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## Examination of the Successful Psychopathy Conceptualization in Youth with Callous-Unemotional Traits

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Examination of the Successful Psychopathy  
Conceptualization in Youth with Callous-Unemotional Traits

A Dissertation

Submitted to the Graduate Faculty of the  
University of New Orleans  
in partial fulfillment of the  
requirements for the degree of

Doctor of Philosophy  
in  
Applied Developmental Psychology

by

Tina D. Wall Myers

B.S. University of Alabama, 2011  
M.S. Eastern Kentucky University, 2013

December, 2016

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This dissertation is dedicated to my parents  
Micky and Kyong Wall  
for their unconditional love and support  
&  
to my husband  
Matthew Myers  
for his humor and comfort

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## **Abstract**

Although research has demonstrated that some adults with psychopathic traits show better executive functioning and higher intelligence that make them “successful”, there has been very minimal research testing whether similar distinctions can be made in samples of youth with elevated CU traits. Utilizing a sample of 1216 male adolescent first-time offenders, the current study examined whether executive functioning, intelligence and/or impulse control would moderate the relationship between CU traits and antisocial outcomes. The current study also examined whether CU traits were more strongly associated with a number of positive adjustment indicators at higher levels of the moderators. Results did not support successful psychopathy conceptualizations for youth with CU traits. Unlike findings in adult psychopathy research, adolescents high on CU traits who were also of higher intelligence engaged in *more* aggressive acts. The current findings also indicated that none of the proposed moderators influenced the relationship between CU traits and the positive adjustment indicators.

Keywords: successful psychopathy, callous-unemotional traits, intelligence, impulse control, antisocial outcomes

## **Examination of the Successful Psychopathy**

### **Conceptualization in Youth with Callous-Unemotional Traits**

Psychopathy is generally described as a personality disorder comprising a constellation of affective, interpersonal, and behavioral characteristics that include traits such as callousness, fearlessness, deceitfulness, grandiosity, impulsiveness, excitement seeking, and aggression (Hare & Neumann, 2008). Persons high on these traits have been described by early theorists such as Pinel (1801) and Prichard (1835) to be “morally insane” or “morally perverted.” Koch (1891) used the term “psychopathic inferiority” to describe individuals who engaged in deviant behavior due to heredity but who were not insane. Kraepelin (1915) expanded upon Koch’s (1891) conceptualization to include categories defined by the cruelest and most wicked of disordered offenders. One of the most complete clinical and theoretical conceptualizations of psychopathy was done by Cleckley (1941/1976) in his observations of psychiatric patients that served as the basis of his classic text, *The Mask of Sanity*. He identified 16 characteristics that differentiated individuals with psychopathy from other patients. Some of these characteristics included negative attributes such as unreliability, untruthfulness and insincerity, and a lack of remorse or shame. However, these traits were “masked” by a superficially charming demeanor, good “intelligence,” and an absence of delusions, irrational thinking, and “nervousness.” Interestingly, Cleckley did not describe individuals with psychopathy as overly aggressive or violent. On the other hand, McCord and McCord (1964), in their text, *The Psychopath: An Essay on the Criminal Mind*, described individuals with psychopathy as vicious and cold with aggressive and dangerous motivation. Thus, from these early descriptions of the construct of psychopathy, there was already an debate emerging as to whether antisocial, aggressive, and criminal behavior were necessary characteristics of the construct or whether individuals could potentially show the

interpersonal and affective characteristics of psychopathy but not show severe violations of the rights of others.

There have been a number of attempts to extend the construct of psychopathy to youth. Most of these extensions have been tied to the conceptualization of the construct that has emerged from research with the Psychopathy Checklist-Revised (PCL-R; Hare, 1991/2003). The PCL-R is a 20-item clinician rating scale for psychopathy with two correlated factors: Factor 1 (affective/ interpersonal traits) and Factor 2 (antisocial lifestyle and behavior traits). This conceptualization of psychopathy explicitly defines the construct as persons being high on *both* dimensions (Hare & Neumann, 2008). Thus, this conceptualization suggests that antisocial behavior is an important component to the construct.

Direct attempts to downward extend items from the PCL-R for use with children and adolescents found similar factor structures, which have been replicated in both boys and girls, across diverse settings, and across different assessment formats (Frick, Bodin, & Barry, 2000; Jones, Cauffman, Miller, & Mulvey, 2006; Kosson et al., 2013; Vitacco, Rogers, & Neumann, 2003). However, this research also suggested that the Factor 2 traits are broadly associated with early onset antisocial behavior but the Factor 1 or callous-unemotional (CU) traits seem to be more important for designating an important subgroup *within* youth who show early onset of antisocial behavior (Frick & Ray, 2015). This affective component consists of traits such as a lack of guilt, lack of empathy, and a basic poverty of emotional reaction (Hare & Neumann, 2008).

To illustrate the importance of CU traits for designating an important subgroup of antisocial youth, CU traits have been associated with higher rates of offending, more violent offending, higher rates of aggression, and more severe aggression in various samples of children

and adolescents (Frick, Ray, Thornton, & Kahn, 2014). Besides showing more severe aggression that results in more harm to others, youth with elevated CU traits display more instrumental and premeditated aggression compared to other antisocial youth (Frick et al., 2003; Kruh, Frick, & Clements, 2005; Lawing, Frick, & Cruise, 2010). Furthermore, CU traits are associated with an early onset and more stable pattern of conduct problems (Frick, Stickle, Dandreaux, Farrell, Kimonis, 2005; Rowe et al., 2010) and are associated with risk for more antisocial outcomes in adulthood (Burke, Loeber, & Lahey, 2007; McMahon, Witkiewitz, Kotler, & the CPPRG, 2010).

Based on this extensive body of research, CU traits were integrated into the diagnostic criteria for Conduct Disorder (CD) in the *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition* (DSM-5; APA, 2013) as a specifier. In an attempt to minimize the potential for iatrogenic effects of the label “callous-unemotional,” the name for the specifier is “with Limited Prosocial Emotions.” In order to be considered for the specifier, youth must meet full criteria for a diagnosis of CD and show at least two CU traits over an extended period time and in most relationships and settings. Thus, this definition *requires* the presence of significant levels of antisocial behavior to accompany CU traits.

### **Successful Psychopathy**

Thus, many of the current conceptualizations of psychopathy in both adults (PCL-R) and youth (DSM-5) make antisocial behavior a critical and often necessary part of the definition of the construct. However, as noted previously, historically, this has not always been the case. In his pioneering work, *The Mask of Sanity*, Cleckley (1941/1976) documented cases of high-functioning “successful” psychopathic individuals, including businessmen, physicians, and scientists, who are characterized by traits of egocentricity, superficial charm, and irresponsibility, but not by arrests or convictions. Since this early conceptualization, there has been significant

empirical support for the presence of psychopathic traits in non-antisocial individuals. Empirical findings on successful psychopathy have been conducted with five different population sources. Of the five populations, four are similar in that they are based on different types of community samples (i.e., psychopathic individuals recruited from the general population, psychopathic individuals recruited from temporary employment agencies, psychopathic individuals recruited from college students, and psychopathic individuals recruited from businesses). In contrast, a fifth sample, psychopathic serial killers, who avoided arrests for extended periods of time, is considered “semi-successful” psychopathic, representing an institutional population that may give secondary clues as to the nature of successful psychopathy due to their ability to avoid criminal detection for significant periods (Gao & Raine, 2010).

When psychopathy is studied in community samples, individuals with psychopathic traits seem to show some of the same cognitive or emotional deficits, including reduced heart rate and electrodermal reactivity, and startle response potentiation to negative emotional stimuli that have been observed in incarcerated individuals with psychopathic traits (Belmore & Quinsey, 1994; Benning, Patrick, & Iacono 2005; Justus & Finn, 2007). However, individuals with psychopathic traits recruited from newspaper advertisements and college samples typically do not show the significant inhibitory deficits (e.g., ability to delay gratification) or intellectual deficits found in institutionalized samples (Levenson, Kiehl, & Fitzpatrick, 1995; Mahmut, Homewood, & Stevenson, 2008; Newman, Patterson, & Kosson, 1987; Widom, 1977; Widom & Newman, 1985).

These findings have led some to suggest that persons with psychopathic traits in community samples may have intact information processing and executive functioning abilities, which promote their ability to lie, con, and manipulate others (Gao, Raine, & Schug, 2011;

Ishikawa, Raine, Lencz, Bihrlé, & LaCasse, 2001). These traits may allow persons with psychopathic traits to succeed in businesses and other settings where these traits can be used for advancement (Babiak, 1995; Babiak & Hare, 2006; Babiak, Neumann, & Hare, 2010). In his seminal descriptions of persons with psychopathic traits, Cleckley (1941/1976) noted that some individuals with psychopathic traits may pursue formal education, particularly in terms of professional degrees in business, the law, or medicine, as a means to achieve status and power. As a result, some individuals with psychopathic tendencies are able to not only avoid institutionalization but are able to prosper in organizational or community settings (Babiak & Hare, 2006; Lykken, 1995).

However, it is unclear if better inhibitory control or intelligence eliminates or reduces the level of antisocial behavior, or whether the way it is expressed is changed. For example, in a college student sample, Wall, Sellbom, and Goodwin (2013) found that intelligence, and in particular verbal intelligence, moderated the relationship between psychopathy and criminality such that those high on psychopathy who are also of higher intelligence engaged in less criminal behavior. Such findings led Gao and Raine (2010) to suggest that efficient executive functioning and intelligence could help individuals with elevated psychopathic traits to think through the consequences of their behavior and inhibit behavior that could get them into trouble. As a result, these individuals do not engage in antisocial behaviors, not because of their concern over the potential harm that they may cause to others, but because of their potential for negative consequences to the individual.

Nevertheless, there are also studies to suggest that individuals in the community with elevated psychopathic traits are still antisocial and aggressive but the form of this behavior differs from those displayed by individuals in institutions with psychopathic traits. For example,

some studies have suggested that professionals high on psychopathic traits engage in covert “white-collar” crime (e.g., embezzling funds, cheating on taxes) (Babiak et al., 2010; Herve & Yuille, 2007). Further, others have suggested that individuals in the community with elevated psychopathic traits may use different forms of aggression that harm others but that do not involve the direct confrontation of the victim. For example, several studies suggest that adults in the community with psychopathic traits may use relational forms of aggression (e.g., excluding others from activities, telling lies about others) in order to hurt others and achieve dominance (Babiak, 1995; Cangemi & Pfohl, 2009). Thus, a critical issue for advancing research on more successful forms of psychopathy is to determine whether or not better inhibitory control and/or higher intelligence reduces the level of antisocial behavior displayed or whether it merely changes the form the antisocial behavior takes.

Another possibility that has been considered in research on psychopathic traits in adult samples is whether better cognitive capabilities of some persons with elevated psychopathic traits allows these individuals to simply avoid detection for their antisocial behavior (Mullins-Nelson, Salekin, & Leistico, 2006). That is, researchers have suggested that the higher intellectual abilities of these individual allow them to hide their antisocial behavior through a combination of interpersonal manipulation and charm, which allow them to effectively navigate and exert influence over social situations, while hiding or disguising the negative aspects of their psychopathic tendencies, such as antisocial and aggressive behavior (Salekin, Neumann, Leistico, & Zalot, 2004; Ullrich, Farrington, & Coid, 2008). In support of this possibility, research on serial killers with elevated psychopathic traits who were able to avoid detection for extended periods of time showed enhanced cognitive capabilities compared with other apprehended violent offenders (Gao & Raine, 2010). For example, Canter, Alison, Alison, and Wentink

(2004) reported that crime scenes from murders committed by serial killers high on psychopathic traits were more organized. Kraemer, Lord, and Heilbrun (2004) reported that serial killers high on psychopathic traits exhibited superior planning by moving the victim or body from one location to another, by using restraints, and by disposing of the body in remote locations.

In summary, it is clear from existing research that some adults with psychopathic traits show better executive functioning and higher intelligence that make them “successful”. However, it is unclear whether this success is best considered a) as leading to more advanced educational and occupational outcomes and less antisocial behavior or b) as leading to use of more covert antisocial and aggressive behavior and better ability to avoid detection. Further, there has been very minimal research testing whether similar distinctions can be made in samples of children and adolescents with elevated CU traits.

### **Successful Callous-Unemotional Traits**

The vast majority of research on elevated CU traits has focused on comparing antisocial youth with and without elevated levels of CU traits and documenting how these antisocial groups differ on clinically and etiologically important variables (Frick et al., 2014). However, there is also emerging research to suggest that some children who are high on CU traits may not display significant externalizing problems. For example, in both a nationwide (n= 7,977) cohort of youth (ages 5 to 16; Rowe et al. 2010) and in a large sample (n= 165) of Romanian adoptees exposed to severe early deprivation (Kumsta, Sonuga-Barke, & Rutter, 2012) there were a large number of youth who were elevated on CU traits but who did not show significant conduct problems. Fanti (2013) also reported data showing a large number of young adolescents (age 12) who were elevated on CU traits without conduct problems, and he reported that this group of youth with CU traits showed less impulsivity than those with elevated CU traits and conduct



problems. Similarly, in a younger sample (ages 7 to 11), Wall, Frick, Fanti, Kimonis, and Lordos (2016) reported that children who were elevated on CU traits without conduct problems scored better on measures of impulse control and executive functioning. Thus, there is some promising work to suggest that better executive control of behavior in children and adolescents with elevated CU traits may lead to lower levels of antisocial behavior, similar to the work on successful psychopathy reported above.

However, there is also some work in adolescent samples to suggest that CU traits in the presence of higher intelligence may not reduce the association between CU traits and antisocial behavior (Salekin, Lee, Schrum Dillard, & Kubak, 2010) or may actually lead to more severe violence and aggression, contrary to the research on adults with psychopathic traits and contrary to a rather large body of research linking lower intelligence to aggression and violence in samples of children and adolescents (Elkins, Iacono, Doyle, & McGue, 1997; Fergusson, Horwood, & Ridder, 2005; Ge, Donnellan, & Wenk, 2001; Kratzer & Hodgins, 1999; Lynam, Moffitt, & Stouthamer-Loeber, 1993; Moffitt & Silva, 1988). Specifically, a study conducted by Munoz, Frick, Kimonis, and Aucoin (2008) reported that, in a sample of 100 detained adolescent boys, higher verbal ability and CU traits interacted in predicting self-reported juvenile offending, such that those high on both CU traits and verbal ability reported the highest level of violence. Similarly, Hampton, Drabick, and Steinberg (2014) reported that in a sample of 1,354 adolescents adjudicated delinquent for serious offenses, higher intelligence and psychopathic traits interacted in the prediction of later self-reported offending, such that the combination of high intelligence and high psychopathy resulted in the most offending. Finally, Baskin-Sommers, Waller, Fish, and Hyde (2015) examined the interaction between CU traits and executive control in predicting self-reported violence in a sample of 1,170 male adolescents adjudicated delinquent

for serious offenses. They reported that adolescents with high CU traits and high executive control self-reported the highest level of violence.

Thus, the findings on the role of executive functioning and intelligence for moderating the association between CU traits and antisocial behavior in children and adolescents are limited and inconsistent to date. That is, better impulse control and better executive functioning abilities are associated with lower rates of conduct problems in community samples, whereas the combination of CU traits and higher intelligence often leads to higher levels of self-reported aggression and violence in samples involving detained adolescents or adolescents adjudicated delinquent for serious offenses. Further, the findings in these samples that demonstrate that CU traits are more strongly associated with violence in the presence of higher levels of intelligence are largely limited to studies using self-reported measures of violence and are not found when official records of offending are used (Salekin et al., 2010). This pattern of results could suggest that those high on CU traits and intelligence are able to avoid contact with the justice system, despite acting in a more violent and aggressive manner. However, again this needs to be tested in a sample in which self-report of violence and official records are both used and compared in their associations with CU traits and intelligence. Finally, no study to date has tested whether CU traits might interact with executive functioning and/or intelligence to lead to more indirect and relational aggression and whether CU traits are associated with more adaptive outcomes in the presence of better inhibitory control and intelligence. Both of these tests could greatly help in linking the research on CU traits in adolescents with the concept of successful psychopathy in adult samples.

## **The Current Study**

The current study addressed these gaps in the existing research in a sample of detained adolescents using a longitudinal design. That is, I tested the hypothesis that executive functioning (and related variables, such as intelligence and impulse control) would moderate the relationship between CU traits and antisocial outcomes using both self-reported and official records of delinquent behavior. However, I predicted that the findings would be different for the two types of outcomes. Specifically, I predicted that CU traits would be more strongly related to self-reported antisocial and aggressive behavior, with this being especially true for self-reported relational aggression, but less strongly related to officially reported offending at high levels of executive functioning and related variables. Further, I tested whether CU traits were more strongly associated with a number of positive adjustment indicators at higher levels of executive functioning. These measures of success were operationalized as higher wages earned, longer job lengths, and more involvement in extracurricular activities (as measured by maximum days spent in activities and more variety of activities) in our adolescent sample.

## **Methods**

### **Participants**

The sample consisted of adolescent male first-time offenders from the Crossroads Study, which draws from the juvenile justice systems of Jefferson Parish, LA; Orange County, CA; and Philadelphia, PA. To be eligible for the Crossroads Study, juveniles had to be first-time male offenders, English speakers between the ages of 13 to 17 years at the time of arrest, and have an eligible offense. It is important to note that although participants were required to have their first official charge in the three sites' court systems, they may have had offenses in other jurisdictions

or have committed prior offenses for which they were not charged. Eligible charges were mid-range offenses, such as theft of goods, simple battery, and vandalism.

Across all sites, 72.32% of individuals eligible to participate enrolled in the study, resulting in a sample of 1,216 adolescents interviewed at the first assessment. The participants were first assessed within 6 weeks of their initial processing decision (baseline) and then reassessed at 6 month ( $n = 1,161$ ; 95 % retention), 12 month ( $n = 1,141$ ; 94% retention), 18 month ( $n = 1,141$ ; 94% retention), and 24 month ( $n = 1,132$ ; 93% retention) follow-ups. Twenty-one participants were omitted from analyses as scores for self-reported offending and aggression measures were missing at all follow-up assessments (i.e., 6 month, 12 month, 18 month, and 24 month). Participants who were missing only one or two follow-up scores for these measures were retained for analyses as an average of the existing scores were imputed. Participants that were not included in analyses did not differ significantly in age, IQ, or race. Participants included in analyses had a mean age at baseline of 15.28 years ( $SD = 1.29$ ), and the sample was predominately White Latino ( $n = 555$ , 46.4%) and Black ( $n = 454$ , 38.0%), followed by White Non-Latino ( $n = 186$ , 15.6%). The highest education completed for either mother or father was predominately high school diploma ( $n = 369$ , 32.2%), followed by some high school ( $n = 225$ ; 19.7%), some college or graduate of 2 year college ( $n = 202$ ; 17.6%), graduate of 4 year college ( $n = 154$ ; 13.4%), and other ( $n = 195$ ; 17.0%).

## **Procedure**

Institutional Review Board approval was obtained at each site before data collection began. Informed consent was obtained from the parent/guardian of all youth who met inclusionary criteria, and assent was obtained from all eligible youth. Both the youth and parent were informed that participation in the study was entirely voluntary and that participation in the

study would in no way influence the youth's treatment by the juvenile court system. Also, youth and parent were informed that the research project had obtained a Privacy Certificate from the Department of Justice, which prevents the research information from being subpoenaed for use in legal proceedings. Furthermore, if participants reached the age of 18 during the course of the study, consent from the participant was obtained before continuing with participation.

Interviews were conducted using laptop computers to assist with administration as well as ease of data entry. The laptops were equipped with an interviewing program that included all of the items, measures, and computer tasks for standardized administration. The interviews took place at a location convenient to the youth, such as their home or a local place in the community (e.g., library, coffee shop) or in a facility if the youth had been incarcerated. If the participant was incarcerated in a facility that did not allow researchers to utilize the interviewing laptop, a paper version of the interview was administered and behavioral measures (i.e., Go/No-Go) were not completed ( $n = 144$ ). To avoid comprehension problems related to low reading ability, interviewers read all interview questions and instructions aloud to the participant. Participants received \$50 for the baseline interview. For each successive interview, participants received \$15 more than the previous one (i.e., \$65 for the 6 month interview, \$80 for the 12 month interview, and \$95 for the 18 month interview, \$110 for the 24 month interview).

## **Measures**

**Callous-Unemotional Traits.** CU traits were assessed at baseline using the *Inventory of Callous-Unemotional traits* (ICU; Kimonis et al., 2008), a 24-item instrument that utilizes a four-point Likert scale, 0 (*Not at all true*) to 3 (*Definitely true*) to indicate how accurate each statement describes them. The total ICU score has been consistently associated with antisocial behavior (Essau, Sasagawa, & Frick, 2006; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008;

Roose, Bijttebier, Decoene, Claes, & Frick, 2010) and negatively associated with prosocial behavior (Eremsoy, Karanci, & Berument, 2011) in adolescent samples. Within the current sample, the internal consistency for the total ICU score was adequate for baseline (Cronbach's  $\alpha = .77$ ). The mean and standard deviation exhibited in Table 1 are similar to those demonstrated in other juvenile justice involved adolescent samples (e.g., Kimonis et al., 2006).

Table 1

*Descriptive Statistics for Main Study Variables*

	<i>Mean</i>	<i>SD</i>	<i>Min-Max</i>	<i>Skew</i>	<i>Kurtosis</i>
CU Traits	26.23	8.10	0-55	.08	.09
Go/No-Go Errors	16.88	9.15	0-50	.64	-.03
Impulse Control	25.96	6.87	8-40	-.06	-.65
IQ	88.40	11.63	55-128	.08	.14
SRO Total Variety	4.53	6.81	0-51	2.85	10.5
Non-violent	2.65	4.72	0-36	2.92	10.52
Violent	1.89	2.72	0-21	2.59	8.89
PCS Average	7.21	8.43	0-60	2.46	7.93
Relational	2.05	3.29	0-23	3.09	11.31
Physical	5.36	5.79	0-42	2.24	7.23
Official Offending	.76	1.34	0-10	2.74	9.91
Highest Wages	6.05	5.53	0-33	.60	.73
Longest Job (Days)	128.08	205.57	0-1460	2.85	9.97
Variety Extracurricular	.77	.78	0-6	1.6	4.41
Max Extracurricular (Days)	3.55	2.40	0-7	-.18	-1.32

Note. SD = standard deviation; CU = callous-unemotional; IQ = intelligence quotient; SRO = self-reported offending; PCS = peer conflict scale. Standard error for Skew = .07; Standard error for Kurtosis = .14

**Executive Functioning.** Executive functioning was assessed at the 12 month follow-up interview using a Go/No-Go paradigm (Durstun et al., 2002). This task is designed to measure sustained attention and inhibitory control. Specifically, the task required participants to view a series of letters one-by-one on a computer screen and hit the spacebar on the Go trials (letters except 'x') and inhibit hitting the spacebar on No-Go trials (the letter 'x'). Prior to the actual task, a practice session was administered to ensure participants fully comprehended the task. The

task consisted of a total of 256 trials, with 75% Go trials. Stimulus duration was 500 ms and the interstimulus interval was 2000 ms. Each trial began with the presentation of a fixation cross. The theory behind a Go/No-Go paradigm is that individuals who have impulse problems will have difficulty inhibiting responses on the No-Go trials. Thus, behavioral performance will be assessed by calculating errors of commission (false alarms, i.e., responding incorrectly to the No-Go letter). No-Go errors have been correlated with measures of impulsivity (Barkley, 1991; Halperin, Wolf, Greenblatt, & Young, 1991; Logan, Schachar, & Tannock, 1997; Reynolds, Ortengren, Richards, & de Wit, 2006) and have differentiated children and adults with Attention-Deficit/Hyperactivity Disorder from controls (Bekker, Kenemans, & Verbaten, 2005; Iaboni, Douglas, & Baker, 1995; McLean et al., 2004; Schachar & Logan, 1990).

**Impulse Control.** Self-report of impulse control was assessed at baseline with the Impulse control (IC) subscale of the *Weinberger Adjustment Inventory* (WAI; Weinberger & Schwartz, 1990). The Impulse Control subscale contains 8 items and scores on this subscale have been correlated with higher levels of drug use, delinquency, and aggression in youth (Farrell & Sullivan, 2000). Within the current sample, the internal consistency for the IC scores was adequate for baseline (Cronbach's  $\alpha = .74$ ).

**Intelligence.** Intelligence was assessed at baseline using the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999). The vocabulary and matrix reasoning subtests were utilized to estimate an intelligence quotient (FSIQ-2). Interviewers administered and scored the vocabulary and matrix reasoning subtests in accordance with the WASI manual. Scoring was required to be conducted immediately after completion of interviews, and scores were then entered into the interviewing laptop. The WASI was normed on a nationally representative sample of 2,245 individuals ages 17-89. Internal consistency reliability coefficients for the FSIQ-

2 averaged .93 for children and stability coefficients (1-month interval) were .85 for children. The FSIQ-2 was also correlated .81 with WISC-III and .87 with the WAIS-III in the normative samples for these tests (Wechsler, 1999).

**Self-Reported Offending.** Self-report of delinquent behavior was assessed using the *Self-Report of Offending Scale* (SRO; Huizinga, Esbensen, & Weiher, 1991) at 6 month, 12 month, 18 month, and 24 month follow-up interviews. This scale requires participants to report their involvement in 24 different activities that range from destroying or damaging property, stealing, selling drugs, carrying a weapon, to committing homicide. The questions were all asked about the time period since the previous assessment (i.e., last 6 months). For those types of offenses that participants endorsed committing, participants also reported how many times he had committed the particular offense and if he was alone or with friends when the crime occurred. The scores were calculated by summing the variety of endorsed criminal activities to create an overall measure of offending behavior, a measure of violent offending, and a measure of non-violent offending, where higher scores are indicative of more crimes committed. The SRO has demonstrated significant correlations with official reports of offending (Thornberry & Krohn, 2000). Within the current sample, the internal consistency for the SRO Total Variety was good across all time points (Cronbach's  $\alpha$ s ranging .81 to .82) and significantly correlated across time ( $r$ s ranging .45 to .63;  $p < .001$ ).

**Self-Reported Aggression.** Self-report of aggression was assessed using the *Peer Conflict Scale* (PCS; Marsee, et al., 2011). The average score across the 6 month, 12 month, 18 month, and 24 month follow-up interview was used in analyses. The PCS is a 40-item scale designed to provide extensive coverage of both forms of aggression expressed both physically (i.e., intentional physical harm to others) and relationally (i.e., intentional harm to others social



relationships). Items are rated on a four-point Likert scale from 0 (*Not at all true*) to 3 (*Definitely true*). Scores on the PCS have been associated with a laboratory measure of aggressive behavior (Muñoz et al., 2008). Factor analytic support for separating physical and relational aggression was reported in a large sample of older children and adolescents ( $N = 855$ ; age range = 12-18 years; Marsee et al., 2011). Within the current sample, the internal consistency for the PCS was excellent across all time points (Cronbach's  $\alpha$ s ranging .91 to .93) and significantly correlated across time ( $r$ s ranging .50 to .66;  $p < .001$ ).

**Criminal Arrest History.** Information about each participant's legal history was obtained from juvenile justice system databases. For participants who reached age 17 during the study period, adult court records were also reviewed. Official records include any arrests during the 6 month, 12 month, 18 month and 24 month follow-up periods. The scores were calculated by summing the number of arrests to create an overall measure of official offending. This total arrest scores was significantly correlated with the total self-report of delinquency score at a level ( $r=.28$ ,  $p < .01$ ) consistent with past samples of adolescents (Thornberry & Krohn, 2000).

**Time Spent in Facility.** Information about each participant's time spent in a secure facility during the 6 month, 12 month, 18 month, and 24 month follow-up periods was assessed. The average number of months across the follow-up periods was used in analyses as a control variable to account for the inability to commit crimes due to not being in the community. For those participants that were incarcerated, average length of incarceration was about 3.24 months for the 6 month follow-up period ( $n = 66$ ), 3.79 months for the 12 month follow-up period ( $n = 144$ ), 4.15 months for the 18 follow-up period ( $n = 137$ ), and 3.72 months for the 24 month follow-up period ( $n = 127$ ).

**Employment Wages.** Information about each participant’s job experiences was assessed at baseline, 6 month, 12 month, 18 month, and 24 month interviews. If participants endorsed having a paying job, the follow-up question “How much do/did you earn per hour to the nearest dollar?” was asked to assess the highest amount earned for any jobs held. If participants did not endorse having a paying job, the highest amount earned was designated \$0.00. Furthermore, if participants endorsed having a paying job, the follow-up question “How long have/did you had/have this job?” was asked. Jobs that cut across follow-up periods were linked so that the longest period within the entire 24 month period that the participant had the same job was used in analyses.

**Extracurricular School Activities.** Information about each participant’s involvement in extracurricular school activities was assessed at baseline, 6 month, 12 month, 18 month, and 24 month interviews. Participants were asked “How many days a week do you spend on the following activities outside of class time?” The participants answered about the following activities: student government; athletic teams; cheerleading or other sport-related team such as drill team or pep squad; music/band; school clubs for hobby, service, or recreational; National Honor Society; newspaper/yearbook; attending athletic events, plays, or school dances; or other extracurricular school activities in which the participant specified the school activity. The average number of different types of activities and the longest length of days spent in an activity across all follow-up points were used in analyses.

## **Results**

### **Descriptive Statistics**

Table 1 reports the means, standard deviations (*SD*), and distributions for all main study variables. CU traits and the three moderators (Go/No-Go Errors, Impulse Control, and IQ) were

all relatively normally distributed. The majority of dependent variables (except Max Extracurricular) were positively skewed, with an excess of zero occurrences.

### **Correlations**

Next, zero-order correlations between all demographic variables (e.g., age, race, study site) and main study variables were conducted. Table 2 shows these results. Based on significant correlations, age, site, and facility time were used as controls. Specifically, age was correlated with Go/No-Go errors, violent self-reported offending, and all of the positive adjustment indicators (Highest Wages, Longest Job, Variety Extracurricular, and Max Extracurricular). Site was correlated with intelligence, Highest Wages, and Longest Job, as well as most of the aggression and offending variables. Facility Time was also correlated the majority of the main study variables. However, due to the high correlation between site and race ( $r = .59, p < .001$ ) site but not race was not used as a control.

Furthermore, as expected CU traits were significantly and modestly correlated with self-reported offending and aggression, as well as official reports of offending. Impulse control was negatively correlated with self-reported offending and aggression, as well as official reports of offending albeit not as strongly. Intelligence was negatively correlated with self-reported aggression and official reports of offending, and positively correlated with Highest Wages, Longest Job, and variety of extracurricular activities. However, Go/No-Go Errors were only positively correlated with violent self-reported offending and official reports of offending. Contrary to expectations, Impulse control and Go/No-Go Errors were not correlated with any of the positive adjustment indicators, nor were any of the moderators correlated with each other.

Table 2

*Zero-Order Pearson Correlations*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Demographic Variables																		
1. Age	—	<b>.14</b>	.03	-.02	<b>-.17</b>	-.01	.06	.01	.06	<b>-.09</b>	-.06	-.05	-.07	-.03	<b>.33</b>	<b>.26</b>	<b>-.10</b>	<b>-.11</b>	-.05
2. Race		—	<b>.59</b>	<b>.11</b>	.04	-.05	-.06	<b>.08</b>	<b>.09</b>	.04	-.06	<b>-.08</b>	-.05	<b>.08</b>	.05	.02	-.04	<b>-.08</b>	-.06
3. Site			—	.04	.04	-.03	<b>.12</b>	<b>.10</b>	<b>.15</b>	-.01	<b>-.12</b>	<b>-.09</b>	<b>-.11</b>	<b>.12</b>	<b>.14</b>	<b>.10</b>	.04	-.04	<b>-.13</b>
	Predictor Variable																		
4. CU Traits				—	.04	<b>-.34</b>	-.07	<b>.33</b>	<b>.30</b>	<b>.30</b>	<b>.35</b>	<b>.25</b>	<b>.37</b>	<b>.15</b>	.00	-.03	<b>-.17</b>	<b>-.09</b>	-.06
	Moderator Variables																		
5. Go/No-Go Errors ( <i>n</i> =1040)					—	-.08	-.07	.07	.05	<b>.09</b>	.05	.05	.05	<b>.10</b>	-.02	-.02	-.06	-.04	.05
6. Impulse Control						—	.02	<b>-.21</b>	<b>-.18</b>	<b>-.21</b>	<b>-.31</b>	<b>-.26</b>	<b>-.31</b>	<b>-.08</b>	-.02	-.06	.07	.06	<b>-.09</b>
7. IQ							—	.01	.05	-.05	<b>-.08</b>	<b>-.09</b>	-.06	<b>-.12</b>	<b>.13</b>	<b>.15</b>	<b>.12</b>	.05	<b>-.08</b>
	Dependent Variables																		
8. SRO Total Variety								—	<b>.95</b>	<b>.85</b>	<b>.45</b>	<b>.27</b>	<b>.50</b>	<b>.28</b>	.01	-.04	<b>-.10</b>	-.06	<b>.20</b>
9. SRO Non-Violent									—	<b>.65</b>	<b>.37</b>	<b>.24</b>	<b>.40</b>	<b>.25</b>	.03	-.02	<b>-.11</b>	<b>-.09</b>	<b>.14</b>
10. SRO Violent										—	<b>.47</b>	<b>.27</b>	<b>.54</b>	<b>.26</b>	-.03	-.07	-.04	.00	<b>.25</b>
11. PCS Average											—	<b>.88</b>	<b>.96</b>	<b>.15</b>	-.05	-.07	<b>-.09</b>	-.07	<b>.19</b>
12. PCS Relational												—	<b>.72</b>	<b>.09</b>	.03	-.05	-.04	-.05	<b>.12</b>
13. PCS Physical													—	<b>.16</b>	-.05	<b>-.08</b>	<b>-.11</b>	<b>-.08</b>	<b>.21</b>
14. Official Offending														—	-.06	<b>-.11</b>	<b>-.12</b>	-.07	<b>.33</b>
15. Highest Wages															—	<b>.47</b>	<b>.11</b>	.04	<b>-.16</b>
16. Longest Job																—	.07	.03	<b>-.14</b>
17. Variety Extracurricular																	—	<b>.64</b>	<b>-.10</b>
18. Max Extracurricular																		—	.00
	Control Variable																		
19. Facility Time																			—

Note. CU = callous-unemotional; IQ = intelligence quotient; SRO = self-reported offending; PCS = peer conflict scale. Dummy coded site (California comparison group) and race (White Latino comparison group) variables. Bolded values indicate  $p < .01$ .

## **Poisson Regression Moderation Analyses**

To test whether intelligence, executive functioning, and/or impulse control moderated the associations between CU traits and the offending/aggression and positive adjustment indicator variables, a series of Poisson regression models were conducted. This type of analysis was used because the distribution of most outcomes (with the exception of Max Extracurricular), indicated a count (Poisson) distribution with an excess of zero occurrences. A comparison of Bayesian Information Criterion (BIC) values was used to determine whether zero-inflated models were necessary over standard Poisson models (Schwarz, 1978). A zero-inflated model has the advantage of accommodating for the multiple possibilities of excess zeros, such that participants had not engaged in offending/aggression or positive adjustment indicators (“certain zero”) as opposed to the possibility that they did not have sufficient opportunities to engage in the behavior (not “certain zero”). A comparison of BIC values supported standard Poisson models over the zero-inflated models for all dependent variables except for models predicting Highest Wages.

Thirty Poisson regression models were conducted testing all combinations of CU trait scores and moderator scores (intelligence, executive functioning, and impulse control) in predicting outcomes variables (except Max Extracurricular). To test interaction effects, baseline scores for CU traits, baseline moderator scores, and mean-centered product (i.e., interaction) term of CU traits and moderator were entered into the regression equation predicting each of the outcomes over a 24-month period.<sup>1</sup> For all significant interactions, post hoc probing as suggested

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<sup>1</sup> Three-way interactions between CU trait scores, intelligence scores, and impulse control scores were also conducted predicting each of the outcomes. There were no significant 3-way interactions for any of the models.

by Holmbeck (2002) was conducted to test the form of the interaction and to determine if the form is consistent with predictions.

Tables 3 and 4 show the results from the standard Poisson regression models.<sup>2</sup> As evident from these tables, there were significant main effects for CU traits across all models predicting self-reported offending and aggression outcomes, such that higher levels of CU traits were related to higher rates of offending and aggression. There were also significant main effects for CU traits predicting variety of extracurricular activities, such that lower levels of CU traits led to more variety of engagement of extracurricular activities.

Table 3

*Regression Weights from Poisson Models predicting Offending and Aggression*

	Count Model				R <sup>2</sup> <sub>model</sub>
	b	SE	OR	z	
Total Self-Reported Offending					
CU Traits	.040	.005	1.04	8.00***	.12
Go/No-Go Errors	.010	.005	1.01	1.79	
Interaction	.000	.001	1.00	-0.22	
CU Traits	.037	.005	1.04	6.66***	.11
Impulse Control	-.016	.007	0.98	-2.31*	
Interaction	.000	.001	1.00	0.22	
CU Traits	.040	.005	1.04	8.09***	.11
IQ	.003	.004	1.00	0.64	
Interaction	.000	.000	1.00	0.11	
Non-Violent Self-Reported Offending					
CU Traits	.034	.005	1.03	6.85***	.08
Go/No-Go Errors	.010	.006	1.01	1.54	
Interaction	.000	.001	1.00	0.24	
CU Traits	.028	.005	1.03	5.23***	.08
Impulse Control	-.017	.007	0.98	-2.27*	
Interaction	.000	.001	1.00	-0.22	
CU Traits	.034	.005	1.03	6.72***	.08
IQ	-.002	.005	1.00	-0.44	(table cont.)

<sup>2</sup> Models were also conducted without entering average facility time as a covariate. The significant interaction effects and many significant main effects fell out of significance when average facility time was not accounted. The only significant main effects that were still significant were the main effects for the moderators.

Interaction	Count Model				R <sup>2</sup> <sub>model</sub>
	b	SE	OR	z	
	.000	.000	1.00	0.28	
Violent Self-Reported Offending					
CU traits	.034	.005	1.03	6.85***	.08
Go/No-Go Errors	.010	.006	1.01	1.54	
Interaction	.000	.001	1.00	0.22	
CU Traits	.028	.005	1.03	5.23***	.08
Impulse Control	-.017	.007	0.98	-2.27*	
Interaction	.000	.001	1.00	-0.22	
CU Traits	.034	.005	1.03	6.72***	.07
IQ	-.002	.005	1.00	-0.44	
Interaction	.000	.000	1.00	0.28	
Total Aggression					
CU Traits	.042	.004	1.04	10.91***	.12
Go/No-Go Errors	.005	.004	1.01	1.26	
Interaction	.000	.000	1.00	-0.24	
CU Traits	.034	.005	1.03	7.38***	.15
Impulse Control	-.034	.005	0.97	-7.39***	
Interaction	.000	.001	1.00	0.50	
CU Traits	.042	.004	1.04	11.30***	.12
IQ	-.006	.003	0.99	-2.03*	
Interaction	.001	.000	1.00	2.08*	
Relational Aggression					
CU Traits	.037	.007	1.04	5.73***	.06
Go/No-Go Errors	.001	.008	1.00	0.15	
Interaction	.001	.01	1.00	1.17	
CU Traits	.031	.009	1.03	3.53***	.08
Impulse Control	-.048	.009	0.95	-5.58***	
Interaction	.001	.001	1.00	1.19	
CU Traits	.037	.006	1.04	6.39***	.06
IQ	-.015	.005	0.99	-3.34**	
Interaction	.001	.000	1.00	1.96	
Physical Aggression					
CU Traits	.041	.004	1.04	11.59***	.11
Go/No-Go Errors	.006	.004	1.01	1.69	
Interaction	-.001	.000	1.00	-1.23	
CU Traits	.033	.004	1.03	8.05***	.13
Impulse Control	-.030	.004	0.97	-6.72***	
Interaction	.000	.001	1.00	0.40	
CU Traits	.040	.003	1.04	11.72***	.11
IQ	-.004	.003	1.00	-1.46	
Interaction	.001	.000	1.00	2.37*	
Official Offending					
CU Traits	.006	.006	1.01	0.90	.10

(table cont.)

	Count Model				R <sup>2</sup> <sub>model</sub>
	b	SE	OR	z	
Go/No-Go Errors	.003	.006	1.00	0.45	
Interaction	.001	.001	1.00	0.64	
CU Traits	.010	.006	1.00	1.55	
Impulse Control	-.002	.008	1.00	-0.28	
Interaction	.000	.001	1.00	0.71	
CU Traits	.012	.006	1.01	2.03*	
IQ	-.015	.005	0.99	-3.18**	
Interaction	.001	.001	1.00	1.88	

Note. CU = callous-unemotional, IQ = intelligence quotient. OR = odds ratio  $e^b$ , R<sup>2</sup> = McFadden estimated R<sup>2</sup> effect size for overall model. Age, dummy coded site (California comparison group), and average time in facility variables were entered as covariates. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

Table 4

*Regression Weights from Poisson Models predicting Positive Adjustment Indicators*

	Count Model				R <sup>2</sup> <sub>model</sub>
	b	SE	OR	z	
Highest Wages					
CU Traits	.000	.002	1.00	-0.15	.04
Go/No-Go Errors	.001	.002	1.00	0.63	
Interaction	.000	.000	1.00	0.01	
CU Traits	-.001	.002	1.01	-0.37	
Impulse Control	-.001	.002	1.00	-0.24	
Interaction	.000	.000	1.00	1.28	
CU Traits	-.001	.002	1.00	-0.30	
IQ	-.001	.001	1.00	-0.47	
Interaction	.000	.000	1.00	-0.97	
Longest Job					
CU Traits	-.004	.005	1.00	-0.81	.04
Go/No-Go Errors	.000	.005	1.00	0.04	
Interaction	.000	.001	1.00	-0.19	
CU Traits	-.008	.005	0.99	-1.56	
Impulse Control	-.015	.006	0.99	-2.34*	
Interaction	.000	.001	1.00	0.71	
CU Traits	-.004	.005	1.00	-0.82	
IQ	.009	.004	1.01	2.53*	
Interaction	.000	.000	1.00	-0.13	
Variety Extracurricular Activities					
CU traits	-.024	.004	0.98	-5.28***	.02
Go/No-Go Errors	-.001	.004	1.00	-0.33	
Interaction	.001	.001	1.00	1.03	



	Count Model				R <sup>2</sup> <sub>model</sub>
	b	SE	OR	z	
					.03
CU Traits	-.024	.005	0.98	-4.73***	
Impulse Control	.001	.005	1.00	0.14	
Interaction	-.001	.001	1.00	-1.19	
					.03
CU Traits	-.024	.005	0.98	-5.08***	
IQ	.007	.003	1.01	2.20*	
Interaction	.000	.000	1.00	-1.19	

*Note:* CU = callous-unemotional, IQ = intelligence quotient. OR = odds ratio  $e^b$ , R<sup>2</sup> = McFadden estimated R<sup>2</sup> effect size for overall model. Age, dummy coded site (California comparison group), and average time in facility variables were entered as covariates. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

As for the moderators, there were significant main effects for impulse control across all models predicting self-reported offending and aggression outcomes, such that lower levels of impulse control were related to higher rates of offending and aggression. However contrary to predictions, lower levels of impulse control were related to longer job lengths. There were significant main effects for intelligence predicting total aggression, relational aggression, and official reports of offending, such that lower intelligence scores were related to higher rates of aggression and offending. As for the positive adjustment indicators, there were only main effects for intelligence predicting Longest Job and Variety Extracurricular activities, such that higher intelligence scores were related to longer maximum job lengths and more variety of engagement in extracurricular activities. Also contrary to predictions, there were no main effects for Go/No-Go Errors predicting any of the outcome measures.

The only significant interaction effect was for intelligence moderating the association between CU traits and self-reported aggression, both total aggression and physical aggression. Figure 1 shows the interaction effect between CU traits and intelligence predicting physical aggression. Specifically, CU traits were less strongly related to self-reported aggressive behavior, particularly for self-reported physical aggression, at lower levels of intelligence. Importantly,

there were no significant interaction effects for official reports of offending nor for any of the positive adjustment indicators.

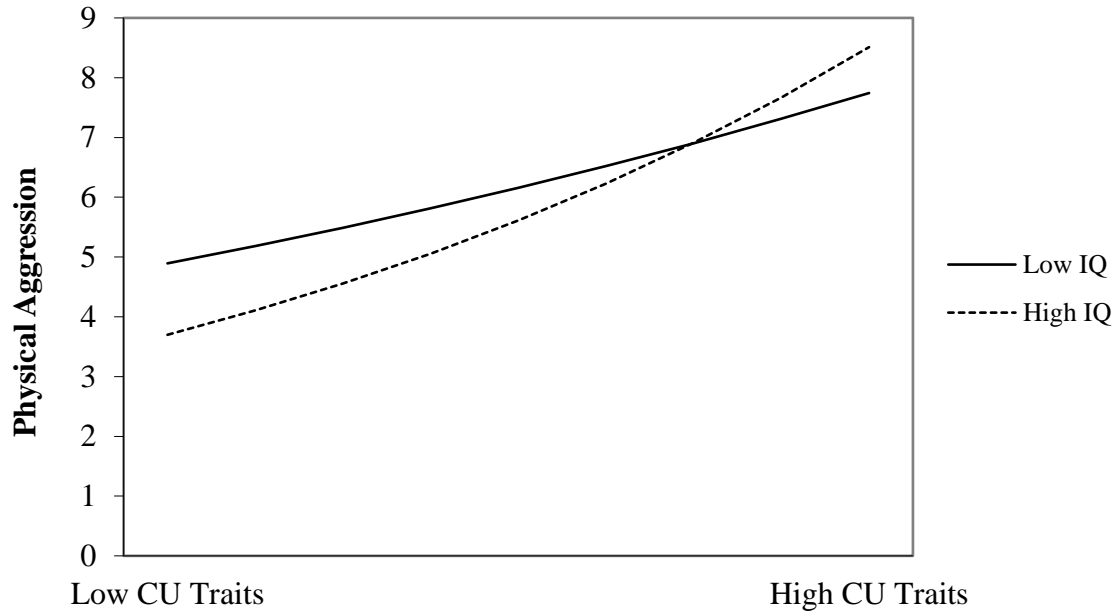


Figure 1. Interaction Effect between Callous-Unemotional Traits and IQ predicting Physical Aggression

For the zero-inflated Poisson models predicting Highest Wages (which indicates whether a person is a certain job abstainer [“0”] vs. lacked sufficient opportunities [“1”]), the only significant main effect was for intelligence ( $b = -.025, p < .001$ ), such that lower intelligence scores regardless of CU traits scores were associated with a greater likelihood of being “certain zero” with respect to wages earned. There were no significant main effects for CU traits, Go/No-Go Errors, or Impulse Control. Also, there were no significant interactions effects for any of the moderators.

### Linear Regression Moderation Analyses

To test whether intelligence, executive functioning, and/or impulse control moderated the associations between CU traits and Max days spent on Extracurricular activities, a series of

linear regression models were conducted, since the distribution of this outcome indicated a relatively normal distribution. Three linear regression models were conducted testing all combinations of CU trait scores and moderator scores (intelligence, executive functioning, and impulse control) in predicting Max Extracurricular. To test interaction effects, baseline scores for CU traits, baseline moderator scores, and mean-centered product (i.e., interaction) term of CU traits and moderator were entered into the regression equation predicting the Max days spend on Extracurricular activities over the 24-month follow-up period. Table 5 shows the results from these linear regression models. As evident from this table, there were significant main effects for CU traits, such that lower levels of CU traits were related to more days spent in extracurricular activities. There were no significant main effects for Go/No-Go Errors, impulse control, or intelligence. Also, there were no significant interactions effects for any of the moderators.

Table 5

*Regression Weights from Linear Regression Models predicting Maximum Days Extracurricular*

	Linear Model				R <sup>2</sup> <sub>model</sub>
	b	SE	β	t	
	Maximum Days Extracurricular Activities				
CU Traits	-.031	.009	-.106	-3.42***	.03
Go/No-Go Errors	-.005	.008	-.020	-0.65	
Interaction	-.001	.001	-.018	-0.57	
CU Traits	-.023	.009	-.079	-2.55*	.02
Impulse Control	.011	.011	.031	1.03	
Interaction	.000	.001	.010	0.33	
CU Traits	-.025	.000	-.085	-2.94**	.03
IQ	.011	.006	.055	1.88	
Interaction	-.001	.001	-.043	-1.49	

Note. CU = callous-unemotional, IQ = intelligence quotient. R<sup>2</sup> = effect size for overall model. Age, dummy coded site (California comparison group), and average time in facility variables were entered as covariates. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

## Discussion

The goal of the current study was to examine the hypothesis that executive functioning (and related variables, such as intelligence and impulse control) would moderate the relationship between CU traits and antisocial outcomes using both self-reported and official records of aggressive and delinquent behavior. The results largely did not support this prediction. That is, there were very few interactions between CU traits and these moderating variables. For the one interaction that was found, the form of the interaction was not one that would be predicted by the concept of successful psychopathy, such that executive functioning would lead to *less* aggressive and antisocial behavior. Specifically, intelligence was a moderating factor for the relationship between CU traits and self-reported aggression (both total and physical aggression) but the form of this interaction suggested that those adolescents high on CU traits who were also of higher intelligence engaged in *more* self-reported aggressive acts. While this interaction was not consistent with theories of successful psychopathy, it is consistent with previous research reporting that the combination of elevated CU traits and higher intelligence leads to higher levels of self-reported aggression and violence in samples involving detained adolescents or adolescents adjudicated delinquent for serious offenses (Baskin-Sommers et al., 2015; Hampton et al., 2014; Munoz et al., 2008). Thus, it appears that intelligence has a synergistic effect with CU traits that contributes to these adolescents being extraordinarily deviant.

As noted above, none of the analyses strongly supported the prediction that executive functioning and impulse control would reduce the relationship between CU traits and antisocial outcomes, as predicted by models of successful psychopathy. The findings for the laboratory measure of executive functioning (i.e., Go-No Go) did not reveal many expected associations. That is, number of Go/No-Go errors were only related to higher rates of violent self-reported

offending and official reports of offending. However, Go/No-Go errors did not predict these outcomes when they were entered in regression equations with CU traits. One possible reason that the Go/No-Go errors did not reveal many significant associations is that this laboratory task was administered outside of a controlled setting. Previous studies using similar tasks were typically conducted in university laboratory or private facility settings (e.g., Guan et al., 2015; Roussy & Toupin, 2000). In comparison, the majority of interviews in the current study occurred in the community, often in participants' homes, local restaurants, coffee shops, or libraries. Although several steps were taken by research staff to ensure a private, distraction free environment to the participant, there are many uncontrollable factors in community settings that may have influenced participants when taking the Go/No-Go task. For example, other auditory and visual stimuli (e.g., television, music playing in restaurants) may distract participants and therefore may have reduced the validity of the task. Another likely reason for the lack of findings for the Go/No-Go errors is that potentially the most deviant youth were excluded from analyses. For participants who were incarcerated in a facility that did not allow researchers to utilize the interviewing laptop, a paper version of the interview was administered and the Go/No-Go task was not completed. A hundred forty-four of the hundred fifty-five missing cases for the Go/No-Go were for those adolescents incarcerated in facilities.

The results using the self-report of impulse control were somewhat different from those using the laboratory measure of executive functioning. That is, lower levels of self-reported impulse control was associated (negatively) with most of the measures of aggressive and antisocial behavior. Further, in most cases these associations remained significant when controlling for CU traits, with the one exception being the failure to independently predict official reports for offending. These findings suggest that there may be additive effects of

impulse control for predicting aggression and antisocial behavior. That is, low impulse control may add incrementally to the prediction of aggression and antisocial behavior above and beyond CU. This finding is important to consider when evaluating risk factors for aggression and antisocial behavior. The combination of CU traits and impulse control together have sometimes been considered indicative of the construct of “psychopathy”, which has long been associated with more severe offending in adult samples (Hare & Neumann, 2008). However, it is also important to consider that the self-reported impulse control findings could be due in part to shared method variance, in that all dependent measures were also self-report and the Go/No-Go task did not show similar associations.

Importantly, these findings are not consistent with models of successful psychopathy and past findings using community samples that suggest that youth with high levels of CU traits without conduct problems have better impulse control (Fanti, 2013; Wall et al., 2016). The type of samples utilized could explain inconsistencies between these findings. The current sample consisted of first-time offenders in which all participants engaged in at least one criminal offense; whereas, the samples utilized in the Fanti (2013) and Wall et al. (2016) studies consisted of youth in the community whom may or may not have engaged in antisocial behavior. Thus, truly successful (i.e., non-antisocial) youth with CU traits may not have been included in the current sample, which may explain why the current study did not find significant interaction effects demonstrating high impulse control leading to less aggression and offending for some youth with elevated CU traits.

Another prediction from models of successful psychopathy that was not supported by the current analyses was that CU traits would be more strongly associated with a number of positive adjustment indicators at higher levels of executive functioning and/or impulse control. The

current findings indicated that none of the proposed moderators influenced the relationship between CU traits and the positive adjustment indicators. However, CU traits were associated (negatively) with the variety of extracurricular activity engagement and the maximum number of days spent in extracurricular activities. One possible explanation for these findings is that CU traits are related to a lack of motivation to engage in activities that are valued by others (Frick, & Ray, 2015). Importantly, this is the first study to explicitly test this contention. This link could be important because the failure to be involved in extracurricular school activities by adolescents high on CU traits could be a risk factor for their high rate of involvement antisocial behavior. Specifically, social control theory proposes that a child who is connected to prosocial institutions (e.g., school) will be less likely to rebel against these institutions, and their connectedness with others could overcome individual predispositions to act in ways that harm others (Sampson, Raudenbush, & Earls, 1997).

In summary, it is unclear whether the conceptualizations of successful psychopathy in the adult psychopathy literature can be downward extended to youth with CU traits. That is, CU traits appeared to be highly related to various forms of aggressive and antisocial behavior in adolescent samples, consistent with a large body of past research (Frick et al., 2014), but this was not moderated by measures of executive functioning and impulsive control. In fact, unlike findings in adult psychopathy research that suggest intelligence may be a protective factor against antisocial behavior and crime (Gao & Raine, 2010), intelligence seemed to serve as an added risk factor that has synergistic effects with CU traits that contribute to higher levels of aggression and violence in adolescents.

However, these opposing findings may not be as inconsistent as they seem when different factors of psychopathy are taken into account. For example, Wall et al. (2013) found that total

psychopathy and Fearless Dominance, as measured by the Psychopathic Personality Inventory (PPI-R; Lilienfeld & Widows, 2005) was associated with *less* criminal behavior at higher level of verbal intelligence. On the other hand, they reported that Self-Centered Impulsivity was associated with *more* criminality at higher levels of non-verbal intelligence. These findings leave open the possibility that intelligence might potentiate differential associations between certain dimensions of psychopathic traits and criminal behaviors. Such differential findings could be theoretically important for understanding and conceptualizing successful psychopathy. It appears that when facets that capture traits such as callousness, Machiavellian narcissism, and/or irresponsibility are used to conceptualize psychopathy, intelligence does not emerge as compensatory factor important for the conceptualization of successful psychopathy. However, when facets that capture traits such as superficial charm, fearlessness, and stress immunity are utilized, intelligence does emerge as a compensatory factor.

### **Limitations and Future Directions**

The results must be considered in light of several limitations. First, a correction for the number of moderational analyses conducted was not computed, so there is a possibility of Type I error given the overall number of analyses conducted. A corrected alpha level for these analyses would have increased the possibility of making a substantial amount of Type II error due to insufficient statistical power, and thus, would have masked potentially important findings. This strategy was chosen due to the novelty of the research topic and to highlight potential findings that could be replicated upon in future research. However, the significant results, especially the one interaction findings, need to be interpreted cautiously due to the large number of analyses.

Second, executive functioning was assessed using a Go/No-Go paradigm at the 12-month follow-up interview, whereas impulse control and intelligence were both assessed at baseline.



Because executive functioning is presumed to be a stable construct (Friedman et al., 2016), this design seemed appropriate although not ideal. Furthermore, as noted previously, this laboratory task was administered outside of a controlled setting, which may have reduced the validity of the task. Also as noted previously, if participants were incarcerated in a facility that did not allow researchers to utilize the interviewing laptop, a paper version of the interview was administered and behavioral measures (i.e., Go/No-Go) were not completed. Therefore, executive functioning was not assessed for some of the most antisocial participants.

Third, a sample of first-time juvenile offenders may not generalize to other youth populations as it is a homogenous population that includes juveniles whom all had engaged in at least one criminal offense. The vast majority of research on elevated CU traits has focused on comparing groups of antisocial youth who differ on their level of these traits (Frick et al., 2014). However, investigating those youth with elevated CU traits without any significant externalizing problems or antisocial behavior could be important in linking the research on CU traits in youth with the concept of successful psychopathy in adult samples.

Fourth, the current sample also included only boys. Thus, it is not clear how well these results might generalize to girls. Specifically, girls tend to engage in fewer antisocial behaviors than boys, and their antisocial behavior is typically manifested differently than boys (Frick & Nigg, 2012; Loeber, Capaldi, & Costello, 2013). For example, there is evidence that relative to boys, girls may express antisocial behavior in ways that are more covert and involve less direct physical confrontation of others (Hartung & Widiger, 1998). In both school-based (Crapanzano, Frick, & Terranova, 2011) and justice-involved (Marsee et al., 2014) samples, there are a significant number of girls who show relational aggression (i.e., behaviors that harm others in peer relationships) but not physical aggression and who are also high on CU traits. As a result, it

is not clear how impulse control, executive functioning, and intelligence might influence the association between CU traits and these different forms of aggression in girls.

Fifth, the study utilized a brief measure of intellectual functioning. The WASI utilizes the vocabulary and matrix reasoning subtests to estimate an intelligence quotient (FSIQ-2). Even though the WASI estimated IQ was correlated .81 with WISC-III and .87 with the WAIS-III in the normative samples of these tests (Wechsler, 1999), a full assessment of intellectual functioning could improve findings for moderational effects and could also allow analyses to examine the specific indices of intelligence (e.g., Verbal Comprehension, Visual-Spatial, Working Memory, Perceptual Reasoning, and Processing Speed). Finally, official reports of offending were not broken down by violent and non-violent forms of offending. Thus, we could not test whether higher intelligence led to more severe violence when using official reports of offending, similar to the findings using self-report.

Within the context of these limitations, these results do highlight a few potential important directions for future research. First, future studies should provide further tests of predictions from the successful psychopathy model in non-forensic populations that include some adolescents who do not show any significant antisocial or aggressive behavior. Optimally, a future study would involve boys and girls who score high on CU traits with juvenile criminal offenses and those who do not have any criminal offenses. Second, the results support the importance of CU traits for predicting antisocial behavior and they also provide one possible reason for this link that has not been the focus of much research. That is, CU traits were associated with less extracurricular school involvement and this lack of bond with social institutions could be a risk factor for antisocial behavior for youth high on CU traits. Third, the results support several past studies suggesting that the association between intelligence and

aggression may differ depending on the child's level of CU traits (Baskin-Sommers et al., 2015; Hampton et al., 2014; Munoz et al., 2008). That is, the combination of high intelligence and elevated CU traits are associated with the highest rates of aggression and violence. Given the consistency of this finding across samples, it is important for research to be testing substantive explanations for these findings. Specifically, other studies could examine whether the synergistic association between CU traits and aggression is limited to proactive aggression that involves more planning and to aggression that leads to severe harm in the victim.

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# Appendix

## Project Report and Continuation Application

(Complete and return to IRB, GP 2001. Direct questions to IRB administrator Jessica Grande 280-6013 or IRB Chairman Bobby Laird at 280-5454)



THE UNIVERSITY of  
NEW ORLEANS

Committee for the Protection of  
Human Subjects in Research  
GP 2076  
Phone: 504-280-6013  
Fax: 504-280-6049  
humansubjects.uno.edu

IRB # 02Dec10 Current approval expires on: 11/1/2014

Review Type: Full Risk Factor: Minimal

PI: Paul Frick Department: Psychology Phone: 504-280-6012

Co-Investigators: \_\_\_\_\_

Project Title: Crossroads: Formal vs. Informal Processing in the Juvenile Justice System

Please read the entire application. Missing information will delay approval!

I. PROJECT FUNDED BY: John D. and Catherine T MacArthur Foundation UNO Proposal # \_\_\_\_\_

II. PROJECT STATUS: Check the appropriate box and complete the following:

- 1. Active, subject enrollment continuing; # of subjects enrolled: \_\_\_\_\_
- 2. Active, subject enrollment complete; work with subjects continues.
- 3. Active, work with subjects complete; data analysis in progress.
- 4. Project stat postponed. New start date: \_\_\_\_\_
- 5. Project complete. end date: \_\_\_\_\_
- 6. Project cancelled. No human subjects used.

III. PROTOCOL: Check one.

- Protocol continues as previously approved
- Changes are requested\* *List (on separate sheet) any changes to the approved protocol.*

IV. UNEXPECTED PROBLEMS: (did anything occur that increased risks to participants?)

Number of events since study inception: 0 since last report: 0

Have there been any previously unreported events? Y?N N

*If such events occurred, describe them (on a separate sheet) and how they affect risks in your study.*

V. CONSENT FORM AND BENEFIT RATIO

Does new knowledge or adverse events change the risk/benefit ratio? Y?N N

Is a corresponding change in the consent form needed? Y/N N

VI. ATTACH A BRIEF, FACTUAL SUMMARY of project progress/results to show continued participation of subjects is justified; or to provide a final report on project findings.

VII. ATTACH CURRENT CONSENT FORM (only if subject enrollment is continuing); and check the appropriate blank:

- Form is unchanged since last approved
- Approval of revision requested herewith; (identify changes)

(Electronic) Signature of Principal Investigator Paul Frick, Ph.D. Date Oct 13, 2015

IRB Action:	<input checked="" type="checkbox"/> Continuation approved; Approval Expires: <u>Oct 26, 2015</u> <u>2016</u>
	<input type="checkbox"/> Continuation disapproved
	<input type="checkbox"/> File closed
Signed: <u>Paul Frick</u>	Date <u>10/20/15</u>

Submit by Email

Print Form

## **Vita**

Tina D. Wall Myers was born in Beale Air Force Base, California and was raised in Warner Robins, Georgia. She obtained her Bachelors of Science in Psychology with a minor in Philosophy from the University of Alabama in 2011 and her Masters of Science in Clinical Psychology from Eastern Kentucky University in 2013. Upon starting the doctoral program in Applied Developmental Psychology, Tina joined Dr. Paul Frick's Developmental Psychopathology laboratory. After graduation from the University of New Orleans, Tina will begin work as the Shea Hellervik Endowed Post-Doctoral Fellow at the University of Dayton.