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Parental aggression as a predictor of boys' hostile attribution across the transition to middle school

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Abstract

Aggression among youth is public health problem that is often studied in the context of how youth interpret social information. Social cognitive factors, especially hostile attribution biases, have been identified as risk factors for the development of youth aggression, particularly across the transition to middle school. Parental behaviors, including parental aggression to children in the form of corporal punishment and other aggressive behavior, have also been linked to aggressive behavior in children at these ages. Despite the important role played by these two risk factors, the connection between the two has not been fully studied in the literature. This study examined the link between parental aggression and children' hostile attributions longitudinally among a diverse sample of 123 boys as they entered middle school. Results support acceptance of a model in which parental aggression to children prior to entering middle school predicted children's hostile attributions after the transition to middle school above and beyond that which was predicted by previous levels of hostile attributions. As expected, hostile attributions also predicted change in parent- and teacher-rated child aggression. These findings provides important evidence of the role that parental behavior plays in youth social cognition at this critical age, which has implications for understanding the development of aggressive behavior.

Keywords

hostile attribution; social cognition; corporal punishment; parenting behaviors

In efforts to prevent acts of youth violence, researchers have suggested that a mix of internal social-cognitive processes, including social information-processing, and external environmental contexts contribute to aggressive behavior in children (e.g. Crick & Dodge, 1994; Lochman, 2006). Studies of one social cognitive process, hostile attribution bias, indicate that children who interpret social cues as threatening and hostile react with more aggressive behavior (see Orobio de Castro et al., 2002 for a meta-analysis). One study found that this relation is robust with hostile attributions and other social information-processing problems predicting changes in aggression from 8th to 11th grade (Lansford, Malone, Dodge, Crozier, Pettit, & Bates, 2006). In this same study, elementary school social information-processing problems did not predict aggression in 11th grade suggesting that the relation

between these variables may change during that period (Lansford et al., 2006). Evidence indicates that hostile attribution style may develop from hostile schemas in children due to a variety of factors including physical abuse, adult modeling of hostile attribution bias, failure in life tasks and rearing in a culture that values self-defense and personal honor (Dodge, 2006). Despite these theoretical underpinnings of hostile attribution bias, the role of parenting in the development of hostile attributions has rarely been directly tested, especially using longitudinal data across middle childhood.

The transition to middle school appears to be a particularly important developmental period, including in the development of hostile attributions. A large meta-analysis found that studies of children ages 8 to 12 years old had larger effect sizes in the relation between hostile attributions and aggressive behavior than younger or older children (Orobio de Castro et al., 2002). Some additional evidence suggests that preadolescence has been linked to a number of variables including decreases in parental monitoring and increases in the hostility of the school environment, child autonomy within the school environment, and peer influence on children (Blyth, Simmons, & Bush, 1978; Eccles et al., 1993; Fite et al., 2006). When taken together, the unique changes of this developmental age suggest a need for additional research on the way that hostile attribution develops in this preadolescent age group.

Another body of literature focuses on the influence of parenting behaviors on child aggression. Parenting behaviors such as poor parental monitoring (e.g. Stattin & Kerr, 2000), inconsistent discipline (e.g. Stormshak et al., 2000), and corporal punishment (see Gershoff, 2002) are associated with increased risk for aggressive behaviors. Parent-to-child aggression, especially in the form of physical or corporal punishment, has been repeatedly linked to increased child aggression (Conger, Neppl, Kim, & Scaramella, 2003; Dodge, Pettit, Bates, & Valente, 1995; Gershoff, 2002), but its role in the development of hostile attributions during middle childhood has not been adequately tested.

As two primary risk factors for aggression, parenting factors and social cognitive styles are important in their own right, but most theoretical models suggest that they likely impact one another (Crick & Dodge, 1994; Dodge, 2006; Lochman, 2006). A recent cross-sectional study of parent behavior and child hostile attributions included relational provocation from parents such as psychological control (Nelson & Coyne, 2009). This study also found that paternal psychological control related to boys' instrumental and relational hostile attributions and paternal corporal punishment related to girls' instrumental hostile attribution (Nelson & Coyne, 2009). A negative relation between paternal corporal punishment and boys' instrumental hostile attribution was found to have a suppressor effect (Nelson & Coyne, 2009).

To clarify the direction of effects, some studies have used longitudinal methods and tests of indirect effects, or mediation, to show that social information processing in children and later child aggressive behavior is affected by earlier physical abuse, characterized by an adult physically harming a child or the child needing medical attention (Dodge, Bates, & Pettit, 1990; Dodge, Bates, Pettit, & Valente, 1995). For the current study, we are interested in testing the role of "parental aggression" which includes serious physical abuse such as that tested in these studies, but also includes milder, less severe forms of aggression toward

children (e.g., corporal punishment; pushing, grabbing, or shoving a child during a parent-child conflict). There are studies that have investigated this (e.g. Weiss, Dodge, Bates, & Pettit, 1992), labeling it as “harsh discipline” or “negative behavior”. Two longitudinal studies tested the mediational role of children’s hostile attributions about their mothers’ behavior (MacKinnon-Lewis, Lamb, Hattie, & Baradaran, 2001; MacKinnon-Lewis, Lindsey, Frabutt, & Campbell Chambers, 2014). One study found mothers’ negative behaviors (i.e., verbalizations, actions, or facial expressions) in a parent-child interaction task predicted later negative attributions by boys about their mothers, which subsequently predicted aggression by the boys in the interaction task (MacKinnon-Lewis et al., 2001). More recent work by MacKinnon-Lewis and colleagues found that the indirect effect of maternal corporal punishment on maternal-child conflict was mediated by hostile attributions about mothers (MacKinnon-Lewis et al., 2014). Both of these studies provide important information about how corporal punishment and maternal negative behaviors contribute to the development of hostile attributions, but the measures of hostile attributions and child behavior in these studies are specific to scenarios with the child’s mother. The current study endeavors to determine if parents’ aggressive behavior can affect both children’s hostile attributions and their behavior in parent-child context as well as in peer contexts.

Several studies have looked at hostile attributions and aggressive behavior in parent-child and peer contexts. One study tested a similar dual-mediational model using a hostile attribution measure that included peer vignettes (Heidgerken, Hughes, Cavell, & Willson, 2004). They found that the relation between harsh parenting and child aggression was mediated through hostile social goals, hostile attributions and other social information processing steps. Their model, using second- and third-grade participants, was cross-sectional and was not able to test change in variables over time. The role of harsh discipline in the change in aggression over time was examined in another study which identified a mediating role of social information-processing, including hostile attribution and 3 additional social information-processing steps (Weiss et al., 1992). The current study seeks to replicate these findings while isolating hostile attributions from other types of social information-processes and testing hostile attribution change over time. While Weiss and colleagues (1992) focused on children ages 5 and 6, the current study seeks to explore these variables in the transition to middle school when aggression and social cognitions are becoming more sophisticated and the role of peers and parents are changing (Steinberg & Morris, 2001).

In summary, the current study builds upon previous literature by investigating parental aggression, broadly defined to include physical aggression and corporal punishment, and its effect on hostile attribution bias over time, and child aggression over time. Both hostile attribution and child aggression will be examined with respect to parent-child interactions and peer interactions. Moreover, hostile attribution and child aggression will be examined while controlling for previous levels of the same variables, allowing us to interpret the role of parental aggression on the change in these constructs across a distinct developmental period – the transition to middle school. The indirect effect of parental aggression on later child aggression with child hostile attribution as a mediator will also be tested.

Hypotheses

Given the theoretical and empirical literature supporting the relations between parental behavior and children's hostile attributions, it is anticipated that parental aggression will predict children's hostile attributions over time. Similarly, parental aggression is expected to predict increases in children's aggression across the transition to middle school. The theorized role of parental aggression to predict both hostile attribution and child aggression across time might suggest that hostile attribution could serve as a mediator of the relation between parental and child aggression. The current study which consists of only two timepoints, allows for a halflongitudinal design model of mediation to be tested (Fritz & MacKinnon, 2012).

METHOD

This study used data from a previous longitudinal evaluation of the Coping Power program collected annually during the summers of six consecutive years (Lochman & Wells, 2002b). The study was conducted in an urban school district of a mid-sized city in the Southeastern United States.

Sample

Participants in the original study were enrolled after being identified using a multiplegating screening procedure (detailed in Lochman & Wells, 2002b). The screening process asked teachers of 4th and 5th grade boys to rate their verbal aggression, physical aggression, and disruptive behavior. The highest rated 22% of the initial screening sample was included in the second screen wherein teachers and parents assessed aggression using the Aggression subscale of the Teacher Report Form (TRF; Achenbach, 1991b) and the Child Behavior Checklist (CBCL; Achenbach, 1991a), respectively. Boys with high scores on both forms were enrolled in the study and randomized to one of 3 treatment groups: Child Intervention (n = 60), Child and Parent Intervention (n = 60), and Risk Comparison (n = 62). In addition, boys who did not meet the initial teacher-rating cutoff were included as a control in the Non-Risk Comparison group (n = 61). Because the current study did not evaluate effects of the preventive intervention, only participants who did not receive the intervention were included in this project. The Risk Comparison and Non-Risk Comparison groups combined (n = 123) made up the sample for the current project. The final sample included 123 boys with almost exactly half identified as at-risk for aggression (n = 61) and half as non-risk (n = 62). The final sample included 123 boys (45.5% White, 53.7% African American and 0.8% Other race). Caregivers completing the survey consisted mostly of mothers (63.4%) and grandmothers (22.8%). Other caregivers included stepmothers (3.3%), fathers (2.4%), grandfathers (1.6%), uncles (1.6%), and one stepfather (0.8%). Within the sample, the mean income level was between \$30,000 and \$34,999. Assessments were first conducted at baseline with each child and his parent separately when the child was in the 4th or 5th grade. The "Time 2" data referred to in the current study was collected two years after baseline, when children in the sample had advanced to the 6th or 7th grade.

Attrition was moderately high across the sample, with 22% of participants leaving the study by Time 2 (n = 27). No significant differences existed between attritted and nonattritted

participants in levels of child aggression, parental aggression, or child hostile attribution, or in demographic variables at Time 1.

Measures

Child aggression—Child aggression was measured by creating a latent variable using both parent and teacher report of aggressive behavior. For parent-report, the Child Behavior Checklist- Aggressive behavior subscale (CBCL; Achenbach, 1991a) is used. The CBCL is an aggression subscale of a parent report measure of child behavior. This 20-item scale asked parents to rate their children's aggressive behaviors as 0 = *not true*, 1 = *somewhat/sometimes true* or 2 = *very/often true*. Examples of aggressive behavior measured on the CBCL included *screams a lot* and *physically attacks people*. Higher scores on the scale indicated more parentrated aggressive and defiant behavior. Internal consistencies of the Aggression subscale of the CBCL were high in each time point in the sample (alpha ranged from .86 to .91).

For teacher report of child aggression, teachers completed the Teacher Report Form – Aggressive Behavior subscale (TRF; Achenbach, 1991b), which is a 25-item teacher report measure of child aggression as observed at school in the classroom. The 3-point response scale was as follows: 0 = *not true (as far as you know)*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*. Items on the aggressive behavior subscale include proactively aggressive behaviors such as *teases a lot* and more disruptive behaviors such as *fidgets*. Overall, higher scores on this scale indicated more aggressive and defiant behaviors. The internal consistency of the Teacher Report Form for this study was strong across timepoints, $\alpha = .95$ to $\alpha = .96$. Research has indicated that the TRF Aggressive behavior subscale is significantly correlated with the CBCL in a national sample (Achenbach & Rescorla, 2001).

Child hostile attribution—The Child Attribution Measure (CAM) used four vignettes of parent-child and child-peer interactions (Lochman & Dodge, 1994; Lochman & Wells, 2002b). The measure used four scenarios involving the child respondent and their imagined peer or parent; the first two vignettes presented conflicts between children and their peers while the last two illustrated child-parent conflicts. For the purposes of this study, only the Attribution subscale was used, as it was the most relevant assessment tool of the hostile attribution bias construct. The Attribution questions asked the child why the peer or mother acted the way that they did. Answers were scored 0 to 2 (0 = *accident*, 1 = *don't know*, 2 = *protagonist was angry*) with a higher score indicating more hostile attribution bias.

Given that each vignette is thematically different from the others, Chronbach's alpha is not be expected to be an appropriate measure of internal consistency. Instead of using the vignettes as a cohesive scale, the items are used as observed variables to create a latent variable measuring children's hostile attribution at Time 1 and at Time 2 within the larger structural equation model testing the hypotheses.

Parental aggression—Parental aggression was measured by standardizing and adding scores on two similar measures - the Physical Aggression subscale of the Conflict Tactics Scale – Child (CTS-C; Straus, 1979) and the Corporal Punishment subscale of the Alabama Parenting Questionnaire (APQ; Shelton, Frick & Wooton, 1996). The Physical Aggression

subscale of the Conflict Tactics Scale – Child (CTS-C; Straus, 1979) asked responding parents how often they engaged in physically aggressive behaviors in the last year while experiencing a conflict with their child. This scale includes 10 items with response choices on a 7-point scale (never, once, twice, 3–5 times, 6–10 times, 11–20 times, more than 20 times). The Corporal Punishment subscale of the Alabama Parenting Questionnaire (APQ; Shelton, Frick & Wooton, 1996) – Parent Version consists of 3 items with higher scores indicating more corporal punishment. Parents responded on a 5-point scale (never, Almost Never, Sometimes, Often, and Always). The two standardized scores at Time 1 were then averaged to create a unitary measure of parent-to-child aggression for Time 1. This procedure was repeated at Times 2. The average parent-to-child aggression score focused on the physical aspect of aggression and had moderate internal consistency, $\alpha = .65$ to $\alpha = .67$.

Data Analyses

In order to understand levels of parental aggression, child aggression, and child hostile attributions, descriptive statistics were completed treating each variable as continuous. Correlations between each variable were also completed to explore bivariate relations. In order to test the hypotheses linking variables over time, we conducted structural equation modeling with the observed variable of parental aggression at Time 1 and latent variables measuring child hostile attribution and child aggression at Times 1 and 2 using MPlus 6 software (Muthen & Muthen, 1998 – 2011). To measure child hostile attribution at Time 1 and Time 2, latent variables were created using 4 vignettes at each time point as observed variables. To measure child aggression, the observed variables of the CBCL Aggressive behavior subscale raw score and the TRF Aggressive behavior subscale raw score were used in a measurement model creating the latent variable at Times 1 and 2. Each of the Time 1 variables – child aggression, child hostile attribution, and parent aggression – were allowed to correlate in the model, as were CBCL scores at Time 1 and Time 2. The overall fit of the structural equation model was tested using the chi-square test of model fit, the Root Mean Square Error of Approximation (RMSEA), the comparative fit index (CFI), the Tucker Lewis Index (TLI) and the standardized root mean squared residual (SRMR).

RESULTS

The means and standard deviations for the sample ($n=123$) are presented in Table 1 and correlations showing cross-sectional and longitudinal relations among the variables are in Table 2. For combining informants of child aggression to create a latent variable, the correlations between the parent-rated CBCL and teacher-rated TRF were examined. They ranged from $r = .486$ to $r = .504$ across time and were significant ($p < .01$).

Aggressive behavior and hostile attributions

To test the hypotheses, a model predicting hostile attribution and child aggression across time was analyzed using Mplus 6 software (Muthen & Muthen, 1998 – 2011; see Figure 1). The model used full information maximum likelihood estimation to deal with missing values due to attrition. Across all variables in the model, an average of 13.9% of data were missing with a range of 0.8% to 30.1% of cases missing depending upon the variables. In order to use full information maximum likelihood estimation, data must be missing completely at

random (MCAR). Little's MCAR test indicated that data are MCAR ($X^2(112) = 103.035$, $p = .716$; Little, 1998).

The model appears to be a good fit for the data, $X^2(55) = 70.840$, $p = .074$, CFI = .921, TLI = .889, RMSEA = .048, 90% CI(.000, .078), SRMR = .074. Statistical literature recommends using a combination of the standardized root mean squared residual (SRMR) and another fit index, such as the RMSEA, to measure model fit (Hu & Bentler, 1999). Among samples less than 250, research suggests using a cutoff of .06 and lower for RMSEA and .08 and lower for SRMR to indicate good model fit (Hu & Bentler, 1999). Using these metrics, the current data fit the model well.

Direct effects in the model included paths predicting hostile attribution at Time 2 from hostile attribution, parental aggression, and child aggression at Time 1, each of which were significant. The R^2 provides an estimate of the effect size of the independent variables at Time 1 explaining about 36% of the variance in hostile attribution at Time 2 ($R^2 = .361$). The model also indicated significant direct paths from Time 1 child aggression and Time 1 hostile attribution to Time 2 child aggression. The paths predicting Time 2 child aggression from parental aggression and Time 2 child attribution were not significant. Overall, the amount of variability in Time 2 child aggression explained by the independent variables was 73% ($R^2 = .359$, 95% CI [-.059, .777]).

Lastly, the half-mediational model of Time 1 parental aggression on Time 2 child aggression through Time 2 hostile attribution was tested by examining the indirect effect of Time 1 parental aggression on Time 2 child aggression. The 95% confidence interval for this indirect effect included zero (95% CI [-.415, .149]) and was nonsignificant (standardized indirect effect = -0.133, $p = .345$). This suggests child hostile attribution does not mediate the effect of parental aggression on child aggression.

DISCUSSION

The results of the current brief report support a model in which parental aggression predicts increases in hostile attribution over time, and hostile attribution predicts increases in aggressive behavior in boys across the transition to middle school. The paths measure change from Time 1 to Time 2 while controlling for Time 1 levels. The findings of this study replicate previous research that has shown a link between parental aggression, social information-processing and child aggression (Weiss et al., 1992; see Orobio de Castro et al., 2002 for a meta-analysis) during a time when young adolescents' relationships with their parents and peers are changing. Our findings suggest that the link between hostile attributions and child aggression remains strong during this developmental period given the medium to large effect size obtained by the model. This is particularly important given the changing role of both parents and peers in middle school (Eccles et al., 1993) and suggests that intervention during this time could be particularly impactful.

As expected, parental aggression predicted children's later hostile attributions above and beyond the impact of previous levels of child hostile attributions. Literature suggests that children may learn hostile attributions through parental modeling of attributions as well as

physical abuse (Dodge, 2006), but the results of the current study highlight the effect of broad-based parental aggressive behavior, including corporal punishment and aggression outside of discipline. Our results suggest that parental aggression has an impact on the way that children think about their social environment, including in peer situations. These parenting behaviors appear to serve as a risk factor for the development of hostile attribution biases, which may explain part of the reason why parental aggression is a risk factor for child aggression.

Given the strong direct effects between parental aggression and child hostile attribution, and child hostile attribution and child aggression over time, we tested a half-longitudinal (Fritz & MacKinnon, 2012) mediational model to determine if hostile attribution could serve as a mediator between parental and child aggression. The change in hostile attribution measured at Time 2 did not relate to that of child aggression measured at the same timepoint and the test of the indirect effect was not significant. It is possible, that if children were followed for another timepoint, a full mediational model could be tested of the effect of parental aggression on child aggression with hostile attribution as a mediator and find different results.

An important strength of this study is its use of parent and teacher report of child aggression. This means that across the model 3 different informants were used – child, parent, and teacher, which not only reduces informant bias, but also allows for measuring child aggressive behavior in two contexts – at home with family and at school with peers and teachers. The study may be further improved if we were to use peer nominations or observational measures as have been used in similar studies (MacKinnon-Lewis et al., 2001; Weiss et al., 1992).

It is important to note the limitations of this brief report. Notably, the sample includes only boys and therefore results are not able to be generalized to girls. Despite this, literature suggests that the link between hostile attributions and aggression in youth is similar in girls and boys (Orobio de Castro et al., 2002). Further research should include both male and female youth and should compare results between the two genders. Additional studies of parent and child hostile attributions and aggressive behavior are needed to examine these variables with more varied populations. Moreover, some additional variable, such as SES, parental stress, or child temperament could be an important piece that could explain the relation between parental aggression, hostile attribution, and child aggression. Some previous research indicates that cultural factors including differences among races and ethnicities in their use of corporal punishment could differentially affect outcomes for youth (Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004). Further research with a larger sample and across a longer span of time could help to solve some of these questions.

Findings of this brief report could have implications in preventative interventions. Both parental aggressive behaviors and hostile attribution biases are often targeted by interventions to prevent youth behavior problems. In addition, both of these variables have been shown to mediate the impact of interventions on youth aggression (Dodge & Godwin, 2013; Lochman & Wells, 2002a). The results of this study provide some context about these two variables indicating that parental aggression is associated with changes in youth hostile

attribution biases. Understanding this relation can help focus elements of preventive intervention on parents to maximize the effect of the intervention on youth aggression prevention.

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Figure 1.

Note: Standardized path coefficients are presented as measures of effect sizes of direct effects. $N = 123$; * $p < .05$, ** $p < .01$ R^2 measures of effect size are presented for the two dependent variables. Overall test of model fit: $X^2(55) = 70.840$, $p = .074$, CFI = .921, TLI = .889, RMSEA = .048, 90% CI(.000, .078), SRMR = .074. TRF = Teacher Report Form, CBCL = Child Behavior Checklist

Table 1

Means and Standard Deviations of Variables at Times 1 and 2

	Timepoint	Range	Time 1			Time 2		
			n	M	sd	n	M	sd
Child Hostile Attribution Bias	Peer Vignette 1	0–2	122	.61	.569	85	.48	.548
	Peer Vignette 2	0–2	122	.69	.708	86	.74	.657
	Parent Vignette 1	0–2	122	.21	.548	86	.12	.448
	Parent Vignette 2	0–2	122	.36	.562	86	.27	.471
Child Aggression	Child Behavior Checklist Aggression	0–37	121	11.55	7.619	88	9.57	7.029
	Teacher Report Form Aggression	0–50	120	16.93	12.360	96	12.85	13.786
Parent Aggression ^a		–1.43–2.51	121	0	1	n/a	n/a	n/a

Note n/a notes variables not included in the model. Standardized score averaging Conflict Tactics Scale Respondent to Child Physical Aggression subscale and Alabama Parenting Questionnaire Corporal Punishment subscale

Table 2

Correlations between variables

	Child Hostile Attribution Latent Variable		Child Aggression (Teacher Report Form)		Child Aggression (Child Behavior Checklist)		Parental Aggression
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	
Child Hostile Attribution Latent Variable	r	-	.136	.363**	.080	.331**	-.043
	95% CI		(-.044, .308)	(.175, .525)	(-.100, .255)	(.131, .505)	(-.220, .137)
	n	123	120	96	121	88	121
Child Aggression (Teacher Report Form)	r	-	.116	.000	.141	.032	.646**
	95% CI		(-.065, .289)	(-.200, .200)	(-.038, .312)	(-.179, .240)	(.528, .739)
	n	120	120	96	121	88	121
Child Aggression (Child Behavior Checklist)	r	-	-	.473**	.504**	.387**	.166
	95% CI			(.298, .617)	(.356, .628)	(.191, .553)	(-.015, .337)
	n	93	93	118	118	86	118
Parental Aggression	r	-	-	-	.377**	.486**	.093
	95% CI				(.190, .538)	(.291, .642)	(-.111, .289)
	n	95	95	75	75	95	95
Parental Aggression	r	-	-	-	.664**	.259**	.124
	95% CI				(.527, .767)	(.084, .418)	(-.089, .326)
	n	87	87	87	87	87	87
Parental Aggression	r	-	-	-	-	-	-
	95% CI						
	n	87	87	87	87	87	87

Note: Pairwise deletion used.

* p < .05,

10 > d
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