



# Self-control and aggression versatility: moderating effects in the prediction of delinquency and conduct disorder among youth

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## ABSTRACT

An individual's capacity for self-control is an important factor when considering the link between aggression and delinquency outcomes. The aim of the present study is to examine the possible role of self-control as a moderator of the aggression-antisociality/delinquency link among a sample of 567 youth ( $M = 15.91$  years,  $SD = .99$  years, age range = 14–18 years) from Portugal. Results indicated that self-control significantly moderates four different forms and functions of aggression – proactive overt, proactive relational, reactive overt, and reactive relational – in models simultaneously predicting delinquency and conduct disorder outcomes. We encourage multifaceted study of aggression as inherent in the Peer Conflict Scale-20 to articulate the ways that various forms of aggression unfold into clinical conduct problems.

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## Introduction

Defined as the motivation to inflict harm on a victim, aggression is a multifaceted construct that is conceptualized into different forms and functions (Anderson & Bushman, 2002; Crick & Dodge, 1996; Crick & Grotpeter, 1995; Dodge & Coie, 1987; Vitaro et al., 2006). The underlying assumption is that different types of aggression may have different causes, may have disparate linkages to more serious self-regulation problems, and may differentially relate to the odds of engaging in conduct problems. An important distinction is whether aggression is proactive or reactive. Proactive aggression is premeditated and involves an instrumental goal in addition to harming the victim, and is also known as instrumental or cold-blooded aggression. Reactive aggression is impulsive and unplanned,

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is driven by anger, and occurs as a reaction to some perceived provocation (Crick & Dodge, 1996; Dodge & Coie, 1987). It is also sometimes called hot-blooded, affective, angry, defensive, impulsive, or hostile aggression. Proactive aggression is considered to be more severe because it describes a person who plans or calculates the use of aggressive force on another person (Raine et al., 2006) as seen in predatory criminal violence (e.g., James et al., 2020; McEllistrem, 2004). Reactive aggression is considered more normative in the sense that the potential use of force is in response to a real or perceived wrong, and is thus more defensive in nature (Anderson & Bushman, 2002; Raine et al., 2006; Regoli et al., 2016; Shields & Cicchetti, 1998). In short, despite their shared variance, proactive and reactive aggression reveal qualitative differences in the use of aggression.

Directness is another important distinction about aggression. Relational or indirect aggression is usually verbal and covert and includes actions such as gossiping and ostracism meant to damage another person in terms of their social functioning and social relationships. Overt or direct aggression is typically physical and includes behaviors such as hitting, kicking, punching, and biting. Overt aggression is theorized to have stronger linkages to self-regulation problems than relational aggression. Although aggression has multiple forms and functions, its variants are not mutually exclusive. Individuals who are highly aggressive tend to engage in multitudinous forms of aggression often at higher levels than non-aggressive people (Barker et al., 2006; Polman et al., 2007; Raine et al., 2006; Vaughn et al., 2009). Decades of research affirm that aggression is an important construct for behavioral competence among youth. Greater aggression in its various forms is significantly associated with externalizing symptoms, maladjustment, delinquency, and psychopathology (Card & Little, 2006; Crick & Grotpeter, 1995; Frick et al., 2003; Raine et al., 2006; Vaughn et al., 2009; Vitaro et al., 1998).

Given that antisocial behavior is a multifactorial construct, it is clear that other phenomena beyond aggression are implicated in delinquency and related conduct problems, and likely moderate the association between aggression and antisocial behavior. One important potential moderator is self-control. Self-control refers to a global capacity to regulate emotional and behavioral responses to stimuli in which instinctual but socially inappropriate impulses are subordinated to socially appropriate responses. Self-control is considered in several theories within the social and behavioral sciences and is particularly prominent in criminology (e.g., DeLisi & Vaughn, 2014; DeWall et al., 2011; Gottfredson & Hirschi, 1990) and empirically there are consistent and often empirically strong linkages between self-control and antisocial conduct (Hay & Meldrum, 2015; Moffitt et al., 2011; De Ridder et al., 2012; Vazsonyi et al., 2017).

In the context of aggression, persons with low self-control would have difficulty muting their impulses to aversive stimuli and would be more likely to aggress relative to those with self-control competency. Indeed, an array of studies have found that self-control is inversely associated with self-reported aggression (Özdemir et al., 2013), laboratory aggression (Denson et al., 2011), driving aggression (Ellwanger & Pratt, 2014), aggressive ideation and aggressive conduct (Murray et al., 2016), and direct aggression (Meldrum et al., 2018). This suggests that self-control is a potentially important mechanism by which various forms of aggression translates into externalizing behaviors. Unfortunately, research on aggression has progressed in a piecemeal fashion where the various forms and functions of aggression are not generally measured at once.

### **Research aim**

The current research aim is to empirically examine whether self-control moderates the association between diverse variants of aggression and antisocial/delinquent outcomes. To accomplish this, we employ the Brief Peer Conflict Scale (Marsee & Frick, 2007), an aggression measure that overcomes the piecemeal approach by including four dimensions of aggression: proactive overt, proactive relational, reactive overt, and reactive relational, and allows for a more comprehensive analytical approach to understanding the constitutive elements of antisocial behavior. We speculate that self-control serves as a bridge that connects various forms of aggression to externalizing conduct problems and surmise that self-control moderates the aggression-antisociality/delinquency link. More specifically, we hypothesize that self-control significantly moderates the four different types of aggression – proactive overt, proactive relational, reactive overt, and reactive relational – in predicting delinquency and conduct disorder outcomes.

## **Method**

### **Participants**

The sample examined in the present study was made up of 567 youth ( $M = 15.91$  years,  $SD = .99$  years, age range = 14–18 years), namely 256 females ( $M = 15.80$  years,  $SD = 1.02$ , range = 14–18) and 311 males ( $M = 15.99$  years,  $SD = .96$ , range = 14–18). No significant differences between genders were detected in terms of age ( $F = 3.38$ ,  $p = .06$ ), socioeconomic status ( $U = 38,318.5$ ,  $p = .41$ ), or education ( $F = .63$ ,  $p = .42$ ). The majority of the participants were Portuguese nationals (88.4%) with approximately nine years of education on average ( $M = 8.95$ ,  $SD = .94$ ).

## Measures

### Predictor

*Peer Conflict Scale-20* (PCS-20; Marsee et al., 2011). This is brief 20-item self-report four-dimensional measure that includes the different forms and functions of aggression. The PCS-20 has five proactive overt items (PO; e.g., 'I start fights to get what I want'), five proactive relational items (PR; e.g., 'I gossip about others to become popular'), five reactive overt items (RO; e.g., 'When someone hurts me, I end up getting into a fight'), and five reactive relational items (RR; e.g., 'If others make me mad, I tell their secrets'). Items are rated on a 4-point Likert scale (ranging from 0 = *Not at all true* to 3 = *Definitely true*). The score of each factor can be obtained by adding the respective items and a total score can also be obtained by summing all of the items. Higher scores indicate higher levels of aggression. The PCS-20 was validated in Portugal among the youth forensic population (Pechorro, DeLisi et al., 2021; Pechorro et al., 2018). The internal consistency for the current study was PO  $\alpha = .90$ , PR  $\alpha = .82$ , RO  $\alpha = .92$ , RR  $\alpha = .84$ , and PCS-20 total  $\alpha = .94$ .

### Moderator

*Brief Self-Control Scale* (BSCS; Tangney et al., 2004). This is a brief 13-item self-report unidimensional measure of self-control. The BSCS includes items such as; 'I refuse things that are bad for me'; 'I am able to work effectively toward long-term goals'; 'Sometimes I can't stop myself from doing something'. Items are rated on a 5-point Likert scale (ranging from 1 = *Not at all like me*, to 5 = *Very much like me*). The total score of the BSCS can be obtained by adding the items. The appropriate items were reverse-scored so higher scores reflect higher levels of self-control. The version of the BSCS validated in Portugal among the youth population was used in the current study (Pechorro, DeLisi et al., 2021). The internal consistency for the current study estimated by Cronbach's  $\alpha$  was excellent ( $\alpha = .93$ ).

### Outcomes

*Add Health Self-Report Delinquency* (AHSRD; Pechorro, Moreira et al., 2019). This is a 17-item self-report measure of juvenile delinquency originally developed for the National Longitudinal Study of Adolescent Health (Add Health). The AHSRD includes violent and non-violent criminal behaviors occurring during the last 12 months before the assessment (e.g., 'Take something from a store without paying for it'; 'Get into a serious physical fight?'). Items are rated on a 4-point Likert scale (ranging from 0 = *None*, to 3 = *Five or more times*). A total delinquency score can be obtained by adding the items. Higher scores indicate higher levels of self-reported criminality. The AHSRD was

validated in Portugal among the youth population (Pechorro, Moreira et al., 2019). The internal consistency for the current study was excellent ( $\alpha = .93$ ).

*Conduct Disorder Screener* (CDS; Lewinsohn et al., 2000). This is a brief self-report screener created to identify adolescents with conduct disorder. The CDS consists of six items representative of a diagnosis of Conduct Disorder (e.g., 'I broke rules at school'; 'I got in trouble for lying or stealing'). The CDS can be scored by adding the items on a 4-point ordinal Likert scale (ranging from 1 = *Rarely or none of the time*, to 4 = *Most or all of the time*). Higher scores indicate higher levels of conduct disorder. The CDS was validated in Portugal among the youth population (Palma et al., submitted). The internal consistency for the current study was Cronbach's  $\alpha = .92$ .

### **Procedures**

The Ministry of Education (ME) of Portugal provided authorization to assess the participants of the present study. These participants came from schools in southern regions of Portugal, including the greater Lisbon area. This sample did not include potential participants with comorbid disorders (e.g., developmental disorders, serious mental illness) because in Portugal youth needing special resources attend separate classes with individualized curricula or are diverted to special needs schools. Written parental authorization was previously obtained, and then potential participants were informed about the aims of our investigation and asked to collaborate voluntarily. Due to various reasons, some youth were excluded (i.e., those who could not read/understand Portuguese, those who were reluctant to participate, those who were 13 or younger to ensure the reading level was generally appropriate to the item content of the measures used, and those who were 19 years old or older because they are considered young adults). The rate of participation was 89%. No form of compensation was given to the participants or their parents. The measures and sociodemographic questionnaire included in the present study were administered in small groups of participants. The measures used in the present study were selected because they were considered appropriate in terms of our research aims, they are validated in Portugal, and are psychometrically robust.

### **Data analysis**

EQS 6.4 software (Bentler & Wu, 2018) was used to analyze the data. Pearson correlations were considered high if  $>.50$ , low if below  $<.20$ , and moderate if in between (Ferguson, 2009). To compare groups, ANOVAs and Mann-Whitney's *U* tests were used. Alpha coefficient was considered adequate if  $>.70$ , good if  $>.80$ , and very good to excellent if  $>.90$  (Maroco, 2021). Path analysis using construct scores were used to overcome sample size

limitations and estimation errors. When the reliability of constructs is high, the underestimation of beta coefficients using path analysis is irrelevant (Maroco, 2021). We tested four fully saturated models with standardized variables. In Model 1, Proactive Overt aggression, self-control, and the interaction between both predicted delinquency and conduct disorder. In Model 2, Proactive Relational aggression, self-control, and the interaction between both predicted delinquency and conduct disorder. In Model 3, Reactive Overt aggression, self-control, and the interaction between both predicted delinquency and conduct disorder. In Model 4, Reactive Relational aggression, self-control, and the interaction between both predicted delinquency and conduct disorder. Due to the high correlation between overt and relational aggression, four supplemental models were also run controlling for alternate subtypes (Supplemental Models 5–8). Our models did not include the potential influence of covariates (e.g., individual, family and community variables) because the participants selection criterion aimed at homogenous participants (e.g., in terms of age, reading ability) and because this is a first approach to the investigation self-control-forms and functions of aggression-delinquency/CD relationship research theme. Maximum Likelihood (ML) estimation methods with covariance matrices were used, which are considered robust for non-severe violations of the normality (absolute skewness and kurtosis values below 3 and 10, respectively; Blunch, 2016).

## Results

Table 1 displays the Pearson correlation matrix and the descriptive statistics of the measures used. The BSCS showed negative statistically significant

**Table 1.** Pearson correlation matrix.

	Proactive Overt	Proactive Relational	Reactive Overt	Reactive Relational	BSCS	AHSRD	CDS
Proactive Overt	1						
Proactive Relational	.58***	1					
Reactive Overt	.84***	.64***	1				
Reactive Relational	.56***	-.45***	.75***	1			
BSCS	-.85***	.53***	.74***	.39***	1		
AHSRD	.83***	.48***	2.79	(2.49)	-.43	1	
CDS	.74***	2.30 (2.41)	(3.46)	.95	-.40	2.59	1
<i>M (SD)</i>	1.42	3.14	1.23	.49		7.07	
Skewness	(2.58)	4.73	.79				
Kurtosis	1.91						
	2.76						

Note. BSCS = Brief Self-Control Scale; AHSRD = Add Health Self-Report Delinquency; CDS = Conduct Disorder Screener; *M (SD)* = Mean (Standard Deviation)

\*\*\* $p \leq .001$

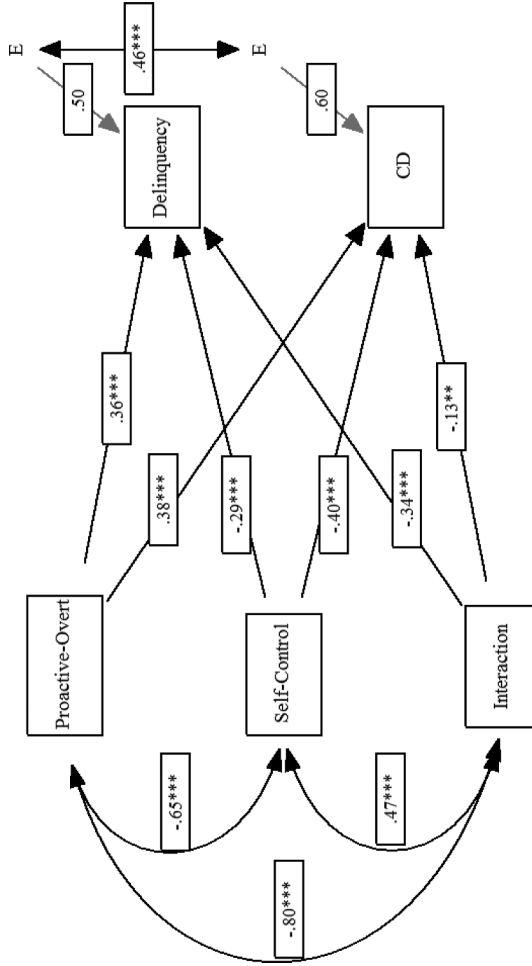
correlations with the rest of the measures including Proactive Overt aggression (Pearson  $r = -.85, p < .001$ ), Proactive Relational aggression (Pearson  $r = -.45, p < .001$ ), Reactive Overt aggression (Pearson  $r = -.59, p < .001$ ), and Reactive Relational aggression (Pearson  $r = -.38, p < .001$ ).

Figure 1 displays Model 1. In this model, Proactive Overt aggression ( $\beta = .36, p < .001$  for delinquency and  $\beta = .38, p < .001$  for CD), self-control ( $\beta = -.29, p < .001$  for delinquency and  $\beta = -.40, p < .001$  for CD), and the interaction between both ( $\beta = -.34, p < .001$  for delinquency and  $\beta = -.13, p < .01$  for CD) were significantly associated with the outcomes. These negative significant interactions indicate that self-control moderates the associations between Proactive Overt aggression and delinquency/CD problems, such that at high levels of self-control, the associations between the aggression and outcome variables are weaker than at low levels of self-control. Model 1 was also analyzed controlling for Proactive Relational aggression and the pattern of results was similar (see Supplemental Figure 5).

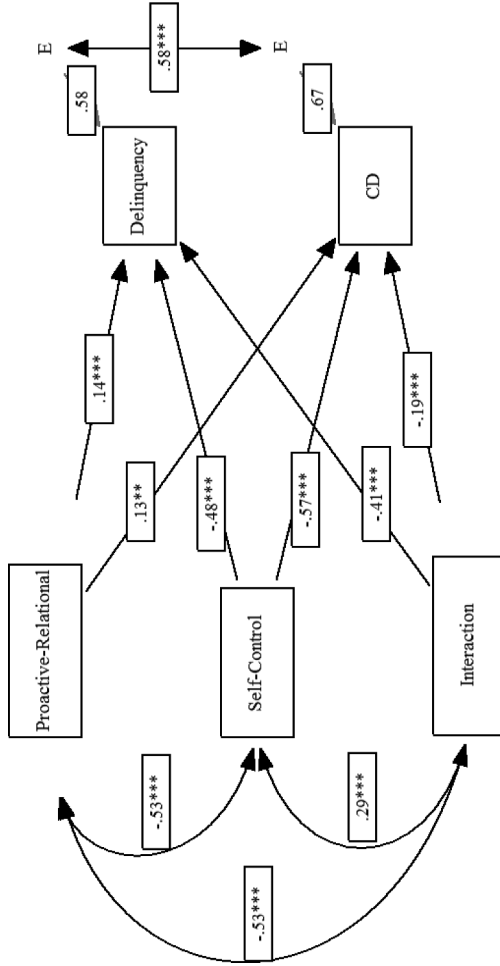
Figure 2 shows Model 2. In this model, Proactive Relational aggression ( $\beta = .14, p < .001$  for delinquency and  $\beta = .13, p < .01$  for CD), self-control ( $\beta = -.48, p < .001$  for delinquency and  $\beta = -.57, p < .001$  for CD), and the interaction between both ( $\beta = -.41, p < .001$  for delinquency and  $\beta = -.19, p < .01$  for CD) were significantly associated with the outcomes. These negative significant interactions indicate that self-control moderates the associations between Proactive Relational aggression and delinquency/CD problems, such that at high levels of self-control, the associations between the aggression and outcome variables are weaker than at low levels of self-control. Model 2 was also analyzed controlling for Proactive Overt aggression (see Supplemental Figure 6). The interaction predicting CD problems became non-significant, and the interaction predicting delinquency was weaker yet remained significant.

Figure 3 shows Model 3. In this model, Reactive Overt aggression ( $\beta = .32, p < .001$  for delinquency and  $\beta = .40, p < .001$  for CD), self-control ( $\beta = -.31, p < .001$  for delinquency and  $\beta = -.38, p < .001$  for CD), and the interaction between both ( $\beta = -.40, p < .001$  for delinquency and  $\beta = -.17, p < .01$  for CD) were significantly associated with the outcomes. These negative significant interactions indicate that self-control moderates the associations between Reactive Overt aggression and delinquency/CD problems, such that at high levels of self-control, the associations between the aggression and outcome variables are weaker than at low levels of self-control. Model 3 was also analyzed controlling for Reactive Relational aggression and the pattern of results was similar (see Supplemental Figure 7).

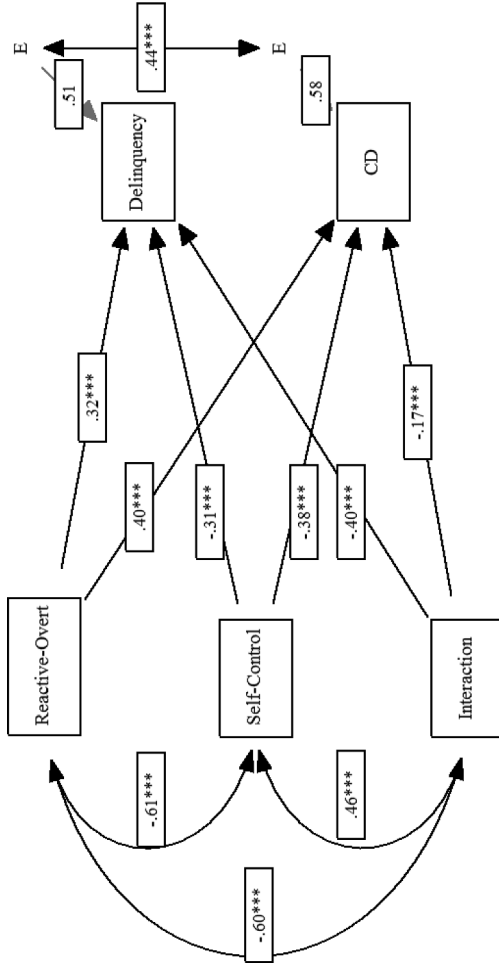
Figure 4 shows Model 4. In this model, Reactive Relational aggression ( $\beta = .08, p < .05$  for delinquency and  $\beta = .08, p < .05$  for CD), self-control ( $\beta = -.61, p < .001$  for delinquency and  $\beta = -.66, p < .001$  for CD), and the interaction between both ( $\beta = -.34, p < .001$  for delinquency and  $\beta = -.15,$



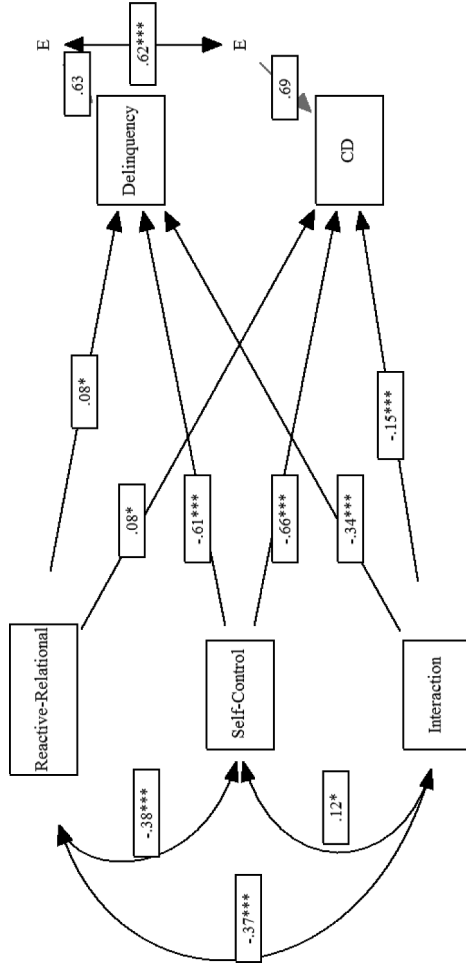
**Figure 1.** Effects of proactive overt aggression on delinquency and conduct disorder moderated by self-control. Note. CD = Conduct Disorder; \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .



**Figure 2.** Effects of proactive relational aggression on delinquency and conduct disorder moderated by self-control. Note. CD = Conduct Disorder; \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .



**Figure 3.** Effects of reactive overt aggression on delinquency and conduct disorder moderated by self-control. Note. CD = Conduct Disorder; \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .



**Figure 4.** Effects of reactive relational aggression on delinquency and conduct disorder moderated by self-control. Note. CD = Conduct Disorder; \* $p \leq .05$ , \*\* $p \leq .01$ , \*\*\* $p \leq .001$ .

$p < .01$  for CD) were significantly associated with the outcomes. These negative significant interactions indicate that self-control moderates the associations between Reactive Relational aggression and delinquency/CD problems, such that at high levels of self-control, the associations between the aggression and outcome variables are weaker than at low levels of self-control. Model 4 was also analyzed controlling for Reactive Overt aggression (see Supplemental Figure 8). The interaction predicting CD problems became non-significant, and the interaction predicting delinquency was weaker yet remained significant.

## Discussion

The present study examined self-control as a potential moderator between aggression, delinquency, and conduct disorder outcomes. Research shows that individuals with high self-control can potentially exercise control over other psychosocial risk factors and maintain prosocial conduct, while individuals with lower self-control tend to succumb to antisocial conduct (Caspi et al., 2016; Moffitt et al., 2011). In general, our results provide support for the notion that self-control is an important moderator mechanism by which aggression translates into externalizing behaviors.

We hypothesized that the interaction between self-control and the four types of aggression – proactive overt, proactive relational, reactive overt, and reactive relational aggression – would reveal counteracting effects that significantly decrease the delinquency and conduct disorder outcomes among our youth sample. Although there are critiques about the usefulness of disaggregating aggression types (see Bushman & Anderson, 2001; Ferguson & Dyck, 2012; Hsieh & Chen, 2017), among the four models examined, each type of aggression demonstrated significant positive associations with delinquency and conduct disorder, while self-control and the interactions demonstrated significant negative associations with delinquency and conduct disorder. This suggests that high self-control is able to significantly mitigate the associations between the four types of aggression and delinquency/conduct problems outcomes. These results are consistent with several prior studies using other measures of aggression (see e.g., Denson et al., 2011; Ellwanger & Pratt, 2014; Meldrum et al., 2018; Murray et al., 2016; Özdemir et al., 2013).

Interestingly, within the proactive and reactive domains, the associations for overt aggression were much higher than for relational aggression as indicated by  $\beta$  coefficients, and remained significant even after controlling for the relational subtypes. In contrast, after controlling for the overt types, the associations for relational aggression became non-significant in predicting conduct problems and were weakened in the prediction of delinquency. This makes intuitive sense since overt aggression corresponds more directly

to delinquent acts and conduct disorder symptoms and is consistent with Loeber's influential typology of disruptive behavior (Loeber et al., 1999, 1993) that involves an overt pathway consisting of aggression, fighting, and violence, a covert pathway consisting of moderate forms of delinquency, and an early authority conflict pathway consisting of defiance, stubbornness, and disobedience. The inclusion of a multifaceted measure of aggression permits the study of explanatory models that similarly indicate that different forms and functions of aggression underlie different delinquent pathways.

In addition to the moderation findings, there are additional important theoretical and practical implications to our study. Theories of self-control within criminology are general and posit that self-control problems manifest in diverse conduct problems and associated social dysfunction. One example of this is antisocial versatility where low self-control is associated with greater violence, property, substance, and other crimes (Boman et al., 2019; Britt, 2003; DeLisi & Vaughn, 2008) along with increased criminal justice contact and noncompliance with court orders and justice system regulations (Beaver et al., 2009; Jackson et al., 2020; Wolfe, 2011). In the present study, self-control showed strong inverse correlations with aggression, delinquency, and conduct disorder symptoms and large associations with all outcomes across the four path models, which attests to its protean linkages to externalizing conduct. For human service and juvenile justice practitioners who provide treatment and supervision of youth, this is important to consider. Youth with the poorest self-control are also likely to be the most aggressive, and the synergistic effects of having both high aggression and low self-control makes delinquent outcomes more likely. Moreover, self-control correlates most strongly with overt forms of aggression – both proactive and reactive – thus their presentation style is direct and confrontational. As such, modalities that increase self-control can help to disconnect the bridge linking aggression, self-regulation problems, and conduct problems.

From an intervention standpoint, programs that target the various forms of aggression should be developed and implemented. Self-control, which is one of the central targets in the intervention literature, is a construct that has been shown to be modifiable to produce significant improvements in behavior (Hay & Meldrum, 2015; Piquero et al., 2016). As the current models show, disrupting various forms of aggression via increased self-control can help to disrupt the causal chains resulting in delinquency and conduct disorder.

Our study contributes to the growing empirical support of the PCS-20 for understanding aggression and externalizing outcomes among school, community, and adjudicated youth samples e.g., (Marsee et al., 2011; Marsee & Frick, 2007; Pechorro, Hayes et al., 2020; Pechorro et al., 2018; Russell, 2014). We must however point out some limitations of our work. An important limitation is that our school-based community sample contains participants whose conduct is benign relative to youth in conflict with the law, including

those in juvenile detention centers. Our work is also limited by shared method variance in that it relies solely on self-report data. The inclusion of external data sources such as police contacts or court referrals would be useful to examine whether self-control moderates the link between aggression types as measured by the PCS-20 and actual records of antisocial behavior. The study is also limited in that we did not control statistically for the potential influence of other covariates (e.g., individual, family and community variables) that could add robustness to the path analyses models, and in that there is some overlap between the predictors and the outcomes (both include items related to aggressive behavior). Finally, our work has a cross-sectional design that does not allow for the causal ordering of variables that longitudinal designs offer. Despite these limitations, this work contributes to the literature on aggression, self-control, and antisocial behavior by expanding the measurement of aggression to include multiple forms and functions.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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