CHILDREN'S REASONING ABOUT

PEERS' AND TEACHERS'

INTENTIONS

By

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Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Psychology

August, 2012

Nashville, Tennessee

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to Mom—who never doubted it

ACKNOWLEDGEMENTS

I could not have completed this research without the principals, faculty, and students at participating schools. Their enthusiasm and welcoming attitude made the data collection flow smoothly. Special thanks are also due to Kelley Durkin, Michele Tomlinson, and Alex Hollo for help with data collection. Most importantly, I'd like to express my thanks to my advisor, Joe Wehby, and the rest of my dissertation committee for their guidance, encouragement, and insight.

Finally, a word to my amazing, wonderful husband, Doug, and to other family and friends too numerous to name. Your love and support has been invaluable throughout this process. I will never be able to adequately express my gratitude.

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CHAPTER I

INTRODUCTION

The tendency to routinely overattribute aggressive intent in others' social behavior is commonly termed hostile attribution bias (HAB; Nasby, Hayden, & DePaulo, 1980). An extensive body of research supports the relation between this tendency in children and aggressive behavior (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002; Yoon, Hughes, Gaur, & Thompson, 1999). However, results of individual studies within this body of research have varied widely (Orobio de Castro et al., 2002) and the focus of current research is shifting to explore the circumstances under which HAB and aggression are most strongly related.

The relation between HAB and aggression may appear stronger when context variables, such as the type of aggressive behavior or social situation, are as similar as possible between the hypothetical vignettes used to measure HAB and outcome behavioral measure (e.g. Crick, Grotpeter, & Bigbee, 2002; Dodge & Price, 1994). One important context variable might be the people involved in the social situation. It has long been accepted that children might reason differently about different peer antagonists (e.g. Dodge, 1980; Dodge & Frame, 1982; Hymel, 1986). However, the role of HAB in children's relationships with adults, specifically teachers, has largely been neglected. Thus, the purpose of the current study was to examine the relation between children's reasoning about teacher versus peer antagonists and how this reasoning relates to conflict in their relationships with teachers and peers.

The following literature review begins with a brief review of the importance of children's relationships with peers and with teachers. The next two sections overview the research relating HAB to aggressive behavior with peers and describe existing research on the importance of context in HAB-aggression research. Finally, the potential of teacher versus peer interaction partners as an important context variable is proposed, and the goals of the current study defined.

Importance of Children's Relationships with Peers and Teachers

Aggressive behavior toward peers may be seen as a subset of broader social difficulties, and is related to rejection by peers (Dodge, Coie, & Brakke, 1982; Newcomb, Bukowski, & Pattee, 1993), loneliness (Asher & Paquette, 2003), internalizing problems (Coie, Lochman, Terry, & Hyman, 1992), and academic difficulties such as school dropout (Ollendick, Weist, Borden, & Greene, 1992). Children who display aggression early in life are at risk for continued aggression (Hymel, Rubin, Rowden, & LeMare, 1990) throughout adolescence (Kupersmidt & Coie, 1990) and adulthood (Huesmann, Eron, Lefkowitz, & Walder, 1984).

Compared to their nonaggressive peers, children who behave aggressively tend to be less liked by their teachers (Mercer & DeRosier, 2008; Wentzel & Asher, 1995). Conflict in the relationship between a child and his/her teachers is predictive of concurrent and later academic and social difficulties (Pianta & Stuhlman, 2004; Spilt, Hughes, Wu, & Kwok, 2012; Wentzel & Asher, 1995). On the other hand, a good teacher-student relationship may act as a protective factor for children who are at-risk for behavioral or academic trouble due

to their home environment (Thomas, Bierman, Thompson, & Powers, 2008). Boys may be especially at risk for high-conflict teacher relationships; teachers usually report more conflict with males than females (Birch & Ladd, 1997; Kesner, 2000). However, it is unclear the extent to which these are real differences rather than biases in teacher reporting.

Support for a Relationship between HAB and Aggression toward Peers

Hostile attribution bias is defined as the tendency to routinely attribute negative intent to others' actions (Nasby et al., 1980). It is most often measured by presenting children with a hypothetical situation in which something negative happens to them as a result of someone else's actions, and then asking either an open-ended question like "why did this happen?" (e.g. Dodge & Frame, 1982; Hughes, Robinson, & Moore, 1991; Lansford et al., 2006; Weiss, Dodge, Bates, & Pettit, 1992), or a forced-choice question such as "was he/she being mean or not being mean" (e.g. Dodge, Price, Bachorowski, & Newman, 1990; Quiggle, Garber, Panak, & Dodge, 1992). Most studies investigating HAB have used peer-rated (Crick et al., 2002; Dodge, 1980; Lemerise, Gregory, & Fredstrom, 2005) and/or teacher-reported (Dodge, 1980; Katsurada & Sugawara, 1998; Wyatt & Haskett, 2001) aggression as an outcome measure. Meta-analytic summary suggests that the average study reported a positive relationship between HAB and aggression, such that increased aggression is related to increased hostile intent attributions, of between $r = .17$ (Orobio de Castro et al., 2002) and $r = .19$[1] (Yoon et al., 1999).

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[1] Yoon et al. report this relationship as a Cohen's *d* effect size. It is transformed to *r* here for comparison purposes.

The relation between HAB and aggression appears to be somewhat robust to variations in methodology and population. Specifically, HAB has predicted aggressive behavior whether the provocation situations were presented on video (e.g. Dodge & Coie, 1987; Dodge & Price, 1994) or in vignettes read by the experimenter (Crick et al., 2002; Dodge, 1980). Although most work has used peer- or teacher-reported behavior as an outcome measure, HAB also predicted aggression when the outcome measure was observed behavior in a lab task (Dodge, Pettit, McClaskey, & Brown, 1986). Finally, evidence exists for a link between positive attribution bias and prosocial behavior. Children who are less socially-accepted tend to underattribute benign intent (Hughes et al., 1991), and children who show a bias to attribute benign intent in ambiguous situations are rated as more prosocial than their peers (Nelson & Crick, 1999; Price & Landsverk, 1998).

HAB is usually studied with elementary school-age children (Dodge & Frame, 1982; Quiggle et al., 1992) because the ultimate goal of understanding aggression is to inform intervention, and early intervention is often the most effective (after age nine, children who are highly aggressive are likely to continue to show aggressive behavior throughout their development; Coie & Dodge, 1998). However, the relation between HAB and aggression has been replicated across age groups from preschool- and kindergarten-age children (Dodge & Frame, 1982; Katsurada & Sugawara, 1998; Weiss et al., 1992) to adolescents and adults (Coccaro, Noblett, & McCloskey, 2009; Lansford et al., 2006). The relation has been observed in a variety of populations, from typically-developing participants (Dodge & Frame, 1982; Dodge & Price, 1994; Guerra & Slaby, 1989) to participants who were clinically aggressive and/or institutionalized (Dodge, Price et al., 1990; Lochman & Dodge, 1994).

Much of the existing research (e.g. Dodge & Coie, 1987; Nas, Orobio de Castro, & Koops, 2005; VanOostrum & Horvath, 1997) has been conducted with boys only, possibly because boys tend to display more physical aggression than girls (Card, Stucky, Sawalani, & Little, 2008). However, studies of HAB in girls did show that the relation between HAB and aggression holds for girls as well as for boys, especially when studies focused on aggression types more typical of girls (Crick et al., 2002; Crick & Werner, 1998) or when the measure was appropriate for both genders (Hughes, Webster-Stratton, & Cavell, 2004).

Individual differences in HAB have been reported to uniquely predict variability in aggressive behavior beyond that accounted for by the intent cues actually displayed in an interaction (Dodge, Murphy, & Buchsbaum, 1984), and separately from children's beliefs legitimizing aggression, accessing of aggressive responses, and evaluation of aggressive solutions (Zelli, Dodge, Lochman, Laird, & Conduct Problems Preventions Research Group, 1999). Variations in HAB predict aggressive behavior after intelligence, socioeconomic status (SES), and race are statistically controlled (Dodge, Price et al., 1990; Orobio de Castro, Merk, Koops, Veerman, & Bosch, 2005). HAB predicts aggression over and above individual differences in perceived harm and importance of the situation (VanOostrum & Horvath, 1997) as well as attention and impulsivity (Waldman, 1996).

Finally, intervention evidence supports the relation between HAB and aggression, and retraining attributional tendencies to reduce HAB has shown promise as an intervention technique for children who exhibit high levels of reactive aggression. Dodge summarizes the available research by remarking that the available intervention studies (five) "demonstrate that hostile attributional biases can be altered, that change in attributional biases mediates change in behavioral outcomes, but that change is difficult to achieve" (2006, p. 808). For

example, Hudley and colleagues reported positive findings for "BrainPower", an attributional retraining program, in two separate studies (Hudley et al., 1998; Hudley & Graham, 1993). Children in this pull-out program met in small groups two times weekly for six weeks (total twelve sessions), and used activities such as role-play, discussion of personal experiences, group brainstorming sessions, and generation of decision rules for social interactions. Assessment immediately following intervention revealed that the BrainPower training decreased hostile attributions and teacher ratings of aggressive behavior in aggressive participants, as compared to an attentional control condition (Hudley et al., 1998; Hudley & Graham, 1993). Moreover, changes in behavior were mediated by changes in attributional bias (Hudley et al., 1998), suggesting that attributional bias does, at least partially, have a causal relation with aggressive behavior.

Context in Hostile Attribution Bias Research

Thus, the relation between HAB and aggressive behavior is generally accepted. In fact, the correlation between HAB and aggression is so well accepted that aggression measures have been used to validate new measures of HAB (e.g. Coccaro et al., 2009). However, it should be noted that, in their meta-analysis of 41 HAB studies, Orobio de Castro and colleagues (2002) reported high between-studies variability in the strength of the relation between HAB and aggression ($r = -.29$ to $r = .65$). This in turn suggests that more research is needed to determine the circumstances under which HAB and aggression are related most closely.

Dodge (1986) hypothesized that social problem solving is context-specific, where context is operationalized as the content of the social situation in which an individual is attempting to solve a problem. If context is indeed an important factor in HAB, then measurement should reflect the context in which the researcher wants to explore and/or intervene in behavior. The context in the HAB measure should match the context in the outcome measure. To the extent that processing is context-specific, we would expect studies which confound context variables (i.e. have important contextual differences between the HAB interview vignettes and the outcome behavior measure) to report smaller effects compared to those in which HAB and behavior are measured in more similar contexts. The context in which HAB and outcome behavior are measured may vary in terms of the situation type, the purpose and type of aggression studied, or, relevant to the current study, the people involved in the situation.

Situation

Hostile attribution bias is usually examined in one of two situational contexts (peer entry and peer provocation situations) and one estimate suggested that the situation depicted in HAB instrument vignettes accounts for 60% of variance in HAB research (Quiggle et al., 1992). Existing research (Dodge et al., 1986; Keil & Price, 2009) has found that processing predicts behavior more strongly within than across situational contexts. Specifically, Dodge and colleagues (1986) reported that, among second- to fourth-grade children, processing of hypothetical peer-group entry social situations predicted success at a lab peer-group entry situation while processing of hypothetical provocation situations predicted behavior in response to a peer provocation lab task. In fact, 5- to 8-year-olds' attribution biases loaded

onto two separate factors, attributions about peer provocation situations and attributions about peer group entry (Keil & Price, 2009).

Purpose and Form of Aggression

Aggressive behavior can be classified by purpose or by form, and both dimensions may be important context variables. Aggressive behavior may be physical, verbal, or relational (affecting the victim's relationships) in form. Any of these aggressive acts may be reactive (in reaction to a perceived provocation) or proactive (with no provocation but to obtain a goal).

Crick and colleagues' (2002) work in two separate studies suggests that the form of aggression depicted in a hypothetical provocation may elicit different processing from the same individuals. Specifically, in two studies with a total of 662 third- to sixth-graders, this team identified children who were considered by their peers to be either physically aggressive or relationally aggressive. Children who were identified as physically aggressive were more likely to attribute hostility in physical provocations, while children who were relationally aggressive were more likely to attribute hostile intent in relational provocations. However, many studies (Dodge, Bates, & Pettit, 1990; Graham, Hudley, & Williams, 1992; Hudley et al., 1998; Price & Glad, 2003; Price & Landsverk, 1998; Quiggle et al., 1992) have not distinguished between physical and relational provocations.

In addition, research has shown that hostile attribution bias predicts reactive aggression much more strongly than proactive aggression (Crick & Dodge, 1996; Dodge & Coie, 1987; Dodge, Lochman, Harnish, Bates, & Pettit, 1997). These two types of aggression, according to a recent meta-analysis (Polman, Orobio de Castro, Koops, van

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Boxtel, & Merk, 2007), can be described as distinct but correlated constructs. However, aggression instruments used in many studies do not distinguish between proactive and reactive aggression (Crick, Ostrov, & Werner, 2006; Dodge, Laird, Lochman, Zelli, & Conduct Problems Preventions Research Group, 2002; Hudley et al., 1998; Hudley & Graham, 1993). In fact, a recent meta-analysis (Orobio de Castro et al., 2002) located only four studies which included children who were purely proactively aggressive. (Contrary to hypothesis, Orobio de Castro and colleagues reported a smaller average effect size for these studies than in general; however, because there were so few, it is impossible to determine what other variables may have been contributing to this difference.)

People

Finally, it has been demonstrated that children reason differently about situations depending on who is depicted in the HAB vignettes. When children were asked to reason about situations in which they pictured themselves as the protagonist and about situations in which there was a third person other as the protagonist, children who were aggressive only showed an HAB when the protagonists in the vignette were themselves (Dodge & Frame, 1982). Dodge and colleagues (Dodge, 1980; Dodge & Frame, 1982) and Hymel (1986) reported that children tend to attribute more hostile intent, and to propose more aggressive responses, when reasoning about an aggressive rather than a non-aggressive peer (as rated by peers and teachers). In other studies, fourth-graders attributed less hostility to friends and more hostility to enemies as compared to neutral peers (Peets, Hodges, Kikas, & Salmivali, 2007), and HAB was higher for angry than for happy or sad provocateurs (Lemerise et al., 2005).

Peer versus Adult Antagonist as a Relevant Context Variable

The same effect may hold when children reason about a vignette depicting a peer versus an adult as the antagonist in the situation. Currently, the vast majority of existing research either examines children's reasoning about peers only (e.g. Bauminger & Kimhi-Kind, 2008; Dodge, Price et al., 1990; Lochman & Dodge, 1994), or includes both peer and adults antagonists without separating the two analyses (e.g. Bauminger, Edelsztein, & Morash, 2005; Crozier et al., 2008; Lansford et al., 2006). A few studies have suggested that, in general, children who are aggressive exhibit an HAB when reasoning about adult as well as peer antagonists (Bickett, Milich, & Brown, 1996; Wyatt & Haskett, 2001). However, it is unclear from existing research the extent to which a specific child's intent attributions are consistent across peer and adult antagonists. Previous work (Price & Glad, 2003; Samson, April, 2010) has reported only moderate to moderately high ($r = .26$ to $.51$) correlations between children's reasoning about peer and adult antagonists. Only a few studies have separated children's intent attributions about peers and adults.

Specifically, Bickett, Milich, and Brown (1996) found that 7- to 12-year-old boys who had been referred for psychiatric outpatient services (for externalizing behavior problems) were more likely than similar boys referred to medical outpatient clinics (for minor physical injuries) to make hostile intent attributions about peers in ambiguous (but not hostile) cue situations, and more likely to make hostile intent attributions about teachers across hostile and ambiguous cue situations. Sixth- to eighth-grade children who were aggressive (as rated by their teachers and/or placement in alternative middle schools), when

reasoning about hypothetical situations in which the teacher's intent was negative or ambiguous, attributed higher levels of hostile intent and attributed hostile intent more often than their nonaggressive peers (Wyatt & Haskett, 2001).

Dodge and Price (1994) examined first- to third-graders' behavior (as reported by peers and teachers) and HAB in three types of situations: peer group entry, peer provocation, and authority directive. Across both hostile and ambiguous cue situations, HAB was related to behavior in authority directive situation (but there was no relation between HAB and behavior in the peer provocation or peer group entry situations). To a lesser degree, it was reported that behavior in the authority domain was predicted by processing of authority vignettes but not from processing of either peer vignette. It should be noted that Dodge and Price include both ambiguous and benign cues situations in these analyses, even though multiple studies (e.g. Dodge, 1980; Graham et al., 1992; Wyatt & Haskett, 2001) have suggested that HAB only differentiates children who are aggressive when the cues are ambiguous. Dodge and Price also included only one type of teacher-student interaction (authority directive) and neglected other types of interactions with teachers where students may interpret hostile intent (e.g. when something the teacher does comes across as "unfair," such as choosing another student for recognition).

Conflict versus Aggression

With the exception of Dodge and Price (1994), studies that examine HAB toward teachers as well as toward peers use general measures of aggression rather than examining reasoning about teacher intentions in relation to the participants' relationship with the teacher specifically. However, previous literature has shown that the correlation between conflict

with teachers and general measures of aggressive behavior, while moderate to strong, is far from perfect. Specifically, Howes (2000) reported a correlation between second-graders' conflict with teachers and teacher-rated aggression toward peers of $r = .64$, and Pianta and Stuhlman (2004) reported a correlation between the Student-Teacher Relationship Scale (Pianta, 2001) conflict subscale and the Child Behavior Checklist–Teacher Report Form (CBCL-TRF, Achenbach & Rescorla, 2001) externalizing scale of $r = .69$. Therefore, these previous studies of children's attribution biases toward teachers are measuring HAB in contexts different from their outcome variable and are possibly not reporting a true effect size.

Spilt and Kooman (March/April, 2011) reported an association between children's HAB toward teachers and child-reported conflict in the teacher-student relationship. In ongoing, currently unpublished research, Spilt (personal communication, 2011) found a relation between broader Social-Information Processing (SIP) reasoning about peers and peer-reported sociometric status, and SIP reasoning about teachers and the teacher-student relationship (as measured by the Student Teacher Relationship Scale, Pianta, 2001). However, Spilt and Kooman are unable to directly compare relationships with peers versus teachers because the outcome variable is different (sociometric status as opposed to conflict in the relationship).

Current Study

In sum, existing research, conducted primarily with elementary school–age boys, supports an association between hostile attribution bias and aggressive behavior, which

appears to be somewhat sensitive to context variables such as the situation, type or purpose of aggression, and people involved in the situation. The current study aims to expand this line of research by examining the specificity of HAB to teacher and peer antagonists using multiple reporters and more closely matched outcome measures. Specifically, the current study proposes to examine children's relationships with peers and teachers as related to their HAB when reasoning about teachers versus about peers. In this way, the current study will add to the research body by explaining the influence of context (in this case, of antagonist) in the variability of the relation between HAB and aggression.

Additionally, while past research (e.g. Dodge, 1980; Dodge & Price, 1994; Nas et al., 2005) has primarily examined HAB as a predictor of aggression in particular, the current study will use a more general measure relationship quality—the amount of conflict experienced. Existing evidence suggests that HAB is related to more general aspects of children's relationships, including sociometric status (Lemerise et al., 2005). In fact, there is some evidence (Waas, 1988), that HAB may be more closely related to peer rejection than to aggression (but see Keane, Brown, & Crenshaw, 1990 for dissenting evidence). Because the purpose of the current study is to compare children's reasoning about peers and teachers, it was important to find an outcome variable that is relevant to both relationship types. Although aggression toward teachers is relatively rare[2], many children experience a sense of conflict in their relationships with teachers as well as with peers (Blankemeyer, Flannery, & Vazsonyi, 2002). Thus, a measure of conflict, including such questions as how often participants and their peers or teachers "get on each other's nerves" was considered to be applicable to both types of relationships and was used in the current study. (Measures of

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[2] it is debatable whether behaviors such as defiance may be termed aggression

aggression were included for replication purposes.) This decision has the duel advantage of allowing relationships with peers and teachers to be compared side-by-side and expanding the research body exploring the link between HAB and more general aspects of relationship quality.

Finally, the current study will expand on existing research by using Hierarchical Linear Modeling (HLM) to account for the non-independence of children who share the same teacher. Acknowledging this nesting of children within teachers may be important because it is likely that classroom climate (which is shared between children with the same teacher) influences children's relationships with the teacher and with one another (Howes, 2000). It is especially important in cases where the outcome variables (aggression and/or relationship quality) are teacher-reported, because a teacher's cultural background, experiences and individual personality are likely to influence his/her perspective (Weisz, Chaiyasit, Weiss, & Eastman, 1995). For instance, a teacher who is used to working with children with extreme behavior problems may be less likely to consider a child with typical behavior "lapses" to be disruptive.

In sum, the current study examined three main questions: a) Does HAB predict aggressive behavior when non-independence of students who share the same teacher is taken into account? b) Is HAB related to conflict as well as to aggression? and c) Is there an effect of context in the relation between HAB and conflict? In other words, when predicting conflict with peers, does HAB toward peers explain unique variance over HAB toward teachers? When predicting conflict with teachers, does HAB toward teachers explain unique variance over HAB toward peers?

Hypotheses

It is hypothesized that a) higher HAB will predict higher levels of aggression within an HLM model, b) HAB will predict conflict as well as aggression, and c) the relation between HAB and conflict will show specificity to antagonists. That is, HAB toward peers will predict conflict with peers better than HAB toward teachers, and over and above HAB toward teachers. Likewise, HAB toward teachers will predict conflict with teachers over and above HAB toward peers, and over and above HAB toward peers.

CHAPTER II

METHOD

Recruitment and Consent Procedures

Consistent with existing research and to avoid potential confounds related to gender described above, the current study included second- to fourth-grade boys only. Power analyses (see Appendix A) revealed that approximately 280 boys were needed for adequate (> .80) power. The central office of the local public school district was contacted for permission to approach schools. Once permission was obtained, schools and then individual second to fourth grade regular education teachers were recruited for participation.

Parents of all English-speaking boys in participating classes were contacted by letter for their consent. To minimize lost forms, boys returning the consent form, whether their parents gave or denied consent, received a colorful pencil. Once all boys had adequate time to return consent forms, the teacher was contacted to schedule a time for measures to be completed.

Participants

Of approximately 780 students who took home consent letters, 408 returned the letters and 291 parents consented. Five students chose not to participate or changed schools between consent and interviews and so were dropped from the sample. Four students were

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dropped by the researcher, one because he did not appear to understand the assent, two

because they appeared to be copying others' answers or answering at random, and one

because he was repeatedly not in the classroom when the researcher attempted to meet with

him. Therefore, a total of 282 boys in 74 second- to fourth-grade classrooms at nine local

elementary schools were included in the current study. The number of boys per classroom

ranged from one to nine (median = 4; see Figure 1). Overall, 61% of the sample were eligible

for free or reduced lunch (the percent eligible from each school ranged from 11% to 100%).

Teacher ratings of students' verbal ability were slightly negatively skewed and averaged 3.34

($s = .94$) on a scale from 1 (far below average) to 5 (far above average).
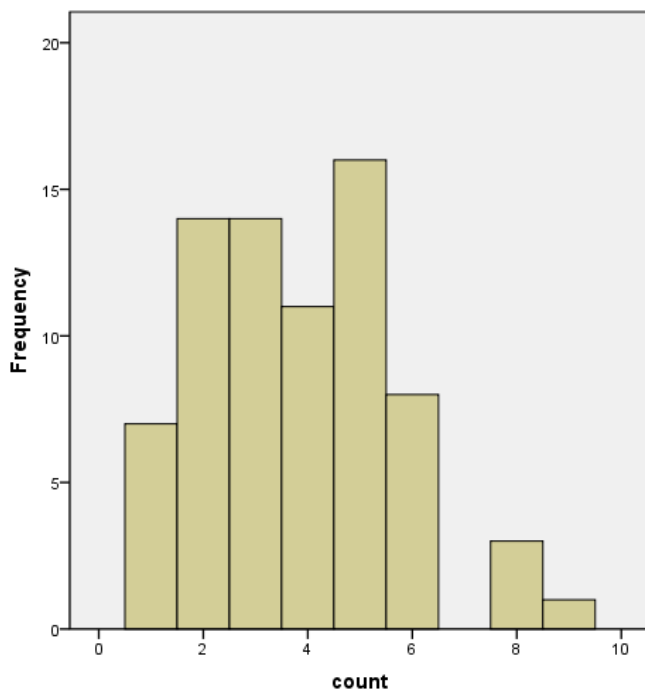
Figure 1: Number of Participating Boys per Classroom

Procedures

On a day and time determined by the teacher and research team, boys with parent consent met in small groups[3] or, in a few cases, one-on-one with a researcher. The boys went with the research team (the study author or other primary researcher and one research assistant) to a quiet area near their classroom. The study was explained; the boys' questions were answered, and written assent completed.

Follow assent, the primary researcher handed out the study materials, consisting of four scales: conflict with peers, conflict with teachers, HABpeer, and HABteacher, (see details below). The order was counterbalanced across groups[4]. The primary researcher read the packet aloud as the assistant monitored participants and answered questions and boys circled their answers independently. Each measure began with a page of practice questions in which boys were familiarized with the scale and taught to circle their answers to each subsequent question, and all groups were reminded frequently that the activity is to be treated "like a test" where each student is to answer the questions independently. To reduce participants' anxiety, it was emphasized that there were no "wrong" answers and their answers would not be shared with anyone except the research team. Boys were asked not to talk about their answers with each other. The entire assent and administration process took about 30 minutes.

Teachers were given a packet of measures (described below) for each participating boy from their classroom and were asked to complete the measures at their convenience. All

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[3] This group administration procedure has been used successfully in the past with similar measures and age groups (e.g. Crick et al., 2002; Reich, 2006).
[4] Independent sample t-tests confirmed no order effects for all outcome variables.

teacher report measures combined took approximately five minutes per child. Teachers were compensated with a gift card once they completed all questionnaires for their class.

Measures

The primary variables included in the current study were conflict with peers, conflict with teachers, and hostile attributions about peers and teachers (HABpeer and HABteacher). Aggression toward peers and general aggression were included for replication purposes. Verbal ability and socioeconomic status (SES) were measured as covariates (see Table 1).

Conflict with Peers

Child self-reported (SR) and teacher-reported (TR) conflict with peers was measured with the negative interactions scale from Furman and Buhrmester's (1985) *Network of Relationships Index–Social Provisions Version* (NRI). The NRI was developed to study the differences in children's relationships with parents, peers, teachers, and siblings, but has been used to study correlates of these relationships, as in the current study. The authors (Furman & Buhrmester, 1985; 1992) report satisfactory internal consistency scores between .6 and .8 for all scales within the NRI-SPV. The negative interaction scale includes six items measuring conflict and antagonism, where students rate on a five-point scale (from 1 = little or none to 5 = "the most") items such as "How often do you and the other kids in your class disagree and quarrel with each other?" The three-item instrumental aid subscale (e.g. "How much do the other kids in your class help you figure out or fix things?") was included as distracter items. Following Spilt and colleagues (2012), a teacher-report version of this measure was created

for this study by rewording items (i.e. items read, "this child" instead of "you"). Distracter items were not included on the teacher-report version.

Conflict with Teachers

Child- and teacher-reported conflict with teachers was also measured by the negative interaction scale from Furman and Buhrmester's (1985) *Network of Relationships Index– Social Provisions Version* (NRI) as described above, with items worded to focus on the child's relationship with his teacher (e.g. "How often do you and your teacher disagree and quarrel with each other?").

Because use of the NRI for this purpose is relatively novel, the conflict subscale of the Student Teacher Relationship Scale (STRS; Pianta, 1992) was included as a validation measure for the NRI. The STRS measures the degree to which teachers experience "discordant interactions and a lack of rapport with the child" (Doumen et al., 2009, p. 503). The 2001 STRS (the published version of this same scale) shows good reliability (conflict subscale $\alpha = .92$, test-retest $r = .92$; Pianta, 2001, as cited in Griggs, Gagnon, Huelsman, Kidder-Ashley, & Ballard, 2009) and has been used in multiple studies examining a variety of teacher-student relationship correlates (e.g. Griggs et al., 2009; Saft & Pianta, 2001). The STRS was designed for use with children in preschool to third grade (Doumen et al., 2009), but has been used successfully with children through fifth grade. For example, Murray and Murray (2004) used the STRS with third- to fifth-grade children in an urban setting to examine the relation between teacher-student relationship and demographics, academic, and behavioral competence. They reported high reliability (conflict scale $\alpha = .91$) with this age group.

Table 1: Overview of Measures (See Appendices B–C for a copy of all measures.)

Construct	Child Self-Report (SR)	Teacher Report (TR)
Conflict with peers	NRI-peers (Furman & Buhrmester, 1985)	NRI-peers (Furman & Buhrmester, 1985) adapted for teacher respondents
Conflict with teachers	NRI-teacher (Furman & Buhrmester, 1985)	STRS short form (Pianta, 1992)
		NRI-teacher (Furman & Buhrmester, 1985) adapted for teacher respondents
Hostile attribution bias	Vignette-response measure, provocation types based on Graham et al. (1992)	none
Aggression toward peers	none	Adaptation of Aggression Scale (Orpinas & Frankowski, 2001, as adapted by Reich, 2006) reworded for teacher respondents
General aggression	none	CBCL-TRF aggression subscale (Achenbach & Rescorla, 2001)
Verbal Ability	none	Created for this study; adapted from CBCL-TRF (Achenbach & Rescorla, 2001) and SSRS (Gresham & Elliot, 1990)
SES	none	Eligibility for free/reduced lunch, as reported by school

NRI = Network of Relationships Index, STRS = Student Teacher Relationship Scale, CBCL-TRF = Child Behavior Checklist–Teacher Report Form

Based on recommendations from the scale author's administrative assistant (J. Stovall, personal communication, September 9, 2010), the current study used the short form of the 1992 STRS. This is a 15-item teacher-report measure which asks teachers to rate on a 5 point scale (from 1 = "definitely does not apply" to 5 = "definitely applies") the degree to which statements about the closeness and conflict in their relationship with a specific child are true. Eight statements such as "this child and I always seem to be struggling with each other" and "dealing with this child drains my energy" make up the conflict subscale, which was the only score used in the current analysis.

Hostile Attribution Bias

Child-reported Hostile Attribution Bias (HAB) was measured by self-report based on hypothetical vignettes (as is typical in this area of research, e.g. Crick et al., 2002). The HAB measures use vignettes depicting six peer and six teacher provocation situations, where the intent of the provocateur is ambiguous. Each vignette is followed by the question, "Why do you think this happened?" followed by four multiple-choice options. Two of the options depict hostile intent, and two depict benign intent. From this measure, HABteacher and HABpeer were calculated as the proportion of items on which the participant chose a hostile intent option.

The development of the vignettes for the HAB measure consisted of several steps. First, a list of vignettes published in existing literature was created. Then, existing vignettes were adapted to create a draft of the HAB measure that would match the vignettes across antagonist (peer, teacher) as closely as possible on provocation type. Four categories of vignettes were pulled from the work of Graham and colleagues (1992)—Social Rejection,

Physical Provocation, Damage to Property, and Goal Obstruction. A fifth category, Unfairness, was added because of its relevance in teacher-student relationships. Next, feedback on the draft was solicited from several researchers familiar with a school environment. After adjustments were made based on researchers' expert opinion, the measure was piloted with 12 children the same age as prospective study participants in order to correct unforeseen problems (e.g. an antagonist's intent seeming unambiguous or children seeing a particular situation as implausible).

It was noted that the HAB vignettes depict an unidentified peer, but a specific teacher. While it is acknowledged that children might reason differently about one teacher than another, keeping the HAB vignettes parallel to the outcome measures (which ask about conflict with peers in general and with a specific teacher) was seen as more important than keeping the specificity of antagonist parallel across HAB vignette types.

Aggression toward Peers

Teacher-reported aggression toward peers was measured with an adaptation of the Aggression Scale (Orpinas & Frankowski, 2001, as adapted by Reich, 2006). This six-item scale asks teachers to report, on a scale from 1 = "not at all" to 4 = "a lot," how much they agree with statements such as "in the last 2 weeks this child pushed, shoved, or hit a kid from school." This scale demonstrated high internal reliability, $\alpha > .80$, in a previous study with third-grade children (Reich, 2006).

General Aggression

Teacher-reported general aggression was measured with the aggression subscale of the Child Behavior Checklist (CBCL-TRF, Achenbach & Rescorla, 2001). The aggression subscale asks teachers to rate on a 3-point Likert scale (from 0 = "not true" to 2 = "very true or often true") how well 20 items such as "gets in many fights" or "disobedient at school" apply to the student. The CBCL-TRF has demonstrated good reliability and validity (Achenbach & Rescorla, 2001), and is, in fact, often used to validate new measures (e.g. Caldarella, Young, Richardson, Young, & Young, 2008).

Verbal Ability

Teacher-reported verbal ability was included as a control variable because previous research (as described in Kauffman & Landrum, 2009) has suggested that verbal ability and behavior problems are negatively correlated. An estimate of verbal ability was obtained by asking teachers to report on participants' vocabulary, comprehension, and overall verbal ability in comparison with his/her age-mates. Five questions, similar in format to academic achievement questions found on the SSRS (Gresham & Elliot, 1990) and the CBCL-TRF (Achenbach & Rescorla, 2001), asked teachers to rate participants' oral and written expressive and receptive language in comparison with their age-mates, on a scale from 1 = "far below average" to 5 = "far above average".

Socioeconomic Status

Because low socioeconomic status (SES) is often associated with increased levels of externalizing behavior problems in general (e.g. as reviewed in Barry, Dunlap, Lochman, &

Wells, 2009), SES is included in the current analysis as a control variable. An estimate of participant socioeconomic status (SES) was obtained by school reports of whether each participant was receiving free or reduced lunch. This variable was coded as 1 for "yes, receiving free or reduced lunch" or 0 for "no, not receiving free or reduced lunch".

Analysis Plan

The analyses proceeded in four steps. First, data was reduced to scale scores[5], and descriptive statistics, including bivariate and intraclass correlations, were examined to guide subsequent analyses. Second, HLM analyses were conducted to examine the relation of HAB and aggression within an HLM framework. Third, additional HLM models were run to examine whether HAB predicted conflict as well as aggression. Finally, the question of peer versus teacher context was addressed by entering HABpeer and HABteacher as copredictors of conflict and examining the relative strength of their relation to the outcome variable. All HLM models regressed aggression or conflict on HAB, controlling for verbal ability and SES. Because the research questions focused on average relations (mean slopes) rather than on variation in relations (between-teacher variation in slopes), all HLM models were run without allowing slopes to vary between teachers[6].

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[5] Because teacher and self-reports were expected to be only moderately correlated (De Los Reyes & Kazdin, 2005), all analyses were conducted with each outcome measure separately. A multi-trait multi-method approach was examined as a possible strategy for combining self and teacher reports, but the design would have required using individual items instead of scale scores as indicators, which introduces too much ambiguity in the interpretation of results due to their likely non-normal distribution (D. Cole, personal communication, June, 2011).
[6] Exploratory analyses confirmed there was no significant variance for these slopes, except in the case of self-reported conflict with teachers.

CHAPTER III

RESULTS

Data Reduction and Descriptive Statistics

Data Reduction

Scale scores were calculated as the mean of all items on that scale. Scales missing fewer than half of their items (a total of 3% of all scale scores) were calculated as the mean of the completed items. The number of missing scale scores was very small (0.7%), and missingness occurred randomly (e.g. when the interviewer ran out of time or a teacher skipped a page of the questionnaire). Therefore, participants missing entire scales were excluded from analyses using those scales (see Table 2).

All measures showed acceptable internal reliability (Cronbach's $\alpha > .7$, Christmann & Van Aelst, 2006) except for the self-report conflict with teachers ($\alpha = .534$) and self-reported conflict with peers ($\alpha = .679$). These self-report measures were also only moderately correlated with teacher-report measures (see Table 3; conflict with peers $r = .242$, conflict with teachers $r = .348$). The low correlations were possibly due to the scales' unreliability, and so, although subsequent analyses included these self-report measures as planned, the results should be interpreted with caution.

As noted earlier, two measures of teacher-reported conflict with teachers, NRI (Furman & Buhrmester, 1985) and STRS (Pianta, 1992), were included in the study. The more established STRS was included as a way to validate the use of the adapted NRI, which

is more closely aligned to the conflict with peers measure used in this study. The correlation between these two measures was calculated to examine the usefulness of the adapted NRI, and because they were found to be strongly correlated ($r = .772$), the adapted NRI was used in all subsequent analyses.

Descriptive Statistics

After scale scores were created, basic descriptive statistics were calculated and examined for all variables (see Table 2). As expected, all variables except verbal ability and SES were, to varying degrees, positively skewed. Teacher-reported conflict with peers and conflict with teachers, and self-reported conflict with teachers showed an especially strong floor effect, with teachers reporting no conflict with peers or themselves for 41% and 57% of participants, respectively, and 38% of students self-reporting no conflict with teachers.

Pearson's bivariate correlations were calculated between all variables to examine the bivariate relations between predictor HAB measures, outcome aggression/conflict measures, and proposed covariates (see Table 3). HAB and aggression/conflict were, as hypothesized, positively related ($r = .125$ to $.344$). Verbal ability was found to be related to all HAB and conflict scales, and SES was found to be related to all conflict scales, supporting the use of verbal ability and SES as covariates in subsequent models.

Correlations were then examined to describe the relations a) between HABpeer and HABteacher and b) between conflict with peers and conflict with teachers. In general, reasoning about and relations with peers versus with teachers appeared to be moderately to strongly correlated. Specifically, conflict with peers and conflict with teachers were

correlated $r = .494$ (self-report) to .752 (teacher-report). HAB toward teachers and HAB toward peers were correlated $r = .351$.

Intraclass correlations (ICC) were calculated to describe the amount of variance in children's relationships that is shared between children with the same classroom teacher. Null HLM models (outcome variable predicted by the intercept term only) were run for each variable. Intraclass correlations were then calculated as the percent of variance which occurred between teachers, as opposed to between students (within teachers). For all outcome variables except self-reported conflict with teachers, a significant amount of variance occurred between teachers, with ICC estimates ranging from 5% to 28% (see Table 2), supporting the use of multi-level modeling. It was also interesting to note that neither HABteacher nor HABpeer showed significant variation at the between-teachers level and that both verbal ability and SES did vary significantly between teachers.

Table 2: Descriptive Statistics

Variable	n	α	mean (s)	min/max	1st quartile	median	3rd quartile	ICC
HABpeer	281	.726	.38(.31)	0/1	.17	.33	.67	.06
HABteacher	281	.716	.14(.22)	0/1	0	0	.17	.04
Aggression Scale	279	.911	1.43(.63)	1/4	1	1.17	1.67	.25*
CBCL-TRF	281	.953	.27(.41)	0/1.8	0	.05	.35	.18*
SR conflict with teacher	279	.534	1.48(.71)	1/5	1	1.17	1.67	.05
SR conflict with peer	276	.679	2.23 (1.09)	1/5	1.33	2	2.98	.28*
TR conflict with teacher	281	.931	1.34(.62)	1/4.17	1	1	1.33	.23*
TR conflict with peer	281	.977	1.73(.97)	1/5	1	1.33	2	.16*
Verbal	281	.944	3.34(.94)	1/5	2.8	3.4	4	.09*
SES	281		.61(.49)	0/1	0	1	1	.39*

*X^2 test for significant level 2 variance $p < .05$; SR = self-report, TR = teacher-report

Table 3: Correlations

	HABpeer	HABteacher	SR_Peer	TR_Peer	SR_Teacher	TR_Teacher	Verbal	SES	AGG	TRF
HABpeer	-	.351*	.275*	.156*	.164*	.129*	−.155*	.032	.159*	.164*
HABteacher		-	.216*	.232*	.344*	.125*	−.297*	.082	.232*	.252*
SR_Peer			-	.242*	.494*	.203*	−.144*	.219*	.277*	.241*
TR_Peer				-	.252*	.752*	−.217*	.183*	.776*	.855*
SR_Teacher					-	.348*	−.142*	.173*	.353*	.336*
TR_Teacher						-	−.147*	.158*	.628*	.825*
Verbal							-	−.368*	.204*	.230*
SES								-	.225*	.229*
AGG									-	.779*
TRF										-

* $p < .05$; SR_Peer = self-report conflict with peer, TR_Peer = teacher-report conflict with peer, SR_Teacher = self-report conflict with teacher, TR_Teacher = teacher-report conflict with teacher, AGG = Aggression Scale, TRF = CBCL-TRF

To address the first research question regarding the relation between HAB and aggression within an HLM framework, HLM models (with students nested within teacher) were run to predict general aggression (TRF, Achenbach & Rescorla, 2001) and aggression toward peers (Aggression Scale; Orpinas & Frankowski, 2001) from HAB, controlling for verbal ability and SES. Specifically, the models were as follows:

Level-1 model: aggression = B0 + B1(HAB) + B2(verbal) + B3(SES) + R
Level-2 model: B0 = G00 + U0
               B1 = G01
               B2 = G02
               B3 = G03

First, models were run using HAB toward peers only as the predictor. Contrary to previous research, higher levels of HAB toward peers only marginally predicted higher levels of aggression (see Table 4; TRF $B = .15$, p $< .10$; AGG $B = .18$, p $< .10$). SES was a significant predictor in both models, with teachers reporting more aggression for children receiving free or reduced lunch, and verbal ability was a significant predictor of TRF scores, with children who exhibited lower verbal ability scoring higher on aggression.

However, when a combined teacher-peer HAB score (created by averaging HABteacher and HABpeer scores) was used as the predictor instead, HAB significantly predicted both general aggression (TRF) and aggression specifically toward peers (Aggression Scale). Specifically, higher scores (more hostile attribution bias) on the combined teacher-peer HAB measure were related to higher scores (more aggressive behavior) on the TRF ($B = .33$, p $< .05$) and on the Aggression Scale ($B = 41$, p $< .05$). SES

was a significant predictor in both cases, with students who qualified for free or reduced

lunch receiving higher (more aggressive) scores on both the Aggression Scale and the TRF.

Table 4: Coefficients (and Standard Errors) of HLM Replication Models

HABpeer as predictor	TRF	AGG
Intercept	0.35(0.13)*	1.49 (0.21)*
HABpeer	0.15(0.078)+	0.18(0.11)+
Verbal	−0.06(0.03)*	−0.07 (0.05)
SES	0.14(0.05)*	0.20(0.07)*
combined HAB as predictor		
Intercept	0.28 (0.13)*	1.40 (0.20)*
HAB	0.33 (0.11)*	0.41 (0.15)*
Verbal	−0.05 (0.03)	−0.06 (0.05)
SES	0.15 (0.05)*	0.21 (0.07)*

+p < .10   * p < .05

Because HAB toward peers only marginally predicted aggression within the HLM

framework, an additional exploratory analysis was completed to determine if HABpeer

would have predicted aggression without accounting for the non-independence of students

sharing the same teacher, as has been done in previous research. Linear regression models

(aggression = B0 + B1(HAB) + B2(verbal) + B3(SES) + E) predicting general aggression

(TRF) and aggression toward peers (Aggression Scale) from HABpeer, verbal ability, and

SES confirmed that, within an OLS linear regression model, HABpeer did significantly

predict both TRF and Aggression Scale scores (see Table 5), such that higher HAB was

related to higher aggression.

Table 5: Coefficients (and Standard Errors) of OLS Regression Models

	TRF	AGG
Intercept	.34(.12)*	1.50(.18)*
HABpeer	.18(.08)*	.27(.12)*
Verbal	−.07(.03)*	−.08(.04)+
SES	.14(.05)*	.22(.08)*

+p < .10   *p < .05

HAB and Conflict

To address the second question regarding the relation of HAB to conflict, models were run to examine whether HABpeer predicted conflict with peers and whether HABteacher predicted conflict with teachers. Specifically, the models were as follows:

Level-1 model: conflict = B0 + B1(HAB) + B2(verbal) + B3(SES) + R
Level-2 model: B0 = G00 + U0
            B1 = G01
            B2 = G02
            B3 = G03

A model predicting self-reported conflict with peers (see Table 7; HABpeer Only Model) revealed a significant effect of HABpeer ($B = .72$, p < .05), where higher HABpeer was related to higher conflict. SES was also a significant predictor of self-reported conflict with peers ($B = .33$, p < .05), with children receiving free or reduced lunch reporting higher levels of conflict.

Because of the previously described floor effect in the other outcome variables, the remaining analyses were completed by considering each students' score on the NRI conflict measure as a "count" of conflict (scale scores were multiplied by the number of items to create all-integer scores), and estimating a Poisson model, allowing for overdispersion, with a log link function. These models test the significance of the relation between predictor and

outcome variables (like a standard HLM model), and the coefficients provide the natural log of the ratio between conflict scores for two hypothetical participants scoring one standard deviation apart on the predictor variable (Raudenbush & Byrk, 2002). Unit-specific models were used because the research questions are not focused on level-2 (teacher) differences, but on individual differences accounting for nesting of students within teachers (Raudenbush & Byrk, 2002).

Results of the model predicting teacher-reported conflict with peers (see Table 6) revealed a marginally significant relation between HABpeer and teacher-reported conflict with peers ($B = .17$, $p < .10$), where higher HABpeer was related to higher conflict. Similar models predicting teacher- (see Table 6) and self-reported (see Table 8; HABteacher Only Model) conflict with teachers from HABteacher suggested that HABteacher was a significant, positive predictor of conflict with teachers, although this was only marginally significant in the teacher-reported outcome model (teacher-report $B = .16$, $p < .10$; self-report $B = .64$, $p < .05$). SES was also a significant predictor of conflict with teachers in both models, with children receiving free or reduced lunch showing higher levels of conflict.

Table 6: Coefficients (and Standard Errors) for Poisson HLM Models Predicting Teacher-Reported Conflict

	TR Conflict with Peer	TR Conflict with Teacher
Intercept	2.42 (0.19)*	2.08 (0.12)*
HABpeer	0.17 (0.09)+	
HABteacher		0.16 (0.08)+
Verbal	−0.08 (0.05)+	−0.03 (0.03)
SES	0.16 (0.08)*	0.12 (0.05)*

+ p < .10   * p < .05

Finally, to address the third question regarding the predictive power of peer versus

HABteacher, both HABpeer and HABteacher were included in models predicting self-

reported conflict with peers and self-reported conflict with teachers. (Teacher-reported

outcome variables were dropped from this part of the analysis because they were only

marginally predicted by HAB in the previous analyses.) These models were as follows:

Level-1 model: conflict = B0 + B1(HABpeer) + B2(HABteacher) + B3(verbal) +
B4(SES) + R
Level-2 model: B0 = G00 + U0
              B1 = G01
              B2 = G02
              B3 = G03
              B4 = G04

As described above, standard HLM models were used to predict the outcome self-

reported conflict with peers, and Poisson models, allowing for overdispersion, with a log link

function were used to predict the outcome self-reported conflict with teachers. Both

HABteacher and HABpeer were significant, positive predictors of SR conflict with peers (see

Table 6; $B_{\text{teacher}} = .65$, p < .05; $B_{\text{peer}} = .58$, p < .05), but only HABteacher significantly

predicted conflict with teachers (see Table 7; $B_{\text{teacher}} = .62$, p < .05).

Table 7: Coefficients (and Standard Errors) for HLM Models Predicting SR Conflict with Peers

	HABpeer Only	HABteacher Only	Full
Intercept	2.01 (0.30)*	2.08 (0.29) *	1.83 (0.29)*
HABteacher		0.91 (0.27) *	0.65 (0.30)*
HABpeer	0.72 (0.22)*		0.58 (0.24)*
Verbal	−0.07 (0.07)	−0.05 (0.07)	−0.03 (0.07)
SES	0.33 (0.15)*	0.32 (0.15)*	0.34 (0.15)*
level 2 variance	0.23565	0.27770	0.23432
level 1 variance	0.82546	0.81714	0.81398
total variance	1.06111	1.09484	1.0483

*p < .05

Table 8: Coefficients (and Standard Errors) for Poisson HLM Models Predicting SR Conflict with Teachers

	HABpeer Only	HABteacher Only	Full
Intercept	2.15 (0.12)*	2.00 (0.11)*	1.98 (0.11)*
HABteacher		0.64 (0.14)*	0.62 (0.09)*
HABpeer	0.20 (0.09)*		0.04 (0.15)
Verbal	−0.04 (0.03)	−0.002 (0.03)	−0.0004 (0.03)
SES	0.14 (0.05)*	0.15 (0.05)*	0.15 (0.05)*
level 2 variance	0.01146	0.01677	0.01548
level 1 variance	1.70249	1.42688	1.44262
total variance	1.71395	1.44365	1.4581

*p < .05

To more closely examine the unique influence of HABteacher versus HABpeer in predicting conflict, models with each HAB variable alone were compared to the full model (including both HABpeer and HABteacher). The percent change in residual variance was calculated for each HAB predictor. This process was completed for both conflict with peers and conflict with teachers outcomes. (See Tables 6–7 for residual variances in each model.)

For self-reported conflict with teachers, the addition of HABpeer explained none of the previously unexplained variance, while the addition of HABteacher decreased the residual variance by 15%. In other words, HABteacher appears to be a much stronger

predictor of conflict with teachers than HABpeer. (This conclusion is also supported by the

finding, above, that conflict with teachers was predicted by HABteacher but not by

HABpeer.)

For self-reported conflict with peers, the addition of HABteacher decreased the

residual variance by 1%, while the addition of HABpeer decreased it by 5%. Combined with

the results of regression modeling, this finding supports the conclusion that HABpeer and

HABteacher are approximately equally important in predicting conflict with peers.

CHAPTER IV

DISCUSSION

The current study was undertaken to a) replicate existing research showing a relation between hostile attribution bias and aggression, b) extend this literature by testing for a relation between hostile attribution bias and conflict in relationships, and c) examine the specificity of hostile attribution bias to teacher versus peer antagonists. The use of HLM was an essential feature of the current study; HLM accounts for the non-independence of children who share the same teacher, and is especially important when using teacher-report outcome measures where a particular teacher's personality or biases may account for some of the variance among students' scores. A second critical addition to the literature is the extension from aggression to a more general measure of relationship quality—conflict. Finally, the primary hypothesis in the current study suggested a new contextual component (peer versus teacher social partners) which may affect the strength of the observed relation between HAB and conflict.

Summary of Findings

The present findings support the existence of a relation between HAB and aggression toward peers (as measured by the Aggression Scale, Orpinas & Frankowski, 2001) and general aggressive behavior (as measured by the TRF, Achenbach & Rescorla, 2001) within an HLM framework, especially when using a combined (teacher and peer) HAB measure as

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the predictor. Using a peer-only HAB measure, HAB and aggression were marginally related within an HLM model but significantly related within an OLS regression model. In all cases, controlling for verbal ability and SES, children who chose hostile intent attributions more often were rated by their teachers as showing more aggression toward peers and in general.

The current study also supports the extension of this literature to include a relation between HAB and amount of conflict in a relationship. Children who chose more hostile intent attributions rated their relationships with peers and teachers as having more conflict than did children who chose fewer hostile intent attributions. Marginal support for this relationship was also found when teacher reports of conflict were used as the outcome variables.

Contrary to hypothesis, mixed support was found for the specificity of the relation between HAB and conflict to peers versus teachers. It was expected that HAB toward peers would be the stronger predictor of conflict with peers, while HAB toward teachers would be the stronger predictor of conflict with teachers. While this theory was supported predicting conflict with teachers, the data showed HAB toward peers and toward teachers to be equally important in predicting conflict with peers.

Relation to Existing Literature

The current study emphasizes the importance of using HLM to account for non-independence of children within teachers when examining the relation between HAB and aggression. Contrary to previous findings which ignore nesting (e.g. Crick et al., 2002), the current results, using an HLM framework, showed only a marginal relation between HAB

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toward peers and aggression. Although alternative explanations exist, this inconsistency suggests that ignoring this nesting may have inflated the significance of the relation between HAB and aggression in previous literature. With observed ICCs of 18% (TRF) and 25% (Aggression Scale), the current data suggests that this non-independence is noteworthy and should be accounted for in this area of research.

The current finding that HAB was related, not only to aggression, but also to the broader measure of relationship quality, conflict, is in agreement with existing literature (e.g. Lemerise et al., 2005; Spilt & Kooman, 2011; Waas, 1988). Some evidence (Dodge & Frame, 1982) suggests that HAB is not a misperception but an accurate reflection of others' behavior toward a particular child—children who exhibited an HAB toward peers were more likely to be the recipients of aggressive behavior. If this is the case, the association between HAB and aggression may become a downward spiral that affects the broader relationship. Children's experiences of others' hostile intent may lead them to assume hostile intent and to react aggressively, thus increasing the amount of conflict in their relationships. Their reactions encourage others to continue acting with hostile intent toward them (as suggested by Dodge, 1980; Dodge et al., 2003), and the cycle begins anew. In this way, HAB may be a reflection of the overall relationship between a child and his peers.

The same may be true for the relation between HAB and conflict in teacher-student relationships (Trachtenberg & Viken, 1994). Children who exhibit an HAB toward their teachers may be detecting the teacher's tendency to avoid interacting with a student who has, in the past, been difficult, or to assume that student will cause a problem. Therefore, the child's HAB toward the teacher is accurately reflecting the teacher's attitude toward him or her. The child's HAB and the teacher's preconceived notions about the child would form a

spiral similar to that described above, ending in a conflict-ridden relationship between the child and teacher.

Although the current study did not completely support the hypothesis that the relation between HAB and conflict is specific to peers versus teacher, it did provide evidence that HAB toward teachers may be an important predictor of children's relationships with both teachers and peers. It is possible that children who show an HAB toward teachers as well as toward peers are exhibiting a more severe form of bias, expecting hostility not only from peers (who, at this age, may very well act with hostile intentions once in a while), but also from teachers (who, in most cases, are acting in children's best interests). This bias toward teachers as well as toward peers may in turn be related to a more extreme form of behavior— conflict in relationships with teachers as well as with peers. Blankemeyer and colleagues (2002) report that children who are aggressive toward their peers vary in their relationship with their teachers, and that children who were both aggressive toward peers and had negative relationships with their teachers were more at-risk for negative outcomes than children who had difficulties only in their relationships with peers.

Limitations and Future Directions

Several limitations to the current study must be acknowledged. These include the relatively narrow population examined, the methodological limitations, and unexpected complications with the distribution of outcome variables. This research was conducted with boys in second to fourth grade. As was discussed in the introduction, the decision was made to focus on this age range to stay consistent with prior literature and to include boys only to

avoid potential gender-based confounding variables. Given the exploratory nature of the current research questions, the use of this narrow but important population provided a solid foundation for theory-building, but the extent to which the current findings are generalizable to a broader population is unclear.

The current study could have been strengthened through the use of a third (perhaps peer- or observer-reported) measure of conflict in relationships. As described above, there was a significant relationship between HAB and self-reported, but not teacher-reported, outcomes. It is unclear the extent to which the findings were significant only because the child completed both predictor and outcome measures (often termed method variance). A second methodological improvement might have been made by redesigning the study to include an equal number of high/low-conflict participants, identified through a screening process, for better variability and thus more reliable comparison.

Finally, as is the case with any study of human behavior, unexpected complications potentially affected the power and therefore the interpretation of the findings in the current study. Specifically, a floor effect in three of the four outcome variables limited their variability and required the HLM analyses to assume a Poisson distribution rather than a continuous distribution in the outcome variable. The use of a Poisson distribution was the best alternative available. However, it is unclear how this change to the planned analysis strategy may have affected the final conclusions.

Future research should address these limitations with more complex designs. For example, a study including both boys and girls, with gender included as a moderator, is needed to examine generalizabilty across gender. A more complex reporter by construct design might allow for a multi-trait, multi-method analysis (Eid et al., 2008) which would

separate each latent conflict variable from each individual reporter's experiences of conflict and better describe true effects independent of method variance. Finally, the implications of ignoring non-independence of children sharing the same teacher should be further explored.

Pending replication within these more complex designs, additional studies might examine what makes HAB toward teachers such an important predictor of children's relationships at school. In particular, the hypothesis that HAB toward teachers, in addition to toward peers, predicts more severe social difficulties should be examined with a study designed for this purpose. Additionally, given the importance of children's relationships with both peers (Newcomb et al., 1993) and teachers (Spilt et al., 2012), it may prove fruitful to examine the potential of attribution training interventions, focusing on children's HAB toward teachers, to improve children's relationships and by extension increase their chances for academic and social success.

Despite its limitations, the current study adds to existing literature by using an HLM framework to study the relation between HAB and aggression, by adding evidence that HAB may be related to the broader relationship rather than to aggression in particular, and by observing that HAB toward teachers may be an important predictor of children's relationships with both teachers and peers. It provides support for some existing theory, and direction for further work examining the intricacies of children's relationships.

APPENDIX A: POWER ANALYSIS

Because of potential nesting of participants within teachers (i.e. if a teacher contributes to "conflict with teacher," then observations of multiple participants who share the same teacher are likely to be non-independent), a simple power analyses was inappropriate. Therefore, to determine the required sample size, a power analyses based on a two level model (students nested within teachers) was conducted with Optimal Design software (Liu, Spybrook, Congdon, Martinez, & Raudenbush, 2005). Using the person-randomized trial option, because examining individual differences can be considered equivalent to randomizing at the individual level, a graph (see Figure 1) was created to display power versus the total number of sites (teachers) in a "multisite block trial" (where a "block" is a teacher). The following parameters were entered:

1) n – The number of students participating in each classroom was set to 8 (assuming that, of about 20 students in a class, about ½ are boys and about 80% of those will participate). Note that exploratory power analyses with an *n* of 6 students per classroom revealed that the overall number of students required would not be affected.

2) δ – The expected correlation between hostile attribution bias and behavior was about .17 (average Orobio de Castro et al., 2002), or *d* = .345 (effect size conversion by Wilson, 1996).

3) R^2 – The covariates (verbal ability and SES) were expected to explain at least 7% of the variance. Previous research (Ackerman, Smith, & Kobak, 2009; Nas et al., 2005; Orobio de Castro et al., 2005) has found a relationship between verbal ability or general intelligence and aggressive behavior equal to a correlation of .28 to .41, which translates to an R^2 of at least .0784.

4) B – the intraclass correlation (ICC) was estimated to be 0 (light line) or .1 (dark line). A literature search revealed that ICC is very rarely calculated for behavioral outcomes. The Institute of Educational Sciences, in reviewing grants, uses a standard ICC estimate of .10 for behavioral outcomes, and a summary of ICCs in behavioral research estimated the mean ICC to be between .2 and .3 (Murray & Blitstein, 2003). Thus, the current analysis was conducted with 0 and .1; note that the graph reveals the difference is almost negligible.

5) $\alpha = .05$
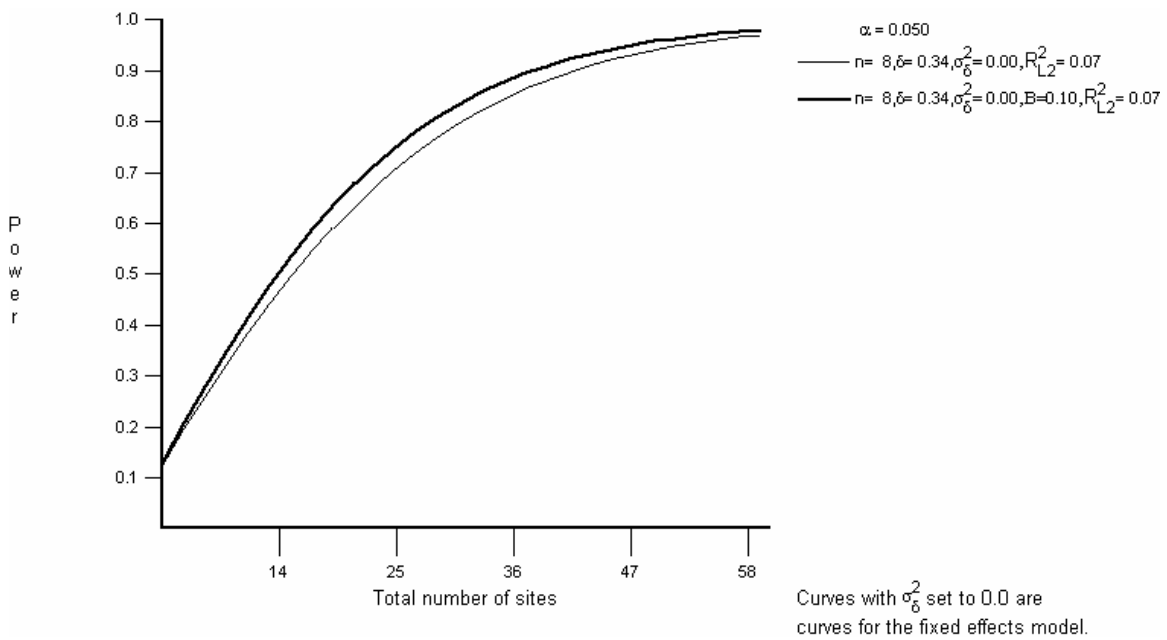
Figure 2: Power x Number of Teachers (Assuming Eight Students per Teacher)

For a power of .8, the study required 35 teachers with 8 students per teacher, or about 280 boys. Note that this analysis assumed that the relationship between HAB and behavior would not vary between teachers, that σ^2 is 0. (An exploratory power analysis was conducted assuming a small variance; the results, as far as how many classrooms are needed, were identical.)

Name _____   Grade _____

See assent document first.

My name is _____. I'd like to ask you some questions. I'm going to read the questions and answers while you circle your answers, kind of like on a test. _____ is going to walk around and watch you work to help make sure everyone understands the questions. Please follow along with your finger as I read and then circle your answer to each question.

These questions do not have right or wrong answers—I just want to know what you think, so please answer honestly. Remember, only _____ and I will ever see your answers. Just like on a test, I want you to write down your answers but don't say anything out loud or look at anyone else's answers. That way no one will know what anybody else's answers are. There are several types of questions, so we'll do some practice questions before each kind. If you have a question, raise your hand and _____ or I will come to you to answer your question.

Now, here are some practice questions. Please follow along with your finger and then circle your answer after I've read all the choices.

1. You are at the store with your mom and see a puddle of soup on the floor. It looks like a jar broke. Why do you think this happened?

a) Someone bumped into the shelf.

b) The shelf was too full.

c) Someone tried to put it in their cart and dropped it.

d) A kid tried to play catch with the jar.

You should have circled the answer that you most think is what happened. Remember there's no right or wrong answer; I just want to know what you think *happened. Any questions?*

2. You are excited about going swimming, but when you get to the pool you find out all the water had to be drained and you can't go swimming today. Why do you think this happened?

a) There was too much rain.

b) The pool had a leak.

c) There were too many people and the water got dirty.

d) Someone lost a necklace on the bottom of the pool.

You should have circled the answer that you most think is what happened. Remember there's no right or wrong answer; I just want to know what you think *happened. Any questions?*

Now, here are some questions about you and the kids in your class. You're going to answer them as I read just like the practice questions. Remember, there are no right or wrong answers, and only _____ and I will ever see your answers. If you have any questions, please raise your hand and one of us will help you.

1. You are on the playground. You want to find someone to play with. You see some kids playing basketball. You walk up and say "Hi!" but no one answers you. Why do you think this happened?

a) They didn't hear me.

b) They don't want to play with me.

c) They have enough people already.

d) They are ignoring me.

2. You are in gym class and you are playing kickball. You wave at the team captain to pick you next. He picks some other kid. Why do you think this happened?

a) He doesn't like me.

b) He didn't see me.

c) He really wants to win and the other kid is a better player.

d) He's mad at me.

3. You are playing a computer game. You are about to win. A kid walks past and says, ''Watch out!'' and pushes a button. But it was the wrong button. Now you've lost the game. Why do you think this happened?

a) He wanted to make me lose.

b) He was trying to help me win.

c) He was mad because I beat his score.

d) He didn't know how the game works.

4. You are at lunch. You are at a table drinking your milk. Another kid walks behind you and bumps your chair. Your milk spills all over your lap. Why do you think this happened?

a) He tripped on something.

b) He wanted to make fun of me.

c) He thought it was funny to mess up my clothes.

d) He wasn't looking where he was going.

5. You hear two kids from your class talking. You hear one of the kids invite the other one to a birthday party. You have not been invited to the party. Why do you think this happened?

a) He doesn't want me to come to the party.

b) He is going to invite me later.

c) He can only have a few people come over.

d) He is mad at me for something and is trying to get back at me.

6. You set your notebook down to tie your shoe. Just then, a kid in your class walks by and steps on the notebook. He leaves a dirty footprint right in the middle. Why do you think this happened?

a) He wanted me to get a bad grade.

b) He was in a hurry and didn't see my notebook.

c) He thought my notebook was going to blow away and was trying to catch it for me.

d) He wanted to mess up my notebook

Now, here are some questions about you and your teacher. You're going to answer them as I read just like the practice questions. Remember, there are no right or wrong answers, and only ____ and I will ever see your answers. If you have any questions, please raise your hand and one of us will help you.

1. You and your class went on a field trip to the zoo. You stop and buy a Coke. Suddenly, your teacher walks by and bumps your arm. Your Coke spills all over your shirt. Why do you think this happened?

a) S/he didn't see me.

b) S/he was in a hurry.

c) S/he thought I shouldn't be drinking a Coke.

d) S/he didn't like my shirt.

2. It is almost recess time. You want to get outside quickly to make sure you get a ball. But, as you're lining up, your teacher tells you to wait because she wants to ask you a question. Why do you think this happened?

a) S/he needs to ask me a question.

b) S/he doesn't want me to get a ball.

c) S/he doesn't think I should get recess.

d) S/he doesn't know I need to hurry.

3. You are in class one day. You need to ask a question. You walk up to the teacher and call his/her name. But the teacher doesn't answer you. Why do you think this happened?

a) S/he is ignoring me.

b) S/he is busy.

c) S/he didn't hear me.

d) S/he doesn't want to talk to me right now.

4. Your teacher asks for a helper to take a message to the office. You raise your hand, but the teacher picks another kid. Why do you think this happened?

a) The other kid raised his hand first.

b) It's the other kid's turn.

c) The teacher likes the other kid better.

d) The teacher doesn't want me to have a special job.

5. Your teacher is hanging all the art projects on the wall. But your paper tears when your teacher clips it the board. Now there is a whole piece of your paper missing. Why do you think this happened?

a) The teacher didn't like my picture.

b) The teacher got distracted and accidentally tore the paper.

c) The teacher wants to give me a bad grade on my art project.

d) The paper was too thin.

6. You are at your desk working. Your teacher calls some kids to his/her desk and gives them a prize for working hard. You do not get a prize. Why do you think this happened?

a) The teacher is mad at me.

b) The other kids were working harder than I was.

c) The teacher likes the other kids better than me.

d) The teacher ran out of prizes.

Now, here are some practice questions. Please follow along with your finger and then circle your answer after I've read all the choices.

A. How often do you watch TV or play video games?

Little or none Somewhat Very much Extremely much The most
     1   2   3   4   5

So, if you watch TV or play video games all the time, you should have circled 5. If you never or almost never watch TV or play video games, you should have circled 1. There's no right or wrong answer. It depends on how much YOU watch TV or play video games. Does anybody have a question? Let's try another practice question.

B. How much do you like to play with your friends?

Little or none Somewhat Very much Extremely much The most
     1   2   3   4   5

So, if you circled 5, that means you like to play with your friends a lot, so you wish you could play with your friends all the time, If you circled 1, it means you don't like to play with your friends, and maybe you would like to do other things instead. There's no right or wrong answer. It depends on how much YOU like to play with your friends. Does anybody have a question?

Now, here are some questions about you and your teachers. You're going to answer them as I read just like the practice questions. Remember, there are no right or wrong answers, and only _____ and I will ever see your answers. If you have any questions, please raise your hand and one of us will help you.

1. How often do you and your teacher disagree and quarrel with each other? *Quarrel means argue.*

Little or none Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

2. How much does your teacher teach you how to do things that you don't know?

Little or none Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

3. How much do you and your teacher get on each other's nerves?

Little or none Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

4. How often do you and your teacher get mad at or get in fights with each other?

Little or none Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

5. How much does your teacher help you figure out or fix things?

Little or none Somewhat Very much Extremely much   The most
    1   2   3   4   5

6. How much do you and your teacher get annoyed with each other's behavior?

Little or none Somewhat Very much Extremely much   The most
    1   2   3   4   5

7. How often do you and your teacher argue with each other?

Little or none Somewhat Very much Extremely much   The most
    1   2   3   4   5

8. How much does your teacher help you when you need to get something done?

Little or none Somewhat Very much Extremely much   The most
    1   2   3   4   5

9. How much do you and your teacher hassle or nag one another?

Little or none Somewhat Very much Extremely much   The most
    1   2   3   4   5

Now, here are some questions about you and the other kids in your class. You're going to answer them as I read just like the practice questions. Remember, there are no right or wrong answers, and only _____ and I will ever see your answers. If you have any questions, please raise your hand and one of us will help you.

1. How often do you and the other kids in your class disagree and quarrel with each other? *Quarrel means argue.*

Little or none   Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

2. How much do the other kids in your class teach you how to do things that you don't know?

Little or none   Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

3. How much do you and the other kids in your class get on each other's nerves?

Little or none   Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

4. How often do you and the other kids in your class get mad at or get in fights with each other?

Little or none   Somewhat   Very much   Extremely much   The most
    1   2   3   4   5

5. How much do the other kids in your class help you figure out or fix things?

Little or none Somewhat Very much Extremely much   The most
        1   2   3   4   5

6. How much do you and the other kids in your class get annoyed with each other's behavior?

Little or none Somewhat Very much Extremely much   The most
        1   2   3   4   5

7. How often do you and the other kids in your class argue with each other?

Little or none Somewhat Very much Extremely much   The most
        1   2   3   4   5

8. How much do the other kids in your class help you when you need to get something done?

Little or none Somewhat Very much Extremely much   The most
        1   2   3   4   5

9. How much do you and the other kids in your class hassle or nag one another?

Little or none Somewhat Very much Extremely much   The most
        1   2   3   4   5

Child's Name _____

Grade _____

Please answer each question below, to the best of your ability.

Please rate the child's communication skills as compared to his age-mates, on the following scale.

1	2	3	4	5
Far Below Average	Somewhat Below Average	Average	Somewhat Above Average	Far Above Average

1) comprehension of written language   1   2   3   4   5

2) comprehension of oral language   1   2   3   4   5

3) expressing himself in writing   1   2   3   4   5

4) expressing himself orally   1   2   3   4   5

5) overall verbal ability   1   2   3   4   5

Please rate how often this child…

6) Does a good job of understanding the intentions of peers in social situations

1	2	3	4	5
Never	Seldom	Sometimes	Frequently	Always

7) Assumes (jumps to the conclusion) that others are being hostile (mean) toward him

1	2	3	4	5
Never	Seldom	Sometimes	Frequently	Always

Please use the following scale to rate this child's behaviors.

1	2	3	4
Never	Once or twice	A few times	Many times

In the last two weeks, how often did this child…

1. Tease another kid at school?	1	2	3	4
2. Push, shove, or hit another child?	1	2	3	4
3. Called another child at school a bad name?	1	2	3	4
4. Threaten to hit another child?	1	2	3	4
5. Exclude (leave out) another child?	1	2	3	4
6. Spread rumors (make up something about other children) to make peers not like them anymore?	1	2	3	4

Please circle the answer which best describes this child **now or within the past 2 months**.

0 = Not True   1 = Somewhat or Sometimes True   2 = Very True or Often True

Argues a lot	0	1	2
Defiant, talks back to staff	0	1	2
Cruelty, bullying, or meanness to others	0	1	2
Demands a lot of attention	0	1	2
Destroys his own things	0	1	2
Destroys property belonging to others	0	1	2
Disobedient at school	0	1	2
Gets in many fights	0	1	2
Physically attacks people	0	1	2
Screams a lot	0	1	2
Explosive and unpredictable behavior	0	1	2
Demands must be met immediately, easily frustrated	0	1	2
Stubborn, sullen, or irritable	0	1	2
Sudden changes in mood or feelings	0	1	2
Sulks a lot	0	1	2
Suspicious	0	1	2
Teases a lot	0	1	2
Temper tantrums or hot temper	0	1	2
Threatens people	0	1	2
Unusually loud	0	1	2

Please use the following scale to rate this child's relationships with his **peers**.

1	2	3	4	5
Little or none	Somewhat	Very much	Extremely much	The most

1. How often does this child disagree and quarrel with his **peers**? 1 2 3 4 5

2. How much do this child and his **peers** get on each other's nerves? 1 2 3 4 5

3. How often do this child and his **peers** get mad at or get in fights with each other? 1 2 3 4 5

4. How much do this child and his **peers** get annoyed with each other's behavior? 1 2 3 4 5

5. How often do this child and his **peers** argue with each other? 1 2 3 4 5

6. How much does this child and his **peers** hassle or nag one another? 1 2 3 4 5

Please use the following scale to rate this child's relationships with **you**.

1	2	3	4	5
Little or none	Somewhat	Very much	Extremely much	The most

1. How often does this child disagree and quarrel with **you**? 1 2 3 4 5

2. How much do this child and **you** get on each other's nerves? 1 2 3 4 5

3. How often do this child and **you** get mad at or get in fights with each other? 1 2 3 4 5

4. How much do this child and **you** get annoyed with each other's behavior? 1 2 3 4 5

5. How often do this child and **you** argue with each other? 1 2 3 4 5

6. How much do this child and **you** hassle or nag one another? 1 2 3 4 5

Please rate this student's current relationship with you, using the following scale.

Definitely does not apply 1	Not really 2	Neutral, not sure 3	Applies somewhat 4	Definitely applies 5

1) I share an affectionate, warm relationship with this child.   1 2 3 4 5

2) This child and I always seem to be struggling with each other.   1 2 3 4 5

3) If upset, this child will seek comfort from me.   1 2 3 4 5

4) This child is uncomfortable with physical affection or touch from me.   1 2 3 4 5

5) This child values his/her relationship with me.   1 2 3 4 5

6) When I praise this child, he/she beams with pride.   1 2 3 4 5

7) This child spontaneously shares information about himself/herself.   1 2 3 4 5

8) This child easily becomes angry with me.   1 2 3 4 5

9) It is easy to be in tune with what this child is feeling.   1 2 3 4 5

10) This child remains angry or is resistant after being disciplined.   1 2 3 4 5

11) Dealing with this child drains my energy   1 2 3 4 5

12) When this child is in a bad mood, I know we're in for a long and difficult day.   1 2 3 4 5

13) This child's feelings toward me can be unpredictable or can change suddenly.   1 2 3 4 5

14) This child is sneaky or manipulative with me.   1 2 3 4 5

15) This child openly shares his/her feelings and experiences with me.   1 2 3 4 5

REFERENCES

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Ackerman, B., Smith, C., & Kobak, R. (2009). Diversity in the school problems of economically disadvantaged adolescents: Duel pathways of reading and externalizing problems. *Social Development, 18*(3), 598–617. doi: 10.1111/j.1467-9507.2008.00496.x

Asher, S. R., & Paquette, J. A. (2003). Loneliness and peer relations in childhood. *Current Directions in Psychological Science, 12*(3), 75–78. doi: 10.1111/1467-8721.01233

Barry, T. D., Dunlap, S. T., Lochman, J. E., & Wells, K. C. (2009). Inconsistent discipline as a mediator between maternal distress and aggression in boys. *Child and Family Behavior Therapy, 31*, 1–19. doi: 10.1080/07317100802701186

Bauminger, N., Edelsztein, H. S., & Morash, J. (2005). Social information processing and emotional understanding in children with LD. *Journal of Learning Disabilities, 38*(1), 45–61. doi: 10.1177/00222194050380010401

Bauminger, N., & Kimhi-Kind, I. (2008). Social information processing, security of attachment, and emotion regulation in children with learning disabilities. *Journal of Learning Disabilities, 41*(4), 315–332. doi: 10.1177/0022219408316095

Bickett, L. R., Milich, R., & Brown, R. T. (1996). Attributional styles of aggressive boys and their mothers. *Journal of Abnormal Child Psychology, 24*(4), 457–472. doi: 10.1007/BF01441568

Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology, 35*(1), 61–79. doi: 10.1016/S0022-4405(96)00029-5

Blankemeyer, M., Flannery, D. J., & Vazsonyi, A. T. (2002). The role of aggression and social competence in children's perceptions of the child-teacher relationship. *Psychology in the Schools, 39*(3), 293–304. doi: 10.1002/pits.10008

Caldarella, P., Young, E. L., Richardson, M. J., Young, B. J., & Young, K. R. (2008). Validation of the Systematic Screening for Behavior Disorders in middle and junior high school. *Journal of Emotional and Behavioral Disorders, 16*(2), 105–117. doi: 10.1177/1063426607313121

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*(5), 1185–1229. doi: 10.1111/j.1467-8624.2008.01184.x

Christmann, A., & Van Aelst, S. (2006). Robust estimation of Cronbach's alpha. *Journal of Multivariate Analyses, 97*, 1660–1674. doi: 10.1016/j.jmva.2005.05.012

Coccaro, E. F., Noblett, K. L., & McCloskey, M. S. (2009). Attributional and emotional responses to socially ambiguous cues: Validation of a new assessment of social/emotional information processing in healthy adults and impulsive aggressive patients. *Journal of Psychiatric Research, 43*, 915–925. doi: 10.1016/j.jpsychires.2009.01.012

Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial behavior. In N. Eisenberg & W. Damon (Eds.), *Handbook of child psychology* (5th ed., Vol. 3 Social, emotional, and personality development, p. 779–862). Hoboken, NJ: John Wiley & Sons.

Coie, J. D., Lochman, J. E., Terry, R., & Hyman, C. (1992). Predicting early adolescent disorder from childhood aggression and peer rejection. *Journal of Consulting and Clinical Psychology, 60*(5), 783–792. doi: 10.1037/0022-006X.60.5.783

Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms in reactive and proactive aggression. *Child Development, 67*(3), 993–1002. doi: 10.2307/1131875

Crick, N. R., Grotpeter, J. K., & Bigbee, M. A. (2002). Relationally and physically aggressive children's intent attributions and feelings of distress for relational and instrumental peer provocations. *Child Development, 73*(4), 1134–1142. doi: 10.1111/1467-8624.00462

Crick, N. R., Ostrov, J. M., & Werner, N. E. (2006). A longitudinal study of relational aggression, physical aggression, and children's social-psychological adjustment. *Journal of Abnormal Child Psychology, 34*(2), 131–142.

Crick, N. R., & Werner, N. E. (1998). Response decision processes in relational and overt aggression. *Child Development, 69*(6), 1630–1639.

Crozier, J., C. , Dodge, K. A., Fontaine, R. G., Bates, J. E., Pettit, G. S., & Levenson, R. W. (2008). Social information processing and cardiac predictors of adolescent antisocial behavior. *Journal of Abnormal Psychology, 117*(2), 253–267. doi: 10.1037/0021-843X.117.2.253

De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and

recommendations for further study. *Psychological Bulletin, 131*(4), 483–509. doi: 10.1037/0033-2909.131.4.483

Dodge, K. A. (1980). Social cognition and children's aggressive behavior. *Child Development, 51*(1), 162–170. doi: 10.2307/1129603

Dodge, K. A. (1986). A social information processing model of social competence in children. In M. Perlmutter (Ed.), *Cognitive perspectives on children's social and behavioral development* (p. 77–125). Hillsdale, NJ: Erlbaum.

Dodge, K. A. (2006). Translational science in action: Hostile attributional style and the development of aggressive behavior problems. *Development and Psychopathology, 18*(3), 791–814. doi: 10.1017/S0954579406060391

Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science, 250*, 1678–1683. doi: 10.1126/science.2270481

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53*(6), 1146–1158. doi: 10.1037/0022-3514.53.6.1146

Dodge, K. A., Coie, J. D., & Brakke, N. P. (1982). Behavior patterns of socially rejected and neglected preadolescents: The roles of social approach and aggression. *Journal of Abnormal Child Psychology, 10*(3), 389–410. doi: 10.1007/BF00912329

Dodge, K. A., & Frame, C. L. (1982). Social cognitive biases and deficits in aggressive boys. *Child Development, 53*(3), 620–635. doi: 10.2307/1129373

Dodge, K. A., Laird, R. D., Lochman, J. E., Zelli, A., & Conduct Problems Preventions Research Group. (2002). Multidimensional latent-construct analysis of children's social information processing patterns: Correlations with aggressive behavior problems. *Psychological Assessment, 14*(1), 60–73. doi: 10.1037/1040-3590.14.1.60

Dodge, K. A., Lansford, J. E., Burks, V. S., Bates, J. E., Pettit, G. S., Fontaine, R., Price, J. M. (2003). Peer rejection and social information-processing factors in the development of aggressive behavior problems in children. *Child Development, 74*(2), 374–393. doi: 10.1111/1467-8624.7402004

Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology, 106*(1), 37–51. doi: 10.1037/0021-843X.106.1.37

Dodge, K. A., Murphy, R. R., & Buchsbaum, K. (1984). The assessment of intention-cue detection skills in children: Implications for developmental psychopathology. *Child Development, 55*, 163–173. doi: 10.2307/1129842

Dodge, K. A., Pettit, G. S., McClaskey, C. L., & Brown, M. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development,51*(2), 1–85. doi: 10.2307/1165906

Dodge, K. A., & Price, J. M. (1994). On the relation between social information processing and socially competent behavior in early school-aged children. *Child Development, 65*(5), 1385–1397. doi: 10.2307/1131505

Dodge, K. A., Price, J. M., Bachorowski, J. A., & Newman, J. P. (1990). Hostile attributional biases in severely aggressive adolescents. *Journal of Abnormal Psychology, 99*(4), 385–392. doi: 10.1037/0021-843X.99.4.385

Doumen, S., Verschueren, K., Buyse, E., Munter, S. D., Mak, K., & Moens, L. (2009). Further examination of the convergent and discriminant validity of the student-teacher relationship scale. *Infant and Child Development, 18*, 502–520. doi: 10.1002/icd.635

Eid, M., Nussbeck, F. W., Geiser, C., Cole, D. A., Gollwitzer, M., & Lischetzke, T. (2008). Structural equation modeling of multitrait-multimethod data: Different models for different types of methods. *Psychological Methods, 13*(3), 230–253. doi: 10.1037/a0013219

Furman, W., & Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Developmental Psychology, 21*, 1016–1022. doi: 10.1037/0012-1649.21.6.1016

Furman, W., & Buhrmester, D. (1992). Age and sex differences in perceptions of networks of personal relationships. *Child Development, 61*(1), 103–115. doi: 10.2307/1130905

Graham, S., Hudley, C., & Williams, E. (1992). Attributional and emotional determinants of aggression among African-American and Latino young adolescents. *Developmental Psychology, 28*(4), 731–740. doi: 10.1037/0012-1649.28.4.731

Gresham, F. M., & Elliot, S. N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.

Griggs, M. S., Gagnon, S. G., Huelsman, T. J., Kidder-Ashley, P., & Ballard, M. (2009). Student-teacher relationships matter: Moderating influences between temperament and preschool social competence. *Psychology in the Schools, 46*(6), 553–567. doi: 10.1002/pits.20397

Guerra, N. G., & Slaby, R. G. (1989). Evaluative factors in social problem solving by aggressive boys. *Journal of Abnormal Child Psychology, 17*(3), 277–289. doi: 10.1007/BF00917399

Howes, C. (2000). Social-emotional classroom climate in child care, child-teacher relationships and children's second grade peer relations. *Social Development, 9*(2), 191–204. doi: 10.1111/1467-9507.00119

Hudley, C., Britsch, B., Wakefield, W. D., Smith, T., Demorat, M., & Cho, S. J. (1998). An attribution retraining program to reduce aggression in elementary school students. *Psychology in the Schools, 35*(3), 271–282. doi: 10.1002/(SICI)1520-6807(199807)35:3<271::AID-PITS7>3.0.CO;2-Q

Hudley, C., & Graham, S. (1993). An attributional intervention to reduce peer-directed aggression among African-American boys. *Child Development, 64*(1), 124–138. doi: 10.2307/1131441

Huesmann, L. R., Eron, L. D., Lefkowitz, M. M., & Walder, L. O. (1984). Stability of aggression over time and generations. *Developmental Psychology, 20*(6), 1120–1134. doi: 10.1037/0012-1649.20.6.1120

Hughes, J. N., Robinson, M. S., & Moore, L. A. (1991). Children's attributions for peers' positive behaviors: Social status differences. *Journal of Abnormal Child Psychology, 19*(6), 645–657. doi: 10.1007/BF00918904

Hughes, J. N., Webster-Stratton, B. T., & Cavell, T. A. (2004). Development and validation of a gender-balanced measure of aggression-relevant social cognition. *Journal of Clinical Child and Adolescent Psychology, 33*(2), 292–302. doi: 10.1207/s15374424jccp3302_11

Hymel, S. (1986). Interpretations of peer behavior: Affective bias in childhood and adolescence. *Child Development, 57*(2), 431–445. doi: 10.2307/1130599

Hymel, S., Rubin, K. H., Rowden, L., & LeMare, L. (1990). Children's peer relationships: Longitudinal prediction of internalizing and externalizing problems from middle to late childhood. *Child Development, 61*(6), 2004–2021.

Katsurada, E., & Sugawara, A. I. (1998). The relationship between hostile attributional bias and aggressive behavior in preschoolers. *Early Childhood Research Quarterly,13*(4), 623–636. doi: 10.1016/S0885-2006(99)80064-7

Kauffman, J. M., & Landrum, T. J. (2009). *Characteristics of Emotional and Behavioral Disorders of children and youth* (9th ed.). Upper Saddle River, NJ: Merrill.

Keane, S. P., Brown, K. P., & Crenshaw, T. M. (1990). Children's intention-cue detection as a function of maternal social behavior: Pathways to social rejection. *Developmental Psychology, 26*(6), 1004–1009. doi: 10.1037/0012-1649.26.6.1004

Keil, V., & Price, J. M. (2009). Social information-processing patterns of maltreated children in two social domains. *Journal of Applied Developmental Psychology, 30*, 43–52. doi: 10.1016/j.appdev.2008.10.003

Kesner, J. E. (2000). Teacher characteristics and the quality of child-teacher relationships. *Journal of School Psychology, 38*(2), 133–149. doi: 10.1016/S0022-4405(99)00043-6

Kupersmidt, J. B., & Coie, J. D. (1990). Preadolescent peer status, aggression, and school adjustment as predictors of externalizing problems in adolescence. *Child Development, 61*(5), 1350–1362. doi: 10.2307/1130747

Lansford, J. E., Malone, P. S., Dodge, K. A., Crozier, J., C., Pettit, G. S., & Bates, J. E. (2006). A 12-year prospective study of patterns of social information processing problems and externalizing behaviors. *Journal of Abnormal Child Psychology, 34*, 715–724. doi: 10.1007/s10802-006-9057-4

Lemerise, E. A., Gregory, D. S., & Fredstrom, B. K. (2005). The influence of provocateurs' emotion displays on the social information processing of children varying in social adjustment and age. *Journal of Experimental Child Psychology, 90*(4), 344–366. doi: 10.1016/j.jecp.2004.12.003

Liu, X., Spybrook, J., Congdon, R., Martinez, A., & Raudenbush, S. W. (2005). *Optimal design for multi-level and longitudinal research* (Version 2.0): Survey Research Center of the Institute of Social Research at the University of Michigan.

Lochman, J. E., & Dodge, K. A. (1994). Social-cognitive processes of severely violent, moderately aggressive, and nonaggressive boys. *Journal of Consulting and Clinical Psychology, 62*(2), 366–374. doi: 10.1037/0022-006X.62.2.366

Mercer, S. H., & DeRosier, M. E. (2008). Teacher preference, peer rejection, and student aggression: A prospective study of transactional influence and independent contributions to emotional adjustment and grades. *Journal of School Psychology, 46*, 661–685. doi: 10.1016/j.jsp.2008.06.006

Murray, D. M., & Blitstein, J. L. (2003). Methods to reduce the impact of intraclass correlation in group-randomized trials. *Evaluation Review, 27*(1), 79–103. doi: 10.1177/0193841X02239019

Murray, C., & Murray, K. M. (2004). Child level correlates of teacher-student relationships: An examination of demographic characteristics, academic orientations, and behavioral orientations. *Psychology in the Schools, 41*(7). 751–762. doi: 10.1002/pits.20015

Nas, C. N., Orobio de Castro, B., & Koops, W. (2005). Social information processing in delinquent adolescents. *Psychology, Crime & Law. Special Issue: Working with aggression and violence: Assessment, prevention and treatment, 11*(4), 363–375.

Nasby, W., Hayden, B., & DePaulo, B. M. (1980). Attributional bias among aggressive boys to interpret unambiguous social stimuli as displays of hostility. *Journal of Abnormal Psychology, 89*(3), 459–468. doi: 10.1037/0021-843X.89.3.459

Nelson, D. A., & Crick, N. R. (1999). Rose-colored glasses: Examining the social information-processing of prosocial young adolescents. *The Journal of Early Adolescence. Special Issue: Prosocial and Moral Development in Early Adolescence, Part I, 19*(1), 17–38.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin, 113*(1), 99–128. doi: 10.1037/0033-2909.113.1.99

Ollendick, T. H., Weist, M. D., Borden, M. C., & Greene, R. W. (1992). Sociometric status and academic, behavioral, and psychological adjustment: A five-year longitudinal study. *Journal of Consulting and Clinical Psychology, 60*(1), 80–87. doi: 10.1037/0022-006X.60.1.80

Orobio de Castro, B., Merk, W., Koops, W., Veerman, J. W., & Bosch, J. D. (2005). Emotions in social information processing and their relations with reactive and proactive aggression in referred aggressive boys. *Journal of Clinical Child and Adolescent Psychology, 34*(1), 105–116. doi: 10.1207/s15374424jccp3401_10

Orobio de Castro, B., Veerman, J. W., Koops, W., Bosch, J. D., & Monshouwer, H. J. (2002). Hostile attribution of intent and aggressive behavior: A meta-analysis. *Child Development, 73*(3), 916–934. doi: 10.1111/1467-8624.00447

Orpinas, P., & Frankowski, R. (2001). The Aggression Scale: A self-report measure of aggressive behavior for young adolescents. *Journal of Early Adolescence, 21*, 50–67. doi: 10.1177/0272431601021001003

Peets, K., Hodges, E. V. E., Kikas, E., & Salmivali, C. (2007). Hostile attributions and behavioral strategies in children: Does relationship type matter? *Developmental Psychology, 43*(4), 889–900. doi: 10.1037/0012-1649.43.4.889

Pianta, R. C. (1992). Student-Teacher Relationship Scale–Short Form. University of Virginia.

Pianta, R. C. (2001). *Student-teacher relationship scale: Professional manual*. Odessa, FL: Psychological Assessment Resources.

Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review, 33*(3), 444–458.

Polman, H., Orobio de Castro, B., Koops, W., van Boxtel, H. W., & Merk, W. W. (2007). A meta-analysis of the distinction between reactive and proactive aggression in children

and adolescents. *Journal of Abnormal Child Psychology, 35*(4), 522–535. doi: 10.1007/s10802-007-9109-4

Price, J. M., & Glad, K. (2003). Hostile attributional tendencies in maltreated children. *Journal of Abnormal Child Psychology, 31*(3), 329–343. doi: 10.1023/A:1023237731683

Price, J. M., & Landsverk, J. (1998). Social information-processing patterns as predictors of social adaptation and behavior problems among maltreated children in foster care. *Child Abuse and Neglect, 22*(9), 845–858. doi: 10.1016/S0145-2134(98)00072-6

Quiggle, N. L., Garber, J., Panak, W. F., & Dodge, K. A. (1992). Social information processing in aggressive and depressed children. *Child Development, 63*(6), 1305–1320. doi: 10.2307/1131557

Raudenbush, S. W., & Byrk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks: Sage.

Reich, S. M. (2006). *Do nice guys finish last? The role of prosocial and aggressive behavior in peer interactions.* Unpublished doctoral dissertation, Vanderbilt University.

Saft, E. W., & Pianta, R. C. (2001). Teachers' perceptions of their relationships with students: Effects of child age, gender, and ethnicity of teachers and children. *School Psychology Quarterly, 16*(2), 125–141. doi: 10.1521/scpq.16.2.125.18698

Samson, J. E. (April, 2010). *The measurement of hostile attribution bias.* Paper presented at the Developmental Lunch Bunch, Vanderbilt University, Nashville, TN.

Spilt, J., Hughes, J. N., Wu, J.-Y., & Kwok, O.-M. (2012). Dynamics of teacher-student relationships: Stability and change across elementary school and the influence on children's academic success. *Child Development.*

Spilt, J., & Koomen, H. (March/April, 2011). *Teacher-child relationships and children's social information processing in ambiguous hypothetical situations with teachers.* Poster presented at the Biannual Meeting of the Society for Research in Child Development, Montreal, Canada.

Thomas, D. E., Bierman, K. L., Thompson, C., & Powers, C. J. (2008). Double jeopardy: Child and school characteristics that predict aggressive-disruptive behavior in first grade. *School Psychology Review. Special Issue: Promoting social justice, 37*(4), 516–532.

Trachtenberg, S., & Viken, R. J. (1994). Aggressive boys in the classroom: Biased attributions or shared perceptions? *Child Development, 65*(3), 829–835. doi: 10.2307/1131421

VanOostrum, N., & Horvath, P. (1997). The effects of hostile attribution on adolescents' aggressive responses to social situations. *Canadian Journal of School Psychology, 13*(1), 48–59. doi: 10.1177/082957359701300105

Waas, G. A. (1988). Social attributional biases of peer-rejected and aggressive children. *Child Development, 59*(4), 969–975. doi: 10.2307/1130263

Waldman, I. D. (1996). Aggressive boys' hostile perceptual and response biases: The role of attention and impulsivity. *Child Development, 67*(3), 1015–1033. doi: 10.2307/1131877

Weiss, B., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1992). Some consequences of early harsh discipline: Child aggression and a maladaptive social information processing style. *Child Development, 63*(6), 1321–1335. doi: 10.2307/1131558

Weisz, J. R., Chaiyasit, W., Weiss, B., & Eastman, K. L. (1995). A multimethod study of problem behavior among Thai and American children in school: Teacher reports versus direct observations. *Child Development, 66*(2), 402–415. doi: 10.2307/1131586

Wentzel, K. R., & Asher, S. R. (1995). The academic lives of neglected, rejected, popular, and controversial children. *Child Development, 66*(3), 754–763. doi: 10.2307/1131948

Wilson, D. B. (1996). *Effect Size Determination Program.* Vanderbilt University.

Wyatt, L. W., & Haskett, M. E. (2001). Aggressive and nonaggressive young adolescents' attributions of intent in teacher/student interactions. *Journal of Early Adolescence, 21*(4), 425–446. doi: 10.1177/0272431601021004003

Yoon, J., Hughes, J., Gaur, A., & Thompson, B. (1999). Social cognition in aggressive children: A metaanalytic review. *Cognitive and Behavioral Practice, 6*(4), 320–331. doi: 10.1016/S1077-7229(99)80051-0

Zelli, A., Dodge, K. A., Lochman, J. E., Laird, R. D., & Conduct Problems Preventions Research Group. (1999). The distinction between beliefs legitimizing aggression and deviant processing of social cues: Testing measurement validity of the hypothesis that biased processing mediates the effects of beliefs on aggression. *Journal of Personality and Social Psychology, 77*(1), 150–166. doi: 10.1037/0022-3514.77.1.150