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Childhood Maltreatment Predictors of Trait Impulsivity

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Chapter

CHILDHOOD MALTREATMENT PREDICTORS OF TRAIT IMPULSIVITY

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ABSTRACT

This chapter provides a summary of empirical evidence linking childhood maltreatment and trait impulsivity. While biological contributors to impulsivity may be substantial, this review speculates that childhood and adolescent contributors may potentially alter the developmental trajectory of this personality trait in important ways. An analysis of original data (N = 401) regarding child maltreatment associations (childhood sexual abuse, physical abuse, sibling abuse, peer bullying, corporal punishment, and exposure to domestic violence) with trait impulsivity as measured by the Personality Inventory for the DSM-5 was also conducted. Adult respondents were assigned to extreme child abuse categories based on their retrospective self-reports. Co-occurrence rates for the various forms of maltreatment were modest (around 10%). While childhood sexual abuse was more closely associated with adult impulsivity among the men than the women, gender differences in these maltreatment relationships were otherwise minimal. Extreme childhood sexual abuse was a significant predictor of trait impulsivity and all other facets of the PID-5 Disinhibition domain (ds ranging from .52 to .80). Adult impulsivity was predicted by both childhood physical abuse (ds ranging from .23 to .28) and exposure to domestic violence during childhood (ds ranging from .21 to .32). The relative risk of adult respondents showing an elevation (> 1.5 SDs) in trait Impulsivity was raised substantially by childhood histories of extreme sexual abuse (RR = 8.68), physical abuse (RR = 3.31), or exposure to parental domestic violence (RR = 4.08). Higher order interactions between these various forms of childhood maltreatment and Impulsivity were not found. The developmental psychopathology implications of these findings are discussed along with suggested directions for future research.

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INTRODUCTION

Impulsivity is a stable, multidimensional personality trait, exemplified by a tendency to react quickly, seemingly without planning or consideration of consequences (Moeller et al., 2001; Perales, Verdejo-García, Moya, Lozano, & Pérez-García, 2009). The *Diagnostic and Statistical Manual-5* (*DSM-5*) defines impulsivity as "acting on the spur of the moment in response to immediate stimuli; acting on a momentary basis without a plan or consideration of outcomes; difficulty establishing and following plans; a sense of urgency and self-harming behavior under emotional distress" (American Psychiatric Association, 2013, p. 780). Various components of impulsivity exist in the literature, including urgency, premeditation, lack of perseverance, and sensation-seeking (Whiteside & Lynam, 2001). A multitude of behaviors also belong to the construct of impulsivity, such as the inability to restrain motor activity, pursuit of immediate gratification, poor cognitive performance, short attention span, distractibility, inattentiveness, disorganization, and a failure to follow through on tasks or activities (Paulsen & Johnson, 1980; Arens, Gaher, & Simons, 2012). Trait impulsivity has consistently been associated with dysfunctional behavior and psychiatric disorders, including Attention-Deficit/Hyperactivity Disorder (ADHD), substance abuse, and personality disorders (American Psychiatric Association, 2013; Robbins, Gillan, Smith, de Wit, & Ersche, 2012). These deleterious outcomes emphasize the importance of understanding the etiology of impulsivity.

One important line of research regarding the etiology of impulsivity focuses on childhood maltreatment such as sexual, physical, and emotional abuse and neglect. While recognizing the apparent biological and early developmental roots of trait development, it seems reasonable to also speculate that recurrent childhood and adolescent experiences can alter trait trajectories that may sometimes remain incompletely crystalized until early adulthood. Approximately 25% of children in the United States experience some form of abuse or neglect (Finkelhor et al., 2013). In 2012, 3.4 million cases of childhood maltreatment were reported to state and local child protection services in the United States alone (United States Department of Health and Human Services, 2012). Childhood maltreatment has been associated with trait impulsivity (e.g., Arens et al., 2012; Fehon, Grilo, & Lipschitz, 2005) and a range of impulsive acts such as non-suicidal self-injury (NSSI), suicide, and substance abuse (Braquehais, Oquendo, Baca-Garcia, & Sher, 2010; Corstorphine et al., 2007; Perales et al., 2009).

CHILDHOOD MALTREATMENT

Prior studies have shown that cognitive, behavioral, social, and emotional functioning can be markedly influenced by different forms of childhood maltreatment. Early, prolonged, and severe trauma appears to increase impulsivity by reducing the neurological capacity to

regulate emotions and inhibit negative actions (Braquehais et al., 2010). For example, individuals with Borderline Personality Disorder (BPD) often have a history of childhood abuse or neglect. A hallmark of BPD is emotional dysregulation, and individuals with BPD have a elevated risk of impulsive suicidal acts. While it is understood childhood maltreatment consequences can be severe, researchers have struggled to disentangle these effects given the high co-occurrence of sexual abuse, physical abuse, emotional abuse, neglect, and exposure to domestic violence (Arens et al., 2012). Further, the specific mechanisms and etiologic pathways that convey these adverse effects on psychological functioning are incompletely understood. Efforts to establish firm linkages between various forms of maltreatment and their psychological sequellae represent a starting point in a systematic investigative process.

Childhood Sexual Abuse

The experience of sexual abuse is multifaceted. It can occur at any developmental period and can involve penetration (i.e., vaginal or anal penetration), oral-genital contact, fondling, and/or exhibitionism or forced pornography exposure (Arens et al., 2012; Senn, Carey, & Vanable, 2008). Approximately 9% of child protective service referrals involve acts of sexual abuse (United States Department of Health and Human Services, 2012). This 9% prevalence rate does not include unreported sexual abuse, which is assumed to be extremely high. Sexual abuse in childhood or adolescence can lead to attempted and completed suicide, aggression, impulsivity, interpersonal violence, emotional dysregulation, Posttraumatic Stress Disorder (PTSD), BPD, Antisocial Personality Disorder (ASPD), and many other manifestations of psychopathology (Braquehais et al., 2010; Brodsky & Stanley, 2008).

While reported sexual abuse victims have been disproportionately female (Maikovich-Fong & Jaffee, 2010), indirect indicators suggest that the epidemiology and impact among boys may be underrepresented. While sexual abuse among boys appears to elevate the risk of adult substance abuse (MacMillan et al., 2001), girls exposed to this form of maltreatment have shown a wider range of negative outcomes including chemical abuse, affective disturbance (MacMillan et al., 2001), and even severe forms of mental illness (Fisher et al., 2009).

Childhood Physical Abuse and Corporal Punishment

Physical abuse is constituted by any act where pain and/or injury is intentionally inflicted on a child secondary to anger or even disciplinary intent. Childhood physical abuse typically involves pushing, grabbing, slapping, or hitting a child with or without a weapon. Around 18% of child protective service referrals involve acts of physical abuse (United States Department of Health and Human Services, 2012). Childhood physical abuse can often be linked to externalized (e.g., aggressiveness, delinquency, substance abuse, legal problems, etc.) forms of adult distress (Verrecchia et al., 2010). Children experiencing physical abuse often perpetrate violence against others (Fehon et al., 2005). Men and women abused as children often experience higher rates of anxiety disorders, alcohol abuse, antisocial behavior, and even severe mental illness (Fisher et al., 2009; MacMillan et al., 2001).

While corporal punishment (infliction of pain without lasting injury) has historically been widely accepted in society as a method of discipline (Socolar, Savage, & Evans, 2007), accumulating evidence suggests that the proximal (e.g., aggressiveness, sociopathy, lower quality parent-child relationships, decreased moral internalization, mental health issues, etc.) and distal (aggressiveness, criminality, sociopathy, mental health concerns, risk of abusing own spouse or child, etc.) effects of severe and recurrent corporal punishment can be equally pernicious (Gershoff, 2002; Gershoff & Bitensky, 2007). Corporal punishment will inevitably be viewed by at least a subset of children as angry, impulsive, and inconsistent acts, which could serve as a vicarious model of trait disinhibition (Straus & Mouradian, 1998).

Emotional Abuse and Neglect

Childhood emotional abuse can involve verbal exchanges, rejection, terrorizing, abandonment, degradation, isolation, and psychological unavailability (Arens et al., 2012). Emotional abuse may intensify other forms of maltreatment (Berzenski & Yates, 2010). Neglect reflects a broad range of inadequate child care, including failure to provide or ensure clothing, food, shelter, supervision, medical care, or education (Arens et al., 2012). In 2012, roughly 11% of referrals to child protective services involved emotional abuse, and approximately 78% of referrals involved child neglect (United States Department of Health and Human Services, 2012). Preschool age children born to neglectful mothers have been shown to exhibit higher levels of motor disinhibition and cognitive impulsivity than their same-age peers (Rohrbeck & Twentyman, 1986). Heightened impulsivity and risk-taking penchants in children can sometimes be traced to mothers who experienced high prenatal stress and lessor capacity for maternal nurturance (Romer, 2010).

Childhood Exposure to Domestic Violence

Domestic violence (aggressive parental acts perpetrated toward one another) can range in severity from infrequent, short-duration acts to repetitive patterns of hostility that involves weapons and medical/legal interventions. Domestic violence can be unidirectional (e.g., one partner aggresses against another) or bidirectional (e.g., both partners complicit) in focus (Evans,

Davies, & DiLillo, 2008). American prevalence rates range from 3 to 10 million incidents per year (Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008), with as many as 80% of the children in these families witnessing those events (Jaffe, Wolfe, & Wilson, 1990). Adults exposed to domestic violence during childhood are disproportionately represented among perpetrators of interpersonal violence (Malik, Sorenson, & Aneshensel, 1997; O'Leary, Malone, & Tyree, 1994; Riggs, O'Learny, & Breslin, 1990). Childhood exposure to domestic violence has been linked to many forms of adolescent and adult maladjustment (Andrews, Foster, Capaldi, & Hops, 2000; Simons, Lin, & Gordon, 1998; Ehrensaft, Cohen, Brown, Smailes, Chen, & Johnson, 2003; Carlson, 1991) that involve behavioral disinhibition and maladaptive coping.

Sibling Abuse

Sibling abuse has been estimated to occur annually in more than 80% of American families (Gelles & Straus, 1988; Straus & Gelles, 1990). Goodwin & Roscoe (1990) found that 66% of their high school sample reported aggressing physically against a sibling within the prior year. Indeed, sibling aggression may represent a hidden, and perhaps most prevalent, form of child maltreatment today. The maladaptive indicators of childhood sibling abuse can be found in aggressive peer interactions (Garcia, Shaw, Winslow, &Yaggi, 2000), dating violence (Simonelli, Mullis, Elliott, & Pierce, 2002), delinquency and aggression (Button & Gealt, 2010), future substance abuse (Widhe, 1997), low self-esteem, anxiety and depression (Stocker, Burwell, & Briggs, 2002), and more general mental health distress (Tucker, Finkelhor, Turner, & Shattuck, 2013). The relationship between these maladaptive attributes and trait impulsivity itself has not yet been examined in the literature.

Peer Bulling and Relational Aggression

Meta-analyses have established the risk of internalized (anxiety and dysphoria) symptoms of psychological distress among peer bullying victims (Reijntjes, Kamphuis, Prinzie, & Telch, 2010). While internalized distress secondary to peer bullying has been most predictable, separate meta-analyses (Reijntjes, Kamphuis, Prinzie, Boelen, & Telch, 2011) have shown that victim ubsets also show increased antisocial and aggressive proclivities. Relational (non-physical) peer aggression can show even more severe forms of internalized distress (Fite, Stoppelbein, Greening, & Preddy, 2011; Prinstein, Boergers, & Vernberg, 2001). Linkages between peer bullying in childhood and adult maladaptive traits have not been examined widely in the literature. One team (Mugge, Beauchman, & King, in press) did recently find relative deficits (effect sizes ranging from .50 to .75) among childhood bullying victims in all nine areas of *perceived* executive functioning competence as measured by the Behavior Rating Inventory of Executive Function (BRIEF-A; Roth, Isquith, & Gioia, 2005, 2014). These perceived deficits included the Inhibit (i.e., impulsivity) and Shift (i.e., attentional focus) dimensions, but did not extend to behavioral impulsivity as reflected by Continuous Performance Test (CPT-II) results.

Biological Implications of Childhood Maltreatment

Childhood maltreatment may contribute to problematic brain development and neurotransmitter involvement, which adds to the progress of impulsivity and undesirable behaviors. Additionally, impulsivity appears highly heritable, and it has clear neuroanatomical correlates (Beauchaine & Neuhaus, 2008). Three of the most frequently studied biological predictors of impulsivity include the hypothalamic-pituitary-adrenal axis (HPA axis), monoamine oxidase A with a variable number tandem repeat in the upstream regulatory region (MAOA-uVNTR), and the serotonin transporter, 5HTT.

HPA Axis

The environment has the ability to affect brain development due early brain plasticity. The HPA axis seems especially vulnerable to early maltreatment effects. The HPA axis plays an important role in emotional regulation. Individuals with damage to these interacting brain structures are more likely to react hastily and impulsively to situational stressors and negative emotional states (Arens et al., 2012). Damage to the HPA axis seems to serve as a nexus between childhood trauma, impulsivity, and depression (Wanklyn, Day, Hart, & Girard, 2012).

MAOA-uVNTR Gene

The MAOA-uVNTR gene is responsible for regulating aggression and impulsivity. The MAOA-uVNTR gene is highly influenced by environmental factors such as childhood maltreatment (Reif et al., 2007). The MAOA-uVNTR gene can present as either a short or a long allele. The short allele has been associated with greater aggression and impulsivity risk in children and adults. Invalidating and abusive environments compound the risk of developing these traits (Foley et al., 2004; Huang et al., 2004; Reif et al., 2007). This risk is particularly important in males, as males seem to be most vulnerable to the interaction between the short MAOA-uVNTR allele and childhood abuse and neglect. This interaction seems to increase the risk of developing impulsive and antisocial traits in males, but the effect is seen less often in females (Huang et al., 2004).

Serotonin and 5HTT

The serotonin transporter 5HTT also appears involved in the expression of impulsivity and aggression following childhood maltreatment. 5HTT regulates the availability of synaptic serotonin, thereby balancing the amount of serotonin in the brain (Reif et al., 2007). In laboratory rats, abused and neglected offspring have lower levels of serotonin in their cerebral spinal fluid than do non-neglected rats (Meaney, 2001). These results have been replicated in humans. Impulsive and aggressive individuals who experienced maternal maltreatment tended to have lower levels of serotonin compared to non-neglected peers. Serotonin levels were particularly lower in the anterior cingulate cortex of the abused groups (Frankle et al., 2005; Reif et al., 2007). These biological findings further elucidate the perniciousness of childhood maltreatment and the effect it has on trait impulsivity and psychopathology.

IMPULSIVITY AND PSYCHOPATHOLOGY

Impulsivity and ADHD

Attention-Deficit/Hyperactivity Disorder (ADHD) is characterized by high levels of inattentiveness, impulsivity, and hyperactivity that are developmentally inappropriate and maladaptive. Inattention includes getting off task, lacking persistence, experiencing difficulty focusing, and disorganization. Hyperactivity includes excessive motor activity, such as tapping, talking, or fidgeting. Impulsivity can manifest behaviorally as interrupting and making rash decisions without thought of consequences. ADHD is a predominately childhood disorder, with a 5% prevalence rate in children and a 2.5% prevalence rate in adults (American Psychiatric Association, 2013).

The key feature of ADHD is the persistent pattern of impulsivity, hyperactivity, and inattention. These same features closely relate to childhood maltreatment, and can be consequences of childhood abuse and neglect. Children with a history of maltreatment and children with ADHD share common internalizing and externalizing behavioral problems, peer rejection, and cognitive difficulties. Families of children with ADHD and abusive families have similar difficulties with communication and interaction (Briscoe-Smith & Hinshaw, 2006). Investigations have uncovered an interaction between childhood maltreatment and ADHD.

Children who are abused and neglected have higher rates of ADHD (Becker-Blease & Freyd, 2008), specifically children who have been sexually abused or neglected (Briscoe-Smith & Hinshaw, 2006). Physical and sexual abuse may also account for up to 25% and 11% respectively of children with an ADHD diagnosis. In one sample of children with co-occurring Oppositional Defiance Disorder (ODD), 91% had a history of trauma, including childhood abuse (Ford et al., 2000).

Impulsivity serves an important role in the diagnosis of these abused and neglected children. Impulsivity appears to affect the way the children's symptoms manifest, as maltreated children seem to have more severe levels of impulsivity and inattention (but not hyperactivity) when compared to non-abused children with an ADHD diagnosis. Moreover, abused females have an earlier age of ADHD onset than would be expected, per the *DSM* criteria (Becker-Blease & Freyd, 2008). The differences in ADHD symptom presentation in abused children have led some experts to propose that there are two distinct groups of children with ADHD: those with abuse histories leading to their disorder, and those with genetic predispositions leading to the disorder (Webb, 2013).

Impulsivity, Childhood Maltreatment, and Personality Disorders

Childhood maltreatment is a risk factor for the development of personality disorders. The effects of abuse and neglect are found in clinical and community populations. Emotional, physical, and sexual abuse and neglect all correlate with increased levels of clinical and subclinical levels of personality disorders (Tyrka et al., 2007). Childhood maltreatment is implicated in many personality disorders, but it is especially prevalent in Schizotypal, Narcissistic, Antisocial (ASPD), and Borderline Personality Disorder (BPD; Afifi et al., 2010). ASPD and BPD have common symptomology and high rates of comorbidity. Impulsivity may be the common factor in these two personality disorders (Beauchaine et al., 2009; DeShong & Kurtz, 2013; Swann et al., 2009), and it is a criterion for diagnosis of both disorders (American Psychiatric Association, 2013).

Impulsivity and Antisocial Personality Disorder

ASPD is often associated with specific facets of impulsivity, such as problematic response inhibition, poor impulse control, and motor impulsiveness. ASPD has been associated with sensation seeking and a lack of premeditation, which are also facets of impulsivity (Swann et al., 2009). The Behavioral Activation System (BAS) and the Behavioral Inhibition System (BIS) are two internal motivational systems often discussed with ASPD. The BAS is sensitive to reward signals, and it increases goal-directed behavior and impulsivity. The BIS is sensitive to punishment signals, and it inhibits goal-directed

activity. Individuals with ASPD tend to be highly motivated by the BAS, have low levels of BIS functioning, and high levels of impulsivity (Broerman, Ross, & Corr, 2014). ADHD, Conduct Disorder, and ASPD often progress as a spectrum of developmental psychopathology disturbance. ADHD and Conduct Disorder are often comorbid, and disturbed conduct represents a central aspect of ASPD (Moran, 1999). Heightened impulsivity presents as a common element of all three conditions.

Impulsivity and Borderline Personality Disorder

Impulsivity is a key feature of BPD. As with ASPD, specific facets of impulsivity have been uniquely associated with BPD, such as negative urgency. Negative urgency is performing hasty acts during intense negative emotional states (DeShong & Kurtz, 2013). Negative urgency has been associated with characteristics of BPD like affective instability, gambling, substance abuse, non-suicidal self-injury, and suicide (Peters et al., 2013). Impulsivity appears permanently elevated in individuals with BPD, and this elevation does not differ based on the person's mood states (Boen et al., 2014). BPD patients exhibit impulsivity in two equally damaging ways. First, they tend to behave recklessly in ways such as gambling and substance abuse. Second, they show an alarming rate of non-suicidal self-injury, suicide attempts, and suicide completions in 8 to 10% of diagnoses (American Psychiatric Association, 2013).

While sexual abuse has been implicated in the etiology of BPD, emotional abuse and neglect warrants equal attention (Gratz, Latzman, Tull, Reynolds, and Lejuez, 2011). Linehan (1993) emphasized the role of an invalidating environment on the development of BPD, which is consistent with the description of emotional abuse. Invalidating environments seem to diminish the capacity of a child to manage negative emotion (Kim, Chicchetti, Rogosch, & Manly, 2009). Indeed, impulsivity and affective dysfunction seems to moderate the severity of BPD in 11 to 14 year old children (Gratz et al., 2011).

Like ASPD, BPD often occurs with ADHD. BPD and ADHD were comorbid for 38% of one adult sample, with impulsivity levels found to partially mediate this relationship (Ferrer et al., 2010). This is consistent with the expanded biosocial model of Linehan (1993), where poor impulse control, such as that seen in ADHD, is thought to emerge early in the development of BPD. Heightened emotional sensitivity is then a natural consequence of the negative reactions elicited by impulsive acts. Family factors like childhood maltreatment seem to amplify impulsivity, and they are included as a risk factor in this proposed expansion of the biosocial model (Crowell, Beauchaine, & Linehan, 2009).

PROPOSED DSM-5 DIMENSIONAL PERSONALITY MODEL

The publication of the *DSM-5* ushered in something of a moratorium regarding best practices for the measurement of maladaptive personality traits. The traditional *DSM* personality disorder conceptualizations were derived largely from theoretical writings and clinical reports, with a range of validity correlates emerging over the decades. The advent of factor analysis, however, has shown that maladaptive personality attributes can be defined and measured more reliably as trait dimensions ("domains") along with their more specific component "facets." Practitioners have tended to support the historic, theoretically derived

categorical symptom clusters, while researchers have lobbied for a dramatic reformulation of personality disturbance into these dimensional "five-factor" symptom clusters.

While the traditional model has been retained in the DSM-5, the merits of categorical versus dimensional personality disorder conceptualizations will continue to be vigorously debated. The task force called for systematic research on a proposed *DSM-6* "Alternative Model for the Personality Disorders" (p. 761) that would be based largely on dimensional measurements of five fundamental domains (Detachment versus Extraversion, Negative Affectivity versus Emotional Stability, Antagonism versus Agreeableness, Psychoticism versus Lucidity, and Disinhibition versus Consciousness). The task force encouraged the collection of investigative data on a new proposed personality pathology measurement inventory (PID-5; Personality Inventory for *DSM-5*) to inform the upcoming *DSM-6* task force about the validity of these collective 25 trait dimensions (American Psychiatric Association, 2013). Table 1 illustrates the proposed domains and their associated facets. The Disinhibition domain is of special interest for this chapter. This proposed dimensional model of personality disorders recognizes the potential role of trait impulsivity in the etiology of ASPD and BPD. Future ASPD diagnoses may require an elevation on six or more trait facets (Manipulativeness, Callousness, Deceitfulness, Hostility, Risk Taking, Impulsivity, and Irresponsibility) with three of these in the Disinhibition domain. Future BPD diagnoses may require an elevation on four or more trait facets (Emotional Lability, Anxiousness, Separation Insecurity, Depressivity, Impulsivity, Risk Taking, and Hostility) with at least one being Impulsivity, Risk Taking, or Hostility.

CURRENT STUDY

Original data were collected for purposes illustrating relationships between various forms of childhood maltreatment and the five PID-5 Disinhibition facet measures. Self-reported adult recollections of childhood maltreatment were hypothesized to predict higher levels of all five facet dimensions (Impulsivity, Irresponsibility, Distractibility, Risk Taking, and inversed Rigid Perfectionism).

Potential Confounds

Childhood maltreatment co-occurrence for different forms of abuse complicates current understanding of the impact of selected forms of developmental adversity. For example, childhood physical abuse has been found in 40% of families seeking protective shelter (McClosky, Figueredo, & Koss, 1995; O'Keefe, 1995), and childhood exposure to domestic violence may occur in up to half of families where physical abuse occurs (Carlson, 1991). Combined sexual and physical abuse occurred in 13% of one recent urban youth sample (Arata, Langhinrichsen-Rohling, Bowers, & O'Brien, 2007). Finkelhor, Ormrod, and Turner (2007) found that 18% of their national child sample experienced four or more different types of abuse during the previous year. Investigators are subsequently required to rely on statistical methods to tease out these co-occurring developmental effects. Uniform criteria for defining maltreatment have not been established, and researchers vary substantially in their definitions,

outcome measures, and the ways their research findings are generated and interpreted. It should be understood that cause and effect cannot be established from correlational data.

Table 1. DSM-5 Proposed Domain Traits and Facets

Domain	Facet
Disinhibition (vs. Conscientiousness)	Irresponsibility Impulsivity Distractibility Risk Taking (Lack of) Rigid Perfectionism
Negative Affectivity (vs. Emotional Stability)	Emotional Lability Anxiousness Separation Insecurity Submissiveness Hostility Perseveration Depressivity Suspiciousness (Lack of) Restricted Affectivity
Detachment (vs. Extraversion)	Withdrawal Intimacy Avoidance Anhedonia Depressivity Restricted Affectivity Suspiciousness
Antagonism (vs. Agreeableness)	Manipulativeness Deceitfulness Grandiosity Attention Seeking Callousness Hostility
Psychoticism (vs. Lucidity	Unusual Beliefs and Experiences Eccentricity Cognitive and Perceptual Dysregulation

Note. Adapted from the *DSM-5* (American Psychiatric Association, 2013).

METHOD

Participants and Procedure

Participants (N = 417) were recruited through Amazon's Mechanical Turk (MTurk). The study was limited to United States residents over 18 years of age. Participants were excluded (N = 16) from the analyses if they did not answer more than 25% of the questions.

After participants signed up for the study on MTurk, they were redirected to the survey on the university's Qualtrics website, which was titled Violent Experiences Survey. Before beginning, they gave informed consent to participate. Once they completed the study, they

received a code to enter on the MTurk website, confirming their participation. Participants received $.75 for the study, which took approximately 30 minutes to complete.

Materials

Violent Experiences Questionnaire (VEQ-R)

The Violent Experiences Questionnaire (VEQ-R: King, 2012; King, 2014; King, 2015) provides retrospective, self-report screening indices for 15 different forms of child and adolescent maltreatment. The Parental Physical Abuse (CPA), Sibling Physical Abuse (SPA), Observed Physical Abuse (OPA), Parent-Parent Consequences (PPC), Corporal Punishment (CORP), and Peer Bullying (BUL) subscales were examined in this study. VEQ-R scores indicate the number of days per year an act in the index group occurred during a 12-year recording period (ages 5 to 16) with scores ranging potentially from 0 to a maximum of 104. The CPA, SPA, and OPA scales all reflect the frequency of the same index acts (Physical acts with or without physical injury: pushing, shoving, shaking, striking, kicking, punching, beating, burning or use of a weapon to inflict pain or injury) perpetrated by either parent (or step-parent), a sibling, or parent-on-parent (or step-parent), respectively. The index events for PPC (police or other authorities summoned, public embarrassment, arrest(s), medical services needed, injury of family member, etc.), CORP (spanking or other forms of reasonable physical discipline producing mild to moderate pain without physical injury) and BUL (How often were you physically taunted or bullied by peers during or after school?) differed in nature of aggression.

Internal consistency and test-retest (one week) reliabilities have been established for all of these VEQ-R subscales (King, 2015): CPA (α = .83); SPA (α = .87); OPA (α = .86); PPC (α = .96); CORP (α = .74); and BULL (α = .82). VEQ and VEQ-R subscale scores have been linked previously to lab-provoked aggression (Moe, King, & Bailly, 2004), best friendship qualities (Green & King, 2008; Mugge, King, & Klophaus, 2009), multiple MMPI (King, Tuhy, & Harris, 1989) and MMPI-2 (Moe & King, 2006) dimensions, and mindfulness skill deficits (Walter & King, 2013). King (2014) found that various VEQ-R subscales (physical, sibling, exposure to domestic violence, and corporal punishment) predicted increased risks (three-to nine-fold) of past physical fighting, violence-related trouble, inflicting violent injury, and making threats to kill someone. The relative risk of a past suicide attempt was 2.5 times higher among bullied participants in this sample. College students reporting higher VEQ-R physical abuse or domestic violence also appear to cast less favorable first impressions on interaction partners and make more errors in predicting how they were viewed by others (King, in press). VEQ-R peer bullying scores have also been broadly linked to a range of self-report executive functioning indices (Mugge, Beauchman, & King, in press).

Sexual Abuse & Assault Self-Report

This 11-item sexual abuse and assault measure was made available through the Consortium of Longitudinal Studies on Child Abuse and Neglect (LONGSCAN) project coordinated at the University of North Carolina [www.unc.edu/depts/sph/longscan/]. This scale was developed for use with sexually victimized children and adolescents. Items contribute to Non-Contact, Actual (or Attempted) Fondling, Actual (or Attempted) Oral-Genital Contact, and Actual (or Attempted) Penetration. The stem items were modified

slightly for adult sampling (i.e., "genitalia" instead of "sexual parts", "rape" in place of "put a part of his body inside your private parts"). Respondents were also asked to identify the severity (three point scale) and developmental period (prior to age 13, between ages 13 and 16, or after age 16) of index events. Item examples included: "Someone made you look at something sexual like pictures or a movie"; "Someone touched your genitalia in some way"; "Someone put their mouth on your genitalia or made you put your mouth on their genitalia." Multiple concurrent validation indices are available on the LONGSCAN website.

Personality Inventory for DSM-5

The Personality Inventory for *DSM-5* (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012) is a 220-item instrument developed by the Personality and Personality Disorder workgroup of the *Diagnostic and Statistical Manual-5* (*DSM-5*; American Psychiatric Association, 2013). This inventory was created to investigate a hybrid model of personality disorders, detailed in the experimental section of the *DSM-5*. The PID-5 includes 25 lower-order trait facets, which combine to create five higher-order personality domains (Table 1). Each personality disorder has domain requirements for diagnosis (Quilty, Ayearst, Chmielewski, Pollock, & Bagby, 2013).

Items on the PID-5 are rated on a 4-point Likert-type scale (1 = *Very False or Often False;* 4 = *Very True or Often True*). To date, the PID-5 psychometric properties have been good, with acceptable construct validity (Wright, Pincus et al., 2012), convergent and discriminant validity (Ashton et al., 2012: Wright, Thomas, et al., 2012), personality disorder variance is substantially accounted for with the measure (Hopwood et al., 2012), and these have been tested and confirmed in a psychiatric sample (Quilty et al., 2013). In the present analysis, Disinhibition domain and associated facet scores were standardized into T-scores. Elevations were defined by a threshold of 1.5 standard deviations (SDs) above the mean ($T \geq 65$).

Extreme Group Assignments

Prior childh79 ood maltreatment studies have identified significant linear relationships between scale measures and criterion variables, with interpretive caution warranted due to the skew typically found in childhood abuse distributions. Correlation data are ideally supplemented by extreme group and relative risk analyses. "High" VEQ-R subscale scores have been defined in previous studies as the top 20% of the respective distribution. Participants in these analyses were assigned to abuse groups based on extreme VEQ-R subscale scores for Parental Physical Abuse (CPA > 14 incidents per year; > 168 total incidents; 80^{th} percentile), Observed Physical Abuse (OPA > 7 incidents per year; > 84 total incidents; 80^{th} percentile), Sibling Physical Abuse (SPA > 9 incidents per year; > 108 total incidents; 81^{st} percentile), Bullying (BUL > 5 incidents per year; > 60 total; 81^{st} percentile), Corporal Punishment (CORP > 8 incidents per year; > 96 total incidents; 79^{th} percentile), and Sexual Abuse (CSA > 9 total incidents; 79^{th} percentile).

Abuse Co-Occurrence

Table 2 shows the extent to which different forms of childhood maltreatment co-occurred in this study. In this sample, maltreatment group overlap was modest. About 48% (191/401)

of the sample were left without any maltreatment classification. The remaining participants met the criteria for one (21%), two (12%), three (7%), or more (12%) maltreatment group classifications. The overlap between any two selected abuse group categories averaged only about 10.33%.

RESULTS

Descriptive Statistics

The sample (n = 401) had a roughly equal gender distribution (53.9% male). Ages ranged from 18 to 80 years (M = 34.06, SD = 12.01). Ethnicity varied, as 45.6% were Asian, 43.1% were Caucasian, 3.7% were African American, 2.2% were Hispanic, 2.2% were bi-racial, 1.5% were Native American, and 1.5% were described as "other."

Table 2. VEQ-R Scale Elevation Co-Occurrence Rates within Total Sample (N = 401)

	Sexual Abuse (CSA)	Physical Abuse (CPA)	Observed Abuse (OPA)	Sibling Abuse (SPA)	Bullying (BUL)	Corporal Punishment (CORP)
M (Incidents/Yr)	3.35	9.08	6.69	7.88	9.76	9.63
SD	7.05	17.68	15.49	17.17	24.00	21.23
Extreme Group (*n*)	85	103	79	77	79	90
% of Total Sample	21.2%	25.7%	19.7%	19.2%	19.7%	22.4%
% Women	41.2%	51.5%	62.0%	51.9%	54.4%	43.3%
	Extreme Abuse Group Shared Cell Membership and Sample Percentage					
Physical Abuse	38 (9.5%)	-				
Observed Abuse	27 (6.7%)	60 (15%)	-			
Sibling Abuse	24 (6.0%)	51 (12.7%)	35 (8.7%)	-		
Bullying	26 (6.5%)	52 (13%)	43 (10.7%)	40 (10%)	-	
Corporal Punishment	28 (7.0%)	64 (16%)	44 (11%)	43 (10.7%)	45 (11.2%)	-

Note. VEQ-R = Violent Experiences Questionnaire. VEQ-R score thresholds set for Sexual Abuse (*>9 incidents*), Physical Abuse (*>168 incidents*), Observed Abuse (*>84 incidents*), Sibling Abuse (*>108 incidents*), Bullying (*>60 incidents*), and Corporal Punishment (*>96 incidents*) as summed over the 12 year recording period.

The top half of Table 2 presents descriptive statistics for Sexual Abuse (CSA), Physical Abuse (CPA), Observed Parental Abuse (OPA), Sibling Abuse (SPA), Bullying (BUL), and Corporal Punishment (CORP). Frequency distributions for all abuse variables were negatively skewed. Women (M = 8.76, SD = 17.78) reported more OPA than men (M = 4.91, SD =

13.00) during childhood, F (1,399) = 6.23, p = .013, d = .25. Women (M = 12.57, SD = 27.52) also reported more BUL than men (M = 7.36, SD = 20.28), F (1,399) = 4.73, p = .030, d = .22.

Gender differences otherwise were not found.

Table 3 presents correlations between the Disinhibition domain and associated facets on the 6 childhood maltreatment variables. Sexual Abuse (CSA), Physical Abuse (CPA), and Observed Physical Abuse (OPA) were all important predictors of Disinhibition and the related facets. Sibling Abuse (SPA), Bullying (BUL), and Corporal Punishment (CORP) had fewer than three significant associations to the domain or facet scores, and will not be considered further in this analysis.

A series of one-way ANOVAs were conducted to determine the main effects of the extreme abuse groups still in consideration on the Disinhibition domain and its associated facets. Table 4-6 demonstrates the results of these analyses. The Group Contrast Means represent the mean T-score in each category in the extreme abuse groups and the controls (participants not in the extreme abuse category). Table 4 includes results for CSA, Table 5 includes results for CPA, and Table 6 includes results for OPA.

Table 3. Correlations between Disinhibition Domain and Facets and Abuse for Total Sample (n = 401)

	Sexual Abuse (CSA)	Physical Abuse (CPA)	Observed Abuse (OPA)	Sibling Abuse (SPA)	Bullying (BUL)	Corporal Punishment (CORP)
Disinhibition	**.33****	.09	.09	**.12***	.09	.05
Impulsivity	**.36****	**.11***	**.12***	.09	.07	.06
Irresponsibility	**.36****	.04	.07	.09	.06	.02
Distractibility	**.30****	.06	.10	.08	**.12***	.03
Risk Taking	**.24****	**.24****	**.15****	**.14****	.05	**.21****
Rigid Perfectionism (Reverse Scored)	**-.28****	**-.12***	**-.15****	-.04	-.05	**-.12***

Note. Significant correlations are **bold; *p < .05; **p < .001**.

Table 4. Sexual Abuse Predictor of Disinhibition Domain and Facet T-Scores in a National Sample

	Group Mean Contrast				
	Abused	*Control*	*F*	*p*	*d*
Disinhibition	55.54	48.51	36.05	< **.001**	.70
Impulsivity	56.28	48.31	47.50	< **.001**	.80
Irresponsibility	55.54	48.51	35.99	< **.001**	.70
Distractibility	54.36	48.83	21.54	< **.001**	.55
Risk Taking	54.60	48.76	24.15	< **.001**	.58
Rigid Perfectionism (Reverse Scored)	51.10	45.90	19.00	< **.001**	.52

Note. Abused group (n = 85) defined by scores exceeding >9 total incidents. Control group (n = 316) represent the remainder of the sample. Significant probabilities are ***bolded***. Total sample M = 50, SD = 10.

Relative risks were calculated for participants in the extreme abuse categories in the sample. Relative risk (RR) calculations of trait elevations (T > 65) were tested using the online (http://statpages.org) *Interactive Statistical Pages* provided by J. C. Pezzullo (Associate Professor of Pharmacology and Biostatistics, Georgetown University). Table 7 provides a summary of these risk differences as a function of abuse group. Individuals in the Extreme Sexual Abuse category had a relative risk of 8.68 (p < .0001, 95% CI = 4.13, 18.24) of being elevated on the Impulsivity facet (> 1.5 *SDs*). Individuals in the Extreme Physical Abuse category had a relative risk of 3.31 (p = .0006, 95% CI = 1.67, 6.54) of being elevated on the Impulsivity facet. Individuals in the Extreme Domestic Violence category had a relative risk of 4.08 (p < .0001, 95% CI = 2.08, 7.98) of showing an elevation on the Impulsivity facet.

Table 5. Physical Abuse Predictor of Disinhibition Domain and Facet T-Scores in a National Sample

	Group Mean Contrast				
	Abused	*Control*	*F*	*p*	*d*
Disinhibition	51.35	49.53	2.54	.112	.18
Impulsivity	51.69	49.42	3.97	**.047**	.23
Irresponsibility	50.47	49.84	.30	.582	.06
Distractibility	50.83	49.71	.95	.330	.11
Risk Taking	52.11	49.27	6.27	**.013**	.28
Rigid Perfectionism (Reverse Scored)	49.20	50.28	.90	.344	.11

Note. Abused group (n = 103) defined by scores exceeding >14 incidents per year; >168 total incidents. Control group (n = 298) represent the remainder of the sample. Significant probabilities are ***bolded***. Total sample M = 50, SD = 10.

Table 6. Observed Physical Abuse Predictor of Disinhibition Domain and Facet T-Scores in a National Sample

	Group Mean Contrast				
	Abused	*Control*	*F*	*p*	*d*
Disinhibition	51.81	49.56	3.25	.072	.23
Impulsivity	52.53	49.38	6.41	**.012**	.32
Irresponsibility	51.36	49.67	1.82	.178	.17
Distractibility	51.53	49.63	2.30	.130	.19
Risk Taking	51.72	49.58	2.92	.089	.21
Rigid Perfectionism (Reverse Scored)	48.36	50.40	2.64	.105	.20

Note. Abused group (n = 79) defined by scores exceeding >7 incidents per year; >84 total incidents. Control group (n = 322) represent the remainder of the sample. Significant probabilities are ***bolded***. Total sample M = 50, SD = 10.

Sexual abuse posed elevated risks as well for Distractibility (RR = 2.32, p = .006, 95% CI = 1.28, 4.23), Irresponsibility (RR = 12.64, p < .0001, 95% CI = 7.76, 20.6), and Disinhibition

(*RR* = 3.88, *p* < .0001, 95% CI = 2.28, 6.62). Physical abuse posed elevated risks as well for Distractibility (*RR* = 3.38, *p* = .0001, 95% CI = 1.87, 6.08), Risk Taking (*RR* = 3.86, *p* = .01, 95% CI = 1.37, 10.85), and Disinhibition (*RR* = 2.31, *p* < .002, 95% CI = 1.34, 3.99). Domestic violence posed elevated risks as well for Distractibility (*RR* = 3.87, *p* < .0001, 95% CI = 2.17, 6.90), Irresponsibility (*RR* = 2.12, *p* = .02, 95% CI = 1.14, 3.95), Risk Taking (*RR* = 4.08, *p* = .007, 95% CI = 1.47, 11.28), and Disinhibition (*RR* = 2.72, *p* = .0003, 95% CI = 1.58, 4.68).

Table 7. Relative Risk Summary

	Sexual Abuse		Observed Violence		Physical Abuse	
	No	Yes	No	Yes	No	Yes
Disinhibition	22 (7.0%)	**23*** (27.1%)**	27 (8.4%)	**18*** (22.8%)**	25 (8.4%)	**20** (19.4%)**
Impulsivity	9 (2.8%)	**21*** (24.7%)**	15 (4.7%)	**15*** (19.0%)**	14 (4.7%)	**16*** (15.5%)**
Irresponsibility	19 (6.0%)	**19*** (22.4%)**	25 (7.8%)	**13* (16.5%)**	25 (8.4%)	13 (12.6%)
Distractibility	24 (6.6%)	**15** (17.6%)**	20 (6.2%)	**19*** (24.1%)**	18 (6.0%)	**21** (20.4%)**
Risk Taking	8 (2.5%)	6 (7.1%)	7 (2.2%)	**7** (8.9%)**	6 (2.0%)	**8* (7.8%)**
Rigid Perfectionism	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
N	316	85	322	79	298	103

Note. * p < .05, ** p < .01, *** p < .001 for relative risk of trait elevation posed by cell membership.

Interaction Analyses

A 2 (Gender) x 2 (Extreme Sexual Abuse) x 2 (Extreme Physical Abuse) x 2 (Extreme Observed Physical Abuse) Analysis of Variance (ANOVA) was conducted to determine if the Impulsivity facet varied as a function of these independent variables or their interaction. There was a significant main effect of gender, *F* (1, 385) = 14.04, *p* < .001, *d* = .68, such that men (*M* = 55.99, *SE* = 1.45, 95% CI = 53.13, 58.85) had higher Impulsivity scores than women (*M* = 49.18, *SE* = 1.09, 95% CI = 47.05, 51.32). There was a significant main effect of Extreme Sexual Abuse, *F* (1, 385) = 21.25, *p* < .001, *d* = .84, such that individuals in the extreme abuse group (*M* = 56.77, *SE* = 1.58, 95% CI = 53.66, 59.88) had higher Impulsivity scores than those not in the extreme group (*M* = 48.40, *SE* = .89, 95% CI = 46.64, 50.16). There was a significant main effect of Extreme Observed Physical Abuse, *F* (1,385) = 7.49, *p* = .007, *d* = .50, such that individuals in the extreme abuse group (*M* = 55.07, *SE* = 1.60, 95% CI = 51.93, 58.22) had higher Impulsivity scores than those not in the extreme group (*M* = 50.10, *SE* = 0.86, 95% CI = 48.41, 51.79) There was not a significant main effect of extreme physical abuse, *F* (1,385) = .67, *p* = .41, *ns*.

There was a significant two-way interaction between gender and Extreme Sexual Abuse, *F*(1,385) = 5.87, *p* = .017, *d* = .34. Men in the Extreme Sexual Abuse group (*M* = 61.59, *SE* = 2.01, 95% CI = 57.64, 65.53) had significantly higher Impulsivity scores than women in the Extreme Sexual Abuse group (*M* = 51.28, *SE* = 1.96, 95% CI = 47.43, 55.14), men not in the abuse group (*M* = 50.55, *SE* = 1.35, 95% CI = 47.88, 53.21), and women not in the abuse group (*M* = 48.34, *SE* = 1.28, 95% CI = 45.83, 50.86). Sexual abuse was more closely

associated with Impulsivity among men than were women in this sample. Other gender interactions were not found.

CONCLUSION

In this national sample of adult survey respondents, various forms of childhood maltreatment were associated with higher levels of trait impulsivity. About 25% of the sample met criteria for an extreme abuse category. Gender differences were relatively equal in the extreme categories, with the exception of Extreme Observed Parental Violence and Extreme Sexual Abuse. Women in this sample accounted for 62% of the cases in Extreme Observed Parental Violence, whereas men accounted for 59% of the cases in the Extreme Sexual Abuse category. In this sample, it appears women witnessed more violence between their parents, but men unexpectedly reported higher levels of sexual abuse. Indeed, these sexually abuse men averaged ten more points on their Impulsivity *T*-score than the sexually abused females. Around 21% of the total sample were identified as sexually abused which was more than double the 9% prevalence rate reported to the United States Department of Health and Human Services in 2012. The online anonymity of this method may have made disclosures more comfortable, especially for the men. This gender difference should reinforce concerns that (Maikovich-Fong & Jaffee, 2010) child sexual abuse may be underreported for boys in broader society.

The shared extreme group membership section of Table 2 also provided important information. Abuse categorical classifications did not co-occur that extensively in this sample, with overlap rates averaging only about 10%. Around 16% of parental physical abuse victims did describe extreme forms of corporal punishment as well. Additionally, 15% of the physically abused respondents observed domestic violence as well. This estimate did seem a bit lower than reported elsewhere in the literature. While emotional abuse and neglect often co-occur with sexual abuse (e.g., Berzenski & Yates, 2010), neither were measured by the VEQ-R or examined in this study. While significant associations between disinhibited personality facets and corporal punishment, peer bullying, and sibling abuse were limited, these three forms of childhood adversity warrant continued attention in the literature. While the impact of those experiences appears less direct than CPA or CSA, they still warrant attention as predictor variables, along with emotional abuse and neglect, in future studies.

Sexual abuse in this sample emerged as the strongest predictor of the Disinhibition domain and its associated facets. Impulsivity was most closely linked (r = .36) to sexual abuse, with the impact of physical abuse and exposure to domestic violence providing less salient predictors. Risk Taking was associated with all of the disinhibition facets except peer bullying.

Tables 4 through 6 provided group analyses of these maltreatment main effects. Effect sizes varied substantially in magnitude with sexual abuse being most salient for the Disinhibition domain (d = .70), Impulsivity (d = .80), and Irresponsibility (d = .70). Table 5 illustrates how these maltreatment-disinhibition links play out in terms of relative risks of extreme trait development in the aftermath of extreme forms of childhood maltreatment. The risk of extreme Impulsivity was increased 8.7, 4.1, and 3.3 by marked sexual, domestic, and physical abuse.

The dimensional model of personality disturbance proposed in the DSM-5 relies on the Impulsivity and Risk Taking facets in the diagnosis of ASPD and BPD. For BPD, an elevation on Impulsivity, Risk Taking, or Hostility would even be required for diagnosis. A substantial subset of respondents in this sample would have likely generated an Impulsivity elevation given their historical exposure to CSA, CPA, or exposure to domestic violence. The impact of aggregate maltreatment was not examined in this study, but it seems likely that co-occurring abuse might substantially elevate these relative risks for subsets of the public.

In the interaction analysis, there was a significant main effect of gender, and men in this sample tended to have higher levels of Impulsivity. Individuals in the extreme abuse categories also had higher levels of Impulsivity. One significant two-way interaction was noted, as men in the Extreme Sexual Abuse group had significantly higher levels of Impulsivity than sexually abused women and non-abused men and women. Table 2 demonstrated that more males in this sample reported sexual abuse, and the impact of that abuse was substantial.

In summary, this chapter provided a literature review of evidence linking trait impulsivity and other disinhibition indices to various forms of childhood maltreatment. This literature review was followed by analysis of original data that resulting in findings that were generally consistent with the basic hypothesis that impulsivity may be influenced by developmental adversity. Various forms of child maltreatment were contrasted in these analyses with emphasis given to the relative risk posed by childhood sexual abuse to the development of extreme forms of impulsivity and disinhibition. This review and these findings will hopefully encourage other research teams to extend these analyses in interesting and meaningful ways. The establishment of consistent links between childhood sexual abuse, physical abuse, and/or domestic violence will have to ultimately be followed by thoughtful efforts to identify and elucidate the specific aspects of maltreatment that seem most salient in mediating targeted adverse effects such as trait impulsivity.

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