

University of Vermont

UVM ScholarWorks

Graduate College Dissertations and Theses

Dissertations and Theses

2020

An Investigation Of The Relationships Between Callous-Unemotional Traits, Emotion Regulation, Antisocial Behavior, And Gender

Amanda Falcon
University of Vermont

Follow this and additional works at: <https://scholarworks.uvm.edu/graddis>



Part of the [Clinical Psychology Commons](#)

Recommended Citation

Falcon, Amanda, "An Investigation Of The Relationships Between Callous-Unemotional Traits, Emotion Regulation, Antisocial Behavior, And Gender" (2020). *Graduate College Dissertations and Theses*. 1201. <https://scholarworks.uvm.edu/graddis/1201>

This Thesis is brought to you for free and open access by the Dissertations and Theses at UVM ScholarWorks. It has been accepted for inclusion in Graduate College Dissertations and Theses by an authorized administrator of UVM ScholarWorks. For more information, please contact scholarworks@uvm.edu.

AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN CALLOUS-
UNEMOTIONAL TRAITS, EMOTION REGULATION, ANTISOCIAL BEHAVIOR,
AND GENDER

A Thesis Presented

by

Amanda K. Falcón

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements
for the Degree of Master of Arts
Specializing in Psychology

May, 2020

Defense Date: January 14, 2020
Thesis Examination Committee:

Timothy Stickle, Ph.D., Advisor
Patricia Prelock, Ph.D., Chairperson
Dianna Murray-Close, Ph.D.
Cynthia J. Forehand, Ph.D., Dean of the Graduate College

ABSTRACT

Callous-Unemotional (CU) Traits, a subset of psychopathic traits often used to characterize youth, affect community wellbeing via associated antisocial behaviors such as aggression, substance use, and additional criminal acts. One possible mechanism of the association between CU traits and antisocial behavior is emotion regulation, impairment in which contributes to both internalizing and externalizing behavior. Further, emotion regulation, like CU traits, appears to manifest inconsistently across genders. Given this discrepancy in both the CU trait and emotion regulation literature, an examination of CU traits, emotion regulation, and antisocial behavior within the context of gender is warranted. The current study tested three separate models of this relationship: two in which gender was tested as a moderator of the indirect effect of CU traits on antisocial behavior via emotion regulation, and one in which gender was tested as a moderator of the effect of emotion regulation on the relationship between CU traits and antisocial behavior (a three-way interaction). Results indicated that gender moderates the indirect effect of CU traits on antisocial behavior via emotion regulation difficulties. Specifically, the effect of emotion regulation difficulties on antisocial behavior was significantly greater for males, although CU traits predicted impaired emotion regulation comparably for either group. These findings underscore emotion regulation as a construct worthy of further investigation in the context of CU traits and intervention targeting antisocial behavior, particularly among males.

TABLE OF CONTENTS

	Page
LIST OF TABLES	iii
LIST OF FIGURES	iv
CHAPTER 1: INTRODUCTION	1
Psychopathy and Callous-Unemotional Traits.....	1
Callous-Unemotional Traits.....	1
Emotional Variability and Callous-Unemotional Traits	4
Emotion Regulation	5
Emotion Regulation and Callous-Unemotional Traits.....	6
Emotion Regulation, Callous-Unemotional Traits, and Gender	8
Current Study	10
CHAPTER 2: METHOD	13
Participants.....	13
Measures	13
Difficulties in Emotion Regulation Scale	13
Young Adult Antisocial Behavior Scale.....	14
The Inventory of Callous-Unemotional Traits.....	14
Procedure and Data Analytic Plan	15
CHAPTER 3: RESULTS.....	17
Sample	17
Moderated Mediation.....	17
Model 1	17
Model 2	18
Three-way Interaction (Model 3).....	18
Follow-up Analyses	19
Awareness	19
Selection.....	20
Goals and Impulsivity	20
CHAPTER 4: DISCUSSION.....	22
Summary of Main Findings	22
Implications.....	24
Strengths and Limitations	26
Future Directions	28
Conclusions.....	29
REFERENCES	37

LIST OF TABLES

Table	Page
Table 1. <i>Descriptive statistics by gender</i>	30
Table 2. <i>Descriptive statistics for overall sample</i>	31
Table 3. <i>Correlations of study variables</i>	32

LIST OF FIGURES

Table	Page
Figure 1. <i>Proposed first mediation model</i>	33
Figure 2. <i>Proposed second mediation model</i>	34
Figure 3. <i>Model 1</i>	35
Figure 4. <i>Model 2</i>	36

CHAPTER 1: INTRODUCTION

Psychopathy and Callous-Unemotional Traits

Characterized by traits including manipulation, callousness, glibness and a lack of remorse (Vitale & Newman, 2017), psychopathy affects community wellbeing as a significant economic and public health burden (DeLisi, Reidy, Heirigs, Tostlebe, & Vaughn, 2018; Reidy, et. al, 2015), largely through its associations with criminal and antisocial behavior (e.g., Seigfried-Spellar, Villacís-Vukadinović, & Lynam, 2017; see Kiehl & Hoffman, 2011 for a review). As the consequences of psychopathic traits are so significant, it is important not only to examine what engenders the traits themselves, but how they translate into antisocial behavior and acts of aggression. One possible mechanism through which these traits give rise to antisocial behavior is Emotion Regulation (ER). Like psychopathic traits, impaired ER predicts aggression and antisocial behavior. The following sections provide an overview of psychopathy and emotion regulation, the links between them, and some proposed mediators and moderators of these associations that are relevant to antisocial behavior and aggression, particularly among youth and emerging adults.

Callous-Unemotional Traits. Although the construct of psychopathy has appeared in literature stretching back about a century (e.g., Haberman, 1917; Mateer, 1924), a surge of modern conceptualizations (e.g., Paulhus & Williams, 2002) follow Cleckley's (1976) seminal description of the psychopathic personality, which emphasizes an emotional dearth. Using the criteria outlined by Cleckley (1976), Hare (1980)

identified five factors of psychopathy, the first of which includes items relating to callousness, a lack of empathy, and affective poverty. A model of psychopathy with those characteristics subsumed within broader factors emerged from Hare's Psychopathy Checklist-Revised (PCL-R, Hare & Neumann, 2006): interpersonal-affective (Factor 1) and antisocial-impulsive (Factor 2). The former factor, like that identified by Hare in 1980, accounts for the callous and emotionally blunted traits of psychopathy, where Factor 2 represents more antisocial, impulsive, and aggressive traits (Harpur, Hare, & Hakstian, 1989). Indeed, a scarcity of emotion emerges as a characteristic of psychopathy in many frameworks. Patrick, Fowles, and Krueger (2009) introduced the triarchic model of psychopathy, which implicates boldness, disinhibition, and meanness as the three defining personality dimensions of psychopathy. While boldness and disinhibition refer generally to confidence and impulsivity, respectively, the meanness trait dimension captures the underdeveloped empathy and callousness described above (Patrick & Drislane, 2015). Unsurprisingly, the meanness dimension of the Triarchic model has been associated with low empathy and Callous-Unemotional (CU) traits (Sellbom & Phillips 2013).

CU traits have been researched largely as a method of extending the construct of psychopathy downward into childhood and adolescence (e.g., Barry, et. al, 2000; Feilhauer & Cima, 2013; Herpers, Scheepers, Bons, Buitelaar, & Rommelse, 2014). These traits, like the Factor 1 and meanness dimensions, include a paucity of both guilt and empathy (Essau, Sasagawa, & Frick, 2006). CU traits have been associated with

bullying (Ciucci & Baroncelli, 2014), substance use (e.g., Wymbs, et. al, 2012; Ray, Thornton, Frick, Steinberg, & Cauffman, 2016; Baskin-Sommers, Waller, Fish, & Hyde, 2015), aggression (Fanti, Frick, & Georgiou, 2009; Frick, Cornell, Barry, Bodin, & Dane, 2003), and delinquency (Frick, et. al, 2003). Among adolescents who demonstrate antisocial behaviors, marked subgroups are characterized by the presence of CU traits (see Frick, Ray, Thornton, & Kahn, 2014 and Frick & White, 2008 for a review), such that those with CU traits demonstrate particularly severe aggressive behaviors. Further emphasizing their distinction, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013) includes CU traits as a specifier of Conduct Disorder under the term Low Prosocial Emotions. In addition to their clinical relevance in adolescence, CU traits have demonstrated utility as a clinical construct in later years. Research has provided support for stability throughout childhood, adolescence, and emerging adulthood, as well as the ability of CU traits to predict later psychopathic traits in adulthood (see Frick & White, 2008). CU traits have also been associated with risky sexual behaviors, physical aggression, and increased alcohol use (Carlson, Oshri, & Kwon, 2015) in adults. Moreover, among a sample of 618 undergraduate students, all subscale scores of the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) as well as the total ICU score were positively correlated with the meanness scale of the Triarchic Psychopathy Measure (TriPM; Drislane, Patrick, & Arsal, 2014; Blagov, Patrick, Oost, Goodman, & Pugh, 2016), underscoring the similarities between CU traits and other interpersonal facets of psychopathy. As such,

callousness and deficient empathy are essential to conceptualization and measurement of any psychopathy framework. Because of their utility in representing elevated psychopathic traits among a younger population (e.g., Barry, et. al, 2000) their conceptual distinction (e.g., e.g., Frick & White, 2008), and notable associated antisocial outcomes among youth and adults (e.g., Frick et. al, 2003), CU traits are a particularly viable area of study.

Emotional Variability and Callous-Unemotional Traits. Although deficient empathy and shallow affect distinguish psychopathy from other antisocial presentations in the literature, recent research suggests variability in emotionality among those with CU traits. For example, many researchers have conceptualized psychopathy and CU traits among both adults and youth in two variants: primary and secondary (Crane, 1978; Newman, MacCoon, Vaughn, & Sadeh, 2005; Vaughn, Edens, Howard, & Smith, 2009; Gill & Stickle 2016). Those individuals who fall in the primary variant have been described as low in both inhibition and fear, the combination of which results in low anxiety and subsequent thrill-seeking. Primary psychopathy also encompasses shallow affect, a lack of empathy, and interpersonal manipulation (Yildirim & Derksen, 2015). Secondary psychopathy presents similarly in terms of social deviance and limited prosocial emotion but is distinguished from primary psychopathy mainly by the presence of emotional distress such as anxiety and remorse (Dean, et. al, 2013), as well as comorbid psychopathology, implying that comparable levels of CU traits do not always yield analogous emotional presentations. Further, individuals in secondary groups appear

to evidence more antisocial behavior than those in primary groups (e.g., Vaughn, et. al, 2009), suggesting a potential relationship between the emotional distress and associated antisocial behaviors. Impaired emotion regulation, which is also associated with antisocial behavior and numerous psychopathologies (e.g., Sloan, et. al, 2017; Robertson, Daffern, and Bucks, 2011), may contribute to the antisocial outcomes seen among many of those with CU traits.

Emotion Regulation

Described by Gross (2014) as the valuation of and shift between inherent affect and “the unfolding emotional response,” emotion regulation (ER) – specifically ER difficulties –have been positively associated with psychopathologies such as anxiety (see Cisler, Olatunji, Feldner, & Forsyth, 2010 for a review) and depression (e.g., Joormann & Gotlib, 2010; Ehring, Tuschen-Caffier, Schnulle, Fischer, & Gross, 2010; Silk, Steinberg, & Morris, 2003), as well as aggressive behaviors (see Robertson, et. al, 2011, for a review). Effectively, ER is a person’s ability to manage their emotional experiences, and individuals may capitalize on skills to do so. Indeed, ER involves the use of strategies with which to inhibit or express emotion appropriately (Gross, 2014; Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Aldao, Noel-Hoeksema, & Schweizer, 2010); a failure to do so and consequently to achieve contextual or social goals characterizes maladaptive emotion regulation (Robertson et al., 2011). Some ER strategies include re-

conceiving of a potentially emotional stimulus differently (cognitive reappraisal), inhibiting expression of emotions (suppression), and continually brooding on emotions as well as their antecedents and consequences (rumination) (Gross & John, 2003). At a broader level, Gross (2015b) outlined ER via the extended process model, which comprises identification, selection, and implementation stages. Identification involves awareness and evaluation of emotions, and subsequently a decision to regulate or not. Selection entails the nomination of an ER strategy with which to meet the demands of the present situation, as effective or adaptive ER is goal-directed, such that it depends on the needs posed by context (Bridges, Denham, & Ganiban, 2004). Finally, implementation includes the successful execution of the selected strategy.

Emotion Regulation and Callous-Unemotional Traits. As suggested earlier, ER may play a role in the emotional differences and antisocial outcomes among those with CU traits. The identification stage described by Gross (2015b) is one in which those with CU traits may falter. Specifically, in addition to being associated with deficits in recognition of emotion in others (Woodworth & Waschbusch, 2008, Muñoz, 2009), CU traits have been linked with poorer awareness of an individual's own emotions. Baroncelli and colleagues (2018) found that the unemotional facet of CU traits was negatively associated with emotional awareness, more so than externalizing and internalizing problems alone. Further, they also identified a negative association between callousness and attendance to the emotions of others. Although research regarding CU traits and ER is limited, it can be inferred from the available evidence that in addition to

antisocial behavior, CU traits might also predict difficulties in ER. Indeed, this is what previous work has shown. A meta-analysis conducted by Megías and colleagues (2018) found a negative association between psychopathy and emotional intelligence, which they operationalized as the perception, use, understanding, and regulation of emotions. Garofalo and Neumann (2018) concluded that the affective facet of psychopathy, that which is most conceptually like CU traits, was associated with emotional *dysregulation*. Finally, Frick and colleagues (2003) found that youth with both conduct problems and CU traits evidenced greater emotional dysregulation than those with conduct problems alone. This research provides modest support for a positive association between CU traits and ER difficulties.

Stronger negative associations between CU traits and emotion regulation skill may in part be a result of the relationship between emotion regulation and the antisocial behaviors that characterize many of those with CU traits. For example, poor ER has predicted problematic substance use among adults and youth (Wang, Burton, & Pachankis, 2018; Blake, Tung, Langley, & Waterman, 2018). Miller, Vachon, and Aalsma (2012) found that among youth with poorer access to ER strategies, negative affect predicted violence and risky sexual behavior. Additionally, as noted above, poorer ER has been associated with increased aggression (e.g., Davidson, Putnam, & Larson, 2000). Scott, DiLillo, Maldonado, and Watkins (2015) found that the use of suppression predicted aggression during negative mood induction. In their review, Robertson and colleagues (2011) cited avoidance and suppression, as well as under- and over- regulation

of emotions as being related to increased aggression through processes such as negative affect, poor inhibition and decision making, and physical arousal. They highlighted the use of emotional awareness (recognition of emotional responses) and emotional acceptance (nonjudgmentally accepting emotional experiences) as being related to decreased aggression. Taken together, this work suggests a potential relationship between ER, CU traits, and associated antisocial behaviors. However, relatively little research has examined the connection between all three, and that which has been conducted has yielded different conceptual models of the relationship between these important constructs. For example, Lanciano, Curci, Guglielmi, Soleti, and Grattagliano (2018) found that capacity for interpreting and managing emotions in the self and others moderated the relationship between psychopathic traits and aggression. Specifically, when participants were more proficient at interpreting and managing emotions, the relationship between psychopathic traits and aggression was nonsignificant, suggesting a protective or moderating effect of ER skills and strategies in the presence of psychopathic traits. Alternatively, Long, Felton, Lilienfeld, and Lejuez (2014) found that ER difficulties significantly *mediated* the relationship between three factors of the Psychopathic Personality Inventory (Fearless Dominance, Self-Centered Impulsivity, and Coldheartedness) and impulsive, but not premeditated, aggression. Further, of that work in which ER, CU traits, and antisocial behavior have been considered, even less work has taken gender into account when examining this relationship, despite observed gender

differences in both the CU Traits and ER literatures (e.g., Anderson, Reilly, Gorrell, Shaumberg, & Anderson, 2016; Nolen-Hoeksema & Aldao 2011).

Emotion Regulation, Callous-Unemotional Traits, and Gender. In their review of emotion regulation and aggressive behavior, Robertson and colleagues (2011) called for further study of access to ER strategies as they contribute to aggression, suggesting that an inventory of ER strategies encourages flexibility in adaptive emotion regulation. Indeed, the execution of ER strategies contributes particularly to research findings of gender differences in ER. For example, men have demonstrated greater use of emotional suppression as an emotion regulation strategy (e.g., Gross & John 2003). Craig and Moretti (2018), however, noted that adolescent girls exhibited greater suppression, in addition to greater general emotion regulation, as assessed using a measure of dysregulation and affect suppression. McRae, Ochsner, Mauss, Gabrieli, and Gross, (2008) suggested that men use more cognitive reappraisal, a strategy negatively associated with anxiety and mood disorders (e.g., Picó-Pérez, Radua, Steward, Menchón, and Soriano-Mas, 2017), but Nolen-Hoeksema and Aldao (2011) found that women – consistent with the findings of Craig and Moretti (2018) – engaged in ER strategies generally considered to be adaptive, including reappraisal, the use of social support (seeking out others to help in regulation of and coping with intense emotional experiences), and unbiased acceptance of emotions, at a greater rate than men. Generally, males have been found to demonstrate more inhibition of emotions and poorer effortful control (intentional management of emotions) where females evidence greater emotional

expression and awareness of emotions (Nolen-Hoeksema, 2012). Taken together, at baseline females tend to display more adaptive ER skills than males. In the presence of CU traits, however, females may exhibit behaviors that imply a greater level of ER difficulty. Specifically, females evidence a lower average level of psychopathic/CU traits, but those with CU traits appear to experience more comorbid psychopathology (Edwards, Ermer, Salovey, & Kiehl, 2018; Efferson & Glenn, 2018; Falkenbach, Reinhard, & Larson, 2017; Gill & Stickle, 2016) as well as negative affect (Stickle, Marini, & Thomas, 2012). A larger proportion of females with CU traits can be found in secondary psychopathy variant groups, which are associated with poorer ER skills (Fanti, Kyranides, Petridou, Demetriou, & Georgiou, 2018; Bennett & Kerig, 2014; Craig & Moretti, 2018). Based on these patterns, we can infer that although CU traits predict ER difficulties, this relationship will likely differ between genders. Research that has addressed psychopathy, ER, and gender has yielded results consistent with this implication. For example, Međedović, Wertag, and Sokić, (2018) found that the affective and interpersonal facets of psychopathy predicted greater emotional distress among females than males.

In summary, CU traits consistently predict antisocial behavior, but are not consistent in their presentation across genders, specifically regarding emotional characteristics. Emotion regulation difficulties are positively associated with CU traits, but given gender differences present for both constructs, it follows logically that the effect of CU traits on ER skills may differ between genders. Indeed, gender may also

come into play when considering antisocial outcomes of CU traits and ER difficulties. As discussed, males tend to rely on inhibitory emotion regulation strategies. Greater use of these regulatory strategies, however, has also predicted more externalizing than internalizing disorders (Aldao, et. al, 2010). For example, rumination, which is associated with anxiety and depression, has been exhibited more often among females (e.g., Zlomke & Hahn, 2010), and may lead to differing internalizing outcomes across gender. Nolen-Hoeksema (2012) noted that where females may ruminate while sad or anxious, males may be more likely to do so while angry, a process that is associated with increased aggression. Additionally, males appear to demonstrate less effortful control – intentional management of emotions and impulses – than females. These findings suggest that ER may contribute more to antisocial behaviors such as aggression among males than females.

Current Study

The current study sought to further elucidate the association between CU traits, emotion regulation difficulties, and antisocial behavior among young adults, by testing three hypothesized models of this relationship. Both moderating (Lanciano, et. al, 2018) and mediating (Long, et. al, 2014) effects of emotion regulation difficulties have been suggested in the literature. Subsequently, we first tested two models in which emotion regulation mediated the relationship between CU traits and antisocial behavior. Gender was incorporated as a moderator of that indirect effect in the a1 and b1 paths, respectively (see Figures 1 and 2 for reference). Specifically, we examined whether the effect of CU

traits on antisocial behavior was at least partially an indirect effect mediated by ER. We also tested a third model, in which ER difficulties moderated the relationship between CU traits and antisocial behavior. Gender was included as a moderator of the effect of ER difficulties on the relationship between CU traits and antisocial behavior (i.e., a three-way interaction).

Consistent with previous studies (e.g., Visser, Bay, Cook, & Myburgh, 2010; Ciucci, Baroncelli, Golmaryami, & Frick, 2015; Sevecke, Franke, Kosson, & Krischer, 2016; Northover, Thapar, Langley, & Van Goozen, 2015), we anticipated (1) a positive relationship between CU traits and emotion regulation difficulties, such that increased CU traits would predict significantly poorer emotion regulation skills. We also hypothesized (2) that poorer emotion regulation would in turn predict increased antisocial behavior, via a significant positive association between the two variables, as higher scores on the ER measure used indicate greater dysregulation. Thus, we expected that at least part of the effect of CU traits on antisocial behavior would occur indirectly through ER difficulties. We also investigated through which route Gender may moderate the indirect effect (mediation) of CU traits on antisocial behavior through ER, by examining Gender as a moderator of the direct effect of CU traits on ER (Figure 1), and of ER on antisocial behavior (Figure 2). We hypothesized (3) that gender would moderate the relationship between CU traits and the proposed mediator, ER, as well as (4) the relationship between ER and antisocial behavior. Specifically, we anticipated the effect size of CU traits on ER would be large^{4r} among females, such that CU traits would

predict more ER difficulties among females. We also expected ER difficulties to predict more antisocial behavior among males. Finally, to explore potential mechanisms in more detail, we conducted follow-up analyses examining subscales of the DERS which mapped on to Gross' (2015b) extended process model as mediators between CU traits and antisocial behavior.

CHAPTER 2: METHOD

Participants

Participants were 199 young adults (67% Female; M age = 20.9), who were recruited for a larger study on the development and validation of a mood induction procedure. The study used two online platforms: an undergraduate study participant portal (SONA) at the University of Vermont, and Amazon Mechanical Turk (mTurk), a portal developed by Amazon.com, Inc. Participants were 70% White, 11% Black or African American, 2% American Indian or Alaska Native, 14% Asian, and 3% Other Race. Those recruited through mTurk received \$5.00 for complete participation. Undergraduate participants were compensated with extra credit in a psychology course.

Measures

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item self-report measure of impairments in ER. Each item includes a statement (e.g., I am attentive to my feelings; When I'm upset, I lose control over my behavior) whose frequency is rated on a 5-point Likert scale from 1 ("almost never") to 5 ("almost always"). In a clinical sample, the DERS has demonstrated good to excellent construct validity (Fowler, et. al, 2014). Similarly, among undergraduate samples the DERS demonstrated adequate predictive and construct validity (Gratz & Roemer, 2004), as well as adequate to excellent reliability (Ritschel, Tone, Schoemann, & Lim, 2015). The measure includes six subscales (items, alphas for current sample), (1) Nonacceptance of emotional responses (NONACCEPTANCE; 6 items, $\alpha = .91$), (2) Difficulty engaging

in goal-directed behavior (GOALS; 5 items, $\alpha = .91$), (3) Impulse control difficulties (IMPULSE; 6 items, $\alpha = .87$), (4) Lack of emotional awareness (AWARENESS; 6 items, $\alpha = .83$), (5) Limited access to emotion regulation strategies (STRATEGIES; 8 items, $\alpha = .89$), and (6) Lack of emotional clarity (CLARITY; 5 items, $\alpha = .78$). Subscales are calculated using the total of each scale, including 11 reverse scored items. Subscale scores are then added to yield a total score; higher scores indicate greater dysregulation. i.e., poorer emotion regulation. Total DERS internal consistency for this sample was excellent, $\alpha = .94$.

The Young Adult Antisocial Behavior Scale (YAABS; Cho, Martin, Conger, & Widaman, 2010). The YAABS assesses the prevalence of antisocial behavior within the past year. Participants rate the frequency of 12-items (e.g., Tell lies to people?, Cheat at school or other places?) using a 5-point Likert scale ranging from “Never” to “More than 5 times”. Items are summed to receive a total score. Reliability for this scale was acceptable, $\alpha = .77$.

The Inventory of Callous-Unemotional Traits (ICU; Frick, 2004). The ICU assesses CU traits through the rating of 24 self-descriptive statements (e.g., I feel bad or guilty when I do something wrong; The feelings of others are unimportant to me) using a 4-point Likert scale ranging from 0 (“Not at all true”) to 3 (“Definitely true”). Although often used among adolescents, this measure has demonstrated validity and good internal consistency among samples similar to that of the present study (Byrd, Kahn, & Pardini, 2013; Kimonis, Branch, Hagman, Graham, & Miller, 2013). Three subscales are included

in the measure (items, alphas for current sample): Callousness (11 items, $\alpha = .84$) (e.g., I do not feel remorseful when I do something wrong), Uncaring (8 items, $\alpha = .80$) (e.g., I try not to hurt others' feelings.), and Unemotional (5 items, $\alpha = .76$) (e.g., I express my feelings openly). Subscales are calculated with the sum of their items, and then added for a total ICU score. Total ICU scores within this sample yielded good internal consistency ($\alpha = .86$).

Procedure and Data Analytic Plan

On each online study platform, participants were provided an informative paragraph describing the study and a link to the survey, which was administered using Qualtrics survey software. Following completion of informed consent, they provided demographic information including age, gender, race, highest level of education, whether they were Hispanic, and whether English was their first language. For the larger study, participants completed several questionnaires, including the DERS, ICU, and YAABS. Participants then completed the following sequence ten times: engage in a brief relaxation activity, view a video clip, and complete a measure regarding feelings consequent of watching the clip. 40 clips were randomized into four conditions, and then counter-balanced across these conditions. The study concluded with a final relaxation activity. All measures used in the present study are from the baseline questionnaire completed prior to viewing video clips.

Analyses were conducted using IBM SPSS Statistics and MPlus Version 8 (Muthén & Muthén, 2019). Descriptive and bivariate correlational analyses were run on gender, emotion regulation, antisocial behavior, and CU Trait variables.

To test Hypotheses 1 through 4, total ICU score was tested as the predictor of antisocial behavior; and ER was examined as a mediator of the association between CU traits and antisocial behavior. We tested gender as a moderator in the above mediation model by examining the differing effects of CU traits on ER and of ER on antisocial behavior, with gender incorporated as a moderating variable. Specifically, to test Hypothesis 3 (Figure 1), gender was tested as a moderator of the effect of CU traits on ER. To test Hypothesis 4 (Figure 2), gender was tested as a moderator of the effect of ER on antisocial behavior.

We followed up on models that indicated Gender as a significant moderator by testing additional mediation models using the components of the DERS which map on to Gross' (2015b) extended process model: awareness of emotional experience, access to emotion regulation strategies, impulse control, and goal-directed behavior.

CHAPTER 3: RESULTS

Sample

Descriptive statistics separated by gender and for the overall sample are displayed in Table 1 and Table 2; bivariate correlations of the study variables are displayed in Table 3. Gender was negatively associated with CU traits, $r = -.45, p < .0001$ such that Males had higher total CU traits on average than did Females. CU traits were positively associated with ER Difficulties, $r = .42, p < .0001$, and Antisocial Behavior, $r = .32, p < .0001$. The average level of CU traits and gender difference in this sample were consistent with other community samples (e.g., Byrd, Kahn, & Pardini, 2013). Most study variables were normally distributed. However, the CU trait variable was skewed and was square root transformed prior to analysis. ER difficulties and Antisocial Behavior variables were also skewed and were log transformed to achieve normality. To minimize collinearity, all variables were mean centered in Mplus prior to analyses.

Moderated Mediation

Moderated mediation analyses were conducted using Mplus Version 8 (Muthén & Muthén, 2019). To examine the first set of hypotheses testing gender as a moderator of indirect effects linking CU traits, emotion regulation, and antisocial behavior, ER difficulties were tested as a mediator of the relationship between CU traits (Independent variable) and Antisocial Behavior (Dependent variable). In Model 1 and Model 2, Gender was tested as moderator of the a1 (ER difficulties on CU traits) and b1 (Antisocial Behavior on ER difficulties) paths of the indirect effect, respectively.

Model 1. Figure 3 depicts Model 1. The direct effects of CU traits on ER difficulties ($B = .20, SE = .07, p = .004$), ER difficulties on Antisocial Behavior ($B = .19, SE = .06, p = .001$), and of CU traits on Antisocial Behavior ($B = .06, SE = .02, p = .002$), were all significant. Additionally, the indirect effect of CU traits on Antisocial Behavior mediated through ER was also significant. However, the interaction of CU traits and Gender did not predict variance in ER difficulties, $B = -0.03, SE = .04, p = .422$, suggesting no moderating effect. Specifically, the indirect effect of CU traits on Antisocial Behavior via ER difficulties was significant and comparable in size for males ($B = .03, SE = .01, 95\% CI [.01, .06]$) and females ($B = .03, SE = .01, 95\% CI [.01, .04]$).

Model 2. Figure 4 depicts Model 2. Again, the direct effect of CU traits on ER difficulties was significant, $B = .13, SE = .02, p = .000$; CU traits were associated with increased ER difficulties. Similarly, the direct effect of ER difficulties on Antisocial Behavior was also significant, $B = .68, SE = .17, p < .0001$. The direct effect of CU traits on Antisocial Behavior was not significant, $B = .03, SE = .02, p = .083$. In this model, however, the interaction of ER difficulties and Gender did differentially predict Antisocial Behavior, $B = -0.28, SE = .09, p = .003$. Specifically, the indirect effect of CU traits on Antisocial Behavior via ER difficulties was significantly greater for males ($B = .05, SE = .01, 95\% CI [.03, .09]$) than for females ($B = .02, SE = .01, 95\% CI [-.001, .04]$), for whom the indirect effect was not significant. The index of moderated mediation, a statistical test of moderated mediation (Hayes, 2015), was significant, $B = -.037, SE = .014, 95\% CI [-.07, -.02]$.

Three-way Interaction (Model 3)

In model 3, which tested a 3-way interaction, ER difficulties were tested as a moderator of the effect of CU traits on antisocial behavior, and Gender was tested as a moderator of that interaction. The direct effect of CU traits on Antisocial Behavior was not significant, $B = .08$, $SE = .09$, $p = .405$, nor was the interaction of CU traits and ER difficulties, $B = .33$, $SE = .22$, $p = .133$. Finally, the 3-way interaction term comprised of CU traits, ER difficulties, and Gender did not significantly predict Antisocial Behavior, $B = -0.19$, $SE = .13$, $p = .12$.

Follow-up Analyses

Results from Model 2 indicate that Gender moderates the indirect effect of CU traits on Antisocial Behavior via ER difficulties, implicating emotion regulation skills in the expression of antisocial behavior for Males. To further investigate the nuance of this effect in a manner consistent with Gross' extended process model, we decomposed the ER construct and re-ran Model 2, in which gender moderates the b1 path between ER Difficulties and antisocial behavior, with the subscales of the Difficulties in Emotion Regulation Scale that map conceptually on to the three components of the extended process model. We conducted 3 such analyses.

Awareness. The Lack of Emotional Awareness subscale of the DERS measure describes the level to which a person is attentive to their feelings and emotions (Gratz & Roemer, 2004). Consequently, this subscale is similar in content to the identification stage of Gross' (2015b) extended process model. Specifically, each construct involves an

awareness of one's own emotional experience. We tested this subscale as a mediator between CU traits and Antisocial Behavior, with Gender moderating the b1 path (see Figure 2 for reference). CU traits were positively associated with the Lack of Emotional Awareness subscale, $B = .13$, $SE = .02$, $p < .0001$, which did not significantly predict increased Antisocial Behavior, $B = .22$, $SE = .24$, $p = .35$. Gender did not moderate the indirect effect, which was nonsignificant for both Males ($B = .01$, $SE = .02$, 95% CI [-.02, .05]) and Females ($B = -.00$, $SE = .01$, 95% CI [-.02, .01]).

Selection. The second stage of Gross' extended process model is selection, during which ER strategies are evaluated and chosen. This segment would naturally depend on the availability of ER strategies, a construct which is assessed via the Limited Access to Emotion Regulation Strategies subscale of the DERS. The use of ER strategies has also been identified as driving gender differences in previous studies of ER and gender (e.g., Nolen-Hoeksema & Aldao, 2011), further warranting its examination as a contributing factor in our identified gender difference of the indirect effect. We tested this subscale as a mediator between CU traits and Antisocial Behavior, with Gender moderating the b1 path (see Figure 2 for reference). An increase in CU traits predicted increased scores on the Limited Access to Emotion Regulation Strategies subscale, $B = .16$, $SE = .03$, $p < .0001$, which in turn predicted increased Antisocial Behavior, $B = .52$, $SE = .15$, $p = .00$. Further, Gender significantly moderated this indirect effect, such that the indirect effect was greater among Males ($B = .05$, $SE = .01$, 95% CI [.02, .08]) than Females ($B = .01$, $SE = .01$, 95% CI [-.004, .03]). The index of moderated mediation was significant, $p =$

.011, as was the direct effect of CU traits on Antisocial Behavior, $B = .04$, $SE = .02$, $p = .016$.

Goals and Impulsivity. Finally, the implementation stage of the model may be represented by both the Difficulty Engaging in Goal Directed Behavior and the Impulse Control Difficulties subscales, both of which contribute to the execution of successful emotion regulation skills, particularly as links between ER difficulties and specifically impulsive aggression have been noted in previous research (Long, et. al, 2014). A combined score was created using the average of these two subscales (GOALS/IMPULSE, $\alpha = .89$). This score was tested as a mediator between CU traits and Antisocial Behavior, with Gender moderating the b1 path. Increased CU traits were predictive of increased scores on the combined GOALS/IMPULSE subscale, $B = .09$, $SE = .02$, $p < .0001$, which in turn predicted increased Antisocial Behavior, $B = .68$, $SE = .19$, $p = .001$. Gender significantly moderated this indirect effect, which was larger for Males ($B = .04$, $SE = .01$, 95% CI [.02, .07]) than Females ($B = .011$, $SE = .005$, 95% CI [.002, .02]), with a significant IMM, $B = -0.026$, $SE = .01$, $p = .04$. The direct effect of CU traits on Antisocial Behavior was also significant, $B = .04$, $SE = .02$, $p = .007$.

CHAPTER 4: DISCUSSION

Summary of Main Findings

The goal of the present study was to explore the relationship between CU traits, associated antisocial behavior, emotion regulation difficulties, and gender. We tested three different models of CU traits' influence on Antisocial Behavior, including two moderated mediation models in which gender was tested as a moderator of the indirect effect of CU on antisocial behavior through ER. Specifically, gender was tested as a moderator of the path from CU traits to ER difficulties (Model 1) and ER difficulties to Antisocial Behavior (Model 2), respectively. We also tested a three-way interaction, in which gender was tested as a moderator of the interaction between ER difficulties and CU traits in their combined effects on Antisocial Behavior.

Model 1 tested Gender as a moderator of the path between CU traits and ER difficulties, within a mediation model in which ER difficulties were tested as a mediator between CU traits and Antisocial Behavior. As expected, and consistent with prior research (e.g., Carlson, Oshri, & Kwon, 2015, Frick et. al, 2003), CU traits directly predicted increased Antisocial Behavior. In this model, higher levels of CU traits predicted increased ER difficulties, which predicted increased Antisocial Behavior. Contrary to our hypothesis, the indirect effect of CU on antisocial behavior through ER was not moderated by gender, such that it was significant for both males and females when considering the effect of gender on the relationship between CU traits and ER difficulties. This suggests a similar pathway of CU traits to ER difficulties across gender,

an interesting result given past studies, in which females have been identified in greater number in the typically more dysregulated and externalizing *secondary* psychopathy variant (e.g., Gill & Stickle, 2016) and associated with greater psychopathology and negative affect (Edwards, et. al, 2018; Stickle, et. al, 2012). While these associations suggest ER difficulties, however, they are not the only way in which ER difficulties may manifest, as demonstrated by the results of Model 2.

Model 2 tested Gender as a moderator of the path between ER difficulties and Antisocial behavior. Again, CU traits significantly predicted ER difficulties, which predicted greater Antisocial Behavior, and the indirect effect of CU traits on antisocial behavior through ER was significant. Further, the direct effect of CU traits on Antisocial Behavior was nonsignificant, underscoring ER as an important mechanism of the relationship between CU traits and Antisocial Behavior. In this model, and consistent with our hypothesis, Gender moderated the indirect effect, such that ER difficulties were significantly associated with greater antisocial behavior for males but not females. Despite CU traits predicting ER difficulties similarly, these ER difficulties contributed significantly more to antisocial behavior among males. This model aligns with gender differences identified in the ER literature, particularly those suggesting a more externalizing manifestation of ER difficulties among males than females (e.g., Nolen-Hoeksema, 2012).

Taken together, Model 1 and Model 2 indicate that in the pathway from CU traits to Antisocial Behavior via ER difficulties, Gender influences the point at which ER

difficulties are translated to Antisocial Behavior. This process was further supported by the results of Model 3, which tested ER difficulties as a moderator of the relationship between CU traits and Antisocial Behavior. In this model, ER did not moderate the effect of CU traits on Antisocial behavior; this effect was nonsignificant for both males and females. These models implicate ER difficulties as a mediator, rather than moderator, of the relationship between CU traits and Antisocial Behavior, and suggest that this mediation is influenced by gender.

Model 2 additionally unpacked the influence of Gender in the expression of ER difficulties. Our follow up analyses, which tested individual components of the DERS that conceptually best mapped on to Gross' (2015b) extended process model, further specified the components of ER that may drive Gender's moderating effect. Gender appeared to moderate both the effect of ER strategy access and a combined goal-directed behavior and impulsivity score on Antisocial Behavior. However, gender did not moderate the effect of emotional awareness on Antisocial Behavior.

Implications

Previous work has identified ER skills as both a moderator (Lanciano, et. al, 2018) and mediator (Long, et. al, 2014) of the effect of psychopathic traits on antisocial, externalizing behaviors such as aggression. The results of our study point to mediation, rather than moderation, suggesting that CU traits may contribute to deficits in ER, rather than interacting with them, which yield antisocial behavior. These results also highlight ER as a point where intervention may mitigate consequent antisocial behavior. As an

effective component of treatment across numerous psychopathologies (e.g., Sloan, et. al, 2017) and a teachable skill (Berking, Wupperman, Reichardt, Pejic, Dippel, & Znoj, 2008), emotion regulation represents a viable treatment target among many clinical populations. Our results suggest that this is the case among those with Callous-Unemotional Traits, particularly young adult males. Given their utility as a research construct among youth, much research on treatment of CU traits has focused on child and adolescent populations. Studies have suggested that a focus on parenting practices is most effective among younger children, but additional components directly involving youth and focusing on ER skills are more promising in later adolescence (Hawes, Price, & Dadds, 2014). As demonstrated among our sample, ER is likely even more salient as a treatment target among emerging adult males demonstrating antisocial behavior. Our follow-up analyses highlight specific facets of ER, non-impulsive/goal-directed behavior and access to ER strategies, as potential skills to emphasize in a treatment program.

Given the notable differences in emotion regulation between males and females in past research (e.g., Gross & John, 2003; McRae, et. al, 2008; Nolen-Hoeksema & Aldao, 2011), it was not surprising that gender moderated the indirect effect between CU traits and antisocial behavior, particularly given well documented trends towards externalizing, rather than internalizing, behavior among emotionally dysregulated males. That CU traits were associated with ER difficulties similarly across gender, however, was unexpected considering consistent findings of gender differences among psychopathy/CU trait variants, as well as research associating affective and interpersonal psychopathy with

emotional distress among females. One possibility for this discrepancy in findings is that previous research has examined characteristics including emotional distress and negative affect (e.g., Mededović, et. al, 2018; Gill & Stickle, 2016), rather than specific measures of ER. Although these constructs are associated with impaired ER and appear more often among females in previous work, they represent only one avenue through which ER difficulties are expressed. Indeed, externalizing and internalizing symptoms among males and females, respectively, may imply similarly impaired ER symptoms. Taken together, our results identify Gender as more likely influencing the point at which ER is expressed, rather than the specific effect that ER may have on the relationship between CU traits and antisocial behavior.

In accordance with Gross' (2015b) model, our follow up analyses suggest that the gender differences in ER affect outcomes via the selection and implementation stages of Emotion Regulation, which consequently contribute to increased Antisocial Behavior among males. Interestingly, the identification stage (i.e. the AWARENESS scale) was not related to antisocial behavior for either males or females. This finding suggests that, though emotional awareness is likely impaired among those with CU traits (Baroncelli, et. al, 2018), it does not contribute heavily to associated antisocial behavior. Results which tested the latter two components of Gross' (2015) model emphasize the importance of strategies as an ER tool and are consistent with previous literature citing gender differences in strategy use (e.g., Nolen-Hoeksema 2012), specifically that patterns of ER strategy selection among males may contribute to more externalizing behaviors. The

males in our sample appeared, on average, to have more impaired access to ER strategies, however we were unable to assess for specific *types* of strategies most often used.

Further, testing of the goal directed behavior and impulsivity subscales of the DERS underlined gender differences in the implementation stage, such that issues of impulsivity and goal-directed behavior associated with CU traits were related to antisocial behavior.

Strengths and Limitations

To our knowledge, this study is the first to test different models of the relationship between CU traits, ER difficulties, and antisocial behavior among young adults, with consideration of gender. Strengths of this study include a relatively large and mixed gender sample. Nevertheless, results must be interpreted with consideration of certain limitations. First, as we sampled from both the community and an undergraduate population, the average level of CU traits in this sample was lower than what would be expected from clinical or incarcerated samples (Byrd, et. al, 2013). Results may differ among a sample of young adults with significantly higher levels of CU Traits. For example, unlike the results of the current study, we might see a different effect of gender on the relationship between CU traits and ER difficulties, as noted by Međedović and colleagues (2018).

Second, ER research has evolved to incorporate psycho-physiological measures of activity and arousal. Indeed, strategic ER may involve, in part, the mitigation of physiological responses to emotionally salient stimuli (Gross & Levenson, 1993) and many researchers have investigated emotion regulation with constructs such as

respiratory sinus arrhythmia (RSA) (e.g., Butler, Wilhelm, & Gross, 2006; Gentzler, Santucci, Kovacs, & Fox, 2009), which is predictive of later self-reports of emotion regulation ability (Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp, 2009). As such, an additional limitation of our study is that our data was obtained purely through self-report, and not via measures of physiology during in-vivo exposure to emotional stimuli. Future work would benefit from the incorporation of these research methods.

This study also benefits from pulling from a larger pool of community participants in addition to an undergraduate population by using Amazon mTurk. However, mTurk is not without its drawbacks, including a smaller number of workers who complete a larger proportion of available surveys, and the potential for participants to be “nonnaïve” – that is, those who are fluent in psychological research assessments and their nuances, such as attentional checks (Miller, Crowe, Weiss, Maples-Keller, & Lynam, 2017).

Future Directions

Emotion regulation is a relatively understudied construct in the field of CU traits. The present study underscores the importance of ER as one mechanism linking CU traits and their associated antisocial behaviors, particularly among males. However, ER is a broad concept, and additional factors should be investigated as they contribute to antisocial outcomes. For example, Gross (2015a) discusses intrinsic and extrinsic regulation, which refer to regulating one’s own or another’s emotions, respectively. As noted by Baroncelli, Roti, and Ciucci (2018), callousness has been associated with

impaired attendance to the emotions of others, which may influence antisocial behavior. The current study focused solely on intrinsic regulation, but as antisocial behavior includes acts of victimization and offense towards others, further study of effort to recognize and regulate the emotions of third parties would complement this research.

Numerous articles have demonstrated the presence of primary and secondary variants of those with psychopathic and/or CU traits. Additional exploration of the relationship between ER and antisocial behavior as it operates within these groups would be illuminating, particularly as these variants often differ on relevant constructs, such as impulsivity, psychopathology, and antisocial behavior. Many of these studies have identified variants using CU traits, childhood trauma, and psychopathology such as anxiety (e.g., Colins, Fanti, Salekin, Mulder, & Andershed, 2018; Kahn, Frick, Youngstrom, Kogos, Youngstrom, Feeny, & Findling, 2013), while looking at aggression and antisocial behavior as outcomes. However, the results of the current study taken together with those of previous research of ER outcomes point to both internalizing psychopathology and antisocial behavior as a potential expression of ER difficulties, suggesting that ER may be additionally informative as a clustering or class variable. For example, Craig and Moretti (2018) successfully identified classes consistent with previous research using measures of ER in addition to anxiety and maltreatment. The phenotypical presentation of the secondary variant, which often includes both emotional distress and antisocial behavior, may be driven in part by impaired ER.

As CU traits were associated with ER difficulties similarly across gender, further study of subsequent expression of impaired ER in the context of CU traits is warranted. It is possible that similar levels of ER difficulties would contribute more to internalizing rather than externalizing symptoms, such as anxiety and mood disorders, among females; this result would be consistent with previous studies of ER outcomes.

Conclusions

The present study identifies impaired emotion regulation as a mechanism in the expression of antisocial behavior among those with callous-unemotional traits, and specifies differing effects based on gender. This work underscores the importance of further consideration of emotion regulation and gender as they relate to CU traits. Particularly, these results implicate emotion regulation, particularly use of strategies and goal-directed, non-impulsive behavior as a treatment target for antisocial behavior among males.

Table 1. Descriptive statistics by gender

	Males			Females		
	Mean	SD	Skewness	Mean	SD	Skewness
1. Age	22.29	2.09	-.21	20.21	2.3	1.08
2. Total ICU Score	26.13	9.46	-.41	16.72	8.38	.59
3. Callousness	10.60	6.21	.58	5.04	4.07	1.64
4. Uncaring	7.92	4.34	.24	5.82	4.01	.75
5. Unemotional	7.84	3.06	.44	6.36	3.55	.03
6. Total DERS Score	93.59	23.43	-.64	87.63	26.41	.11
7. NONACCEPTANCE	15.56	5.97	-.19	14.67	6.33	.45
8. GOALS	15.15	3.92	-.05	15.37	5.02	-.28
9. IMPULSE	14.54	5.36	-.17	12.41	5.49	.82
10. AWARENESS	14.67	4.34	.58	14.73	5.16	.21
11. STRATEGIES	21.23	7.51	-.11	18.46	7.85	.39
12. CLARITY	11.97	3.89	.07	11.96	4.07	.21
13. Total YAABS Score	18.12	6.48	1.68	15.50	3.74	1.44

Table 2. Descriptive statistics for overall sample

	Mean	SD	Skewness
1. Age	20.89	2.44	.52
2. Total ICU Score	19.82	9.79	.32
3. Callousness	6.86	5.52	1.26
4. Uncaring	6.49	4.22	.57
5. Unemotional	6.86	3.46	.07
6. Total DERS Score	89.68	25.52	-.13
7. NONACCEPTANCE	14.96	6.21	.25
8. GOALS	15.29	4.67	-.23
9. IMPULSE	13.11	5.53	.47
10. AWARENESS	14.71	4.89	.29
11. STRATEGIES	19.39	7.82	.21
12. CLARITY	11.96	4.00	.17
13. Total YAABS Score	16.36	4.95	2.02

Table 3. Correlations of study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	-										
2. Gender	.40**										
3. CU Traits	.19*	.45**	-								
4. ER Difficulties	.02	-.11	.42**	-							
5. NONACCEPTANCE	.08	-.07	.32**	.86**	-						
6. GOALS	-.13	.02	.09	.69**	.55**	-					
7. IMPULSE	.14	-.18*	.34**	.82**	.64**	.52**	-				
8. AWARENESS	-.07	.01	.37**	.40**	.19**	.00	.09	-			
9. CLARITY	.19**	-.00	.41**	.75**	.55**	.35**	.51**	.52**	-		
10. STRATEGIES	.11	-.17*	.36**	.91**	.78**	.62**	.76**	.18*	.54**	-	
11. Antisocial Behavior	.10	.25**	.32**	.34**	.29**	.16*	.36**	.10	.29**	.33**	-

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed)

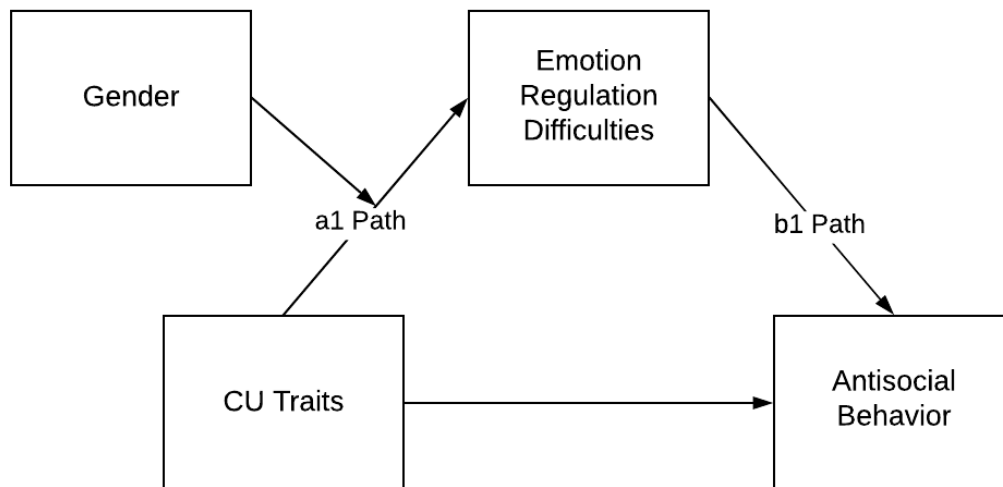


Figure 1: Proposed first moderated mediation model.

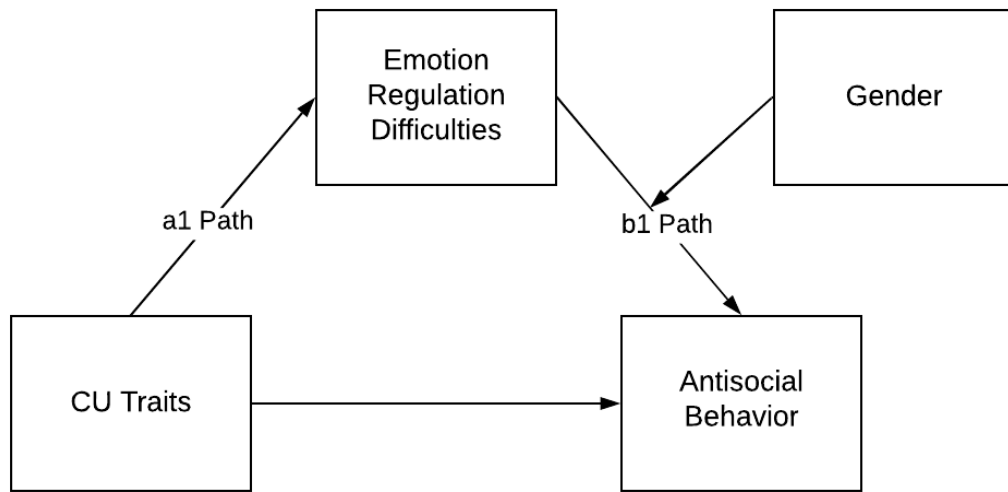


Figure 2: Proposed second moderated mediation model.

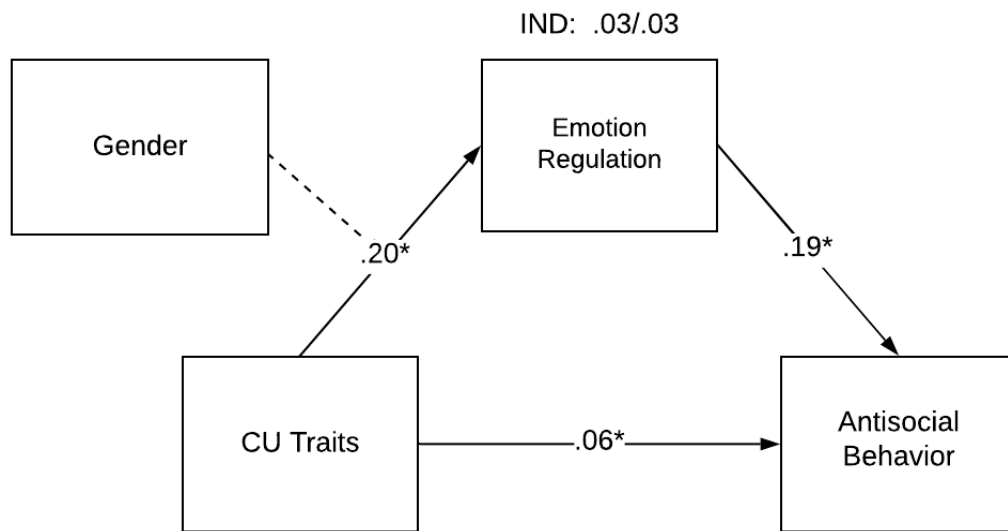


Figure 3: Model 1. IND = Indirect effects for males/females, 95% CI [.01, .06]/[.01, .04]. * = $p < .01$. Dotted lines indicate a nonsignificant effect. Solid lines indicate a significant effect.

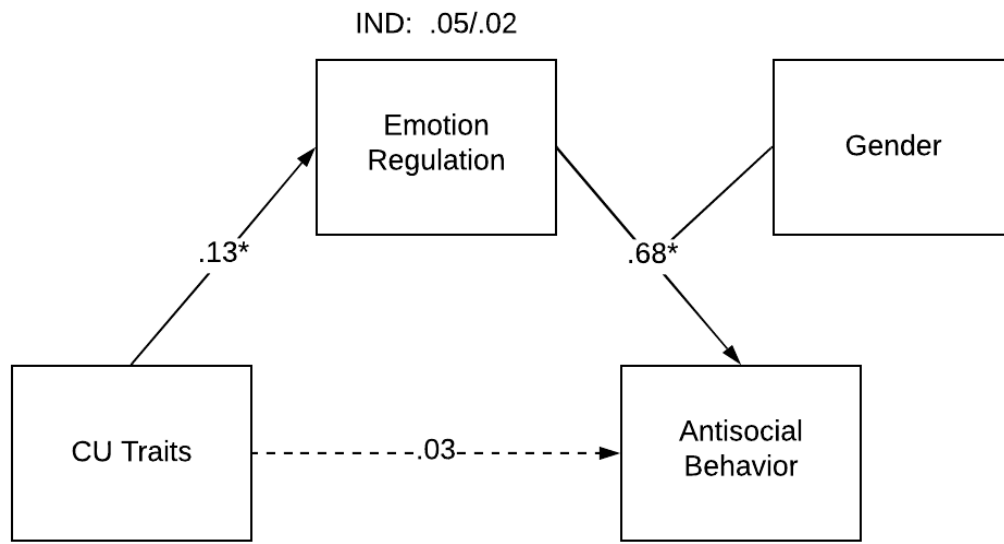


Figure 4: Model 2. IND = Indirect effects for males/females, 95% CI [.03, .09]/[-.001, .04]. * = $p < .01$. Dotted lines indicate a nonsignificant effect. Solid lines indicate a significant effect.

REFERENCES

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review, 30*(2), 217-237.
- Anderson, L. M., Reilly, E. E., Gorrell, S., Schaumberg, K., & Anderson, D. A. (2016). Gender-based differential item function for the difficulties in emotion regulation scale. *Personality and Individual Differences, 92*, 87-91.
- Barry, C. T., Frick, P. J., DeShazo, T. M., McCoy, M., Ellis, M., & Loney, B. R. (2000). The importance of callous-unemotional traits for extending the concept of psychopathy to children. *Journal of abnormal psychology, 109*(2), 335.
- Baroncelli, A., Roti, B., & Ciucci, E. (2018). The associations between callous-unemotional traits and emotional awareness in youth. *Personality and Individual Differences, 120*, 247-252.
- Baskin-Sommers, A. R., Waller, R., Fish, A. M., & Hyde, L. W. (2015). Callous-unemotional traits trajectories interact with earlier conduct problems and executive control to predict violence and substance use among high risk male adolescents. *Journal of abnormal child psychology, 43*(8), 1529-1541.
- Bennett, D. C., & Kerig, P. K. (2014). Investigating the construct of trauma-related acquired callousness among delinquent youth: Differences in emotion processing. *Journal of Traumatic Stress, 27*(4), 415-422.
- Berking, M., Wupperman, P., Reichardt, A., Pejic, T., Dippel, A., & Znoj, H. (2008). Emotion-regulation skills as a treatment target in psychotherapy. *Behaviour research and therapy, 46*(11), f230-1237.
- Blagov, P. S., Patrick, C. J., Oost, K. M., Goodman, J. A., & Pugh, A. T. (2016). Triarchic psychopathy measure: Validity in relation to normal-range traits, personality pathology, and psychological adjustment. *Journal of personality disorders, 30*(1), 71-81.
- Blake, A. J., Tung, I., Langley, A. K., & Waterman, J. M. (2018). Substance use in youth adopted from foster care: Developmental mechanisms of risk. *Children and Youth Services Review, 85*, 264-272.
- Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological science, 15*(7), 482-487.
- Bridges, L. J., Denham, S. A., & Ganiban, J. M. (2004). Definitional issues in emotion regulation research. *Child development, 75*(2), 340-345.
- Butler, E. A., Wilhelm, F. H., & Gross, J. J. (2006). Respiratory sinus arrhythmia, emotion, and emotion regulation during social interaction. *Psychophysiology, 43*(6), 612-622.
- Byrd, A. L., Kahn, R. E., & Pardini, D. A. (2013). A validation of the Inventory of Callous-Unemotional Traits in a community sample of young adult males. *Journal of psychopathology and behavioral assessment, 35*(1), 20-34.

- Carlson, M., Oshri, A., & Kwon, J. (2015). Child maltreatment and risk behaviors: The roles of callous/unemotional traits and conscientiousness. *Child abuse & neglect*, 50, 234-243.
- Ciucci, E., Baroncelli, A., Golmaryami, F. N., & Frick, P. J. (2015). The emotional correlates to callous–unemotional traits in children. *Journal of Child and Family Studies*, 24(8), 2374-2387.
- Ciucci, E., & Baroncelli, A. (2014). The emotional core of bullying: Further evidences of the role of callous–unemotional traits and empathy. *Personality and individual differences*, 67, 69-74.
- Craig, S. G., & Moretti, M. M. (2018). Profiles of primary and secondary callous-unemotional features in youth: The role of emotion regulation. *Development and psychopathology*, 1-12.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby.
- Cho, Y. I., Martin, M. J., Conger, R. D., & Widaman, K. F. (2010). Differential item functioning on antisocial behavior scale items for adolescents and young adults from single-parent and two-parent families. *Journal of psychopathology and behavioral assessment*, 32(2), 157-168.
- Cisler, J. M., Olatunji, B. O., Feldner, M. T., & Forsyth, J. P. (2010). Emotion regulation and the anxiety disorders: An integrative review. *Journal of psychopathology and behavioral assessment*, 32(1), 68-82.
- Colins, O. F., Fanti, K. A., Salekin, R. T., Mulder, E., & Andershed, H. (2018). Psychopathy in detained boys: The search for primary and secondary variants in a clinical setting. *Personality Disorders: Theory, Research, and Treatment*, 9(5), 408.
- Crane, D., State Technical Institute of Memphis, & United States of America. (1978). Primary versus secondary psychopathy. *Quarterly journal of corrections*, 2(1), 16-25.
- Davidson, R. J., Putnam, K. M., & Larson, C. L. (2000). Dysfunction in the neural circuitry of emotion regulation--a possible prelude to violence. *science*, 289(5479), 591-594.
- Dean, A. C., Altstein, L. L., Berman, M. E., Constans, J. I., Sugar, C. A., & McCloskey, M. S. (2013). Secondary psychopathy, but not primary psychopathy, is associated with risky decision-making in noninstitutionalized young adults. *Personality and individual differences*, 54(2), 272-277.
- DeLisi, M., Reidy, D. E., Heirigs, M. H., Tostlebe, J. J., & Vaughn, M. G. (2018). Psychopathic costs: a monetization study of the fiscal toll of psychopathy features among institutionalized delinquents. *Journal of Criminal Psychology*, 8(2), 112-124.
- Drislane, L. E., Patrick, C. J., & Arsal, G. (2014). Clarifying the content coverage of differing psychopathy inventories through reference to the Triarchic Psychopathy Measure. *Psychological Assessment*, 26(2), 350.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*. Arlington: American Psychiatric Publishing.

- Edwards, B. G., Ermer, E., Salovey, P., & Kiehl, K. A. (2018). Emotional Intelligence in Incarcerated Female Offenders with Psychopathic Traits. *Journal of personality disorders*, 1-24.
- Efferson, L. M., & Glenn, A. L. (2018). Examining gender differences in the correlates of psychopathy: A systematic review of emotional, cognitive, and morality-related constructs. *Aggression and Violent Behavior*.
- Ehring, T., Tuschen-Caffier, B., Schnülle, J., Fischer, S., & Gross, J. J. (2010). Emotion regulation and vulnerability to depression: spontaneous versus instructed use of emotion suppression and reappraisal. *Emotion*, 10(4), 563.
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment*, 13(4), 454-469.
- Falkenbach, D. M., Reinhard, E. E., & Larson, F. R. R. (2017). Theory based gender differences in psychopathy subtypes. *Personality and Individual Differences*, 105, 1-6.
- Fanti, K. A., Frick, P. J., & Georgiou, S. (2009). Linking callous-unemotional traits to instrumental and non-instrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment*, 31(4), 285.
- Fanti, K. A., Kyranides, M. N., Petridou, M., Demetriou, C. A., & Georgiou, G. (2018). Neurophysiological markers associated with heterogeneity in conduct problems, callous unemotional traits, and anxiety: Comparing children to young adults. *Developmental Psychology*, 54(9), 1634-1649.
<http://dx.doi.org/10.1037/dev0000505>
- Feilhauer, J., & Cima, M. (2013). Youth psychopathy: Differential correlates of callous-unemotional traits, narcissism, and impulsivity. *Forensic science international*, 224(1-3), 1-7.
- Fowler, J. C., Charak, R., Elhai, J. D., Allen, J. G., Frueh, B. C., & Oldham, J. M. (2014). Construct validity and factor structure of the difficulties in emotion regulation scale among adults with severe mental illness. *Journal of psychiatric research*, 58, 175-180.
- Frick, P.J. (2004). The Inventory of Callous–Unemotional Traits. Unpublished rating scale.
- Frick, P. J., Cornell, A. H., Barry, C. T., Bodin, S. D., & Dane, H. E. (2003). Callous-unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency. *Journal of abnormal child psychology*, 31(4), 457-470.
- Frick, P. J., Cornell, A. H., Bodin, S. D., Dane, H. E., Barry, C. T., & Loney, B. R. (2003). Callous-unemotional traits and developmental pathways to severe conduct problems. *Developmental psychology*, 39(2), 246.
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Annual research review: A developmental psychopathology approach to understanding callous-unemotional traits in children and adolescents with serious conduct problems. *Journal of child Psychology and Psychiatry*, 55(6), 532-548.

- Frick, P. J., & White, S. F. (2008). Research review: The importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of child psychology and psychiatry*, 49(4), 359-375.
- Garofalo, C., & Neumann, C. S. (2018). Psychopathy and emotion regulation: Taking stock and moving forward. In *Routledge international handbook of psychopathy and crime* (pp. 76-97). Routledge.
- Gentzler, A. L., Santucci, A. K., Kovacs, M., & Fox, N. A. (2009). Respiratory sinus arrhythmia reactivity predicts emotion regulation and depressive symptoms in at-risk and control children. *Biological psychology*, 82(2), 156-163.
- Gill, A. D., & Stickle, T. R. (2016). Affective differences between psychopathy variants and genders in adjudicated youth. *Journal of abnormal child psychology*, 44(2), 295-307.
- Gratz, K. L. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54.
- Gross, J. J. (2014). Emotion regulation: Conceptual and empirical foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3-20). New York, NY, US: Guilford Press.
- Gross, J. J. (2015a). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, 26(1), 1-26.
- Gross, J. J. (2015b). The extended process model of emotion regulation: Elaborations, applications, and future directions. *Psychological Inquiry*, 26(1), 130-137.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of personality and social psychology*, 85(2), 348.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: physiology, self-report, and expressive behavior. *Journal of personality and social psychology*, 64(6), 970.
- Haberman, V. J. (1917). Heredity; in its relation to psychopathy and clinical psychology. February.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and individual differences*, 1(2), 111-119.
- Hare, R. D., & Neumann, C. S. (2006). The PCL-R assessment of psychopathy. *Handbook of psychopathy*, 58-88.
- Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 1, 6-17.
- Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous-unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. *Clinical child and family psychology review*, 17(3), 248-267.
- Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate behavioral research*, 50(1), 1-22.

- Herpers, P. C., Scheepers, F. E., Bons, D. M., Buitelaar, J. K., & Rommelse, N. N. (2014). The cognitive and neural correlates of psychopathy and especially callous–unemotional traits in youths: A systematic review of the evidence. *Development and Psychopathology*, 26(1), 245-273.
- Joormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: relation to cognitive inhibition. *Cognition and Emotion*, 24(2), 281-298.
- Kahn, R. E., Frick, P. J., Youngstrom, E. A., Kogos Youngstrom, J., Feeny, N. C., & Findling, R. L. (2013). Distinguishing primary and secondary variants of callous-unemotional traits among adolescents in a clinic-referred sample. *Psychological assessment*, 25(3), 966.
- Kahn, R. E., Byrd, A. L., & Pardini, D. A. (2013). Callous-unemotional traits robustly predict future criminal offending in young men. *Law and human behavior*, 37(2), 87.
- Kiehl, K. A., & Hoffman, M. B. (2011). The criminal psychopath: History, neuroscience, treatment, and economics. *Jurimetrics*, 51, 355.
- Kimonis, E. R., Branch, J., Hagman, B., Graham, N., & Miller, C. (2013). The psychometric properties of the Inventory of Callous–Unemotional Traits in an undergraduate sample. *Psychological Assessment*, 25(1), 84.
- Lanciano, T., Curci, A., Guglielmi, F., Soleti, E., & Grattagliano, I. (2018). Preliminary data on the role of emotional intelligence in moderating the link between psychopathy and aggression in a nonforensic sample. *Journal of forensic sciences*, 63(3), 906-910.
- Long, K., Felton, J. W., Lilienfeld, S. O., & Lejuez, C. W. (2014). The role of emotion regulation in the relations between psychopathy factors and impulsive and premeditated aggression. *Personality Disorders: Theory, Research, and Treatment*, 5(4), 390.
- Mateer, F. (1924). *The unstable child: An interpretation of psychopathy as a source of unbalanced behavior in abnormal and troublesome children*. New York, NY, US: D Appleton & Company.
- McRae, K., Ochsner, K. N., Mauss, I. B., Gabrieli, J. J., & Gross, J. J. (2008). Gender differences in emotion regulation: An fMRI study of cognitive reappraisal. *Group processes & intergroup relations*, 11(2), 143-162.
- Međedović, J., Wertag, A., & Sokić, K. (2018). Can psychopathic traits be adaptive? Sex differences in relations between psychopathy and emotional distress. *Psihologijske teme*, 27(3), 481-497.
- Megías, A., Gómez-Leal, R., Gutiérrez-Cobo, M. J., Cabello, R., & Fernández-Berrocal, P. (2018). The relationship between trait psychopathy and emotional intelligence: A meta-analytic review. *Neuroscience & Biobehavioral Reviews*, 84, 198-203.
- Miller, J. D., Crowe, M., Weiss, B., Maples-Keller, J. L., & Lynam, D. R. (2017). Using online, crowdsourcing platforms for data collection in personality disorder research: The example of Amazon’s Mechanical Turk. *Personality Disorders: Theory, Research, and Treatment*, 8(1), 26.
- Miller, D. J., Vachon, D. D., & Aalsma, M. C. (2012). Negative affect and emotion dysregulation: Conditional relations with violence and risky sexual behavior in a

- sample of justice-involved adolescents. *Criminal Justice and Behavior*, 39(10), 1316-1327.
- Muñoz, L. C. (2009). Callous-unemotional traits are related to combined deficits in recognizing afraid faces and body poses. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(5), 554-562.
- Muthén, L. K., & Muthén, B. (2019). Mplus. *The comprehensive modelling program for applied researchers: user's guide*, 5.
- Newman, J. P., MacCoon, D. G., Vaughn, L. J., & Sadeh, N. (2005). Validating a distinction between primary and secondary psychopathy with measures of Gray's BIS and BAS constructs. *Journal of abnormal psychology*, 114(2), 319.
- Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual review of clinical psychology*, 8, 161-187.
- Nolen-Hoeksema, S., & Aldao, A. (2011). Gender and age differences in emotion regulation strategies and their relationship to depressive symptoms. *Personality and individual differences*, 51(6), 704-708.
- Northover, C., Thapar, A., Langley, K., & Van Goozen, S. (2015). Emotion regulation in adolescent males with attention-deficit hyperactivity disorder: testing the effects of comorbid conduct disorder. *Brain sciences*, 5(3), 369-386.
- Patrick, C. J., Bradley, M. M., & Lang, P. J. (1993). Emotion in the criminal psychopath: startle reflex modulation. *Journal of abnormal psychology*, 102(1), 82.
- Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913-938.
doi:10.1017/S0954579409000492
- Patrick, C. J., & Drislane, L. E. (2015). Triarchic model of psychopathy: Origins, operationalizations, and observed linkages with personality and general psychopathology. *Journal of personality*, 83(6), 627-643.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of research in personality*, 36(6), 556-563.
- Picó-Pérez, M., Radua, J., Steward, T., Menchón, J. M., & Soriano-Mas, C. (2017). Emotion regulation in mood and anxiety disorders: A meta-analysis of fMRI cognitive reappraisal studies. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 79, 96-104.
- Ray, J. V., Thornton, L. C., Frick, P. J., Steinberg, L., & Cauffman, E. (2016). Impulse control and callous-unemotional traits distinguish patterns of delinquency and substance use in justice involved adolescents: Examining the moderating role of neighborhood context. *Journal of abnormal child psychology*, 44(3), 599-611.
- Reidy, D. E., Kearns, M. C., DeGue, S., Lilienfeld, S. O., Massetti, G., & Kiehl, K. A. (2015). Why psychopathy matters: Implications for public health and violence prevention. *Aggression and violent behavior*, 24, 214-225.
- Ritschel, L. A., Tone, E. B., Schoemann, A. M., & Lim, N. E. (2015). Psychometric properties of the Difficulties in Emotion Regulation Scale across demographic groups. *Psychological Assessment*, 27(3), 944.

- Robertson, T., Daffern, M., & Bucks, R. S. (2011). Emotion regulation and aggression. *Aggression and violent behavior, 17*(1), 72-82.
- Scott, J. P., DiLillo, D., Maldonado, R. C., & Watkins, L. E. (2015). Negative urgency and emotion regulation strategy use: Associations with displaced aggression. *Aggressive behavior, 41*(5), 502-512.
- Seigfried-Spellar, K. C., Villacís-Vukadinović, N., & Lynam, D. R. (2017). Computer criminal behavior is related to psychopathy and other antisocial behavior. *Journal of Criminal Justice, 51*, 67-73.
- Sellbom, M., & Phillips, T. R. (2013). An examination of the triarchic conceptualization of psychopathy in incarcerated and nonincarcerated samples. *Journal of Abnormal Psychology, 122*(1), 208.
- Sevecke, K., Franke, S., Kosson, D., & Krischer, M. (2016). Emotional dysregulation and trauma predicting psychopathy dimensions in female and male juvenile offenders. *Child and adolescent psychiatry and mental health, 10*(1), 43.
- Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child development, 74*(6), 1869-1880.
- Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: a systematic review. *Clinical psychology review.*
- Stickle, T. R., Marini, V. A., & Thomas, J. N. (2012). Gender differences in psychopathic traits, types, and correlates of aggression among adjudicated youth. *Journal of abnormal child psychology, 40*(4), 513-525
- Vasilev, C. A., Crowell, S. E., Beauchaine, T. P., Mead, H. K., & Gatzke-Kopp, L. M. (2009). Correspondence between physiological and self-report measures of emotion dysregulation: A longitudinal investigation of youth with and without psychopathology. *Journal of Child Psychology and Psychiatry, 50*(11), 1357-1364.
- Vaughn, M. G., Edens, J. F., Howard, M. O., & Smith, S. T. (2009). An investigation of primary and secondary psychopathy in a statewide sample of incarcerated youth. *Youth Violence and Juvenile Justice, 7*(3), 172-188.
- Visser, B. A., Bay, D., Cook, G. L., & Myburgh, J. (2010). Psychopathic and antisocial, but not emotionally intelligent. *Personality and Individual Differences, 48*(5) 644-648.
- Vitale, J. E., & Newman, J. P. (2017). Psychopathy as psychopathology: Key developments in assessment, etiology, and treatment. In *Psychopathology: History, Diagnosis, and Empirical Foundations* (3rd ed., pp. 612-651). Wiley.
- Wang, K., Burton, C. L., & Pachankis, J. E. (2018). Depression and Substance Use: Towards the Development of an Emotion Regulation Model of Stigma Coping. *Substance use & misuse, 53*(5), 859-866.
- Woodworth, M., & Waschbusch, D. (2008). Emotional processing in children with conduct problems and callous/unemotional traits. *Child: care, health and development, 34*(2), 234-244.

- Wymbs, B. T., McCarty, C. A., King, K. M., McCauley, E., Vander Stoep, A., Baer, J. S., & Waschbusch, D. A. (2012). Callous-unemotional traits as unique prospective risk factors for substance use in early adolescent boys and girls. *Journal of abnormal child psychology*, 40(7), 1099-1110.
- Yildirim, B. O., & Derksen, J. J. (2015). Clarifying the heterogeneity in psychopathic samples: Towards a new continuum of primary and secondary psychopathy. *Aggression and violent behavior*, 24, 9-41.
- Zlomke, K. R., & Hahn, K. S. (2010). Cognitive emotion regulation strategies: Gender differences and associations to worry. *Personality and Individual Differences*, 48(4), 408-413.