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The Role of Hostile Attributions in the Associations between Child Maltreatment and Reactive and Proactive Aggression

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Abstract

The present study examined the relations between child maltreatment and reactive and proactive functions of aggression, and whether hostile attribution biases partially accounted for these associations in a sample of 339 college students (mean age = 19; 51% male). Child maltreatment was associated with reactive, but not proactive, aggression, and instrumental hostile attribution biases accounted for this association. Relational hostile attributions were correlated with both reactive and proactive aggression, but did not play a role in the link between child maltreatment and reactive aggression.

Keywords

abuse; neglect; aggression subtypes; social-information processing

Child maltreatment, defined as the occurrence of abuse (physical, emotional, or sexual) and/or neglect (physical or emotional) during childhood, is estimated to have a prevalence rate between 25% to 41% in American children (Finkelhor, Turner, Shattuck, & Hamby, 2013; Hussey, Chang, & Kotch, 2006). The long-term negative impacts of child maltreatment affect both the individual and society collectively, including mental illness (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999) and juvenile delinquency (Seifert, 2003). In particular, there is strong evidence implicating child maltreatment as a risk factor in the development of aggression (Allen, 2011; Dodge, Bates, & Pettit, 1990; Lee & Hoaken, 2007). Given the link between aggression and poor adjustment throughout the

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All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation [institutional and national] and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

lifespan (e.g., poor social relationships, psychological difficulties, and crime; Fite, Rathert, Colder, Lochman, & Wells, 2012; Moffitt, 1993; Vitaro & Brendgen, 2011), a better understanding of the association between child maltreatment and aggression is vital for the development of effective aggression prevention and intervention efforts.

The existing literature examining the association between child maltreatment and aggression is limited in several significant ways. First, most of this research has focused on broadly defined aggression, ignoring subtypes (i.e., reactive and proactive aggression) of aggressive behavior (Bandura, 1973; Friend, 2014). Second, studies that have examined the link between child maltreatment and reactive (in response to a perceived threat) and proactive (goal-oriented) aggression have produced mixed results (Fite, Wimsatt, Elkins, & Grassetti, 2012; Shields & Cicchetti, 1998). Another limitation of the current literature is that few studies have examined the mechanisms through which maltreatment experiences might contribute to reactive and proactive aggression. Importantly, previous evidence suggests that hostile attribution biases are associated with both child maltreatment (Price & Glad, 2003) and aggression (Aber, Gershoff, Ware, & Kotler, 2004; Homant & Kennedy, 2003; Walters, 2007). Research is needed to evaluate whether hostile attribution biases might account for the association between child maltreatment and reactive and proactive aggression. This information can inform the actual mechanisms to target in treatment to reduce reactive and/or proactive aggression outcomes among those with maltreatment histories.

The current study extends prior research by examining associations between child maltreatment and reactive and proactive aggression and evaluating the role of hostile attribution biases in these associations. The goal of this study is to improve our understanding of these associations in order to aid in the development of more targeted and refined prevention and intervention strategies, such as social information-processing therapies focused on reducing aggression in emerging adults.

Reactive and Proactive Aggression

Researchers recognize that aggression is multi-faceted and that aggressive acts can be characterized by their function, specifically reactive and proactive aggression (Dodge & Coie, 1987; Fite, Rathert, et al., 2012). Reactive aggression is retaliatory in nature, whereas proactive aggression is goal-oriented (Fite, Rathert, et al., 2012). Though both subtypes of aggression have been linked to externalizing symptoms, research has consistently found that proactive aggression is more strongly related to externalizing symptoms, such as conduct disorder and antisocial characteristics, than reactive aggression (Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Fite, Rathert, et al., 2012; Vitaro & Brendgen, 2011). In contrast, reactive aggression, not proactive, aggression is associated with internalizing symptoms, such as depression and anxiety (Fite, Rathert, et al., 2012; Vitaro & Brendgen, 2011).

The variation between these two subtypes is best explained by different theories. Reactive aggression corresponds with the frustration-aggression model, suggesting that aggression represents the externalization of internal frustrations (Berkowitz, 1978). Proactive aggression is supported by social learning theory, which suggests that one has learned that aggression can be used to obtain a desired goal or objective (Bandura, 1973; Card & Little,

2007). Given the differences of these functions of aggression, it is important to identify the unique risk factors, such as child maltreatment and hostile attributions, associated with each aggression subtype.

Child Maltreatment and Reactive and Proactive Aggression

Existing research suggests a link between child maltreatment and current, as well as future, aggression (e.g., Allen, 2011; Cullerton-Sen et al., 2008; Lee & Hoaken, 2007). In particular, there is growing evidence indicating that child maltreatment may be more strongly associated with reactive aggression. Shields and Cicchetti (1998) examined the interplay of aggression, emotion, and attention among youth with and without maltreatment histories and found that physically abused youth exhibited higher levels of reactive aggression than youth without such histories. Additional research has found a unique association between stressful life events and reactive, but not proactive, aggression (Brown, Fite, & Poquiz, In press; Fite, Wimsatt, et al., 2012; Silvern & Griese, 2012). In contrast, Connor and colleagues (2004) examined correlates of reactive and proactive aggression among psychiatrically referred youth. Findings indicated that physical abuse, but not sexual abuse, was positively associated with both reactive and proactive aggression. However, this association could be affected by the covariation between the two aggression subtypes. Further research is needed to determine the associations between child maltreatment and both reactive and proactive aggression.

Researchers have posited that stressful life events, such as child maltreatment, may be more strongly associated with reactive than proactive aggression, as reactive aggression is thought to develop as a consequence of lack of security in relationships or inconsistency in the environment, conditions that may result from any form of child maltreatment (Dodge, 1991; Fite, Wimsatt, et al., 2012). The findings are consistent with the stress-process framework, suggesting that stressful life events may result in poor behavioral and emotional regulation (Roosa et al., 2010; Thoits, 1983; Turner & Finkelhor, 1996); these are key components of reactive aggression (Fite, Rathert, et al., 2012). Researchers further hypothesize that child maltreatment and proactive aggression may not necessarily be associated (Fite, Wimsatt, et al., 2012). Social-learning theory suggests that exposure to maltreatment could lead to proactively aggressive behaviors through modeling and imitation (Bandura, 1973; Dodge, 1991). However, child maltreatment often times includes non-violent acts (i.e., neglect), which might cause the environmental instability associated with reactive, not proactive, aggression. These neglectful forms of maltreatment may not necessarily provide youth with a model of violent behavior.

Despite previous findings of a stronger association between child maltreatment and reactive aggression compared to proactive aggression in youth (Shields & Cicchetti, 1998), research is limited with regard to if, and to what extent, this relation continues into emerging adulthood (Trickett & McBride-Chang, 1995). The period of emerging adulthood is characterized by unique challenges, including periods of transition and instability, particularly the time between leaving secondary school and entering the work force or college, shifts in identity, and reduced daily structure as compared to younger ages (Arnett, 2007; Duncan, 2000; Pecora et al., 2006). These differentiations separate emerging adults

sufficiently from juveniles, making it important to examine the association between child maltreatment and aggression specifically in this age group. Further, there is no literature investigating how factors, such as hostile attributions, might play a role in the association between maltreatment and functions of aggression. Accordingly, the current study expands on previous research that examined the link between child maltreatment and reactive and proactive aggression among youth by determining if these findings are applicable to emerging adults and evaluating the extent to which hostile attribution biases account for these associations.

The Role of Hostile Attributions

There is preliminary evidence supporting a link between exposure to child maltreatment and hostile attribution biases (Price & Glad, 2003). Price and Glad (2003) examined the role of children's hostile attributions among maltreated and non-maltreated youth. Findings indicated that, compared to non-maltreated youth, physically abused boys were more likely to attribute hostile intentions across relationships (e.g., parents, teachers, peers). The link between child maltreatment and hostile attributions is likely explained by attachment theory, which posits that the security of a child's relationship with their primary caregivers shapes the child's interpersonal relationships throughout the lifespan (Bowlby, 1978). Maltreating families and environments are often characterized by insecure and disorganized attachment, emotional and physical rejection, aggression, and inconsistent parenting (Cicchetti, Rogosch, & Toth, 2006). These environments make it difficult for children to interpret and predict their parents' behavior, and this insecurity may generalize to other social relationships and situations (Luke & Banerjee, 2012).

There is also research suggesting that deficits in social information processing are associated with aggression (Li, Fraser, & Wike, 2013; Terzian, Li, Fraser, Day, & Rose, 2015). Hostile attributions, a component of social information processing, have been linked to aggression, particularly reactive aggression (Dodge, Price, Bachorowski, & Newman, 1990; Homant & Kennedy, 2003; Walters, 2007). Dodge and colleagues' study of male juvenile offenders found a unique association between hostile attribution biases and reactive aggression when controlling for the covariance between the two aggression subtypes (Dodge, Price, et al., 1990). Reactive aggression is thought to be caused by the aggressor believing even benign situations to be hostile and reacting aggressively in response (Aber et al., 2004). Thus, hostile attributions may be a particularly important factor in associations between child maltreatment and reactive aggression.

More recent research, however, has separated hostile attribution biases into two distinct subtypes: instrumental and relational hostile attributions. Instrumental hostile attributions relate to the belief that a person is acting hostile towards another person's belongings, and relational hostile attributions relate to the belief that another person's hostility is directed at a personal relationship (Bailey & Ostrov, 2008). Previous research has found that, in emerging adults, hostile attributions were uniquely associated with reactive, but not proactive, aggression. (Bailey & Ostrov, 2008). Specifically, relational hostile attributions were more strongly linked to relational reactive aggression while instrumental hostile attributions were more strongly linked to physical reactive aggression in a bivariate correlational analysis

(Bailey & Ostrov, 2008). However, regression analysis revealed that the association between relational hostile attributions and relational reactive aggression was stronger than the association between instrumental hostile attributions and physical reactive aggression (Bailey & Ostrov, 2008). Hostile attribution biases are believed to be products of errors in the mental representation stage of the social information processing theory (Dodge, 1986; Dodge & Coie, 1987), rather than social-learning of aggression (Bandura, 1973). Thus, both subtypes of hostile attribution biases were posited to be more strongly associated with reactive than proactive aggression.

To the authors' knowledge, the association between child maltreatment and hostile attribution subtypes (i.e., instrumental and relational hostile attribution biases) has not been previously investigated; however, research has identified an association between both hostile attribution subtypes and peer victimization, a common negative life event in adolescence (Hoglund & Leadbeater, 2007). Consistent with these effects, child maltreatment was expected to be associated with both instrumental and relational hostile attributions, and both hostile attribution subtypes were expected to play a role in the link between child maltreatment and reactive aggression.

Current Study

In sum, the current study extends previous research by evaluating the role of hostile attributions in associations between child maltreatment and reactive and proactive functions of aggression in a sample of emerging adults. We hypothesized that child maltreatment would be more strongly related to reactive than proactive aggression. Additionally, given findings indicating that child maltreatment is associated with hostile attributions (Price & Glad, 2003), and both relational and instrumental hostile attributions are associated with varying forms of reactive aggression (Bailey & Ostrov, 2008), we hypothesized that both hostile attributions subtypes would account for a significant portion of the variance in the proposed association between child maltreatment and reactive aggression.

Method

Participants

Participants in this study were 339 university students between 18 and 25 years of age (M age = 19; SD = 1.26). The distribution of gender was fairly even (51% male) and the racial/ethnic breakdown was representative of the diversity present in a large, Midwestern college (72% Caucasian; 10.3% Asian; 5% Hispanic/Latino; 3.8% African American; 1.5% Native American; 7.4% other or bi-racial). Class breakdown included 61.7% freshman; 26% sophomores; 9.4% juniors; 2.1% seniors; 0.8% 5+ years.

Participants were recruited by means of the SONA experiment tracking software system, wherein currently enrolled students could choose to participate in a list of active and available studies. Upon completion, participants were awarded SONA course credit as compensation.

Measures

Demographics—Participants provided demographic data, including age, gender, race/ethnicity, and academic year.

Child maltreatment—Child maltreatment was assessed using 25 items of the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). This retrospective, self-report measure assesses the occurrence and extent of five different types of abuse and neglect, including sexual abuse, physical abuse, physical neglect, emotional neglect, and emotional abuse. Participants rate the frequency with which a range of experiences took place during their childhood using a scale ranging from “Never True” to “Very Often True.” A mean score was computed and used for analyses. The CTQ has demonstrated strong psychometric properties in a range of clinical and community samples (Bernstein & Fink, 1998). Internal consistency of the CTQ in the current sample was excellent ($\alpha = .91$).

Aggression subtypes—Aggression subtypes were assessed using Dodge and Coie’s (1987) reactive-proactive aggression scale. Responses were measured using a five-point Likert scale. Three of the six items assessed reactive aggression (e.g., “When I have been teased or threatened, I get angry easily and strike back”). The remaining three of the six items assessed proactive aggression (e.g., “I threaten or bully others in order to get my own way”). A mean score was computed for each subtype and used for analyses. This scale has shown strong reliability and validity in various samples (Dodge et al., 1997; Waschbusch & Willoughby, 1998). Internal consistencies for the current study were low to modest, $\alpha = .58$ for reactive aggression and $\alpha = .75$ for proactive aggression.

Hostile attributions—Hostile attributions were assessed using the revised version of the Assessment of Intent Attributions measure (Bailey & Ostrov, 2008). The measure included 10 vignettes (e. g., “Imagine that you brought a new iPod and you show it to other students in your residence hall. You let another student play with it for a few minutes while you go to the bathroom. When you get back you realize that the student has broken your new iPod”). Two questions were asked for each story. The first question asked why the antagonist of the story took part in the event, with a four item multiple choice response. Two of the options attribute the negative outcome to the hostility of the antagonist and the other two options attribute the negative outcome to benign motives. The second question was “in this story, do you think that the student was...” with the answer choices of “trying to be mean” or “not trying to be mean”. The scale examines both instrumental provocation scenarios (i.e., damage to a material possession, such as is seen in the iPod story) and relational provocation scenarios (i.e., damage to an interpersonal relationship). Scores for the four instrumental provocation scenarios and for the four relational provocation scenarios were summed independently and used for analyses. This measure has shown strong reliability and validity in multiple samples (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Leff et al., 2006). Internal consistencies of the subscales in the current study were modest, $\alpha = .71$ for instrumental hostile attributions and $\alpha = .70$ for relational hostile attributions.

Procedures

This study was approved by the researchers' institutional review board prior to data collection. The data for the present study was collected as part of a larger study that also included health related information and biological data. Only procedures related to the survey are reviewed. Up to five individuals participated in the study during any one test session. Informed consent was obtained from all participants prior to participating in the study. Participants completed an online survey, which took the majority of participants 45 minutes. All information gathered was anonymous. Two research assistants provided detailed instructions and remained in the room to answer any questions participants might have had about the survey items. Participants were given three of 11 SONA credits needed to fulfill a psychology course requirement (or for extra credit) as compensation for completing the survey. All participants were given an opportunity to ask questions about the study and were provided with a referral list to local mental health service providers upon study completion.

Results

Descriptive Statistics

Correlations, as well as means and standard deviations, for all study variables can be found in Table 1. Age was modestly negatively associated with relational hostile attribution biases, suggesting that younger participants reported higher relational hostile attribution biases than older participants. Age was also modestly positively associated with child maltreatment, signifying that older participants reported more child maltreatment than younger participants. Males were more likely to report proactive aggression, and females were more likely to report relational hostile attributions.

Reactive and proactive aggression were moderately positively associated, sharing approximately 20.5% of their variance. Child maltreatment was modestly positively associated with reactive aggression but was not associated with proactive aggression. Instrumental hostile attribution biases and relational hostile attribution biases were modestly positively associated, sharing approximately 4.5% of their variance. Child maltreatment was modestly positively associated with instrumental hostile attribution biases, but was not associated with relational hostile attribution biases. Instrumental hostile attributions were modestly positively associated with both reactive and proactive aggression. Relational hostile attribution biases were also modestly positively associated with both reactive and proactive aggression. Given this pattern of associations, subsequent regression analyses focused on whether instrumental hostile attributions accounted for the association between child maltreatment and reactive aggression.

Regression Analyses

Two multiple regression models were estimated in order to evaluate the role of instrumental hostile attributions in the link between child maltreatment and reactive aggression. First, reactive aggression was regressed on child maltreatment, while also controlling for proactive aggression, in order to evaluate unique associations. In a second model, instrumental hostile attributions were added to determine if instrumental hostile attributions accounted for some

of the variance in the association between child maltreatment and reactive aggression. Note that age and gender were included as control variables in both models given the above noted correlations and previous literature suggesting gender and age differences in aggression (Coie & Dodge, 1998).

In both reactive aggression models, proactive aggression was positively associated with reactive aggression ($Bs = .52$ & $.54$, $p < .001$). However, neither gender ($Bs = -.10$, $ps > .10$) nor age ($Bs = -.05$, $p > .10$) were associated with reactive aggression in either model. The initial model indicated that child maltreatment was positively associated with reactive aggression ($B = .16$, $p = .05$) when also accounting for the variance associated with proactive aggression. When instrumental hostile attribution biases were added to the model, hostile attributions were positively associated with reactive aggression ($B = .05$; $p = .04$), and the association between maltreatment and reactive aggression was no longer statistically significant ($B = .14$, $p = .10$). Findings are depicted in Figure 1.

MacKinnon and colleagues' Z' approach to evaluating indirect effects was utilized to determine if instrumental hostile attributions accounted for the association between child maltreatment and reactive aggression, as the Z' approach has been found to reduce Type I error rates and increased statistical power relative to other tests of indirect effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The test of indirect effects indicated that, indeed, instrumental hostile attributions accounted for the link between child maltreatment and reactive aggression ($Z = 1.58$, $p < 0.05$).

Discussion

The current study extended the literature by examining the relations between child maltreatment and reactive and proactive aggression, and evaluated the role of hostile attribution biases in these associations in a sample of emerging adults. Results of the current study supported the hypothesis and added to the growing research indicating that child maltreatment is associated with reactive aggression (Shields & Cicchetti, 1998). As explained in the stress-process framework, abusive and neglectful homes might foster disrupted relationships and environmental instability, negatively affecting children's ability to appropriately regulate emotional states (Roosa et al., 2010; Thoits, 1983; Turner & Finkelhor, 1996), a characteristic of reactive aggression (Dodge, 1991; Fite, Wimsatt, et al., 2012). Child maltreatment and proactive aggression were not associated. Proactive aggression is more closely associated with the social-learning theory (Bandura, 1973; Card & Little, 2007), which states that aggression develops in response to the modeling and reinforcement of aggressive behaviors rather than experiencing aggressive behavior (Dodge, 1991; Dodge & Coie, 1987; Fite, Rathert, et al., 2012; Fite, Wimsatt, et al., 2012).

Consistent with limited previous research (Price & Glad, 2013), the current study found an association between child maltreatment and hostile attribution biases. As explained in attachment theory (Bowlby, 1978), the link between child maltreatment and hostile attribution biases is likely due to inconsistencies in the family environment, which might lead to negative beliefs about other relationships (Cicchetti et al., 2006; Luke & Banerjee, 2012). Importantly, this study extends previous literature by finding that child maltreatment

was associated with instrumental, not relational, hostile attribution biases. Peer victimization research suggests that peer victimization is associated with both instrumental and relational hostile attribution biases (Hoglund & Leadbeater, 2007), as well as both relational and physical acts of aggression (Crick, Casas, & Ku, 1999; Finkelhor, Ormrod, Turner, & Hamby, 2005). Previous evidence has indicated that physical aspects of maltreatment have more deleterious social effects than the relational aspects (Trickett & McBride-Chang, 1995), which could explain why child maltreatment is associated specifically with instrumental, rather than relational, hostile attribution biases. This study provides the first insight into how childhood maltreatment is associated with hostile attribution biases subtypes.

Both instrumental and relational hostile attribution biases subtypes were positively associated with both aggression subtypes. The significant bivariate association between instrumental and relational hostile attributions and proactive aggression might be due to the covariance between reactive and proactive aggression. Indeed, in follow-up regression analysis, hostile attributions were not associated with proactive aggression when including the variance associated with reactive aggression (p s = .145 & .305). The association between both types of hostile attribution biases and reactive aggression can be explained within the social-information processing framework, which suggests that interruptions at the second stage of the framework (i.e., mental representations) could affect subsequent stages of processing (i.e., response accessing, evaluation, and enactment; Dodge, 1986; Dodge & Coie, 1987). More importantly, the current study indicated that instrumental hostile attribution biases accounted for the link between child maltreatment and reactive aggression. This finding indicates the importance of targeting instrumental hostile attribution biases for the prevention of reactive aggression in maltreated individuals.

Limitations of the current study include a cross-sectional design and reliance on self-report data. Cross-sectional designs limit the ability to make inferences about the directionality of associations; longitudinal research is needed. Participants provided retrospective self-report data, which can be subject to social desirability, as well as recall and response, biases (Davis, Luecken, & Zautra, 2005). Past research suggests that reliable accounts of childhood trauma can be obtained using self-report methods (Hardt & Rutter, 2004). Nonetheless, data gathered from multiple informants provides a more comprehensive assessment of trauma histories. In addition, understanding of the complexities of child maltreatment would be enriched by future research evaluating subtypes of child maltreatment individually. Another potential limitation was the restricted variability of participants. Although participants in the current study were representative of the university population from which the data were drawn, the extent to which current findings might generalize to a more diverse sample with regards to age, race/ethnicity, and socio-economic status is unknown. Previous research has also indicated that child maltreatment is negatively associated with rates of college enrollment (Duncan, 2000; Pecora et al., 2006). It may be that attributions of a college sample are not representative of all emerging adults with maltreatment histories. Low to modest internal consistencies of some measures (i.e. reactive and proactive aggression; relational hostile attribution biases and instrumental hostile attribution biases) is also a limitation. Lastly, the measure of aggression used (Dodge & Coie, 1987) has previously

been critiqued for focusing more heavily on the physical, rather than the emotional, features of aggression (Gottman, 1986). Further research is needed to address these limitations.

Despite the limitations, the current study contributes to our understanding of the link between child maltreatment and reactive aggression, suggesting that instrumental hostile attributions play a role in this association. These findings can contribute to the advancement of therapeutic programs focused on the prevention and intervention of aggression. Indeed, recent studies have found support for targeting social information processing in aggression intervention efforts (Li et al., 2013; Terzian et al., 2015). For example, Terzian and colleagues found that social information-processing based intervention programs led to decreases in aggression among third grade boys (Terzian et al., 2015). However, hostile attribution biases have not been studied as a unique variable, separate from social information processing. As the previously studied programs have included intervention at each of the five stages of the social information-processing series, focusing intervention programs exclusively on hostile attributions can reduce the time and resources needed to implement such programs, giving access to therapeutic intervention to more juveniles and emerging adults who are at risk of becoming reactively aggressive. The findings of this study also suggest that intervention efforts would be improved by focusing on instrumental hostile attributions when intervening with aggressive individuals who have a history of child maltreatment. However, future work is needed to determine the effectiveness of aggression prevention strategies for aggressive behavior among individuals with a history of maltreatment.

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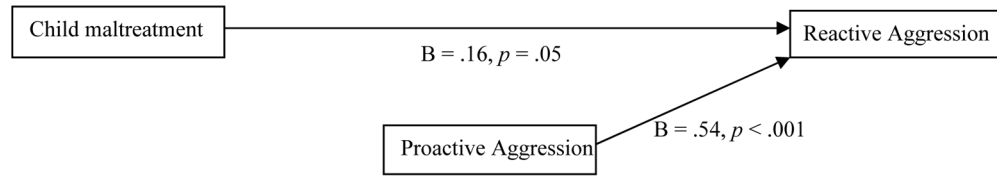
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Model 1



Model 2

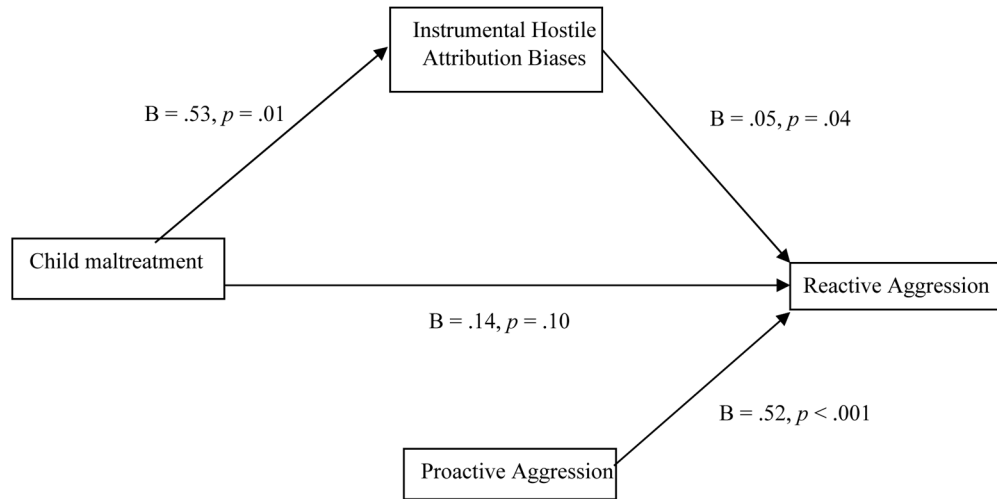


Figure 1. Visualization of the Indirect Effect of Instrumental Hostile Attribution in the Association between Child Maltreatment and Reactive Aggression

Table 1

Correlations, Means, and Standard Deviations

	1	2	3	4	5	6	7
1 Age	-						
2 Gender	-.15 ^{**}	-					
3 Reactive Aggression	-.04	-.10	-				
4 Proactive Aggression	.03	-.11 [*]	.45 ^{**}	-			
5 Relational HAB	-.14 [*]	.16 ^{**}	.23 ^{**}	.13 [*]	-		
6 Instrumental HAB	.00	-.05	.19 ^{**}	.16 ^{**}	.22 ^{**}	-	
7 CTQ Mean	.19 ^{**}	-.02	.14 [*]	.09	-.02	.14 [*]	-
Mean	19.00	-	2.15	1.35	4.39	1.24	1.35
Standard Deviation	1.26	-	.69	.57	2.02	1.60	.44

* p < .05

** p < .01

*** p < .001