring/supervision and (b) consistent discipline. A test of the full model with covariates and predictors against a constant-only model was not statistically significant ( $X^2(6) = 10.39, p = .11$ ), indicating that the predictors did not reliably distinguish between children with externalizing behaviors that were within normal limits and those at-risk for externalizing behaviors per parent report. However, there were significant main effects of sex ( $X^2(1) = 4.73, p < .05$ ) and consistent discipline ( $X^2(1) = 5.14, p < .05$ ; see Table 4).



**Table 4. HAI Bias by Parenting Practices to Predict CBCL Externalizing**Notes. \* $p < .05$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	-.69	.32	4.73*	.50	.27	.93
HAI Bias (centered)	.03	.06	.21	1.03	.91	1.17
Monitoring/Supervision (centered)	.04	.05	.87	1.05	.95	1.15
Consistent Discipline (centered)	-.25	.11	5.14*	.78	.63	.97
HAI x Monitoring	-.01	.02	.21	.99	.95	1.03
HAI x Discipline	.03	.05	.34	1.03	.94	1.13
Constant	-.34	.47	.54			

I performed another binary logistic regression analysis identical to the previous one except the outcome variable was child-reported externalizing behavior (0-within normal limits, 1-borderline clinical/at-risk or clinical). A test of the full model with all five predictors against a constant-only model was not statistically significant ( $X^2(6) = 12.24, p = .06$ ), indicating that the predictors did not reliably distinguish between children with externalizing behaviors that were within normal limits and those at-risk for externalizing behaviors per child report. There was a significant main effect of consistent discipline,  $X^2(1) = 4.01, p < .05$  (see Table 5).

**Table 5. HAI Bias by Parenting Practices to predict YSR Externalizing**Notes. \* $p < .05$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	.16	.28	.33	1.18	.67	2.07
HAI Bias (centered)	.09	.06	2.50	1.10	.98	1.23
Monitoring/Supervision (centered)	-.08	.04	3.62	.92	.85	1.00
Consistent Discipline (centered)	-.21	.11	4.01*	.81	.66	1.00

HAI x Monitoring	.01	.02	.07	1.01	.97	1.05
HAI x Discipline	-.03	.05	.42	.97	.89	1.06
Constant	-1.30	.46	.46			

### 3.3 Exploratory Aims

See Table 3 for the bivariate correlations analyses I performed with exploratory analysis variables.

### 3.4 Aggression.

I performed a binary logistic regression analysis with parent-reported aggressive behavior as the outcome (0-within normal limits, 1-borderline clinical/at-risk or clinical), sex as a control variable, and four predictors: monitoring/supervision, consistent discipline, and the interaction of HAI bias with (a) monitoring/supervision and (b) consistent discipline. A test of the full model against a constant-only model was not statistically significant ( $X^2(6) = 9.59, p = .14$ ), indicating that the predictors did not reliably distinguish between children with aggressive behaviors that were within normal limits and those at-risk for aggressive behaviors per parent report (see Table 6).

**Table 6. HAI Bias by Parenting Practices to Predict CBCL Aggression**

Notes. \* $p < .05$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	-.42	.44	.91	.66	.28	1.56
HAI Bias (centered)	.19	.10	3.47	1.21	.99	1.48
Monitoring/Supervision (centered)	.07	.07	1.09	1.08	.94	1.24
Consistent Discipline (centered)	-.23	.15	2.44	.79	.59	1.06
HAI x Monitoring	-.03	.03	.82	.97	.92	1.03
HAI x Discipline	.16	.07	5.44*	1.18	1.03	1.35
Constant	-1.82	.66	.66			

I performed another binary logistic regression analysis identical to the previous one except that the outcome variable was child-reported aggressive behavior (0-within normal limits, 1-borderline clinical/at-risk or clinical). A test of the full model against a constant-only model was statistically significant ( $X^2(6) = 14.64, p < .05$ ), indicating that the predictors reliably distinguished between children with aggressive behaviors that were within normal limits and those at-risk for aggressive behaviors per child report. The variance in aggressive behavior status accounted for was small (Nagelkerke's  $R = .12$ , indicating that 12% of the variance in child-reported aggressive behavior was accounted for by the model). One hundred percent of the children with aggressive behaviors within normal limits and 0% of the children with at-risk aggressive behaviors were correctly predicted, with an overall success rate of 91.4%. According to the Wald criterion, consistent discipline predicted aggressive behavior ( $X^2(1) = 8.96, p < .01$ ). The odds ratio of .63 shows change in likelihood of being at-risk for externalizing behaviors based on a one-unit change in consistent discipline. Thus, consistent discipline distinguishes between children at-risk for externalizing behaviors and those within normal limits, but the distinction is weak (see Table 7).

**Table 7. HAI Bias by Parenting Practices to Predict YSR Aggression**

Notes. \*\* $p < .01$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	.42	.47	.79	1.52	.60	3.84
HAI Bias (centered)	.12	.11	1.30	1.13	.92	1.39
Monitoring/Supervision (centered)	.03	.07	.13	1.03	.89	1.18
Consistent Discipline (centered)	-.47	.16	8.96**	.63	.46	.85
HAI x Monitoring	.01	.03	.03	1.01	.94	1.07
HAI x Discipline	-.04	.07	.40	.96	.84	1.10

Constant	-3.25	.79	.79
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### 3.4.1 Rule Breaking.

I performed a binary logistic regression analysis with parent-reported rule-breaking behavior as the outcome (0-no rule-breaking behavior, 1-some rule-breaking behavior), sex as a covariate, and four predictors: monitoring/supervision, consistent discipline, and the interaction of HAI bias with (a) monitoring/supervision and (b) consistent discipline. A test of the full model against a constant-only model was not statistically significant ( $X^2(6) = 7.29, p = .30$ ), indicating that the predictors did not reliably distinguish between children with some rule-breaking behaviors and those with none per parent report. There was a significant main effect of sex, ( $X^2(1) = 4.71, p < .05$ ) (see Table 8).

**Table 8. HAI Bias by Parenting Practices to Predict CBCL Rule Breaking**

Notes. \* $p < .05$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	-.57	.26	4.71*	.56	.34	.95
HAI Bias (centered)	.02	.05	.11	1.02	.92	1.13
Monitoring/Supervision (centered)	-.05	.04	1.61	.95	.88	1.03
Consistent Discipline (centered)	.05	.10	.27	1.05	.87	1.27
HAI x Monitoring	-.01	.02	.01	1.00	.96	1.04
HAI x Discipline	-.02	.04	.16	.98	.90	1.07
Constant	1.52	.43	12.63			

I performed another binary logistic regression analysis identical to the previous one except that the outcome variable was child-reported rule-breaking behavior (0-no rule-breaking behavior, 1-some rule-breaking behavior). A test of the full model against a constant-only model

was not statistically significant ( $X^2(6) = 6.20, p = .40$ ), indicating that the predictors did not reliably distinguish between children with some rule-breaking behaviors and those with none per child report. There were no significant main effects (see Table 9).

**Table 9. HAI Bias by Parenting Practices to Predict YSR Rule Breaking**

Notes. \* $p < .05$ ; S.E. = Standard Error, HAI = Hostile Attribution of Intent.

<u>Variables</u>	<u>B</u>	<u>S.E.</u>	<u>Wald <math>X^2</math>- test</u>	<u>Odds Ratio</u>	<u>95% Confidence Interval for Odds Ratio</u>	
					<u>Lower</u>	<u>Upper</u>
Sex	.08	.30	.07	1.08	.60	1.93
HAI Bias (centered)	.08	.06	2.07	1.07	.97	1.22
Monitoring/Supervision (centered)	-.07	.05	2.05	.93	.85	1.03
Consistent Discipline (centered)	.06	.11	.32	1.06	.86	1.32
HAI x Monitoring	.02	.02	.65	1.02	.98	1.06
HAI x Discipline	-.04	.05	.79	.96	.87	1.05
Constant	1.11	.46	.76			

#### 4 DISCUSSION

The present study examined children's social information processing, specifically their tendency to make hostile attributions in the context of the mother-child relationship, and its patterns of associations with parenting and behavioral outcomes. I sought to understand whether and how foundational parenting practices (monitoring/supervision and discipline) moderate the relationship between HAI biases toward mothers and externalizing behaviors in children. Of particular interest was the possibility that parenting practices commonly considered to be adaptive might buffer against the risk that youth with HAI biases will exhibit externalizing behaviors.

I first tested the prediction that HAI biases would be positively associated with externalizing behaviors and negatively associated with the presence of adaptive parenting practices and that parenting practices would be negatively associated with externalizing

behaviors. Second, I tested the hypotheses that parenting practices (monitoring/supervision and consistent discipline) would moderate the association between child HAI biases regarding maternal intent and parent and child reports of externalizing behavior. Finally, in exploratory analyses, I examined these same parenting practices as potential moderators of the association between child hostile attributions about maternal intent and child and parent reports of aggressive and rule breaking behaviors.

Broadly, results yielded limited support for the study hypotheses. Given the small to medium effect sizes found in earlier studies examining relationships between HAI biases and externalizing behavior in the context of peer relationships (e.g., Orobio de Castro et al., 2002), this outcome is not entirely surprising. Further, small interaction effects are particularly hard to detect in the absence of very large samples (McClelland & Judd, 1993). However, factors unrelated to statistical power may also have figured in the pattern of significant and non-significant findings that I obtained. In the sections below, I present the findings, broken out by aim, and explore possible interpretations. Subsequently, I discuss limitations of the current study and offer suggestions for future research.

#### **4.1 Aim 1**

Primary Aim 1 was to explore associations among hostile attributions of maternal intent, externalizing behaviors, and parenting practices. Results partly supported the prediction that child HAI biases toward mothers would be positively associated with externalizing behaviors. The association was positive and significant, although small ( $r = .14$ ), when the child served as the reporter for externalizing behaviors; in contrast, the relationship between HAI biases and parent-reported externalizing behaviors was not significant. The small but significant effect size is consistent with those obtained in studies examining the relationship between externalizing

behaviors and child HAI biases toward peers (Orobio de Castro et al. 2002). Findings from one study, however, suggest a more nuanced relationship between aggression and HAI biases, with different patterns appearing, depending on the participants' racial identity (MacKinnon-Lewis et al., 2014). Thus, demographic variability warrants attention in larger future studies (Orobio de Castro et al., 2002).<sup>2</sup>

The absence of a significant relationship between hostile attribution biases and parent-reported externalizing behavior and findings from other studies of peer-directed attributions are discrepant (Orobio de Castro et al., 2002). This lack of association in the current study may reflect, at least in part, a limited range of behavior in this community sample, for which few behavior problems were endorsed. Such well-behaved samples are common in community studies, where high rates of externalizing behaviors are not typically evident (e.g., Achenbach & Rescorla, 2001).

It is also possible that children who exhibit HAI biases in the context of the mother-child interaction perceive the world in general, including themselves and their own behavior, as more hostile and negative than do their parents. Research has consistently found that children who display HAI biases in ambiguous social situations tend to ignore relevant, external cues when encoding situations and instead rely on pre-existing schemas (e.g., past experiences, emotions) rather than these cues when interpreting situations (Dodge & Tomlin, 1987). In addition to interpreting others' intents in ambiguous social situations through the lens of their schemas, individuals with HAI biases appear to interpret others' intents in unambiguous social situations

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<sup>2</sup> Neither HAI bias scores nor externalizing behavior measure scores in the present sample differed on racial group; the associations between the two variables varied by racial group but the difference was not statistically significant. The association between HAI bias scores and child-reported externalizing behavior scores was significant for White families ( $N=154$ ,  $r = .21$ ,  $p < .01$ ) and not significant for Black families ( $N = 114$ ,  $r = -.02$ ,  $p = .84$ ), which is consistent with findings from MacKinnon-Lewis and colleagues (2014).

in a more hostile manner than do individuals who do not display HAI biases (Nasby, DePaulo, & Hayden, 1980; Epps & Kendall, 1995). This suggests that children with HAI biases tend to view the world in a broadly hostile way, and it would not be surprising if this perspective led them to see their own behavior as more hostile than their parents do. This tinted view of why and how things happen is called an “attributional style”. For instance, children with a depressogenic attributional style tend to explain ambiguous events, actions, and intentions in a negative way (Mathews & MacLeod, 2005). It is possible that a hostile attributional style functions in a similar way, leading children to assume hostile behaviors for themselves as well as their mothers.

Alternatively, reliance on child report for both hostile attribution biases and externalizing behavior may have led to inflated estimates of this relationship relative to the relationship between child HAI biases and mother-reported externalizing behaviors. Single informant (or mono-method) designs may be vulnerable to rater bias, which is the tendency of informants to report the presence of other symptoms or behaviors based on other behaviors or responses (Berman & Kenny, 1976). For example, if children report responding to their mothers in hostile ways, they may also over-report externalizing symptoms because they are biased to see themselves in a negative light.

Given the inconsistencies with previous studies that primarily focused on HAI biases toward peers, results raise the possibility that HAI biases toward mothers and HAI biases toward peers are distinct entities. This possibility is difficult to evaluate, however, because few studies have examined associations between the two types of hostile biases. Bickett and colleagues (1996) compared hostile attributions toward mothers and peers and found that both aggressive and nonaggressive school-aged boys more frequently attributed hostile intent to peers than they did to their mothers; both groups also perceived peers’ hostile intent as more intense than



mothers'. Such discrepancies between HAI biases toward peers and mothers suggest that their degree of overlap warrants further study.

Unexpectedly, HAI biases were not significantly associated with either monitoring/supervision or consistent discipline. Studies have found that both parenting practices relate to attributions about academic success, such that youth who receive more frequent monitoring and more consistent discipline endorse more adaptive attributions toward peers and about academic success (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997; Gomez, Gomez, DeMello, & Tallent, 2001). I had anticipated that more closely monitored and consistently disciplined children would similarly make more benign attributions about their mothers' intents; however, data did not support this prediction.

Consistent with a proposal by Schaefer (1965), there is evidence that children's attitudes and beliefs regarding their parents may be more closely related to the child's own behaviors and adjustment than to the behaviors and practices in which their parents engage. For example, adolescents who self-reported frequent and intense externalizing behaviors tended to rate their mothers and fathers as directing more hostility toward them than did adolescents who reported fewer externalizing behaviors (Bosco, Renk, Dinger, Epstein, & Phares, 2003). It is possible that these specific parenting practices relate weakly, if at all, to children's perceptions of maternal intentions, and these perceptions are instead determined by other child-centered factors.

The nature of HAI biases themselves may have made it difficult to detect a relationship between such biases and parenting practices in the current sample. Dodge (2006) proposed that HAI biases are normative in early life; in other words, all youth acquire HAI biases by about preschool age (Weiss et al., 1992). However, most children then learn, typically from their parents, that others' intents are more commonly benign, and thus they approach subsequent

social situations with flexibility (Dodge, 2006). Only a few children develop a pattern of stable HAI biases that are intractable and resistant to change, and these children appear especially prone to later aggression (Dodge et al., 2015). Monitoring/supervision and consistent discipline may be more impactful for the children that approach social situations flexibly than for the children that approach social situations rigidly. It is possible that the children who approach social situations flexibly may be more malleable in general, including to parenting practices.

The decision to measure isolated parenting practices, rather than global parenting styles, may also have factored in to this study's failure to find hypothesized associations between HAI biases and parenting practices. Parenting styles consist of parenting practices coupled with the emotional climate and social context of the parent-child relationship (Darling & Steinberg, 1993). One parenting style, termed "authoritarian", that is characterized by high demandingness and low responsivity (Baumrind, 1971), was found to predict child HAI biases toward peers as early as first-grade (Runions & Keating, 2007). Results suggest that perhaps it is not the specific parenting practices that predict attribution biases, but rather the underlying parenting style. Given that parenting styles are a broader construct than parenting practices (Darling & Steinberg, 1993), it is possible that the child's experience is better captured by this vaguer concept of parenting.

An additional factor that complicates interpretation of the present findings is the collection of data regarding externalizing behavior and parenting practices from multiple informants (parent, children) who completed different measures. Child-report data alone were used in analyses of the associations between child-reported HAI biases regarding maternal intent and both child-reported externalizing behavior and child-reported monitoring/supervision. This mono-informant approach carries the risk of inflating correlations as a function of shared method

variance. In addition, associations between child-reported HAI biases toward mothers and both parent-reported externalizing behavior and parent-reported consistent discipline are difficult to interpret because the parents are the targets of the child's attributions and also the reporters of the behaviors and practices. This failure to gather the same information from multiple informants is problematic. In particular, because there are not reports from outside observers to corroborate or conflict with self-reported data, it is not clear whether parents or children provide accurate and unbiased reports about their own behavior. The present results must therefore be viewed cautiously. To avoid this problem in the future, it would be beneficial to collect information from objective sources and if that information is not available, all measures should be administered to all informants.

The finding that consistent discipline was negatively related to child-reported externalizing behaviors lent partial support to study hypotheses. This finding is concordant with previous literature in that more frequent consistent discipline was associated with fewer and less intense externalizing behaviors as self-reported by youth (Kamboukos, 2005). Results from previous research also suggest that when parents report disciplining their children in consistent ways, children report fewer and less intense externalizing behaviors (Ullsperger et al., 2015).

Notably, however, consistent discipline was not related to *parent-reported* externalizing behaviors in the present study. This different pattern of association could reflect a lack of awareness among parents about their children's behavior across different contexts, or differences between parents and children in how they perceive behavior. Caregiver's self-perceptions of their actions may influence how they interpret and report their children's behavior. It could be that caregivers who see themselves as inconsistent discipliners more commonly report problem behaviors than do their children of their own behaviors. For instance, in the depression

literature, mothers who are depressed tended to rate their children's externalizing behaviors as more intense and frequent, regardless of how their children behaved per independent observer (Webster-Stratton & Hammond, 1988). It may be that parents' own biases influence their report of their parenting practices and their child's behavior.

Moreover, "good" parenting practices may vary based on the temperament and behavior of the child, such that externalizing problems emerge when parent and child styles are not a good fit. Belsky (1984) proposed that parenting is reciprocally determined by parent characteristics (e.g., occupation, developmental history, marital relations, personality, social network) and child characteristics (e.g., temperament, attentional control) and that different children respond to parenting practices in various ways. For example, in one study, parent practices had a greater impact on behavioral outcomes for children who tended to be more difficult to manage (e.g., impulsive, socially unresponsive) than for more easily-managed children (Bates et al., 1998). Thus, whereas close monitoring and consistent discipline might be beneficial for one child, other strategies may better prevent or curb externalizing behavior in another.

Monitoring/supervision was not related to either parent or child report of externalizing behaviors; these findings were discordant with the present hypotheses and with previous literature (e.g., Shaffer et al, 2013; Fosco et al., 2012). It is possible that these variables are not associated; however, it seems more likely that these inconsistencies with previous literature reflect variability in the ways in which researchers measure monitoring/supervision. Previous studies that have found a significant relationship with externalizing behavior used different measures of monitoring/supervision (e.g., the Alabama Parenting Questionnaire; Shelton, Frick, & Wootton, 1996). The measure for monitoring/supervision used in the current study, the Parenting Style Index Strictness/Supervision subscale, was used independently of the other

subscales due to time constraints, which is atypical of how it is typically used in research. The Parenting Style Index Strictness/Supervision is short and includes items that ask specifically about children's curfews, which is a departure from other parenting questionnaires, like the Alabama Parenting Questionnaire. These measurement issues may have compromised the construct validity of the scale.

#### **4.2 Aim 2**

Primary aim 2 looked to explore the potential moderating role of parenting practices on the relationship between hostile attributions of maternal intent and externalizing behaviors. Results revealed a main effect of consistent discipline on externalizing behavior, suggesting that parents of youth whose externalizing behavior, by both parent and child report, was within normal limits were more likely than parents of youth who act out more regularly, to endorse using consistent discipline. In line with previous literature (e.g., Ullsperger et al., 2015), this finding may indicate that teaching parents to use consistent discipline is a good first line of intervention in parent management training programs to decrease the frequency and intensity of externalizing behaviors.

Neither HAI biases nor monitoring/supervision significantly predicted the likelihood of membership in the at-risk group for externalizing behaviors, which was inconsistent with hypotheses. Additionally, HAI biases and parenting practices did not interact to predict externalizing behaviors. Previous literature has found that HAI biases and parenting practices each relate independently to externalizing behaviors (Orobio de Castro et al., 2002; Ullsperger et al., 2015; Fosco et al., 2012). However, present results suggest that while child hostile attributions toward mothers relate to externalizing behaviors as reported by youth,

monitoring/supervision and consistent discipline do not protect against the risk conferred by HAI biases.

Interventions for externalizing behaviors, however, do not address parent behavior in isolation. These treatments are typically multi-modal, targeting additional factors such as child self-efficacy, academic achievement, and social relationships, and also addressing cognitive distortions via such activities as role plays, which allow children to practice perspective taking, attribution re-training, and problem solving (Lochman, Wells, & Murray, 2007; Chase & Eyberg, 2008; Barkley & Robin, 2014). It thus may be that cognitive distortions (e.g., HAI biases) and parent behaviors need to be targeted simultaneously to reduce the frequency and intensity of externalizing behaviors. However, some studies have examined specific predictors of response to treatment to explore if any of these specific targets better predict outcomes than do others. Child variables, such as comorbid ADHD, anxiety, and depression, as well as age, and parent variables, such as critical, harsh, and ineffective parenting, typically have been found to predict resistance to treatment (Beauchaine, Webster-Stratton, & Reid, 2005). Few to no studies have explored the predictive capacity of child cognitive variables (e.g., HAI biases) for externalizing behavior treatments.

Given the multi-modal nature of these interventions, parent training does not typically isolate individual parenting practices, but many different practices and, consequently, their interaction. The current study attempted to identify foundational parenting practices that would buffer children from the risk that HAI biases confer. However, the findings suggest that children with HAI biases toward mothers are at similar risk for displaying externalizing behaviors as reported by youth whether or not their parents discipline consistently and monitor closely. Even though these specific parenting practices did not appear to alter the relationship between HAI

biases and externalizing behaviors, HAI biases still confer a risk for externalizing behaviors as reported by children in the current study and parents and other informants in previous studies (Orobio de Castro et al., 2002). Future research is needed to examine other variables, such as other parenting practices and other child characteristics that may affect HAI biases as they relate to externalizing behaviors.

### **4.3 Exploratory Analyses**

I conducted exploratory analyses to investigate the possibility that aggressive behaviors and rule-breaking behaviors would show distinct associations with hostile attributions of maternal intent and parenting practices. Additionally, I explored the potential moderating role of parenting practices for the relationship between hostile attributions of maternal intent and both aggressive and rule-breaking behaviors. I conducted additional analyses to examine patterns between HAI biases regarding maternal intent, foundational parenting practices, and the component parts of externalizing behaviors. While aggressive behaviors and rule breaking behaviors are strongly related to each other and to the overarching construct of externalizing behaviors, aggression and rule-breaking have distinct correlates (e.g., Burt, Mikolajewski, & Larson, 2009).

Results were largely consistent with those obtained when externalizing behavior was treated as a unitary variable. Child HAI biases were associated with child-reported aggressive and rule-breaking behaviors but not when these behaviors were reported by mothers. Further consistent with Primary Aim 1 findings, monitoring/supervision was not related to aggression or rule-breaking behaviors regardless of informant. Consistent discipline was associated with child-reported aggressive behavior (with a small effect size; e.g., Stanger et al., 2004), consistent discipline did not relate significantly to child-reported rule-breaking behavior. Finally, neither

monitoring nor consistent discipline moderated the association between HAI biases toward mothers and externalizing behavior.

#### **4.4 Limitations and Future Directions**

Although the present study made unique contributions to the emerging literature examining preadolescent children's attribution biases specifically about their mothers' intentions, it has limitations that warrant mention. Several of these limitations stem from weaknesses in key measures or in the way in which they were administered. First, not all the measures were administered in their entirety, due to time constraints; consequently, only one of three subscales (Strictness/Supervision) of the Parenting Style Index (Lamborn, Mounts, Steinberg & Dornbusch, 1991; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994) was administered. How well this relatively thin slice of information reflects actual parenting practices is unclear.

Second, measures of parenting behavior were not all administered to both children and parents who participated in the study; only youth provided data on monitoring/supervision, whereas only parents reported on consistent discipline. Given the notable differences in parent and child report generally (De Los Reyes & Kazdin, 2005), it is possible that information from a single informant did not comprehensively capture what is occurring in real life for either parenting practice. Perhaps collecting information from multiple informants regarding a certain parenting practice would yield a more complete picture of what is occurring and would allow for more confident assessment of whether HAI biases toward mothers are associated with these practices.

Third, the current data do not allow us to determine how accurate or useful youths' hostile attributions may have been. For example, hostile attributions are typically considered a risk factor for externalizing behaviors; however, if a mother acts in genuinely hostile ways



toward her child, what appears to be a bias may reflect an accurate evaluation of her typical behavior. Hostile attributions in the context of mother-child relationships are an emerging concept in the research literature, and they are typically measured in different ways than are hostile attribution biases in the context of peer relationships (De Winter, Vandevivere, Waters, Braet, & Bosmans, 2016). For instance, because HAI biases toward mothers are directed at one specific person, it is plausible that these HAI biases reflect actual maternal behavior patterns. In contrast, measures of HAI biases regarding peers' intents require respondents to consider a wide range of peers, who are, as a group, less likely to exhibit consistent behavior patterns. To address the possibility that the accuracy of hostile attributions regarding mothers' intentions differ from that of hostile attributions regarding peers, it would be useful for future studies to measure and control for observed hostility within the mother-child relationship. Although observing true parent behavior in a lab has proven challenging in past research, there is value in measuring mother-child relationship hostility by many different methods (e.g., in-vivo observation, other caregiver-report) to get a comprehensive picture that can be generalized to multiple contexts. It may also be helpful to assess, in the context of a single study, HAI biases toward parents, peers, and other figures in children's lives, such as teachers, to examine the pervasiveness of hostile attributions across people and situations.

Fourth, the key CBCL and YSR variables (e.g., Externalizing, Aggression, and Rule Breaking) were strongly and positively skewed, suggesting that most participating youth exhibited few to no externalizing behaviors. While these distributions align with those from other studies of non-referred samples (Achenbach, 1991), they were inappropriate for use in multiple hierarchical regression analyses. Therefore, I elected to dichotomize the continuous dependent variables using empirically-derived borderline clinical and clinical cutoff points from

the CBCL and YSR scales (Achenbach, 1991) and to conduct binary logistic regression analyses. This approach has costs—dichotomization can result in loss of information about individual differences and present challenges to interpretation of results (MacCallum et al., 2002); however, when cutoffs are empirically defined rather than arbitrary, it can be useful for analysis of highly skewed continuous variables.

Another limitation of the present study is that it is cross-sectional. Longitudinal studies have found that HAI biases toward peers tend to exist prior to the development of externalizing behaviors in childhood (e.g., Dodge et al., 2015); however, it is unknown how parenting practices play a role, if at all, in the development of the aggressive and rule breaking behaviors over time. Future studies should investigate how parent practices over the course of time may interrupt or exacerbate the trajectory from hostile attribution biases (in the context of both parents and peers) to externalizing behaviors. Finally, given the small effect sizes found in comparable studies, future research should examine these relationships in larger samples that are enriched for the presence of externalizing behaviors to increase the chances of detecting a small effect.

#### **4.5 Conclusion**

The current study examined hostile attributions toward mothers and specific parenting practices (monitoring/supervision and consistent discipline), as well as their interaction, as potential predictors of externalizing behaviors. Researchers have consistently found that hostile attributions, mostly toward peers, in ambiguous situations are linked to externalizing behaviors (i.e., aggression and rule breaking) in childhood (Orobio de Castro et al., 2002) and are also linked to parenting practices (i.e., monitoring/supervision and consistent discipline; Glasgow et al., 1997; Gomez et al., 2001). Recent work has begun to search for variables that might buffer

the inherent risk of externalizing behaviors associated with hostile attributions in the context of peer relationships (Arsiwalla, 2009); little to no research, however, has examined potential buffer variables in the context of HAI biases regarding maternal intent.

Results of the current study replicated earlier findings that consistent discipline was associated with externalizing behaviors, but did not confirm hypotheses that parenting practices interacted with HAI biases to predict externalizing behaviors. Findings suggested that monitoring/supervision and consistent discipline may not buffer against the inherent risk that HAI biases confer for externalizing behaviors. Despite the lack of support for hypotheses, the current study and sample characteristics formed a foundational step in exploring the interaction of hostile attribution biases specifically toward mothers and parenting practices to predict externalizing behaviors in preadolescents. Future studies should examine other family and child variables (e.g., parenting styles) that may attenuate the relationship between HAI biases and externalizing behaviors in childhood.

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## APPENDICES

## Appendix A. Parenting Style Index

1. In a typical week, what is the latest you can stay out on SCHOOL NIGHTS (Monday-Thursday)?

1	2	3	4	5	6	7
I am not allowed out	Before 8:00 PM	8:00 – 8:59	9:00 – 9:59	10:00 – 10:59	11:00 or later	As late as I want

2. In a typical week, what is the latest you can stay out on FRIDAY OR SATURDAY NIGHT?

1	2	3	4	5	6	7
I am not allowed out	Before 8:00 PM	8:00 – 8:59	9:00 – 9:59	10:00 – 10:59	11:00 or later	As late as I want

3. How much do your parents TRY to know where you go at night?

1	2	3
Don't try	Try a little	Try a lot

4. How much do your parents TRY to know what you do with your free time?

1	2	3
Don't try	Try a little	Try a lot

5. How much do your parents TRY to know where you are most afternoons after school?

1	2	3
Don't try	Try a little	Try a lot

6. How much do your parents REALLY know where you go at night?

1	2	3
Don't try	Try a little	Try a lot

7. How much do your parents REALLY know what you do with your free time?

1	2	3
Don't try	Try a little	Try a lot

8. How much do your parents REALLY know where you are most afternoons after school?

1	2	3
Don't try	Try a little	Try a lot

## Appendix B. Parenting Scale

- |     |   |   |
|-----|---|---|
| 1.  | When I say my child can't do something, I let my child do it anyway.                | I stick to what I said.                           |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 2.  | If my child gets upset, I back down and give in.                                    | I stick to what I said.                           |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 3.  | When my child does something I don't like, I often let it go.                       | I do something about it every time it happens.    |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 4.  | When I give a fair threat or warning, I often don't carry it out.                   | I always do what I said.                          |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 5.  | When my child won't do what I ask, I often let it go or end up doing it myself.     | I take some other action.                         |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 6.  | If saying "no" doesn't work, I offer my child something nice so he/she will behave. | I take some other kind of action.                 |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 7.  | I coax or beg my child to stop.   | I firmly tell my child to stop.                   |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 8.  | I let my child do whatever he or she wants.   | I set limits on what my child can do.             |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 9.  | I threaten to do things that I know I won't actually do.                            | I only threaten things I am sure I can carry out. |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 10. | If my child misbehaves and then acts sorry, I let it go that time.                  | I handle the problem like I usually would.        |
|     | 0      1      2      3      4      5      6      7                                  |   |
| 11. | When we're not at home, I let my child get away with a lot more.                    | I handle my child the same way.                   |
|     | 0      1      2      3      4      5      6      7                                  |   |

**Appendix C. Child Attribution Measure**

1. Pretend that you and your mom are shopping at a grocery store and that you reach for a snack that you want to look at. Your mother tells you that you cannot have it.
  - a. Why do you think your mother told you that you could not have the snack?
2. Pretend that you are working on your schoolwork. You have a problem that you can't figure out. You ask your mother if she will help you. She says, "I can't."
  - a. Why do you think your mother can't help you with your homework?
3. Pretend that you and your mothers are playing a board game. You are almost to the finish line and you are winning. Your mother knocks the pieces off the board onto the floor.
  - a. Why did your mother knock the pieces to the floor?
4. Pretend it is your birthday. There is something that you have been wanting for a long time. All of your friends already have it. Your mother told you to wait until your birthday to get it. The day before your birthday she says, "You are not going to get the thing you wanted."
  - a. Why do you think your mother said that you were not going to get what you wanted?
5. Pretend that it is a special event at school. Moms are invited and there are going to be refreshments. When you left for school you thought your mom would be coming for the special event. She didn't come.
  - a. Why do you think your mother didn't show up at school?