Child Psychiatry Hum Dev (2011) 42:609–621
DOI 10.1007/s10578-011-0236-3

ORIGINAL ARTICLE

Associations Between Effortful Control, Psychological Control and Proactive and Reactive Aggression

Jamie Rathert · Paula J. Fite · Alden E. Gaertner

Published online: 14 June 2011

Abstract The current study examined relations between effortful control (ones ability to focus and shift attention in an adaptive manner), psychological control (caregiver attempts to manipulate the child's internal world) and proactive and reactive aggression. Participants were 69 children (54% male) ranging from 9 to 12 years of age ($M = 10.35$, $SD = 1.14$) and their primary caregivers from a community-recruited sample. Results indicate that psychological control and effortful control interacted and contributed to proactive aggression. At high levels of effortful control psychological control was positively associated with proactive aggression, whereas at low levels of effortful control psychological control was unrelated to proactive aggression. In contrast, although both effortful control and psychological control were correlated with reactive aggression, only effortful control was uniquely negatively associated with reactive aggression. Implications for prevention and intervention are discussed.

Keywords Proactive and reactive aggression · Parental psychological control · Effortful control

Introduction

Child aggression researchers often conceptualize aggression by the function or motivation underlying the behavior, namely proactive and reactive aggression [1, 2]. Proactive aggression is goal oriented and planful in nature whereas reactive aggression occurs in response to a perceived threat. There is evidence to suggest that proactive and reactive aggression are theoretically and empirically distinct subtypes of aggression [1–3]. As such, one may expect different factors to be associated with these aggression subtypes [1, 4], which would ultimately indicate unique targets of intervention. However, more empirical

J. Rathert (✉) · P. J. Fite · A. E. Gaertner
Department of Psychology, The University of Tennessee, Austin Peay Building, 1404 Circle Dr., Knoxville, TN 37996, USA
e-mail: jrathert@utk.edu

investigation examining relations between individual and contextual influences and these subtypes of aggression is needed in order to inform prevention and intervention strategies [5].

More specifically, parental psychological control (i.e., attempts to manipulate the child's internal world) has been indicated as a factor that affects child problem behavior, including aggression [6]. Additionally, effortful control (i.e., the ability to adapt behavior according to the demands of a situation) has been found to influence aggressive behavior [7]. However, these constructs have not yet been thoroughly examined in relation to aggression and the aggression subtypes. These factors may likely interact in their associations with these aggression subtypes. This information could potentially aid in tailoring parenting interventions to the needs of particular children in order to prevent the development and exacerbation of both proactive and reactive aggression. Accordingly, the current study sought to examine the unique and interactive contributions of effortful control and parental psychological control on proactive and reactive aggression subtypes of aggression.

Proactive and Reactive Aggression

Although some question the utility in distinguishing between proactive and reactive aggression due to their statistical overlap [8] there is theoretical and empirical support for distinguishing between these two functions of aggression [2, 3, 9]. Proactive aggression appears to be best described by social learning theory, which posits that aggression is motivated by the desire to obtain a goal [10, 11]. Although there are biological predispositions that enable an individual to act aggressively, environmental factors are hypothesized to stimulate the activation of aggressive behavior. That is, social experiences provide the context that set the stage for the type of aggression, the frequency of the aggressive behavior, and the situations in which aggressive behavior is displayed [10]. In accordance with social learning theory, early social experiences (such as coercive and controlling family processes) as well as exposure to, and parental endorsement of, aggression are believed to be important antecedents of proactive aggression [1].

Reactive aggression, on the other hand, may be best explained by the frustration-aggression model. This model posits that aggression is an angry and hostile reaction to frustration [12]. The theory also suggests that aversive events are the root of angry aggression, such that aversive events perceived as threatening or intentional elicit a fear response or the need to defend oneself [12]. Consistent with the frustration-aggression model, reactive aggression is believed to be the result of poor emotional and behavioral regulation, more specifically strong reactions to angry and hostile emotions [13]. Poor emotional and behavioral regulation may be the result of a temperamental predisposition [13], abusive and inconsistent parenting, and/or poor attachments with parental figures [1]. These children are likely to experience the world as harsh and hostile and are not equipped to shift their attention away from negative stimuli due to social cognitive processing deficits [14]. This results in severe emotional dysregulation and the tendency to react aggressively to perceived threats in an emotionful way. However, there is still very little research examining factors that contribute to proactive and reactive aggression. Specifically, little is known about how individual (i.e., temperament) and contextual (i.e., parenting behaviors) factors impact the development and exacerbation of the aggression subtypes.

Effortful Control

Effortful control is one dimension of temperament that has been empirically linked to problem behavior [15–18]. Effortful control refers to a child's ability to regulate their emotions and behavior and engage in willful attentional shifting [19]. Effortful control allows a child to maintain an "optimal" level of behavioral expression appropriate for the context, and therefore is considered an essential adaptive function [20]. High levels of effortful control are related to moderate emotional expressivity [20], such that children with high levels of effortful control do not exhibit excess or deficits in emotional expressivity. However, a lack of effortful control has been linked to emotion driven externalizing problems. For example, Eisenberg, Champion and Ma [21] found that for individuals high in anger proneness, low levels of effortful control were associated with high levels of externalizing problems. Thus low levels of effortful control have been found to predict emotionally driven behavioral problems.

Frick and Morris [13], propose that there may be distinct pathways from temperament to proactive and reactive aggression. More specifically, low levels of effortful control may be specifically related to reactive aggression due to poor emotional regulation and the inability to inhibit aggressive urges. In contrast, however, poor effortful control is not characteristic of proactively aggressive behavior. Rather the ability to engage in planful aggressive acts requires good behavioral regulation. This suggests that proactive aggression may be influenced by high levels of effortful control in conjunction with contextual factors that encourage aggressive behavior.

Parental Psychological Control

One contextual factor to consider in the development and exacerbation of aggressive behavior is caregiver behavior [22, 23]. One negative caregiver behavior that has been found to influence child problem behavior is parental psychological control [24, 25]. Psychological control is an attempt on the caregiver's part to undermine the child's autonomy and assert control over the child's internal processes [6] through the use of psychologically intrusive and manipulative parenting strategies, such as guilt induction, love withdrawal, instillation of anxiety, and fostering emotional dependence on the parent [24, 26].

Social learning theory may be instrumental in understanding how this dimension of parenting contributes to emotional and behavioral outcomes in childhood and adolescence. More specifically, children with psychologically controlling parents are exposed to a relationally manipulative and controlling interaction style, which may in turn foster the development of aggressive behavior [27, 28]. This may be the case for the expression of proactive aggression, as psychological control may contribute to proactive aggression by serving as a modeling mechanism and demonstrating to the child ways to control others.

Psychological control may also contribute to the development of reactive aggression. Parental psychological control may lead the child to become emotionally dependent on the parent, stifling the development of effective coping skills, resulting in the development of internalizing difficulties, which has been linked to reactive aggression [24, 29, 30]. Thus, there is reason to believe that that psychological control could contribute to the development of both aggression subtypes. It is also theoretically plausible that psychological control may interact with effortful control to contribute to the development and exacerbation of proactive and reactive aggression.

Parenting by Temperament Interactions

In accordance with Chess and Thomas's [31] goodness of fit model, which posits that complex interactions between individual biological factors and contextual social factors contribute to the development of specific behaviors, parenting by temperament interactions have been found to impact child externalizing behavior problems [32–35]. However, this research has been limited to only a handful of studies. For example, Bates, Pettit, Dodge, and Ridge [36] found that restrictive parenting and a child's level of resistance to control interact to predict externalizing problems, such that, less restrictive parenting was more effective for less resistant children. Additionally, for children who were highly resistant, restrictive parenting was associated with lower externalizing problems.

Specific to the constructs of effortful control and psychological control, only one study, to our knowledge, has attempted to examine their interactive effect. Morris et al. [37] examined the interactive effects of psychological control and effortful control on child adjustment in a sample of first and second graders; however, no significant interactions were found. This may be the result of not examining specific subtypes of child behavior. In particular, there is theoretical as well as empirical evidence to suggest that effortful control may differentially impact the association between psychological control and proactive aggression versus the association between psychological control and reactive aggression. Because proactive aggression is believed to develop as a result of modeling and requires behavioral control [1, 2] high levels of effortful control may strengthen the association between psychological control and proactive aggression. In contrast, because reactive aggression is associated with poor behavioral control [2, 5, 15], high levels of effortful control may buffer or weaken the association between psychological control and reactive aggression.

The Current Study

In sum, to date research examining associations between temperament and parenting factors and subtypes of aggressive behavior has been limited. Furthermore, the interactive effects of temperament and parenting on child problem behavior are largely unknown. The current study extended previous research by examining relations between effortful control, psychological control and proactive and reactive aggression. First-order effects as well as the interactive effects of effortful control and psychological control were examined. We expected that high levels of effortful control would be associated with proactive aggression and low levels of effortful control would be related to reactive aggression. We also expected psychological control to be associated with both proactive and reactive aggression. Finally, based on proactive aggression being goal oriented and calculated in nature, we expected high levels of effortful control in conjunction with high levels of psychological control to be most strongly associated with proactive aggression. In contrast, based on the link between poor effortful control and emotionally driven behavior, along with the link between psychological control and problem behavior, we expected low levels of effortful control in conjunction with high levels of psychological control to be most strongly linked to reactive aggression.

Methods

Participants

Eighty-nine children ranging from 9 to 12 years of age and their primary caregiver were recruited through the community via flyers posted at local daycares, recreational centers, physician's offices and eateries. Of the 89 families who participated, 6 children were home schooled and 1 caregiver refused to sign a release of information for the laboratory to contact their school teacher. Eighty-two packets were sent to teacher for information regarding child behavior. Of the 82 packets sent, 69 teachers returned their packets, resulting in a sample size of 69 for the current study. We compared those with and without teacher data and these individuals did not differ on gender, race ($X^2 = .00$ $p = .98$ & $X^2 = .81$, p .37), age, income, psychological control, or effortful control ($ts = -1.50$, .94, .96, 1.20, $ps > .14$) respectively, suggesting that the subsample of those with teacher data is representative of the entire sample.

Fifty-four percent of these children were male with a mean age of 10.35 years (SD = 1.14). The sample is racially representative of the moderate sized metropolitan area in which the data was collected, with the majority of children in this sample (74%) identified as Caucasian (20% African American, 1.5% Asian America, and 4.35% identifying with an other racial group or biracial). The majority of caregiver respondents were mothers (87%). The sample included a variety of socioeconomic backgrounds, with annual household income ranging from $3,000 to $240,000 (Mdn = $55,000) and approximately 26% of the sample receiving public assistance.

Procedures

Children and their primary caregivers were invited to come to the laboratory for approximately one and a half hours. Caregiver consent and child assent were obtained prior to data collection. Caregivers and children were interviewed simultaneously in separate rooms in order to ensure confidentiality. All questionnaires were read aloud to children and caregivers and study staff recorded responses so that reading level was not a concern. In addition, caregivers were asked to sign a release of information that allowed study staff to contact the child's teacher to obtain information regarding the child's behavior at school. Families were compensated with $45 and children received a prize for participation. Teacher packets were mailed directly to the school with a copy of the release of information. Teachers were compensated with $10 gift cards for their participation.

The current study focused on caregiver report of effortful control, child report of psychological control and teacher reports of aggression. Caregiver report of effortful control is commonly utilized in research, as parents have been found to be valid raters of infant and child temperament [38]. Youth reports of psychological control are considered to be valid and reliable, compatible with observational measures of psychological control, and demonstrating salience over time [39]. Finally, teachers have been found to be valid and reliable reporters of the aggression subtypes, as teachers have the ability to observe children in social situations in which children have opportunities to aggress toward peers [2, 40, 41].

Measures

Effortful Control

Effortful control was assessed using caregiver report of the Effortful Control scale of the Children's Behavior Questionnaire, as widely used and reliable measure of children's behavior [42]. This 38 item scale is comprised of 3 subscales, including attentional focusing (e.g., "When picking up toys or other jobs usually keeps at the task until its done") attentional shifting (e.g., "Can easily shift from one activity to another") and inhibitory control (e.g., "Can wait before entering into new activities if s/he is asked to"), and has been found to be valid and reliable [42]. Caregivers respond using a 7-point Likert Scale (1 = Extremely untrue, to 7 = Extremely true) to rate how true a particular statement is of the child. Items were coded such that high scores indicated high levels of effortful control. Items were then averaged and used for analyses. The internal consistency of the measure was adequate ($\alpha = .76$).

Psychological Control

Perceived psychological control was assessed using child report of 10 Psychological Control items [39, 43]. This measure has been found to be valid and reliable [39]. Children were asked to rate on a 3-point Likert Scale (1 = Not like her/him, to 3 = A lot like her/him) how well a particular statement described their caregivers (e.g., "Is always trying to change how I feel or think about things"). Informants reported separately for each caregiver, mother and father, respectively. Mother and father scales were highly positively correlated ($r = .70$, $p < .01$). Accordingly, mother and father scales were averaged together and used for analyses. Internal consistencies for mother and father reports were acceptable (Mother $\alpha = .72$; Father $\alpha = .81$), and the internal consistency of the two scales combined was good ($\alpha = .86$).

Proactive and Reactive Aggression

Proactive and reactive aggression were assessed using teacher report on Dodge and Coie's [2] aggression questionnaire. This six item questionnaire consists of three items for each aggression subtype. The measure uses a 5-point Likert Scale (1 = never, to 5 = almost always) to rate how often the child engages in physically aggressive behavior. An example of a proactive item is "This child uses physical force or threatens to use physical force in order to dominate other kids", and a reactive item is "When this child has been teased or threatened, he/she gets angry easily and strikes back." Items were averaged and used for analyses. This measure has been found to be valid and reliable [44, 45]. Internal consistencies for these subscales were good (αs = .94 and .91).

Data Analysis

Analyses were conducted using SAS 9.1 statistical software (SAS Institute Inc., Cary, NC). First, correlation analyses were conducted for descriptive purposes. Multiple regression analyses were then used to evaluate unique associations as well as examine the interaction between effortful control and psychological control. Due to the

statistical overlap of proactive and reactive aggression, the opposite aggression subtype was controlled for in the model in order to examine unique associations. Previous research has found age and gender differences in aggression [46]; therefore age and gender were included in the regression models to prevent potentially confounding present findings.

Note that all variables were standardized prior to estimating regression models. That is, all variables were rescaled in a manner that sets the mean to zero and the standard deviation to one. This is a common procedure utilized to enhance the interpretation of regression coefficients. Significant interactions were conditioned and probed at high (+1 SD) and low (−1 SD) levels of effortful control in order to determine the nature of the interactions [47].

Results

Descriptive Statistics

Means, standard deviations and correlations are reported in Table 1. Consistent with previous research [2, 41] teachers reported higher levels of reactive aggression than proactive aggression. On average, children reported low levels of parental psychological control, with limited variability. Caregiver reports suggested moderate levels of effortful control, with limited variability in the sample. As expected, proactive and reactive aggression were highly correlated. That is, an individual who exhibits high levels of one function of aggression is also likely to exhibit the other function of aggression (See Table 1). Effortful control was negatively related to reactive aggression and unrelated to proactive aggression., suggesting that effortful control is only associated with impulsive aggression. Finally, as expected psychological control was positively related to both aggression subtypes, suggesting that parenting behavior is associated with both functions of aggression.

Table 1 Correlations, means, and standard deviations

	1	2	3	4	5	6	7
1. Age	–						
2. Gender	−.08	–					
3. Race	−.07	.00	–				
4. Proactive aggression	−.01	−.16	.26*	–			
5. Reactive aggression	−.04	−.21	.29*	.79 *	–		
6. Psychological control	−.22*	−.08	.23*	.34*	.30*	–	
7. Effortful control	−.11	.05	−.08	−.19	−.36*	−.23*	–
Mean	10.44	1.44	1.26	1.42	1.99	1.42	3.62
Standard deviation	1.14	.50	.44	.83	1.10	.33	.36
Skewness	.01	.25	1.10	2.13	1.14	1.15	−1.61

* $p < .05$

Regression Analyses

Proactive Aggression

A first-order effects model, whereby proactive aggression was regressed on psychological control, effortful control, reactive aggression, gender, age, and race, was first estimated in order to examine unique associations of proactive aggression (See Table 2). Reactive aggression was positively associated with proactive aggression. Neither age, nor gender, nor race or effortful control or psychological control were significantly related to proactive aggression.

The interaction between effortful control and psychological control was then added to the model and a significant interaction was found ($\beta = .18$, $t = 2.74$, $p = .01$). The interaction was then probed at high and low levels of effortful control in order to understand the nature of the interaction (See Fig. 1). At high levels of effortful control, psychological control was positively related to proactive aggression ($\beta = .38$, $t = 3.28$, $p = .00$), such that high levels of psychological control were associated with high levels of proactive aggression. However, at low levels of effortful control, psychological control and proactive aggression were not significantly related ($\beta = .01$, $t = .17$, $p = .87$; Fig. 1).

Table 2 Proactive and reactive aggression regression analyses

	Proactive aggression		Reactive aggression	
	β	t	β	t
Age	.07	.97	−.07	−.98
Gender	.00	.06	−.09	−1.28
Race	.02	.23	.08	1.09
Opposite aggression subtype	.80	9.35*	.73	9.35*
Psychological control	.14	1.76†	−.03	−.42
Effortful control	.14	1.79†	−.21	−2.97*

Note that reactive aggression was controlled for in the proactive aggression model and proactive aggression was controlled for in the reactive aggression model, respectively

* $p < .05$; $^{\dagger} \leq .08$

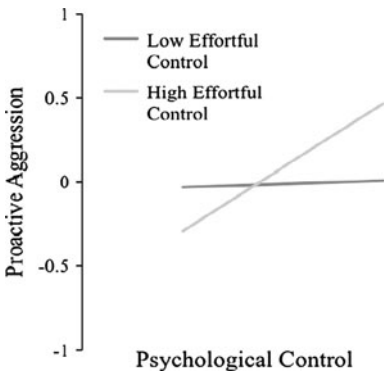

Fig. 1 Association between psychological control and proactive aggression at *high* (+1 SD) and *low* (−1 SD) levels of effortful control

Reactive Aggression

A first-order effects model, whereby reactive aggression was regressed on psychological control, effortful control, proactive aggression, gender, age, and race, was first estimated in order to examine unique associations of reactive aggression (See Table 2). Proactive aggression was positively associated with reactive aggression. Effortful control was significantly negatively related to reactive aggression. However, psychological control, age, gender, and race were unrelated to reactive aggression (See Table 2). The interaction between effortful control and psychological control was then added to the model; however no significant interaction was found ($\beta = -.10$, $t = -1.5$, $p = .14$).

Discussion

The current study examined relations between psychological control, effortful control and proactive and reactive aggression. This is the first empirical study to investigate the relation between psychological control, effortful control and proactive and reactive aggression subtypes. Furthermore, this is one of very few studies to examine the interactive effects of psychological control and effortful control on child problem behavior. Findings suggested that while effortful control and psychological control interact to contribute to proactive aggression, effortful control appears to be uniquely related to reactive aggression. Specific findings and their potential implications are discussed further below.

Proactive Aggression

As expected, the first-order effects for proactive aggression indicated a positive trend between psychological control and proactive aggression, as well as a positive relation between effortful control and proactive aggression. Note, however, that these associations were not statistically significant. Findings are consistent with previous research linking psychological control to aggression [27]. Psychological control may model coercive techniques for children and aid in the development of proactive aggression. Findings are also consistent with the theoretical notion that proactive aggression is planful in nature [1], and as such high levels of effortful control are required for a child to engage in calculated acts of aggression. More importantly, however, was the significant interaction between psychological control and effortful control to and its relation to proactive aggression. As hypothesized and consistent with theory, at high levels of effortful control, psychological control was positively associated with proactive aggression; whereas at low levels of effortful control, psychological control was unrelated to proactive aggression. These findings suggest that children with the ability to focus their attention and regulate emotional arousal and perceive their parents as psychologically controlling are at most risk for exhibiting proactive aggression. Current findings are consistent with Bandura's social learning theory [10]. Psychologically controlling parenting may help a child internalize the idea that the manipulation of others is possible and high levels of effortful control may contribute to a child's ability to be goal oriented and planful in their aggressive behavior. In contrast, children with low levels of effortful control may not have the ability to engage in such sophisticated acts of planful aggression.

Reactive Aggression

As expected, a negative relation between effortful control and reactive aggression was found. The association between effortful control and reactive aggression is in alignment with [1] perspective that reactive aggression develops from poor emotional regulation, as well as the literature linking poor effortful control with emotionally driven behavioral problems [21]. We also expected psychological control to be associated with reactive aggression. A link between psychological control and reactive aggression was established when examining correlation analyses; however, when unique effects were examined, psychological control was no longer significantly associated with reactive aggression. Findings suggest that although both psychological control and effortful control are independently related to one another, effortful control appears to be more strongly associated with reactive aggression than psychological control. Finally, contrary to expectation, the interaction between psychological control and effortful control was not associated with reactive aggression. Rather, findings suggest effortful control alone is most strongly linked to reactive aggression.

In sum, current findings indicate that psychological control and effortful control are differentially related to proactive and reactive aggression. It appears that proactive aggression is related to high levels of effortful control in conjunction with psychologically controlling parenting. Reactive aggression, on the other hand, appears to be most strongly associated with temperamental regulation deficits.

Limitations, Conclusions and Future Directions

This study has several limitations that should be considered. First and foremost the current study utilized a sample size 69, which may have limited power to detect effects. However, note that based on Aiken and West's [47] power table, the current sample size was large enough to detect moderate to large effects. This study is also limited by the use of cross sectional data. Future studies should encompass a larger and more diverse sample size and examine these relations over time. For example, the sample size was not adequate to investigate racial, developmental or gender differences in relations. Further research examining such relations is needed. Associations were examined in a community recruited sample, with minimal problem behavior reported and limited variability is some constructs (i.e., psychological control and effortful control). Findings may be stronger in more aggressive and clinical samples. Another potential methodological limitation of this study is the potential presence of responder bias. Some respondents may have been influenced by social desirability bias, as they were administered the questions via an interviewer reading them out loud to the participants. Further note that the current study focused specifically on overt physical forms of aggression, and other forms of aggression (e.g., relational aggression) have been found to have distinct correlates [48, 49]. Future research should include the use of multiple informants (e.g., parents and children), various types of measures (observational and sociometric ratings), and various forms of aggression. The current study focused on one temperament and one parenting dimension. Future studies examining the interactive effects of additional temperament (e.g., impulsivity, fearfulness) and parenting dimensions (e.g., coercive parenting) on proactive and reactive aggression are needed. It would also be useful for future research to simultaneously examine the effects of psychological control and other parental control variables (coercive and harsh parenting) on aggressive behavior in order to determine unique effects. Finally, it needs to be noted that an alternative perspective on these associations is the possibility that both effortful

control and psychological control develop together over time in the context of the parent child relationship. That is, positive parenting may lead to the development of child effortful control and effortful control (or the lack of) may elicit the use of specific parenting strategies, such as psychological control. Further bidirectional and interactional research is needed to further inform our understanding of these associations and inform the development of targeted prevention and intervention strategies.

Summary

Current findings contribute to current literature on child and adolescent problem behavior. Findings suggest that parenting behavior and temperament are differentially associated with proactive and reactive subtypes of aggression, and this information may be useful for refining current prevention and intervention strategies for aggressive behavior. More specifically, findings may aid in determining who should be targeted for interventions as well as the mechanisms to target for intervention. For example, current findings suggest that even children who exhibit high levels of effortful control can be at risk for aggressive behavior, particularly if their parents engage in psychologically controlling behavior. If a child exhibits deficits in effortful control, targeting parental psychological control may not be the wisest strategy for the prevention of aggression. Rather interventions that target improving emotional and behavioral regulation may be most effective for these individuals. Indeed Lochman and Well's [41] Coping Power Program, which focuses on considering the consequences of behavior, using a complete set of problem solving skills for social problems, and learning coping strategies (e.g., using inhibitory self-statements) in lieu of automatically responding aggressively, has been effective in reducing reactively aggressive behavior. Findings, however, also suggest that providing aggressive children with tools to help control their reaction to anger without removing the situations in which aggression is an effective strategy for them may have the potential to decrease their reactive aggression, but could also increase their proactive aggression. Thus, comprehensive intervention is warranted.

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