Research article

Child maltreatment and risk behaviors: The roles of callous/unemotional traits and conscientiousness

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A B S T R A C T

Child maltreatment poses significant risk to the development of callous/unemotional traits as well as risk behaviors such as engaging in violence, having sex with strangers, and binge drinking. In the current study, the indirect pathway from child maltreatment to risk behaviors was examined via callous/unemotional traits; whereas the conscientious personality trait was tested as a moderator of this indirect pathway. Young adults and parents (N = 361; M_age = 19.14, SD = 1.44) completed questionnaires on child maltreatment histories, callousness/unemotional traits, personality characteristics, and risk behaviors. Structural equation modeling was used to examine the hypothesized direct, indirect and conditional indirect effects. Findings showed indirect links between the child maltreatment latent factor and physical fighting, having sex with strangers, and binge drinking via callous/unemotional traits. Furthermore, the conscientiousness personality type significantly buffered the connection between callous/unemotional traits and physical fighting, supporting a conditional indirect effects. Callous/unemotional traits are important factors in the underlying mechanism between child maltreatment and risk behaviors among young adults, and conscientiousness serves as a protective factor against violence. Preventive intervention programs and clinicians may benefit from focusing in addressing callous/unemotional traits among youth who report childhood maltreatment experiences as well as targeting conscientiousness as a protective factor.

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Introduction

Participation in risk behaviors peaks in emerging adulthood (e.g., Arnett, 1992; Pharao, Sim, Graham, Gross, & Hayne, 2011), making it an important developmental phase to study. Exposure to adverse rearing environments, such as those involving the maltreatment of children, potentiates significant risk for the development of risk behaviors during young adulthood such as violence (Smith, Ireland, & Thornberry, 2005; Wolfe, Scott, Wekerle, & Pittman, 2001), sexual risk-taking (Arriola, Louden, Doldren, & Fortenberry, 2005; Bornova, Gwadz, Kahler, Akin, & Lejuez, 2008), and substance use (Fergusson, Boden, & Horwood, 2008; Jasinski, Williams, & Siegel, 2000; Oshri, Rogosch, Burnette, & Cicchetti, 2011). However, why young adults with maltreatment histories are at increased risk for the development of risk behaviors is less clear. Growing research suggests that underlying emotional dysregulation and interacting personality traits might be involved in this path (Oshri, Rogosch, & Cicchetti, 2013). Thus, the present study utilizes a sample of young adults to examine the indirect paths

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from child maltreatment to various risk behaviors via individual differences in callous/unemotional traits. Subsequently, the utility of conscientious personality characteristics in buffering this indirect path is tested.

Child Maltreatment and Risk Behaviors

Research has empirically documented associations between adverse parenting and a wide range of risk behaviors in adolescence and young adulthood (Gilbert et al., 2009). More specifically, child maltreatment has been found to lead to increased alcohol use (Moran, Vuchinich, & Hall, 2004; Shin, Hong, & Wills, 2012; Shin, 2012), increased risky sexual behavior (Mason, Zimmerman, & Evans, 1998; Oshri, Tubman, & Burnette, 2012; Schraufnagel, Davis, George, & Norris, 2010), and aggressive, violent acts (Fang & Corso, 2007; Lee & Hoaken, 2007; Smith et al., 2005; White & Widom, 2003; Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004). Less is known about the process through which self-reported childhood adversity is related to risk behaviors in young adulthood. Growing developmental research on substance use in adolescents and young adults suggests that different problem behaviors with underlying emotion dysregulation bases (e.g., externalizing problems, impulsivity) mediate the link between childhood adversity and risk behaviors (e.g., Oshri et al., 2013; Tarter, Kirisci, Reynolds, & Mezzich, 2004). It may be the case that emotional coping strategies used by abused youth result in increased vulnerability for risky behavior in young adulthood. One of these candidate adaptations is callous/unemotional traits, which represent a specific emotion organization that is linked to poor behavioral inhibition. However, callous/unemotional traits have been infrequently tested in relation to child maltreatment and multiple distinct risk behaviors in young adulthood.

Child Maltreatment, Emotion Regulation, and Callous/Unemotional Traits

Experiences of child maltreatment have been connected to the development of callous/unemotional traits (Kimonis, Fanti, Isoma, & Donoghue, 2013), which are strong predictors of antisocial behaviors (Frick & White, 2008; Lynam, Miller, Vachon, Loeber, & Stouthamer-Loeber, 2009). Emotion regulation is an important developmental task that is consolidated during childhood in part through continuous and consistent positive socialization experiences with the main caretaker (Eisenberg & Morris, 2002; Gross, 1998). Children who experience maltreatment by parental figures may be at risk for the development of psychopathology (i.e., incapacitated emotion regulation) via undermined emotion regulation capacities (Cicchetti & Toth, 2005; Gilbert et al., 2009; Kim-Spoon, Cicchetti, & Rogosch, 2013). For example, high levels of callous/unemotional traits have been conceptualized as manifestations of emotional dysregulation. Specifically, callous/unemotional traits are characterized by the disrupted emotional processing of one’s own fear and another’s expression of distress (Blair, 2013; Frick & White, 2008).

Youth with elevated callous/unemotional traits are characterized as having a lack of feelings of guilt and empathy (Frick & White, 2008). The connection between child maltreatment and callous/unemotional traits has been recently theorized to reflect an adaptive emotional organization (Belsky & Pluess, 2013; Del Giudice, Ellis, & Shirtcliffe, 2011). Specifically, the Adaptive Calibration Model suggests that the organization of extreme patterns of emotional responsivity, such as callous/unemotional traits, arise as strategic coping responses aimed for adaption to stressful settings (Del Giudice et al., 2011). Youth who are exposed to adverse rearing environments cope via dampened stress responsivity, thereby shielding them emotionally from harsh relational patterns while subsequently increasing their vulnerability to participation in risky behaviors. Despite an emerging body of research that indicates that child maltreatment is significantly associated with the development of callous/unemotional traits, most of the empirical work has largely focused on clinical and incarcerated youth samples, limiting the generalizability of the findings (Kimonis, Fanti, et al., 2013; Kimonis, Cross, Howard, & Donoghue, 2013; Kimonis, Frick, Munoz, & Aucoin, 2008). Thus, an empirical examination of the indirect role that callous/unemotional traits may have in the development of risk behaviors in a non-clinical/incarcerated young adult sample is needed.

Callous/Unemotional Traits, Dysregulation, and Risk Behaviors

Callous/unemotional traits are defined as a general absence of guilt and empathy and are empirically attendant to dysregulated emotional arousal. Youth with elevated callous/unemotional traits exhibit reduced emotional arousal when exposed to other people’s distress cues (Blair, 1999; Pardini, Lochman, & Frick, 2003) and a flat fear reaction to distressing or potentially risky scenarios (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini et al., 2003). Consequently, increased callous/unemotional traits entail emotional unresponsiveness to negative reinforcement introduced by the environment (Hawes & Dadds, 2007; O’Brien and Frick, 1996). Frick and White (2008) have purported that underlying callous/unemotional traits are a dysregulated emotional processing of negative consequences as well as underdeveloped empathic responses. Specifically, youth with elevated callous/unemotional traits lack the ability to appropriately respond to perceived consequences associated with risk behaviors, hurting their decision-making abilities. Indeed, recent neurological studies add support to this hypothesis by showing associations between callous/unemotional traits and reduced amygdala responsivity (see Blair, 2013 for a review), which is an essential brain structure in decision-making that links emotional responses to experiences.

Callous/unemotional traits (i.e., insensitivity to fear and empathy) may represent a fitting adaptation to adversity (Belsky & Pluess, 2013; Del Giudice et al., 2011). However, adaptation to adversity is not without cost and has the potential to increase vulnerability for engagement in unique risk behaviors. Extant research has found strong associations between

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callous/unemotional traits and aggression and conduct problems (see Frick & White, 2008 for a review). Individuals with high callous/unemotional traits consistently engage in high rates of antisocial behavior, particularly violence toward others (Kimonis et al., 2014). Similarly, proactive aggression is even more pronounced in youth with high callous/unemotional traits (Kimonis et al., 2006). Limited research has utilized callous/unemotional traits in multivariate models that include other forms of risk-taking, such as sexual risk taking and substance abuse. Existing research reveals that children with co-morbid callous/unemotional traits and conduct disorder symptoms engage in earlier sexual intercourse (Wymbs et al., 2013) and higher rates of substance use in adolescence (Wymbs et al., 2012). Examining the influence of callous/unemotional traits on other risk behaviors than violence is critical because of callous/unemotional traits’ association with disinhibited behavior and dysregulation in emotional responsivity (Blair, 2013; Frick & White, 2008; Kimonis et al., 2006). This vulnerability within callous/unemotional traits may create differential associations with distinct types of risk factors. In the current study, the unempathic aspect of callous/unemotional traits is hypothesized as predisposing youth for violent acts (e.g., not experiencing empathy for those one fights) and the insensitivity to fear regarding negative reinforcement is hypothesized as predisposing youth for other risk-taking such as sexual risk-taking and substance abuse (e.g., ignoring the risk incurred by having sex with an unknown person or frequently becoming intoxicated).

The Protective Role of Conscientiousness

Personality characteristics are stable traits that influence how an individual interacts with the environment (Matthews, Deary, & Whiteman, 2003). Conscientiousness is a personality trait that captures an individual’s propensity to follow social norms for impulse control, to be goal-directed, and to engage in prosocial behavior (Jackson et al., 2010; Roberts, Jackson, Fayard, Edmonds, & Meints, 2009). These characteristics stand in sharp contrast to the antisocial behaviors typically displayed by individuals who have higher levels of callous/unemotional traits (Frick, Cornell, Barry, Bodin, & Dane, 2003). Furthermore, empirical evidence reports that conscientiousness and callous/unemotional traits are inversely correlated (Essau, Sasagawa, & Frick, 2006), whereas the link between conscientiousness and risk behaviors has shown equivocal results. For example, one study suggested that there are no significant links between conscientiousness and substance abuse or antisocial behaviors (Miller, Lynam, & Jones 2008), whereas another study purported negative associations (Flory, Lynam, Milich, Leukefeld, & Clayton, 2002). Albeit these diverse reports, the prosocial and duty-focused characteristics embedded in conscientiousness appear to be plausible protective factors in the indirect link between maltreatment and risk behaviors via callous/unemotional traits. Thus, vulnerability to risk behaviors created by the dampened emotional responsivity found in individuals with high callous/unemotional traits may be counteracted by a trait such as conscientiousness; that is high callous/unemotional youth with a personality-embedded predisposition to responsible, prosocial behaviors may be able to divert themselves from engaging in risky behavior in ways that high callous/unemotional youth without these personality characteristics may not.

The Present Study

In the present study, we aim to test a path model which links child maltreatment, callous/unemotional traits, conscientiousness, and various risk behaviors in a cross-sectional sample of young adults. Specifically, our first aim is to establish a direct link between experiences of maltreatment and elevated callous/unemotional traits. We hypothesize that the pathway will show a significant positive association. Our second aim is to test the indirect associations between maltreatment and multiple risk behaviors through elevations in callous/unemotional traits. We expect that child maltreatment severity and risk behaviors will be indirectly associated via elevations in callous/unemotional traits. Our third aim is to test for conditional indirect effects (Preacher, Rucker, & Hayes, 2007) by conscientiousness. We hypothesize that higher levels of conscientiousness will have a buffering effect, significantly reducing the indirect path from child maltreatment to risk outcomes via callous/unemotional traits.

Methods

Participants and Procedures

Data was collected from 361 participants who were undergraduate students in a U.S. public university (62% female; 87.2% white; $M_{\text{age}} = 19.1, SD_{\text{age}} = 1.7$). Participants were given research credit for an introductory psychology class for their participation. Participants gave written informed consent before participating in the study.

Measures

Child Maltreatment. Child maltreatment was assessed with the Child Abuse and Trauma Scale (CATS) (Sanders & Giolas, 1991), a 38-item self-report questionnaire with empirically-tested convergent validity against other measures of maltreatment (Higgins & McCabe, 2001). The current study uses the revised scales presented by Poythress, Skeem, and Lilienfeld (2006), which measures four types of maltreatment: physical (i.e., physical mistreatment or violence), sexual (i.e., traumatic sexual contact), verbal (i.e., insulting or damaging language), and emotional abuse (i.e., being unwanted and disliked). Four items
are used to assess physical abuse ($\alpha = 0.71$), three items for sexual abuse ($\alpha = 0.86$), three items for verbal abuse ($\alpha = 0.77$), and four items for emotional abuse ($\alpha = 0.82$). For each question, participants are asked to indicate the frequency at which each aspect of maltreatment (e.g., ‘Did your parents insult you or call you names?’) occurred during childhood and adolescence. Responses ranged from 0 (‘never’) to 4 (‘always’). Items averaged to create a mean score of each form of abuse. A confirmatory factor analysis was used to derive a factor of maltreatment from the four total subscale scores in order to better capture common variance between reports of various types of maltreatment (Brown, 2012).

**Callous/Unemotional Traits.** The Self-Report Psychopathy Scale-III (SRP) (Williams, Paulhus, & Hare, 2007) is a self-report measure of psychopathy that includes a subscale for callous/unemotional traits called the Callous Affect (SRP-CA) subscale ($\alpha = .80$). The Callous Affect subscale consists of 10 items that assess a lack of guilt and empathy (e.g., ‘I am often rude to other people’) and the impersonal use of others for one’s own gain (e.g., ‘I am not afraid to step on others to get what I want’). The SRP-III has been validated against other accepted measures of psychopathy (Williams, Nathanson, & Paulhus, 2003) and previous utilized as a direct measure of callous/unemotional traits (e.g., Andershed, Gustafson, Kerr, & Stattin, 2002).

**Risk Behaviors.** Three items from the Crime and Analogous Behavior Scale (Miller & Lynam, 2003) were used to measure a broad range of engagement in risk behaviors – one item assessing binge drinking (‘How many times in the past month have you had 5 or more drinks in a single day?’), one item assessing physical fights (‘How many times have you been in a physical fight with another individual in the last 12 months?’), and an item assessing risky sexual behavior (i.e., sex with a stranger; ‘How many times have you had sex with someone you had known for less than 24 hours in your lifetime?’). The three items showed moderate correlations, ranging from .28 and .33 ($\alpha = .43$).

**Conscientiousness.** Personality was assessed by the Revised NEO Personality Inventory (NEO PI-R). The NEO PI-R (Costa & McCrae, 1992) is a 240–item self-report measure of the five-factor model of personality (Norman, 1963) that has been validated against other measures of personality (Schunk, Kinder, & Kremer, 1997). The NEO PI-R assesses each of the domains of the five-factor model: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. The domain of conscientiousness is assessed with six subscales ($\alpha = .86$): competence, order, dutifulness, achievement striving, self-discipline, and deliberation. In the current study, both the self-report and informant-report versions of the NEO PI-R were used to assess participants’ conscientiousness. The participants filled out the self-report version with the other survey measures. Following the survey, participants’ parents were sent the informant version of the NEO PI-R and 143 informant-reports returned completed. Informant reports of personality have been found to be valid and are considered to be an ideal counterpart for self-reports for personality traits (Vazire, 2006). The participant self-report and parent informant-reports of participants’ conscientiousness were averaged to enhance construct validity. The aggregation of multiple reports of one’s personality has been shown to increase accuracy of personality assessment (McCrae & Costa, 1987).

**Demographics.** Age, gender, and minority status were used as covariates in the model. Age was coded as the participants’ age in years. Gender was coded as 0 = males and 1 = females. Minority status was coded as non-minority = 0 and minority = 1.

**Analytic Plan**

Data was modeled using Mplus Version 7.11 (Muthén & Muthén, 1998–2014). Missing data were handled with data imputation to account for non-response on the parent reports of participants’ personality. Structural equation modeling was used to examine the indirect associations between child maltreatment and risk behaviors via callous/unemotional traits as well as the moderating influence of conscientiousness on the associations between callous/unemotional traits and risk behaviors. Indirect links were assessed with the product-of-coefficients ($\alpha \beta$) approach (Fritz & MacKinnon, 2007). Conditional indirect effects were assessed using a procedure described by Preacher et al. (2007) and moderated mediation pathways were assessed by the conditional indirect approach. Statistical fit criteria suggested by Hu and Bentler (1999) were utilized to assess model fit.

**Results**

Descriptive statistics and bivariate correlations of the study variables are presented in Table 1. Callous/unemotional traits showed significant positive correlations to maltreatment subtypes and deviant behaviors. Participant and parent reports of conscientiousness showed significant negative correlations to risk behaviors, maltreatment subtypes, and callous/unemotional traits.

**Measurement Model**

Confirmatory factor analysis was used to assess the latent measurement model of child maltreatment (Brown, 2012). The latent factor of child maltreatment consisted of the four subtypes of maltreatment assessed (i.e., sexual, physical, emotional,
Table 1
Bivariate correlations, means, and standard deviations (N = 356).

<table>
<thead>
<tr>
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<th>1</th>
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<th>5</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physical Abuse</td>
<td>–</td>
<td>.54**</td>
<td></td>
<td>–</td>
<td>.37**</td>
<td></td>
<td>–</td>
<td>.63**</td>
<td></td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>2. Verbal Abuse</td>
<td></td>
<td>–</td>
<td>.19**</td>
<td>–</td>
<td>.16</td>
<td>.15</td>
<td>.13</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3. Sexual Abuse</td>
<td></td>
<td>.69**</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<td>–</td>
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<td>–</td>
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<tr>
<td>4. Emotional Abuse</td>
<td></td>
<td>.63**</td>
<td>.75**</td>
<td>.45**</td>
<td>–</td>
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<td>–</td>
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<td>–</td>
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</tr>
<tr>
<td>5. CU Traits</td>
<td></td>
<td>.19**</td>
<td>.16</td>
<td>.15</td>
<td>.13</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6. Conscientious (CR)</td>
<td>–.12</td>
<td>–.20</td>
<td>–.12</td>
<td>–.20</td>
<td>–.08</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7. Conscientious (PR)</td>
<td>–.04</td>
<td>–.08</td>
<td>–.07</td>
<td>–.07</td>
<td>–.21</td>
<td>.46</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>8. Physical Fights</td>
<td>.09</td>
<td>.11</td>
<td>.14</td>
<td>.70</td>
<td>.33</td>
<td>.02</td>
<td>–.11</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>9. Sex with Strangers</td>
<td>.15</td>
<td>.11</td>
<td>.19</td>
<td>.09</td>
<td>.27</td>
<td>–.10</td>
<td>–.08</td>
<td>.39</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>10. Binge Drinking</td>
<td>.05</td>
<td>.13</td>
<td>.11</td>
<td>.04</td>
<td>.22</td>
<td>–.24</td>
<td>–.18</td>
<td>.33</td>
<td>.28</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>11. Age</td>
<td>.06</td>
<td>.00</td>
<td>.05</td>
<td>.12</td>
<td>.05</td>
<td>.09</td>
<td>.05</td>
<td>.09</td>
<td>.15</td>
<td>.04</td>
<td>–</td>
</tr>
<tr>
<td>Mean</td>
<td>.27</td>
<td>.92</td>
<td>.16</td>
<td>.63</td>
<td>3.14</td>
<td>3.31</td>
<td>3.72</td>
<td>.19</td>
<td>.45</td>
<td>2.47</td>
<td>19.14</td>
</tr>
<tr>
<td>SD</td>
<td>.51</td>
<td>.87</td>
<td>.55</td>
<td>.90</td>
<td>8.91</td>
<td>.52</td>
<td>.70</td>
<td>.64</td>
<td>1.47</td>
<td>3.40</td>
<td>1.44</td>
</tr>
</tbody>
</table>

Note: Abuse variables are participants’ report of being abused. CU Traits = callous/emotional trait; CR = child report; PR = parent report.

* p < .05,
** p < .01.

Fig. 1. The indirect role of CU traits and moderating role of conscientiousness.

and verbal abuse). All factor loadings were moderate to large (λ > .50; Brown, 2012). The overall measurement model fit was very good: χ²(46) = 50.36, p = .31; CFI = .99; RMSEA = .02; SRMR = .07.

Child Maltreatment, Callous/Unemotional Traits, and Deviant Behavior

Fig. 1 presents the structural equation model evaluating the associations between child maltreatment, callous/unemotional traits, and risk behaviors. Age, gender, and minority status were included as covariates. Model fit was very good: χ²(46) = 50.36, p = .31; CFI = .99; RMSEA = .02; SRMR = .07 (Hu & Bentler, 1999). Males (β = -.58; p < .01) and minorities (β = .3; p < .01) reported higher callous/unemotional traits compared to females and non-minorities, respectively. Older participants were more likely to report having had sex with a stranger (β = .15; p < .01). Higher severities of child maltreatment were associated with higher reports of callous/unemotional traits (β = .23; p < .01). Child maltreatment did not have significant direct associations with physical fighting (β = .01; p = n.s.), sex with strangers (β = .09; p = n.s.), or binge drinking (β = .03; p = n.s.). Higher callous/unemotional traits were significantly associated with greater reports of physical fighting (β = .36; p < .01), sex with strangers (β = .25; p < .01), and binge drinking (β = .22; p < .01) (Fig. 1 and Table 2). Chi square difference
Table 2
Parameter estimates of direct and indirect effects (N = 361).

<table>
<thead>
<tr>
<th>Factor Loadings</th>
<th>λ (SE)</th>
<th>R²</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM → Sexual Abuse</td>
<td>.56 (.05)</td>
<td>.31</td>
<td>[.46, .66]</td>
</tr>
<tr>
<td>CM → Physical Abuse</td>
<td>.73 (.03)</td>
<td>.54</td>
<td>[.67, .79]</td>
</tr>
<tr>
<td>CM → Emotional Abuse</td>
<td>.88 (.02)</td>
<td>.78</td>
<td>[.84, .92]</td>
</tr>
<tr>
<td>CM → Verbal Abuse</td>
<td>.80 (.03)</td>
<td>.64</td>
<td>[.74, .86]</td>
</tr>
</tbody>
</table>

Direct Associations

<table>
<thead>
<tr>
<th>B (SE)</th>
<th>β</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM → CU Traits</td>
<td>.59 (.12)</td>
<td>.23</td>
</tr>
<tr>
<td>CM → Physical Fighting</td>
<td>.01 (.12)</td>
<td>.01</td>
</tr>
<tr>
<td>CM → Sex with Strangers</td>
<td>.41 (.27)</td>
<td>.09</td>
</tr>
<tr>
<td>CM → Binge Drinking</td>
<td>.28 (.65)</td>
<td>.03</td>
</tr>
<tr>
<td>CU Traits → Physical Fighting</td>
<td>.29 (.06)</td>
<td>.36</td>
</tr>
<tr>
<td>CU Traits → Sex with Strangers</td>
<td>.46 (.10)</td>
<td>.25</td>
</tr>
<tr>
<td>CU Traits → Binge Drinking</td>
<td>.92 (.25)</td>
<td>.22</td>
</tr>
<tr>
<td>CT → CU Traits</td>
<td>−.01 (.01)</td>
<td>−.05</td>
</tr>
<tr>
<td>CT → Physical Fighting</td>
<td>−.00 (.01)</td>
<td>−.01</td>
</tr>
<tr>
<td>CT → Sex with Strangers</td>
<td>−.01 (.02)</td>
<td>−.02</td>
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<tr>
<td>CT → Binge Drinking</td>
<td>−.08 (.05)</td>
<td>−.13</td>
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</tbody>
</table>

Indirect Associations (α*β)

<table>
<thead>
<tr>
<th>B (SE)</th>
<th>β</th>
<th>95% CI</th>
</tr>
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<tbody>
<tr>
<td>CM → CU Traits → Physical Fighting</td>
<td>.17 (.04)</td>
<td>.08</td>
</tr>
<tr>
<td>CM → CU Traits → Sex with Strangers</td>
<td>.27 (.08)</td>
<td>.06</td>
</tr>
<tr>
<td>CM → CU Traits → Binge Drinking</td>
<td>.54 (.18)</td>
<td>.05</td>
</tr>
</tbody>
</table>

Conditional Associations (W*β)

<table>
<thead>
<tr>
<th>B (SE)</th>
<th>β</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT × CU Traits → Physical Fighting</td>
<td>−.04 (.02)</td>
<td>−.24</td>
</tr>
<tr>
<td>CT × CU Traits → Sex with Strangers</td>
<td>−.02 (.03)</td>
<td>−.04</td>
</tr>
<tr>
<td>CT × CU Traits → Binge Drinking</td>
<td>−.10 (.08)</td>
<td>−.09</td>
</tr>
</tbody>
</table>

Covariates

<table>
<thead>
<tr>
<th>B (SE)</th>
<th>β</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender → CU Traits</td>
<td>−.94 (.06)</td>
<td>−.57</td>
</tr>
<tr>
<td>Minority Status → CU Traits</td>
<td>.24 (.07)</td>
<td>.30</td>
</tr>
<tr>
<td>Age → Sex with Strangers</td>
<td>.12 (.05)</td>
<td>.05</td>
</tr>
</tbody>
</table>

Note: Model fit was very good: χ²(46) = 50.36, p = .31; CFI = .99; RMSEA = .02; SRMR = .07. CM = Child maltreatment; CU Traits = Callous/unemotional traits; CT = Conscientious personality. Only significant covariate pathways were included in the final model.

Indirect Associations. The product-of-coefficients (α*β) approach (Fritz & MacKinnon, 2007) was used to test the indirect paths from the child maltreatment factor to each risk behavior via callous/unemotional traits. Child maltreatment via callous/unemotional traits was significantly associated with three of the risk behaviors outcomes: physical fighting (β = .08, SE = .02, 95% CI = [.05, .12]), sex with strangers (β = .06, SE = .02, 95% CI = [.03, .09]), and binge drinking (β = .05, SE = .02, 95% CI = [.02, .08]).

Conditional Indirect Effects. In order to formally probe the interaction between conscientiousness and callous/unemotional traits on risk behaviors, the conditional indirect approach was used (Preacher et al., 2007). Conscientiousness was not significantly associated with callous/unemotional traits (β = −.01; p = n.s.), physical fighting (β = .00; p = n.s.), sex with strangers (β = −.01; p = n.s.), or binge drinking (β = −.08; p = n.s.). The interaction of callous/unemotional traits and conscientiousness was significantly associated with physical fighting (β = −.24, p < .05) but not with sex with strangers (β = −.02, p = n.s.) or binge drinking (β = −.10, p = n.s.). In order to probe the interaction in the context of the indirect effects, the Johnson and Newman (1936) technique was employed (see Fig. 2). Specifically, the regions of significance of the conscientiousness × callous/unemotional interaction were explored. Individuals who reported lower levels of conscientiousness showed significantly stronger associations between callous/unemotional traits and physical fighting via callous/unemotional traits, whereas individuals who reported higher levels of conscientiousness showed significantly weaker associations between callous/unemotional traits and physical fighting.

tests revealed that the path from callous/unemotional traits to physical fighting was moderated by gender (Δχ² = 6.95; Δdf = 1) such that the association was stronger for males than for females.
Discussion

The current study contributes to the literature regarding the link between child maltreatment and multiple risk behaviors via callous/unemotional traits. Overall findings are consistent with research that has shown engagement in risk behaviors to be associated with previous experiences of child maltreatment (e.g., Gilbert et al., 2009) and concurrent elevation in callous/unemotional traits (e.g., Essau et al., 2006). The first aim was to test the direct associations between experiences of child maltreatment and callous/unemotional traits. Our results suggested that there are associations between the severity of self-reported maltreatment experiences as a child and subsequent elevated callous/unemotional traits. Other investigations have found a link between experiences of maltreatment and the subsequent development of psychopathy (Gao, Raine, Chan, Venables, & Mednick, 2010), though little empirical work has explored the relation between child maltreatment and callous/unemotional traits specifically. Confirming existing research (e.g., Kimonis, Frick, Munoz, & Aucoin, 2008), our findings showed a significant link between being maltreated and increased levels of callous/unemotional traits, potentiating callous/unemotional traits as a candidate adaptation to adversity that incurs a later liability toward risk.

The second aim was to test the indirect association between maltreatment and risk behaviors through elevations in callous/unemotional traits. Previous investigations have found that child maltreatment is related to a range of risk outcomes such as substance abuse (Oshri et al., 2013; Shin, Hong, & Wills, 2012), physical fighting (Smith, Ireland, & Thornberry, 2005), and engaging in risky sexual behavior (Oshri et al., 2012). Indeed, increased levels of callous/unemotional traits were positively associated with physical fighting, having sex with strangers, and binge drinking. Furthermore, our findings confirmed that the association between child maltreatment and risk behaviors was fully explained by an indirect path through callous/unemotional traits, adding further evidence to the mediational role of callous/unemotional traits in the trajectory from child maltreatment to various risk behaviors. Despite the lack of a direct link between child maltreatment and risk behaviors, this study supports the mediational mechanism of callous/unemotional traits in the pathway to multivariate risk.

The findings on the links among child maltreatment, callous/unemotional traits, and risk taking behavior support the theorization behind the Adaptive Calibration Model. According to this model, the development of callous/unemotional traits is regarded as a functional adaptation (i.e., coping strategy) to chronically stressful rearing environments in youth. As physically and/or psychologically harmful events occur, a child experiencing such events finds utility in becoming unresponsive to the stimuli. For example, a child who is maltreated may develop a fearless emotional disposition in an attempt to ward off a potential threat or depresses their natural emotional reaction to achieve increased readiness to strategically respond (i.e., attack or flee) (Del Giudice et al., 2011). Though adaptive during times of chronic adversity, callous/unemotional traits may engender a predisposition to dangerous acts via dysregulated emotional responses (e.g., flattened emotional arousal to foresee negative consequences, lack of empathic concern for others) (Frick & White, 2008). Accordingly, in the present
study callous/unemotional traits were positively associated with physical fighting, having sex with strangers, and binge drinking. Each of these behaviors has or can have negative outcomes for the self and others. Engaging in physical fighting can result in being beaten up or arrested; having sex with a stranger can lead to getting a sexually transmitted disease or unwittingly choosing a sexually violent partner; and binge drinking can end in experiencing a hangover or engagement in riskier behaviors. Furthermore, gender moderated the association between callous/unemotional traits and physical fighting. This interaction suggests that males with elevated callous/unemotional traits are at a greater risk for engaging in physical fighting than females with elevated callous/unemotional traits. This is consistent with previous research that finds that males are more likely than females to have elevated callous/unemotional traits (Miller, Watts, & Jones, 2011) as well as engagement in physical violence (Cleary, 2000). The lack of gender differences in the other examined paths may suggest that males and females are at comparable risk for having sex with strangers and binge drinking as a result of elevated callous/unemotional traits.

The third aim was to test the moderating influence of conscientiousness on the paths from callous/unemotional traits to risk behaviors. Conscientiousness has been previously found to be negatively related to callous/unemotional traits (Essau et al., 2006) as well as other risk outcomes (Flory et al., 2002). Our results supported our hypothesis regarding the buffering role that conscientiousness serves in the path from callous/unemotional traits to physical fighting. Though experiences of maltreatment can develop into a vulnerability for committing violence via callous/unemotional traits, being responsible and planful appears to counteract that susceptibility. Perhaps youth with jointly high callous/unemotional and conscientiousness traits are able to divert themselves from engaging in violence behaviors in ways that high callous/unemotional youth without conscientious personality traits may not, thus counteracting the risk associated with increased callous/unemotional traits. The lack of a moderation effect by conscientiousness in the association between callous/unemotional traits and having sex with strangers or binge drinking suggests differential relationships among conscientiousness, callous/unemotional traits, and various risk outcomes. The characteristics associated with a conscientious personality may not contrast risky sexual behavior and substance abuse in the same way that it does with violence. It may be that conscientiousness only serves as a protective factor against the unempathic aspect of callous/unemotional traits (e.g., feeling concern for those you want to fight), and less so against the insensitivity to negative reinforcement (e.g., foreseeing the consequences of having sex with someone you don’t know or having too many alcoholic drinks). There may be other personality traits or protective factors (e.g., motivation, religiosity) that moderate the pathways from callous/unemotional traits to sex with strangers and binge drinking. More research is needed to understand the protective role of conscientiousness in the path from callous/unemotional traits to violence as well as finding protective factors in the paths from callous/unemotional traits to sexual risk-taking and substance abuse.

Limitations

The current study utilized a sample of college undergraduates, which limits the generalizability of these findings. However, much previous research has examined the development of callous/unemotional traits among clinical or adjudicated samples (Frick & White, 2008). College samples are an important population to study due to their high risk for participation in risk behaviors, though the normative nature of risk-taking for this age group may also limit the generalizability of these findings. In addition to self-report measures (i.e., of child maltreatment, callous/unemotional traits, risk behaviors, and personality), the present investigation included parent reports of personality which enhanced the measurement validity while reducing shared variance effect. However, there were missing data for parents’ reports of personality. The impact of this limitation was addressed through multiple imputation, though non-missing data would be preferred. Also, some of the parents who reported participants’ personality were reported as previously abusive by the participants and these abusive parents may have an impeded view of their children’s personality. Furthermore, though combining reports of personality has been shown to improve accuracy (McCrae & Costa, 1987), this method is not without limitation. Results regarding the moderating role of conscientiousness should be interpreted with caution. Next, the risk taking outcomes (i.e., physical fighting, having sex with strangers, and binge drinking) were assessed by single items in order to test each item’s unique predicted variance. Though this method tolerates smaller sample sizes, it incurs a limitation to the study’s findings as these items represent complex phenomenon (i.e., violence, sexual risk-taking, and substance abuse). Lastly, the study utilized a cross-sectional design, limiting the ability to deduct any causal implications from the examined models as well as the temporal ordering of the examined model (e.g., child maltreatment may lead to risk-taking which in turn leads to higher callous/unemotional traits). However, obtaining longitudinal data requires substantial resources which renders cross-sectional data an important initial step in testing tentative theoretical and empirical models.

Implications

The findings have several implications for future research. First, callous/unemotional traits can be contextualized as potential outcomes of early adversity. Second, researchers can treat callous/unemotional traits as a predictor of a wide range of risk behaviors in addition to delinquent and violent behavior. Third, personality types should be considered when examining the impact that callous/unemotional traits have on various risk outcomes. Specifically, future research can examine how conscientiousness counteracts a predisposition toward violence, which is prevalent among youth with elevated callous/unemotional traits. Furthermore, our sample was comprised of college undergraduates, which suggests that...
callous/unemotional traits can be used as a risk assessment outside of clinical, incarcerated, and other at-risk youth populations. Lastly, our findings are broadly consistent with prior findings which suggest that youth in chronically stressful environments might develop emotional coping strategies which can turn less functional in later developmental stages (e.g., Del Giudice et al., 2011).

The current study bears implications for clinical practice and programmatic intervention. Understanding the protective influence of conscientiousness could have important implications for clinical practice and interventions. Clinicians working with victims of child maltreatment can assess for callous/unemotional traits in an attempt to understand the changes their clients underwent as an adaptation to early adversity as well as identifying potential vulnerability toward a range of risk outcomes. Also, clinicians can see personality traits such as conscientiousness as a potential place of strength against the negative outcomes associated with the liability incurred by callous/unemotional traits and address that as such with their clients. Programs targeting maltreated youth would benefit from being aware of callous/unemotional traits, the various risk outcomes that may be associated with callous/unemotional traits, and the potential buffering effect of conscientiousness in the pathway from callous/unemotional traits to risk behaviors.

References
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