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# Psychopathy and Violence: Does Antisocial Cognition Mediate the Relationship Between the PCL: YV Factor Scores and Violent Offending?

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The purpose of this study was to determine whether proactive and reactive antisocial cognition mediate the effect of Factors 1 (core personality features) and 2 (behavioral deviance) of the Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003) on violent offending. In this study Bandura et al.'s (1996) Moral Disengagement (MD) scale and the Impulse Control (IC) scale of the Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990) served as proxies for proactive and reactive antisocial cognition, respectively. It was hypothesized that proactive antisocial cognition (MD) would mediate the Factor 1–violence relationship and that both proactive antisocial cognition and reactive antisocial cognition (IC) would mediate the Factor 2–violence relationship. A 3-wave path analysis of data from 1,354 adjudicated delinquents produced results consistent with the first part of the hypothesis (i.e., proactive antisocial mediation of the Factor 1–violence relationship) but inconsistent with the second part of the hypothesis (i.e., only proactive antisocial cognition mediated the Factor 2–violence relationship). Whereas the direct path from Factor 1 to violent offending was no longer significant when MD and IC were taken into account, the direct path from Factor 2 to violent offender remained significant even after MD and IC were included as mediators. This suggests that whereas proactive antisocial cognition plays a major role in mediating the Factor 1–violence relationship, the Factor 2–violence relationship is mediated by proactive antisocial cognition and variables not included or not adequately covered in the current study.

*Keywords:* delinquency, mediation, moderation, moral disengagement, Psychopathy Checklist: Youth Version



One consequence of the debate over whether antisocial behavior is a core feature of psychopathy (see Hare & Neumann, 2010; Skeem & Cooke, 2010) is the possibility that psychopathy, at least as measured by the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and its derivatives—the Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995) and Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003)—is irrelevant to offending behavior. For if, as the results of several studies and meta-analyses indicate, the core personality features of PCL-measured psychopathy lack incremental validity relative to the behavioral deviance features in predicting offending behavior (DeLisi et al., 2014; Leistico, Salekin, DeCoster, & Rogers, 2008; Walters, 2003), then it may be that the PCL-R has little to contribute to our understanding of crime and violence above and beyond the overt antisocial content of several of its items. There is another possibility, however, one in which the core features of PCL-measured psychopathy contribute to the development of offending behavior through the development of specific forms of criminal or antisocial cognition. Toward this end, the current study will test two general forms of antisocial cognition—namely proactive and reactive criminal thinking (Walters, 2012)—as possible mediators of the psychopathy–violent offending relationship, with proactive criminal thinking mediating the core features of PCL-measured psychopathy and both proactive and reactive criminal thinking mediating the behavioral features of PCL-measured psychopathy.

Although proactive and reactive criminal thinking overlap substantially (Walters, 2009), they represent distinct cognitive processes. Proactive criminal thinking can be defined as the calculated and planned use of techniques and strategies designed to initiate ongoing criminal activity and excuse past criminal actions. Reactive criminal thinking, by comparison, is a thought process triggered by real or imagined environmental challenges and threats, from boredom to an unintentional bump in a crowded elevator, that frequently give rise to behavioral impulsivity. Given the planned nature of proactive criminal thinking it would make sense for it to correspond better to the callous, unemotional, and manipulative features of old Factor 1 of the PCL-R/YV (core personality features of PCL-defined psychopathy and referred to from this point forward as Factor 1) than reactive criminal thinking. Old Factor 2 (behavioral deviance features of PCL-defined psychopathy and referred to from this point forward as Factor 2), on the other hand, should correspond equally well to proactive and reactive criminal thinking as well as to additional factors like past criminality and variables that may mediate the relationship between past and future criminality. A mediational theory of the

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psychopathy–violence relationship might therefore hold that Factor 1 is connected to violence via proactive criminal thinking, whereas Factor 2 is connected to violence by means of several different mediators, to include both proactive and reactive criminal thinking.

The callous and unemotional features of psychopathy have worked their way into the fifth edition of *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) as markers of severe conduct disorder (APA, 2013) on the strength of research showing that these features predict future aggressive and violent behavior after the current level of conduct disorder, age of onset, and comorbid diagnoses have been controlled (Frick, Ray, Thornton, & Kahn, 2014). In addition, several studies have found that children and adolescents who display callous and unemotional traits tend to blame others for their misbehavior and seek dominance in social situations (Chabrol, van Leeuwen, Rodgers, & Gibbs, 2011; Pardini, 2011), two of the four individual thinking styles associated with proactive criminal thinking—mollification and power orientation, respectively (Walters, 2012). Research conducted on adults has also found that the criminality perpetrated by those exhibiting high levels of psychopathic traits on the PCL-R and other measures is often calculated, unemotional, and hardhearted (Cornell et al., 1996; Declercq, Willemsen, Audenaert, & Verhaeghe, 2012; Hancock, Woodworth, & Porter, 2013; McCuish, Corrado, Lussier, & Hart, 2014; Woodworth & Porter, 2002). Using a 10-year follow-up of individuals who completed a proactive-reactive aggression questionnaire at age 16, Fite, Raine, Stouthamer-Loeber, Loeber, and Pardini (2009) determined that proactive but not reactive aggression correlated with psychopathy and antisocial behavior in early adulthood.

In their general theory of crime, Gottfredson and Hirschi (1990) maintain that criminal offending is nearly exclusively a function of low self-control, impulsivity, and other reactive concerns. Although there is no denying the fact that reactive factors and low self-control impact significantly on crime (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012), what the previously reviewed research seems to suggest is that proactive criminal thinking may be more important than reactive criminal thinking in mediating the relationship between the core personality features of PCL-measured psychopathy (Factor 1) and violent offending. Additional cognitive factors should probably be entertained when attempting to explain the connection between the behavioral deviance features of psychopathy (Factor 2) and violent offending, particularly because cognitive variables are well-suited to playing a mediating or intervening role in variable relationships (MacKinnon, Fairchild, & Fritz, 2007). It is quite likely that proactive criminal thinking also mediates the relationship between behavioral deviance and violent offending but that additional cognitive and noncognitive factors like reactive criminal thinking and general antisociality (given the presence of criminal and delinquent items on Factor 2 of the PCL-R) also mediate the behavioral deviance–violence relationship. Hence, the direct effect of behavioral deviance on violent offending after controlling for the mediating effect of proactive and reactive antisocial cognition should be greater than the direct effect of the core personality features of psychopathy on violent offending.

Studies show that antisocial cognition overlaps with psychopathy whether it is assessed with the PCL-R (Gonsalves, Scalora, & Huss, 2009) or with one of several self-report measures of psychopathy (Walters, 2009). In these studies the PCL-R correlated .34 with proactive criminal thinking and .28 with reactive criminal thinking (Gonsalves et al., 2009) whereas the Levenson Self-Report Psychopathy scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) correlated .36 with proactive criminal thinking and .23 with reactive criminal thinking (Walters, 2009). Several self-report measures were administered multiple times as part of the Pathways to Desistance study (Mulvey, 2012). Two of these measures were used to represent proactive and reactive criminal thinking. The moral disengagement scale (MD; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) bears a strong resemblance to Walters' (1995) proactive criminal thinking style of mollification and several of Sykes and Matza's (1957) techniques of neutralization (i.e., denial of responsibility, denial of the victim, and appeal to higher loyalties), making it an ideal measure of proactive antisocial cognition. The Impulse Control (IC) scale of the Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990), with its emphasis on impulsivity and lack of forethought, was considered an appropriate proxy for reactive antisocial cognition. Based on previous research and Hare's own assertions that the proactive aspects of psychopathy are instrumental in promoting crime (Hare & Neumann, 2008), it was postulated that proactive antisocial cognition would outperform reactive antisocial cognition in mediating the Factor 1–violence relationship but that both proactive and reactive antisocial cognition would mediate the Factor 2–violence relationship.

## Current Aim

The purpose of this study was to determine whether proactive antisocial cognition, as measured by a scale currently available from the 11-wave (interview) Pathways database (moral disengagement; MD), and reactive antisocial cognition, as measured by another scale currently available from the Pathways study (impulse control; IC), were capable of mediating the relationship between the two PCL: YV factor scores and subsequent violent or aggressive offending (AGG). Operating on the premise that proactive antisocial cognition is more important than reactive antisocial cognition in mediating the relationship between the core personality features of PCL-measured psychopathy and violent offending, it was predicted that the indirect effect (the effect that runs from the independent variable to the dependent variable via a mediating variable) of moral disengagement on the Factor 1–violent offending relationship would be significant, the indirect effect of impulse control on the Factor 1–violent offending relationship would be nonsignificant, and the two effects would be significantly different from one another. It was further hypothesized that the indirect effects of moral disengagement and impulse control on the Factor 2–violent offending relationship would each be significant and that the difference between the two would not be significant. Also as part of this second hypothesis, it was predicted that direct effect of Factor 2 on violent offending would be significantly stronger than the direct effect of Factor 1 on violent offending after the mediating effects of moral disengagement and impulse control had been taken into account.

## Method

### Participants

All 1,354 members of the Pathways to Desistance sample (Mulvey, 2012) served as participants in this study. Each participant had been adjudicated delinquent in Philadelphia, Pennsylvania or Phoenix, Arizona when they were between the ages of 14 and 17. The Pathways sample is composed of 1170 males and 184 females and the ethnic breakdown is 20.2% white, 41.4% black, 33.5% Hispanic, and 4.8% other. The average age of participants at the time the baseline interview was conducted was 16.04 years ($SD$ = 1.14).

### Measures

**Independent variables.** The independent variables for this study came from a baseline (Wave 0) administration of the Psychopathy Checklist: Youth Version (PCL: YV; Forth et al., 2003). The PCL: YV is a 20-item rating scale designed to assess the personality and behavioral features of psychopathy. All 20 PCL: YV items are rated on a 3-point scale (0 = *absent*, 1 = *partially or possibly present*, 2 = *present*), which when combined yield a score that can range from 0 to 40. The two original factor scores from the PCL: YV, old Factors 1 (core personality features of psychopathy) and 2 (behavioral deviance), served as the independent variables in this study. Factors 1 and 2 achieved adequate internal consistency (Cronbach's alpha = .76 and .78, respectively) and good to excellent interrater reliability (intraclass correlation coefficient = .79 and .93, respectively) in the Pathways study (Mulvey, 2012).

**Dependent variable.** Crime was measured with Huizinga, Esbensen, and Weihar's (1991) Self-Reported Offending (SRO) scale. The SRO asks respondents to evaluate their recent involvement in 24 crimes. Eleven of these crimes are designated as aggressive (destroyed/damaged property, set a fire, forced someone to have sex, killed someone, shot someone, shot at someone, took by force with a weapon, took by force without a weapon, beat someone up and caused serious injury, participated in a fight, and beat someone up as part of a gang). The dependent variable for this study was the SRO aggressive offending variety score (AGG-2–6), which is the ratio of all aggressive crime types endorsed during the time frame in question to the total number of possible aggressive crime types (i.e., 11). The mean score for the five waves (interviews), excluding any missing data, was calculated and then multiplied by five to form the AGG-2–6.

**Mediator variables.** The moral disengagement (MD) scale from Bandura et al.'s (1996) Mechanisms of Moral Disengagement assesses a person's tendency to justify, rationalize, and excuse actions that violate the rights of others. MD encompasses eight mechanisms of moral disengagement: *Moral justification* (*It is all right to fight to protect your friends*); *Euphemistic language* (*Talking about people behind their backs is just part of the game*); *Advantageous comparison* (*Stealing some money is not too serious compared with those who steal a lot of money*); *Displacement of responsibility* (*Kids cannot be blamed for using bad words when all of their friends do it*); *Diffusion of responsibility* (*It is unfair to blame a child who had only a small part in the harm caused by a group*); *Distorting consequences* (*It is okay to tell small lies because they don't really do any harm*); *Attribution of blame* (*If people are careless where they leave their things it is their own fault if they get stolen*); and *Dehumanization* (*Some people deserve to be treated like animals*). The 32 MD items are scored on a 3-point Likert-type scale (1 = *disagree*, 3 = *agree*), and an average score per item is calculated. The internal consistency of the MD score at Waves 0 and 1 of the Pathways study, the waves used in the current investigation, was excellent ($\alpha$ = .90–.91; Mulvey, 2012).

Three scales from the 84-item Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990) were also administered to participants in the Pathways study: Impulse Control, Suppression of Aggression, and Consideration of Others. In completing the WAI respondents were instructed to rate each WAI item on a 5-point Likert-type scale (1 = *false*, 5 = *true*). Higher scores on each scale indicate more positive adjustment (i.e., better impulse control, more suppression of aggression, greater consideration of others). As such, scores were multiplied by −1 so that higher scores indicated more negative adjustment in the same manner as the MD. The reverse-coded 8-item WAI Impulse Control (IC) scale served as a measure of reactive criminal thinking in the current study. The content of items from the IC (e.g., *I say the first thing that comes into my mind without thinking enough about it*; *I'm the kind of person who will try anything once, even if it's not that safe*) denotes that the scale potentially serves as a reasonable proxy for reactive criminal thinking. The WAI-IC demonstrated adequate internal consistency in the Pathways study ($\alpha$ = .76; Mulvey, 2012) and as with the MD, the Wave 0 and 1 administrations of the WAI-IC were used in the current set of analyses.

**Control variables.** Eight control variables were included in this study. Age at baseline (range = 14 to 19 years), sex (male, female), and race (white, nonwhite) were the demographic control variables. Five background/historical control variables with relevance to psychopathy and violent offending, all measured at baseline (Wave 0), were also included in the analyses: parental socioeconomic status (based on parental education level and social position, with higher scores denoting higher SES); biological father presence in the home, anyone in the family ever arrested, number of four closest friends who have ever been arrested, and neighborhood disorder (range = 1.00–4.00, with higher scores denoting poorer physical and social conditions in the environment around the child's home; Sampson & Raudenbush, 1999). In addition, baseline measures of the two mediators (MD-0 and IC-0) were included as precursor measures in all regressions predicting the mediators and dependent variable and a baseline measure of the dependent variable (AGG-0) was included as a precursor measure in the regression predicting the dependent variable (Cole & Maxwell, 2003).

### Procedure

The first seven waves of interview data from the Pathways study were included in the current investigation, with six months between each wave. The eight control variables were collected at baseline when participants were 14 to 19 years of age and were included in all five regression equations calculated as part of the path analysis. Three precursor variables were also measured at baseline. Mediator precursors (MD-0, IC-0) were included in the two regressions predicting the mediators and in the one regression

predicting the dependent variable. The outcome precursor (AGG-0) was included in the single regression predicting the dependent variable. The two independent variables, PCL: YV Factor 1 (PCL-F1) and PCL: YV Factor 2 (PCL-F2), were administered during baseline (Wave 0), the mediator variables (MD-1, IC-1) were administered at Wave 1, and the dependent variable (aggressive offending variety score) was summed across the last five 6-month waves of the Pathways study (i.e., Waves 2–6). The PCL-F1 and PCL-F2 raw scores were converted to $z$ scores to allow comparisons between the pathways running from the two factor scores to violent offending.

Data were analyzed with procedures from the structured equation modeling (SEM) program *Mplus 5.2* (Muthén & Muthén, 1998–2007). A path analysis was conducted in which the PCL: YV Factor 1 and 2 scores at baseline (Wave 0) served as the independent variables, the proactive (MD) and reactive (IC) cognitive variables at Wave 1 served as mediators, and the summed aggressive offending variety score over Waves 2 through 6 served as the dependent variable. All analyses made use of a maximum likelihood (ML) estimator and produced bias-corrected bootstrapped confidence intervals ($b$ = 5000). There is general consensus among mediation researchers that bootstrapping is the optimal procedure for testing indirect effects (Hayes, 2013). As such, bias-corrected bootstrapped confidence intervals were used to evaluate the significance of the total, direct, and indirect effects obtained in this study (i.e., for an effect to be significant the confidence interval should not include zero). To evaluate the sequential ignorability assumption upon which mediation analysis is based (i.e., that unobserved and uncontrolled covariates are not responsible for the mediation effect observed in the study) sensitivity testing was performed using Kenny's (2013) "failsafe ef" procedure: $(r_{my.x}) \times (SD_{m.x}) \times (SD_{y.x})/(SD_m) \times (SD_y)$.

There were 245 participants from the Pathways study with missing data on at least one variable. Most participants (81.96%), however, had no missing data on any of the 16 variables included in the present investigation and only 8 individuals (0.5%) had missing data on more than three variables. All 1,354 members of the Pathways study were consequently included in the path analysis, with missing data being handled through full information maximum likelihood (FIML). FIML handles missing data by calculating model parameters and standard errors using estimated likelihood functions derived from known relationships between nonmissing data.

## Results

Descriptive statistics for the eight control variables, two independent variables (PCL-F1 and PCL-F2), two mediator variables (MD-1, IC-1), one dependent variable (AGG-2–6), two precursor-to-mediator variables (MD-0, IC-0), and one precursor-to-outcome variable (AGG-0) in the full sample are summarized in Table 1. Further analysis revealed that the AGG-2–6 outcome measure was moderately skewed (2.66). The 28 zero-order correlations between the independent, mediator, dependent, and precursor variables were all significant using a Bonferroni-corrected alpha level of .0018 (see Table 2). There was no evidence of multicollinearity between the 15 predictors used in this study: Tolerance = .502–.961; Variance Inflation Factor (VIF) = 1.040–1.991.

Table 1
*Descriptive Statistics for All 16 Variables Included in This Study*

| Variable | *N/n* | *M* | *SD* | Range |
|---|---|---|---|---|
| Age | 1,354 | 16.04 | 1.14 | 14–19 |
| Race | 1,354 | 0.20 | 0.40 | 0–1 |
| Sex | 1,354 | 1.14 | 0.34 | 1–2 |
| SES | 1,346 | 51.41 | 12.30 | 11–77 |
| Father present in home | 1,354 | 0.23 | 0.42 | 0–1 |
| Family criminality | 1,350 | 0.78 | 0.41 | 0–1 |
| Peer criminality | 1,304 | 1.29 | 1.16 | 0–4 |
| Neighborhood disorder | 1,352 | 2.35 | 0.75 | 1–4 |
| PCL-F1 | 1,300 | 5.03 | 3.48 | 0–20 |
| PCL-F2 | 1,300 | 8.32 | 3.87 | 0–21 |
| MD-0 | 1,351 | 1.62 | 0.35 | 1–3 |
| MD-1 | 1,261 | 1.57 | 0.36 | 1–3 |
| IC-0 | 1,325 | 2.92 | 0.92 | 1–4.88 |
| IC-1 | 1,239 | 3.04 | 0.91 | 1–4.88 |
| AGG-0 | 1,351 | 0.33 | 0.21 | .00–.95 |
| AGG-2–6 | 1,323 | 0.31 | 0.41 | .00–3.40 |

*Note.* Age = chronological age in years at baseline; Race = 1 (white) and 0 (nonwhite); Sex = 1 (male) and 2 (female); SES = parental socioeconomic status at baseline; Father present in home = biological father present in home at time of baseline interview; Family criminality = prior arrest in at least one family member; Peer criminality = number of four closest friends with an arrest; Neighborhood disorder = total neighborhood conditions score; PCL-F1 = Psychopathy Checklist: Youth Version (PCL: YV) Factor 1 score at baseline; PCL-F2 = PCL: YV Factor 2 score at baseline; MD-0 = moral disengagement score at baseline; MD-1 = moral disengagement score at Wave 1; IC-0 = impulse control score at baseline; IC-1 = impulse control score at Wave 1; AGG-0 = aggressive offending variety score at baseline; AGG-2–6 = aggressive offending variety score from Wave 2 to Wave 6; *N/n* = number of cases with complete data on that particular variable; *M* = mean, *SD* = standard deviation; Range = range of scores in current sample.

The results of the path analysis are reproduced in Table 3 and the coefficients for the principal pathways can be found in Figure 1. Three of the four $a$ pathways (from independent variables to mediators) were significant (PCL-F1 → MD-1; PCL-F2 → MD-1; PCL-F2 → IC-1) but only one of the two $b$ pathways (from mediators to dependent variable) achieved significance (MD-1 → AGG-2–6). The bias-corrected bootstrapped confidence intervals for the total, direct, overall indirect, and specific indirect effects used to test both hypotheses can be found in Table 4. Significance is marked by a 95% confidence interval that does not include zero. Because *Mplus* calculates confidence intervals to the thousandths place and the lower boundary of one of the confidence intervals in the original analysis was .000 the two $x$ variables (PCL-F1 and PCL-F2) were divided by 10 to produce a lower boundary with a number after the decimal so that significance could be determined. The results indicated that the indirect effects running through MD-1 were both significant, the indirect effects running through IC-1 were both nonsignificant, and the MD effect was significantly stronger than the IC effect for PCL-F1 but not for PCL-F2.

Table 4 also shows that the direct effect of PCL-F1 on violent offending was no longer significant once MD-1 and IC-1 were entered as mediators, whereas the direct effect of PCL-F2 on violent offending continued to be significant even after controlling for the intervening effects of MD-1 and IC-1. A comparison of the two direct effects using Preacher and Hayes (2008) contrast test revealed that the direct effect of PCL-F2 on violent offending was significantly stronger than the direct effect of PCL-F1 on violent

Table 2
*Independent, Mediating, Precursor, and Dependent Variable Intercorrelations*

| Variable | PCL-F2 | MD-0 | MD-1 | IC-0 | IC-1 | AGG-0 | AGG-2–6 |
|---|---|---|---|---|---|---|---|
| PCL-F1 | .61† | .31† | .27† | .21† | .19† | .32† | .20† |
| PCL-F2 | | .28† | .26† | .32† | .27† | .49† | .29† |
| MD-0 | | | .56† | .36† | .31† | .37† | .24† |
| MD-1 | | | | .26† | .30† | .31† | .26† |
| IC-0 | | | | | .56† | .37† | .25† |
| IC-1 | | | | | | .28† | .21† |
| AGG-0 | | | | | | | .40† |

*Note.* PCL-F1 = Psychopathy Checklist: Youth Version (PCL: YV) Factor 1 score at baseline; PCL-F2 = PCL: YV Factor 2 score at baseline; MD-0 = moral disengagement at baseline; MD-1 = moral disengagement score at Wave 1; IC-0 = impulse control score at baseline; IC-1 = impulse control score at Wave 1; AGG-0 = aggressive offending variety score at baseline; AGG-2–6 = aggressive offending variety score from Wave 2 to Wave 6; $n$ = 1,354.
† $p < .0018$ (Bonferroni-corrected alpha level: .05/28 correlations).

offending, controlling for Wave 1 MD and IC (estimate = −0.547, BCBCI = −1.030, −0.095).

Sensitivity testing revealed that an unobserved covariate confounder would need to correlate .20 with both the mediator and outcome variables to completely eliminate the mediating effect of MD-1 on the PCL-F1–violence relationship and .18 with both the mediator and outcome variables to completely eliminate the mediating effect of MD-1 on the PCL-F2–violence relationship. These results indicate that the indirect effects of moral disengagement on the PCL–violence relationship were modestly to moderately robust to the effects of unobserved covariate confounders. In addition, the MD specific indirect effect accounted for 61.1% of the variance in the total PCL-F1 effect and 7.4% of the variance in the total PCL-F2 effect.

Because the precursor MD measure (MD-0) failed to correlate with either of the mediators or with total offending in the SEM analysis and the precursor IC measure (IC-0) correlated with all three outcomes (see Table 4) a supplementary analysis was performed without the precursor measures to determine whether this anomalous pattern could have been responsible for the current results. The significance and nonsignificance of the direct, indirect, and contrast effects did not change except that the mediating effect of IC-1 on the PCL-F2–violence relationship was now statistically significant.

## Discussion

The first hypothesis tested in this study held that proactive antisocial cognition would do a significantly better job of mediating the Factor 1–violence relationship than reactive antisocial cognition. Consistent with this hypothesis, moral disengagement—a putative measure of proactive antisocial cognition—effectively mediated the relationship between PCL: YV Factor 1 and violent offending, whereas impulse control—a putative measure of reactive antisocial cognition—did not. When the moral disengagement and impulse control pathways were directly compared moral disengagement achieved a significantly stronger effect than impulse control. These results suggest that proactive antisocial cognition may be the proximal mechanism that links the two more distally related traits of PCL-measured psychopathy and violent crime. The limitations of drawing causal conclusions from mediation research conducted without benefit of random assignment are discussed in the final paragraph of the Discussion. In the meantime, it should be noted that the indirect effect of proactive antisocial cognition accounted for 61% of the total effect of Factor 1 on subsequent violent offending and displayed modest to moderate robustness to violations of the sequential ignorability assumption at a level somewhat below that which has been attained in studies on cognitive mediation of the past crime–future crime relationship (Walters, 2013; Walters & DeLisi, 2013)

The second hypothesis tested in this study predicted that moral disengagement and impulse control would both mediate the relationship between PCL: YV Factor 2 and violent offending, that there would not be a significant difference in the effect of these two mediators on the Factor 2-violence relationship, and that the direct effect of PCL: YV Factor 2 on violent offending would be significantly stronger than the direct effect of PCL: YV Factor 1 on violent offending after controlling for the two mediators. The first part of this hypothesis received only partial support in that while moral disengagement successfully mediated the Factor 2–violence relationship, impulse control did not. Fully consistent with the second hypothesis, the difference between the two mediating effects was not significant and the direct effect of Factor 2 on violent offending (c′ pathway) was significantly stronger than the direct effect of Factor 1 on violent offending. This last finding suggests that whereas Factors 1 and 2 are both relevant to future violent offending, the mechanism of effect may differ somewhat between the two factors. The principal mechanism of action for Factor 1, for instance, appears to be mediation by proactive criminal thinking, whereas the mechanism of action for Factor 2 is less uniform. Therefore, although proactive criminal thinking appears to mediate the Factor 2 effect, there is still a great deal of variance in the Factor 2–violence relationship that was not accounted for by the moral disengagement and impulse control mediators.

### Full Versus Partial Mediation

The fact that the direct path from PCL: YV Factor 1 to violent offending was no longer significant when the two mediators were added to the equation does not provide unequivocal evidence of full mediation. This is another way of saying that just because a direct effect is no longer significant in the presence of mediators does not mean that the mediators fully accounted for the relationship between the independent and dependent variables. One reason is that the direct effect may have less power to reject the null hypothesis than the indirect effect (Kenny & Judd, 2014). Another reason is that the direct effect could be suppressed by an omitted or suppressor variable (Rucker, Preacher, Tormala, & Petty, 2011). Current thinking on mediation, in fact, holds that we should ordinarily refrain from using such terms as full and partial mediation and examine the sensitivity of our results to the effects of unobserved confounding covariates and consider the possibility that a direct effect has been suppressed by an omitted variable (Hayes, 2013). Before we can fully appreciate the Factor 2–violence relationship we must determine the factors that are mediating this relationship. In addition to the proactive and reactive cognitive mediators examined in this study, there may also be behavior mediators owing to the fact that Factor 2 contains several

Table 3
*Path Analysis With Factors 1 and 2 of the PCL: YV as Predictors of Aggressive Offending and MD and IC as Mediators*

| Variable | *b* (95% CI) | β | *t* | *p* |
|---|---|---|---|---|
| PCL-F1 on | | | | |
| Age | 0.014 (−0.033, 0.060) | 0.016 | 0.57 | .567 |
| Race | 0.086 (−0.049, 0.224) | 0.035 | 1.23 | .219 |
| Sex | −0.065 (−0.211, 0.088) | −0.022 | −0.86 | .392 |
| SES | −0.005 (−0.010, −0.001) | −0.064 | −2.31 | .021 |
| Father present | 0.128 (−0.010, 0.267) | 0.054 | 1.80 | .072 |
| Family criminality | 0.128 (0.004, 0.255) | 0.053 | 2.01 | .044 |
| Peer criminality | 0.094 (0.044, 0.142) | 0.108 | 3.76 | <.001 |
| Neighborhood disorder | 0.112 (0.039, 0.187) | 0.084 | 2.97 | .003 |
| PCL-F2 on | | | | |
| Age | 0.067 (0.021, 0.112) | 0.076 | 2.92 | .004 |
| Race | 0.131 (−0.003, 0.261) | 0.053 | 1.94 | .052 |
| Sex | −0.158 (−0.299, −0.012) | −0.054 | −2.12 | .034 |
| SES | −0.001 (−0.006, 0.003) | −0.014 | −0.50 | .617 |
| Father present | 0.037 (−0.088, 0.159) | 0.016 | 0.58 | .564 |
| Family criminality | 0.235 (0.108, 0.358) | 0.097 | 3.66 | <.001 |
| Peer criminality | 0.168 (0.121, 0.216) | 0.194 | 6.91 | <.001 |
| Neighborhood disorder | 0.223 (0.149, 0.298) | 0.168 | 5.99 | <.001 |
| MD-1 on | | | | |
| PCL-F1 | 0.067 (0.021, 0.097) | 0.185 | 3.43 | .001 |
| PCL-F2 | 0.032 (0.006, 0.061) | 0.087 | 2.24 | .025 |
| Age | −0.002 (−0.019, 0.014) | −0.007 | −0.25 | .805 |
| Race | −0.098 (−0.153, −0.052) | −0.108 | −3.78 | <.001 |
| Sex | −0.098 (−0.155, −0.045) | −0.093 | −3.48 | .001 |
| SES | 0.001 (0.000, 0.003) | 0.050 | 1.61 | .107 |
| Father Present | 0.035 (−0.010, 0.084) | 0.041 | 1.47 | .141 |
| Family Criminality | 0.028 (−0.019, 0.073) | 0.032 | 1.21 | .225 |
| Peer Criminality | 0.021 (0.002, 0.041 | 0.066 | 2.08 | .038 |
| Neighborhood disorder | 0.004 (−0.028, 0.034) | 0.007 | 0.22 | .823 |
| MD-0 | −0.019 (−0.030, 0.512) | −0.487 | −0.11 | .916 |
| IC-0 | 0.051 (0.017, 0.077) | 0.578 | 3.36 | .001 |
| IC-1 on | | | | |
| PCL-F1 | 0.042 (−0.021, 0.107) | 0.046 | 1.28 | .201 |
| PCL-F2 | 0.096 (0.036, 0.160) | 0.104 | 3.06 | .002 |
| Age | −0.036 (−0.075, 0.002) | −0.044 | −1.82 | .068 |
| Race | 0.121 (0.003, 0.230) | 0.052 | 2.05 | .040 |
| Sex | −0.126 (−0.266, 0.005) | −0.047 | −1.81 | .071 |
| SES | 0.002 (−0.001, 0.006) | 0.028 | 1.18 | .238 |
| Father present | −0.042 (−0.143, 0.057) | −0.019 | −0.81 | .418 |
| Family criminality | 0.026 (−0.080, 0.139) | 0.011 | 0.46 | .648 |
| Peer criminality | −0.017 (−0.057, 0.025) | −0.021 | −0.78 | .436 |
| Neighborhood disorder | 0.007 (−0.062, 0.080) | 0.006 | 0.20 | .840 |
| MD-0 | −0.218 (−0.245, 0.313) | −2.238 | −1.25 | .213 |
| IC-0 | 0.528 (0.472, 0.587) | 2.348 | 18.28 | <.001 |
| AGG-2–6 on | | | | |
| MD-1 | 0.169 (0.096, 0.251) | 0.157 | 4.31 | <.001 |
| IC-1 | 0.016 (−0.013, 0.044) | 0.039 | 1.11 | .268 |
| PCL-F1 | 0.006 (−0.020, 0.031) | 0.016 | 0.48 | .635 |
| PCL-F2 | 0.061 (0.027, 0.090) | 0.156 | 3.85 | <.001 |
| Age | −0.037 (−0.053, −0.020) | −0.107 | −4.23 | <.001 |
| Race | 0.058 (0.004, 0.112) | 0.059 | 2.11 | .035 |
| Sex | −0.123 (−0.169, −0.078) | −0.108 | −5.39 | <.001 |
| SES | −0.001 (−0.003, 0.000) | −0.038 | −1.40 | .161 |
| Father present | −0.004 (−0.051, 0.044) | −0.005 | −0.18 | .857 |
| Family criminality | 0.056 (0.017, 0.095) | 0.059 | 2.75 | .006 |
| Peer criminality | 0.022 (0.001, 0.045) | 0.064 | 1.92 | .054 |
| Neighborhood disorder | 0.043 (0.012, 0.076) | 0.084 | 2.69 | .007 |
| MD-0 | −0.018 (−0.106, 0.059) | −0.443 | −0.61 | .543 |
| IC-0 | 0.045 (0.015, 0.075) | 0.474 | 2.98 | .003 |
| AGG-0 | 0.001 (0.0.001, 0.169) | 0.024 | 0.01 | .992 |
| MD-1 with IC-1 | 0.063 (0.035, 0.078) | 0.243 | 5.28 | <.001 |
| PCL-F1 with PCL-F2 | 0.548 (0.496, 0.608) | 0.594 | 19.53 | <.001 |

*Note.* PCL-F1 on = regression equation that predicts PCL: YV Factor 1; PCL-F2 on = regression equation that predicts PCL:YV Factor 2; MD-1 on = regression equation that predicts moral disengagement at Wave 1; IC-1 = regression equation that predicts impulse control at Wave 1; AGG-2–6 on = regression equation that predicts aggressive offending variety score at Waves 2 through 6; MD1 with IC-1 = correlation between moral disengagement and outcome expectancies for crime at Wave 1; PCL-F1 with PCL-F2 = correlation between PCL: YV Factors 1 and 2 at Wave 0; Age = chronological age in years at baseline; Race = 1 (white) and 0 (nonwhite); Sex = 1 (male) and 2 (female); SES = parental socioeconomic status at baseline; Father present in home = biological father present in home at time of baseline interview; Family criminality = prior arrest in at least one family member; Peer criminality = number of four closest friends with an arrest; Neighborhood disorder = total neighborhood conditions score; PCL-F1 = Psychopathy Checklist: Youth Version (PCL: YV) Factor 1 score at baseline; PCL-F2 = PCL: YV Factor 2 score at baseline; MD-0 = moral disengagement score at baseline; MD-1 = moral disengagement score at Wave 1; IC-0 = impulse control score at baseline; IC-1 = impulse control score at Wave 1; AGG-0 = aggressive offending variety score at baseline; AGG-2–6 = aggressive offending variety score from Wave 2 to Wave 6; b(95% CI) = unstandardized coefficient and the lower and upper limits of the bootstrapped 95% confidence interval for the unstandardized coefficient (in parentheses); β = standardized coefficient; *t* = asymptotic *t* test; *p* = significance level of the asymptotic *t* test; *n* = 1,354.

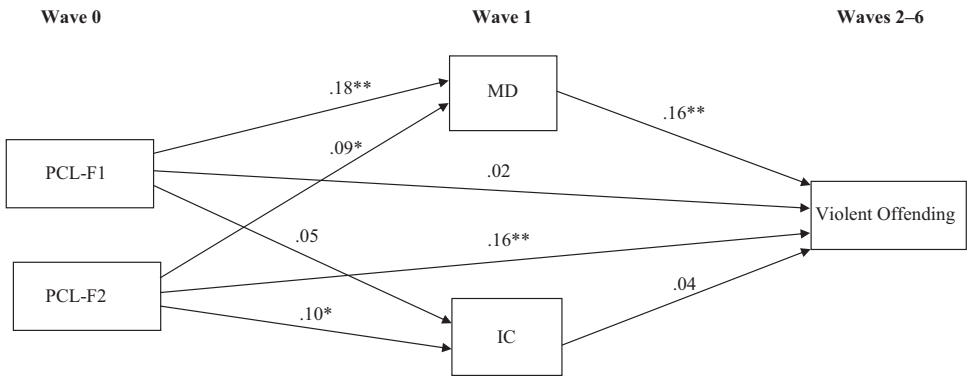


*Figure 1.* Path analysis of the mediating effect of moral disengagement and impulse control on the PCL: YV factor score–Wave 2–6 offending relationships. Standardized beta coefficients are reported; PCL-YV = Psychopathy Checklist: Youth Version; F1 = Factor 1; F2 = Factor 2; MD = moral disengagement; IC = impulse control; Violent Offending = aggressive offending variety score. Control variables are not shown; $n$ = 1,354. $^{*}$ $p < .05$, $^{**}$ $p < .001$.

items that refer specifically to antisocial and overt criminal behavior. It could also be that factors in addition to proactive antisocial cognition are mediating the Factor 1–violence relationship. Additional research, therefore, is required to ascertain which additional factors are mediating the Factor 2–violence relationship and if additional factors may also be mediating the Factor 1–violence relationship.

Table 4
*Total, Direct, and Indirect Effects for the PCL Factor 1 → Violent Offending and PCL Factor 2 → Violent Offending Pathways*

| Pathway | Estimate | BCBCI Lower | BCBCI Upper |
|---|---|---|---|
| PCL-F1 → AGG-2–6 | | | |
| Total effect | 0.181 | −0.074 | 0.437 |
| Direct effect | 0.061 | −0.194 | 0.305 |
| Indirect effect | 0.120 | 0.037 | 0.213 |
| PCL-F1 → MD-1 → AGG-2–6 | 0.113 | 0.035 | 0.205 |
| PCL-F1 → IC-1 → AGG-2–6 | 0.007 | −0.003 | 0.040 |
| Preacher & Hayes Contrast Test | 0.106 | 0.032 | 0.200 |
| PCL-F2 → AGG-2–6 | | | |
| Total effect | 0.677 | 0.352 | 0.977 |
| Direct effect | 0.608 | 0.271 | 0.899 |
| Indirect effect | 0.069 | 0.020 | 0.143 |
| PCL-F1 → MD-1 → AGG-2–6 | 0.053 | 0.013 | 0.131 |
| PCL-F1 → IC-1 → AGG-2–6 | 0.016 | −0.009 | 0.057 |
| Preacher & Hayes Contrast Test | 0.038 | −0.015 | 0.126 |

*Note.* Independent variables (PCL-F1 and PCL-F2) were divided by 10 to get a lower boundary of the confidence interval that was either positive or negative; Criteria for significance = 95% confidence interval that does not include zero; PCL-F1 = Psychopathy Checklist: Youth Version (PCL: YV) Factor 1 score; PCL-F2 = PCL:YV Factor 2 score; MD-1 = moral disengagement at Wave 1; IC-1 = impulse control at Wave 1; AGG-2–6 = aggressive offending from Waves 2 to 6; Preacher & Hayes Contrast Test = comparison between the specific indirect effects; Estimate = point estimate; BCBCI = 95% bias-corrected bootstrapped confidence interval, lower = lower boundary of bias-corrected bootstrapped confidence interval; upper = upper boundary of bias-corrected bootstrapped confidence interval; $n$ = 1,354.

## Implications

The results of this study have implications for both theory and practice. The Factor 1 results, for instance, establish the presence of a relationship between the core features of PCL-measured psychopathy and violent offending and suggest that this relationship is largely mediated by proactive antisocial cognition. Hence, the callous/unemotional and superficial/manipulative traits associated with Factor 1 of the PCL: YV may well assist in the formation of proactive antisocial thinking styles like mollification (justification), entitlement (sense of ownership and privilege), power orientation (interpersonal control), and superoptimism (belief in personal invulnerability). These antisocial thinking styles, in turn, increase a person's propensity to engage in violent offending, probably by impacting on his or her decision-making and neutralizing any moral considerations that stand in the way of committing a violent act. In their review of the literature on callous-unemotional (CU) traits, Frick and colleagues (2014) concluded that intensive interventions tailored to the individual emotional, cognitive, and motivational needs of high CU children and adolescents can be effective in reducing problem behavior in these often difficult-to-reach youth. A principal goal of those working with high CU clients, according to the results of the current study, should be development and dissemination of interventions for proactive antisocial cognition. Because criminal justice interventions for youth and adults usually target reactive issues like problem solving and self-control (Walters, 2012), there is a need for interventions that target such proactive issues as moral reasoning and outcome expectancies for crime.

There are theoretical and practical implications to the Factor 2 results as well. Unlike the connection between the core personality traits of PCL-measured psychopathy and violent crime, which appears to be mediated primarily by proactive antisocial cognition, the connection between the behavioral deviance features of PCL-measured psychopathy and violent crime may be mediated by several different factors. One factor appears to be proactive antisocial cognition. Another factor may be reactive antisocial cognition, which correlated 40% to 50% higher with Factor 2 than with

Factor 1 in the current study (according to the zero order correlations in Table 2). The reason why reactive criminal thinking failed to mediate the Factor 2–violence relationship in the current study was that the WAI Impulse Control score correlated weakly with violent criminality in this sample. That may have more to do with the WAI Impulse Control score's effectiveness as a proxy for reactive antisocial cognition than with reactive antisocial cognition's ability to mediate the behavioral deviance–violence relationship. Thus, the reactive criminal thinking styles of cutoff (low frustration tolerance), cognitive indolence (lack of critical reasoning skills), and discontinuity (easy distractibility) may be just as critical in mediating the behavioral deviance–violence relationship as the proactive criminal thinking styles of mollification, entitlement, power orientation, and superoptimism are in mediating the core personality–violence and behavioral deviance–violence relationships. The significant direct effect suggests that additional factors, such as hostile attribution biases, short-term hedonistic values and goals, and hypersensitivity (Walters, 2012), may also play a role in mediating the behavioral deviance-violence relationship. As such, these cognitive variables need to be assessed as possible targets for intervention as part of a comprehensive treatment program.

## Limitations

Studies are normally grounded in assumptions, and the current investigation is no exception. A principal assumption on which the present study was based is that the two mediator variables used to assess proactive and reactive antisocial cognition mapped well onto the constructs they were designed to represent. In other words, the current study assumed that the moral disengagement and WAI impulse control scales adequately operationalized proactive and reactive antisocial cognition, respectively. Although there were no established criterion measures of proactive and reactive antisocial cognition available in the Pathways study to serve as a standard against which to validate these measures, there is reason to believe that the MD scale was assessing proactive antisocial cognition and the IC scale was assessing reactive antisocial cognition. Conceptually, both measures conformed to definitions of proactive and reactive antisocial cognition provided by Walters (2012). Procedurally, both measures assessed attitudes, beliefs, and ideas rather than behaviors, abilities, or formal personality traits. It could be argued, nonetheless, that MD and IC are just more specific measures of personality that should, by definition, correlate with more global measures of personality like psychopathy, although this does not explain why only the MD scale mediated the psychopathy-violence relationship or why Bandura et al. (1996) assert that the MD scale is assessing a cognitive construct.

In addition to questioning how well the mediating variables in this study mapped onto the proactive and reactive constructs they were designed to represent, another limitation of this study is that the sample was heavily weighted toward severely delinquent male adolescents. A sample of less seriously antisocial adolescents that is more equally balanced between males and females and that is either younger or older than the present sample is required to test the generalizability of the current results. In addition, the dependent variable for this study, the summed aggressive offending variety score from Waves 2 through 6, was moderately skewed. It could be argued that this level of skew made use of a maximum likelihood estimator inappropriate for a study on mediator effects. However, a maximum likelihood estimator is required to calculate indirect effects and compute bias-corrected bootstrapped confidence intervals. Moreover, research indicates that constructing bootstrapped confidence intervals using the bias-corrected method is not only the best way to test for mediation and indirect effects but is also effective for use with non-normal dependent outcome measures (MacKinnon, Kisbu-Sakarya, & Gottschall, 2013).

## Conclusion

Assessing causality with anything less than an experimental design can be problematic. This just said, some of the most interesting research questions in the social sciences do not lend themselves to experimental manipulation. As such, alternate approaches to causality need to be found. One such alternative—mediation analysis (Baron & Kenny, 1986)—was used in the current study. The results obtained in this study revealed that the relationship between the core features of personality, as measured by Factor 1 of the PCL: YV, and violent offending was mediated by a putative measure of proactive antisocial cognition even after important demographic and background differences between participants, precursor variables for both mediators, and baseline violent offending were controlled (Cole & Maxwell, 2003). In addition, MD mediation of the Factor 1–violent offending relationship was modestly to moderately robust to the effects of unobserved covariate confounders. Continued development of the psychopathy construct and PCL family of measures as predictors of future violence requires that we investigate the contributing cognitive factors in addition to the core personality and behavioral deviance factors of the PCL-based hierarchical model of psychopathy (Neumann, Hare, & Newman, 2007) and if necessary, supplement our superordinate factors (PCL-R/SV/YV Factors 1 and 2) with more specific measures of the cognitive and noncognitive factors that appear to connect the superordinate factors to criminal violence.

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