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Child maltreatment types and risk behaviors: Associations with attachment style and emotion regulation dimensions

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ABSTRACT

Child maltreatment is a robust psychosocial risk factor linked to the development of a wide range of risk behaviors among young adults. Adult attachment style and emotion dysregulation are two potential mechanisms through which maltreatment leads to risk behaviors. Yet, less is known about the specificity of the relations among different maltreatment types, attachment styles, emotion regulation strategies, and risk behaviors. The present study examined the relations among various forms of maltreatment and risk behaviors (e.g., substance use; risky sex) among 361 undergraduate students and tested whether attachment styles and emotion dysregulation might underlie these relations. Emotional, and sexual but not verbal abuse (although verbal abuse was directly related to alcohol use), were related to anxious and avoidant attachment styles, emotion dysregulation, and a variety of risk behaviors. Among the emotion regulation dimensions, impulsivity showed the strongest indirect effect from child maltreatment to risk behaviors. Results support a cross-sectional link between child maltreatment and risk behavior outcomes via attachment styles and emotion regulation. Implications for treatment and prevention of these risk behaviors in young adults are discussed.

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1. Introduction

Child maltreatment is associated with a variety of risk behaviors, yet the specific mechanisms that underlie this link are not fully understood. Difficulties with attachment style and emotion regulation (ER) are two factors that have received extensive empirical support in relation to both child maltreatment and risk behaviors (English & John, 2013; Gratz, Paulson, Jakupcak, & Tull, 2009; Maughan & Cicchetti, 2002; Wekerle & Wolfe, 1998). In fact, attachment quality and ER are primary developmental processes that can be affected by child maltreatment (Cicchetti & Valentino, 2006), turning these factors into putative mechanisms through which child maltreatment may lead to risk behaviors. More research is needed examining both maltreatment and ER in a less narrow (uni or bidimensional) manner (English & John, 2013; Maughan & Cicchetti, 2002), which may obscure differences found when using more multifaceted articulated measures. The current study examines the specificity of linkages between child maltreatment types (e.g., emotional, sexual abuse), adult attachment styles (i.e., anxious and avoidant), ER dimensions (e.g., clarity, nonacceptance), and risk behaviors (e.g., alcohol use; antisocial behaviors) using a cross-sectional sample of young adults. Subsequently, indirect linkages between maltreatment and risk behaviors were tested via attachment styles and ER dimensions.

1.1. Child maltreatment and risk behaviors

Child maltreatment poses challenges that can channel victims into maladaptive developmental pathways eventuating in risk behavior participation over time. For instance, adolescents and young adults with child maltreatment histories report greater participation in sexual risk behaviors (Hussey, Chang, & Kotch, 2006), cannabis use (Oshri, Rogosch, & Cicchetti, 2013), and alcohol use (Shin, Miller, & Teicher, 2013). The experience of chronic stress in childhood may permeate and disrupt multiple stage-salient tasks (e.g., relational and self-regulatory capacities) that continue to develop throughout adolescence and young adulthood (Cicchetti & Toth, 2005). Although research has shown specific associations from different types of maltreatment and risk taking behaviors (Oshri, Tubman, & Burnette, 2012), more research is needed on the specific relations of adult attachment styles and ER dimensions in explaining the connection between child maltreatment and participation in various risk behaviors.

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1.2. Attachment style

Attachment theory postulates that children develop the ability to regulate their emotions through supportive, sensitive parenting and secure attachment (Bowlby, 1969/1982). Attachment organization is theorized to be an evolutionary mechanism that serves the individual in coping with stressful situations. However, if parents are abusive or unavailable, children are likely to develop an insecure attachment style (e.g., anxiety) as attempts to seek out attachment figures do not provide relief from stress or fear (Mikulincer, Shaver, & Pereg, 2003). The impact of child maltreatment on attachment is established in childhood (Stronach et al., 2011), with this effect remaining relatively stable through adulthood (Weinfeld, Sroufe, & Egeland, 2000). Adult relationship researchers extended the concept of childhood attachment into adulthood using two insecure attachment dimensions (anxious and avoidant). Anxious individuals fear abandonment, are obsessive, and desire high levels of reciprocity with others whereas avoidant individuals fear intimacy and closeness and avoid committed relationships (Hazan & Shaver, 1987). Recent studies demonstrate that an insecure attachment style is a risk factor for engagement in antisocial behaviors (e.g., Allen, Porter, McFarland, McElhaney, & Marsh, 2007). Missing is research that can delineate the link between different types of child maltreatment, the two attachment styles and risk behaviors.

1.3. Emotion regulation

ER is formed through a range of socialization experiences during development (Aldao, Nolen-Hoeksema, & Schweizer, 2010) and is composed of multiple facets reflecting the individual's strategies to achieve emotional control. For example, attention to the occurrence of various emotions and the ability to correctly identify emotions are thought to be central to effective emotion modulation. Similarly, awareness, acceptance, and use of effective strategies to modulate emotions and subsequent arousal have been shown to play a key role in ER (Gratz & Roemer, 2004). The greatest plasticity of ER occurs during childhood and adolescence when cognitive and emotional capacities are rapidly forming (John & Gross, 2004). Parents and other caregivers serve as the primary source of emotion socialization in childhood and adolescence, and abusive parenting is related to poor ER strategies among children (Shipman & Zeman, 2001). For example, experiential avoidance has been hypothesized and recently shown as one behavioral characteristic that affects the risk for psychological difficulties linked to experiences of childhood abuse (Gratz, Bornovalova, Delany-Brumse, Nick, & Lejue, 2007). Theoretically, in the process of evaluating and interpreting their emotions, abuse victims may be reinforced via secondary emotional responses (e.g., anxiety) to avoid "aversive" emotions (Gratz et al., 2007). Maladaptive emotion regulation strategies are associated with multiple risk behaviors (Simons, Maisto, & Wray, 2010). Thus, child maltreatment may be linked with risk behaviors via ineffective ER strategies. An effective test of this hypothesis requires the use of a multivariate analytic strategy such as structural equation modeling that can parse relevant constructs into specific and smaller components while accounting for their shared method error variances.

1.4. The present investigation

The aim of the present study is to examine the direct and indirect effects that account for the multivariate associations between child maltreatment types and risk behaviors in young adults. The specific hypotheses and aims of the present study are as follows. First, we examine the specificity of associations between child maltreatment types, attachment anxiety and avoidance, and with six dimensions of ER. Second, the study tests which adult attachment styles and emotional regulation dimensions are most strongly related with four risk behaviors: alcohol use, drug use, condom use, and antisocial behaviors. Lastly, the last aim is to identify direct and indirect linkages between child maltreatment types and risk behaviors via attachment styles and ER dimensions. We hypothesize significant indirect links between child maltreatment types and risk behaviors via insecure attachment styles and reduced ER.

2. Methods

2.1. Participants

Participants were 361 undergraduate students in a U.S. public University (225 women and 135 men; 1 unknown). 315 participants were White, 16 were Black, 15 were Asian, and 9 were of Hispanic ethnicity; 6 chose "other" for their racial/ethnic status. Mean age was 19.1 (SD = 1.7, range 19–32). Participants completed the assessments in small groups in a classroom setting with sufficient space from one another to allow for privacy; they received research credit for their participation. Written informed consent was obtained from each participant.

2.2. Measures (alphas reported for the current sample)

2.2.1. Child abuse and trauma scale (CATS)

The CATS (Sanders & Giolas, 1991) is a 38-item self-report measure (0 = Never to 5 = always) in which items are summed then averaged to form each subscale: of physical, verbal, emotional, and sexual abuse. Revised subscales were used on the basis of analyses presented by Poythress, Skeem, and Lilienfeld (2006). Four items were used to assess physical abuse and emotional abuse ($\alpha = 0.71$, $\alpha = 0.82$, respectively), and three items were used for verbal abuse and sexual abuse ($\alpha = 0.77$, $\alpha = 0.86$, respectively).

2.2.2. Experiences in close relationships – Revised scale (ECR-R)

The ECR-R is a 36-item self-report measure of adult attachment consisting of two subscales: (1) anxiety and (2) avoidance (Fraley, Waller, & Brennan, 2000). Both anxiety ($\alpha = 0.92$) and avoidance ($\alpha = 0.93$) were measured with 18 items answered on a 1 = Strongly Disagree to 7 = Strongly Agree scale. Items were summed and averaged to form each subscale. High scores represent a more insecure attachment, either anxious or avoidant, while low scores represent a more secure attachment style.

2.2.3. Difficulties in Emotion Regulation Scale (DERS)

The DERS (Gratz & Roemer, 2004) is a 36-item self-report measure (1 = Almost Never to 5 = Almost Always) of difficulties with ER. The DERS comprises six subscales: (1) *clarity* – lack of clarity of emotional responses ($\alpha = 0.78$), (2) *strategies* – limited access to ER strategies perceived as effective ($\alpha = 0.89$), (3) *awareness* – lack of awareness of emotional reactions ($\alpha = 0.74$), (4) *impulsivity* – difficulties controlling behavior when experiencing negative emotions ($\alpha = 0.84$), (5) *goals* – difficulties engaging in goal-directed behaviors when experiencing negative emotions ($\alpha = 0.84$), and (6) *nonacceptance* – lack of acceptance of emotional responses ($\alpha = 0.89$). High scores for each subscale represents greater difficulty in that domain of ER.

2.2.4. Alcohol use/drug use/condom use

Five z-scored items from the Crime and Analogous Behavior (CAB) scale (Miller & Lynam, 2003) were used to measure alcohol use (i.e. use of alcohol, age of first use, current pattern of use, ever binge drinking, number of binge drinking episodes in the last

month; $\alpha = 0.40$). The total drug use score, composed of the sum of five items from the CAB scale, was used to measure drug use ($\alpha = 0.60$). Participants were asked if they ever used alcohol, marijuana, cocaine or crack, psychedelics, or "hard drugs" (e.g., heroin). Response categories were 0 = No and 1 = Yes with total scores indicating the number of "yes" responses, with scores ranging from 0 to 5. The low alphas requires some caution when interpreting the results. Condom use was measured with the item "When having sex with someone you are NOT in a relationship with, how often do you use condoms?" Response categories were 0 = never to 4 = always. Higher scores indicated more frequent condom use.

2.2.5. Antisocial behavior

A total summation score of ten additional items from the CAB scale was used to measure antisocial behavior ($\alpha = 0.64$). Examples of items used include ""Have you ever taken something not belonging to you worth less than $50?" and "Have you ever attacked another person with a weapon with the intent to injure, rape, or kill?" Response categories were 0 = No and 1 = Yes with total scores indicating the number of "yes" responses. To account for non-normality (slight kurtosis), the final variable was transformed using log transformation.

2.2.6. Covariates

Participant sex and age were entered as covariates in each model. Participant sex was coded so that 0 = male and 1 = female.

2.3. Data analytic plan

Data were analyzed using Mplus Version 7.11 (Muthén & Muthén, 2012). Minimal missing data (i.e., 1%) were modeled under the missing-at-random assumption (Schafer & Graham, 2002). The SEM analyses were performed using the robust maximum likelihood (MLR) estimator to account for data non-normality identified in the health risk behavior indicators. Competing indirect associations were evaluated using the distribution of the product approach, using bias-corrected bootstrap (5000 replications) confidence intervals (Preacher & Hayes, 2008).

3. Results

3.1. Descriptive analyses

Table 1 summarizes the bivariate zero-order correlations among the variables included in this study.

3.2. Evaluation of structural model

3.2.1. Child maltreatment, attachment, and risk behaviors

An SEM model was run to evaluate specific paths between maltreatment types, attachment styles, and risk behaviors. Insignificant paths were trimmed from the final model, resulting in the removal of physical abuse (see Fig. 1). Verbal abuse was unrelated to either attachment style but was significantly, positively related to alcohol use ($\beta = .20$, $p = .002$) and antisocial behavior ($\beta = .13$, $p = .027$; see Table 2). Sexual abuse was positively related to anxious ($\beta = .11$, $p = .013$) and avoidant attachment ($\beta = .19$, $p = .001$), alcohol ($\beta = .10$, $p = .035$) and drug use ($\beta = .08$, $p = .048$), and negatively related to condom use ($\beta = -.11$, $p = .011$). Emotional abuse was significantly, positively related to anxious ($\beta = .30$, $p = .001$) and avoidant ($\beta = .15$, $p = .010$) attachment, antisocial behavior ($\beta = .15$, $p = .012$), and was negatively related to alcohol use ($\beta = -.24$, $p = .001$). Last, anxious attachment was positively related to alcohol use ($\beta = .14$, $p = .001$), and avoidant attachment was positively related to drug use ($\beta = .09$, $p = .025$) and antisocial behavior ($\beta = .10$, $p = .028$). Next, we tested and found that the indirect links from child maltreatment types to risk behaviors via both anxious and avoidant attachment styles were all significant (Table 2).

3.2.2. Child maltreatment, emotion regulation, & risk behaviors

An SEM model was run to evaluate specific paths between maltreatment types, ER dimensions, and risk behaviors (see Fig. 2).

Table 1
Zero order correlations for study variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Abuse																		
1. Physical	–																	
2. Verbal	.54**	–																
3. Sexual	.69**	.37**	–															
4. Emotional	.63**	.75**	.45**	–														
Attachment																		
5. Anxiety	.26**	.31**	.24**	.35**	–													
6. Avoidance	.22**	.18**	.24**	.22**	.52**	–												
Emotion regulation																		
7. Clarity	.27**	.32**	.27**	.34**	.44**	.34**	–											
8. Strategies	.26**	.33**	.24**	.37**	.51**	.23**	.53**	–										
9. Awareness	.14**	.04	.15**	.05	.10	.27**	.35**	.04	–									
10. Impulse	.32**	.34**	.28**	.35**	.38**	.24**	.53**	.70**	.16**	–								
11 Goals	.13*	.23**	.10	.28**	.31**	.09	.28**	.50**	−.07	.44**	–							
12. Nonacceptance	.23**	.32**	.26**	.34**	.45**	.28**	.52**	.63**	.10	.55**	.42**	–						
Risk behaviors																		
13. Alcohol Use	−.01	.12*	.07	−.02	.12*	.12*	.14**	.10	.12*	.17**	.05	.11*	–					
14. Drug Use	.02	.11*	.10	.08	.05	.14*	.16**	.13*	.11*	.23**	.05	.08	.65**	–				
15. Condom Use	−.13	−.15*	−.11	−.14*	−.01	−.01	−.10	−.09	−.14**	−.17**	.05	−.04	−.26**	−.38**	–			
16. Antisocial behavior	.14**	.26**	.15**	.22**	.12*	.16**	.19**	.13*	.14**	.26**	.11*	.15**	.34**	.51**	−.31**	–		
17. Age	.06	.05	.00	.12*	.01	−.01	.02	.08	.06	.05	.08	.07	.10	.21**	−.08	.08	–	
18. Sex	.00	.09	.00	.17**	.02	−.01	.10	.06	−.13*	−.02	.09	.09	−.12*	−.08	.11**	−.33**	−.02	–
Mean	0.22	0.92	0.16	0.63	3.34	3.02	2.09	1.95	2.28	1.79	2.96	2.21	−0.04	1.47	4.33	0.69	19.11	0.62
Std. Dev.	0.51	0.87	0.55	0.90	1.18	1.09	0.71	0.82	0.68	0.73	1.00	0.93	0.67	1.07	1.32	0.58	1.68	0.49

Note: $N = 361$; Sex coded as 0 = male, 1 = female.
* $p < .05$.
** $p < .01$.

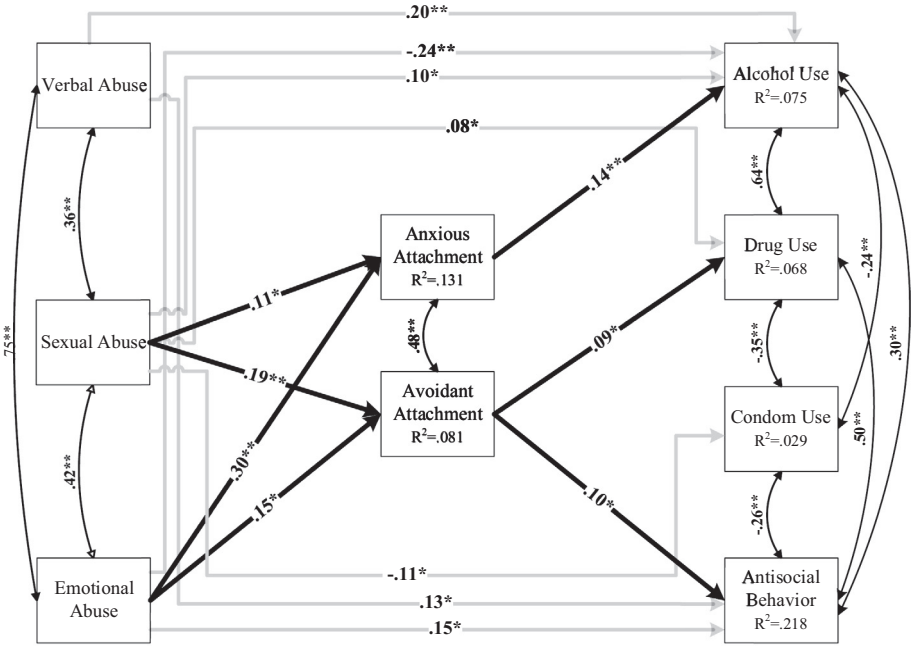

Fig. 1. Model 1 with paths between child maltreatment, attachment, and risk behavior observed variables. *Note*: Age and sex entered as covariates. Standardized betas presented.

Insignificant paths were trimmed for the final model, resulting in the removal of physical abuse and four DERS subscales from the model: clarity, strategies, awareness, and nonacceptance. As shown in Table 3, verbal abuse was unrelated to the DERS subscales but was positively related to alcohol use ($\beta = .21$, $p = .001$). Sexual abuse was positively related to impulsivity ($\beta = .17$, $p = .001$). Emotional abuse was positively related to both impulsivity ($\beta = .29$, $p = .001$) and goals ($\beta = .28$, $p = .001$). Further, emotional abuse was negatively related to alcohol use ($\beta = -.21$, $p = .002$) and positively related to antisocial behavior ($\beta = .21$, $p = .001$). In relation to the ER dimensions, impulsivity was positively related to alcohol use ($\beta = .17$, $p = .002$), drug use ($\beta = .22$, $p = .001$), and antisocial behavior ($\beta = .18$, $p = .001$), and negatively related to condom use ($\beta = -.22$, $p = .001$). Last, goals was positively related to condom use ($\beta = .13$, $p = .017$). Significant indirect links from the child maltreatment types to risk behaviors via the DERS subscales of impulsivity and goals were found (see Table 3).

4. Discussion

The effect of maltreatment on adolescents' and young adults' risk behaviors has been well documented (Oshri et al., 2013). However, more research is needed to delineate the specific underlying mechanisms of this link. Findings from the current study support the organizational perspective embedded within the developmental psychopathology paradigm in suggesting that environmental stress during childhood generates a cascade of vulnerabilities through disrupted attachment organization, compromised ER, and subsequent engagement in risk behaviors (Cicchetti, 2006).

In line with the first hypothesis, the current findings revealed diverse associations between types of child maltreatment and dimensions of attachment and ER. The differential associations were evident, for example, when sexual abuse and emotional abuse were each significantly associated with avoidant and anxious attachment as well as some of the DERS subscales, whereas verbal abuse was not a significant predictor of either type of adult attachment or any of the DERS subscales. These heterogeneous associations between child maltreatment and attachment style highlight the importance of exploring specificity of the relations involving different types of abuse. From a developmental psychopathology perspective, early adverse experiences can impact multiple developmental processes which can eventuate in similar (equifinality) or different behavioral outcomes (multifinality; Cicchetti, & Valentino, 2006). For example, emotional and sexual abuse are distinct maltreatment types, yet they are conjointly linked to the same attachment dimensions (anxiety and avoidance), results that are compatible with the concept of equifinality. In line with the notion of multifinality, inconsistent condom use as well as alcohol and drug use were associated directly with sexual abuse. The link from verbal abuse to alcohol use may be suggestive of disrupted processes not measured in present study (e.g., self-concepts).

In addition, maltreatment types manifested differential associations with the ER dimensions. After trimming insignificant paths, sexual abuse was significantly and positively related to compromised impulse control, whereas emotional abuse was linked to impulsivity and problems with behaving in accordance with desired goals. Verbal abuse was unrelated to the DERS dimensions but was related to alcohol use. These results confirm the hypothesis that child maltreatment is an important psychosocial stressor related to individuals' relational abilities, encompassed by attachment and ER capacity (Crowell, Skidmore, Rau, & Williams, 2013).

Congruent with our second hypothesis, insecure attachment styles were significantly related to risk behaviors. Anxious attachment was linked to alcohol use, whereas avoidant attachment showed significant associations with drug use and antisocial behaviors. The differential relations found between attachment style and risk behaviors are informative in understanding individual variability existing in the etiology of risk behaviors. Anxious individuals may be more sensitive to peer rejection, which may make them more vulnerable to peer influence in intensely social environments such as college where drinking is normative (Purdie & Downey, 2000). In the context of child trauma, individuals who are characterized with avoidant attachment style may engage in risk behaviors due their use of deactivation strategies that includes

Table 2
Results and fit indices for model 1.

Paths		*B* (SE)	*β*	95% CI
Verbal abuse				
	Alcohol use	0.15 (.05)	0.20	[0.057, 0.247]**
	Antisocial behavior	0.09 (.04)	0.13	[0.010, 0.169]*
Sexual abuse				
	Anxious attachment	0.24 (.10)	0.11	[0.050, 0.436]*
	Avoidant attachment	0.39 (.08)	0.19	[0.236, 0.551]**
	Alcohol use	0.13 (.06)	0.10	[0.009, 0.242]*
	Drug use	0.16 (.08)	0.08	[0.001, 0.320]*
	Condom use	−0.20 (.08)	−0.11	[−0.350, −0.046]*
Emotional abuse				
	Anxious attachment	0.41 (.07)	0.30	[0.276, 0.543**
	Avoidant attachment	0.18 (.07)	0.15	[0.043, 0.319]*
	Alcohol use	−0.19 (.05)	−0.24	[−0.283, −0.088]**
	Antisocial behavior	0.10 (.04)	0.15	[0.021, 0.172]*
Anxious attachment				
	Alcohol use	0.08 (.02)	0.14	[0.033, 0.123]**
Avoidant attachment				
	Drug use	0.09 (.04)	0.09	[0.011, 0.171]*
	Antisocial behavior	0.05 (.02)	0.10	[0.006, 0.100]*
Indirect effects				
Sexual abuse → Anxious attachment → Alcohol use		0.02 (.01)	0.02	[0.004, 0.046]*
Sexual abuse → Avoidant attachment → Drug use		0.04 (.02)	0.02	[0.006, 0.076]*
Sexual abuse → Avoidant attachment → Antisocial behavior		0.02 (.01)	0.02	[0.004, 0.042]*
Emotional abuse → Anxious attachment → Alcohol use		0.03 (.01)	0.04	[0.013, 0.058]**
Emotional abuse → Avoidant attachment → Drug use		0.02 (.01)	0.01	[0.001, 0.044]*
Emotional abuse → Avoidant attachment → Antisocial behavior		0.01 (.01)	0.02	[0.001, 0.025]*
R^2				
	Anxious attachment	0.131		
	Avoidant attachment	0.081		
	Alcohol use	0.075		
	Drug use	0.068		
	Condom use	0.029		
	Antisocial behavior	0.218		
Fit indices				
	CFI/TLI:	.995/.940		
	RMSEA:	.058		
	SRMR:	.021		

* $p < .05$.
** $p < .01$.

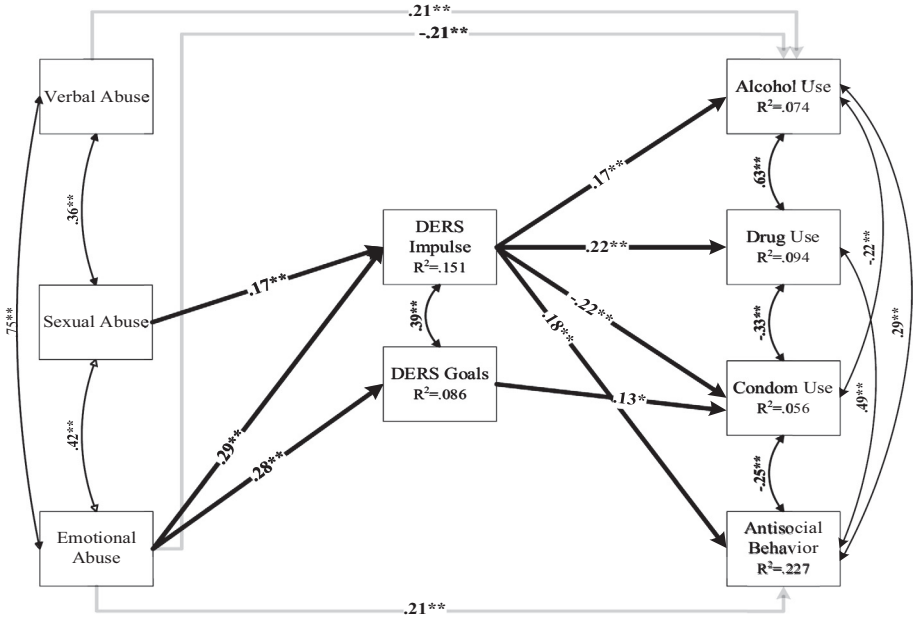

Fig. 2. Model 2 with paths between child maltreatment, emotion regulation, and risk behavior observed variables. *Note*: Age and sex entered as covariates. Standardized betas presented.

Table 3
Results and fit indices for model 2.

Paths		*B* (SE)	*β*	95% CI
Verbal abuse				
	Alcohol use	0.17 (.05)	0.21	[0.070, 0.260]**
Sexual abuse				
	DERS impulsivity	0.23 (.07)	0.17	[0.088, 0.373]**
Emotional abuse				
	DERS impulsivity	0.24 (.05)	0.29	[0.147, 0.335]**
	DERS goals	0.32 (.05)	0.28	[0.217, 0.421]**
	Alcohol use	−0.16 (.05)	−0.21	[−0.259, −0.061]**
	Antisocial behavior	0.14 (.03)	0.21	[0.082, 0.200]**
DERS impulsivity				
	Alcohol use	0.15 (.05)	0.17	[0.057, 0.251]**
	Drug use	0.32 (.08)	0.22	[0.168, 0.462]**
	Condom use	−0.30 (.07)	−0.22	[−0.432, −0.157]**
	Antisocial behavior	0.14 (.04)	0.18	[0.064, 0.221]**
DERS goals				
	Condom use	0.13 (.05)	0.13	[0.023, 0.232]*
Indirect effects				
Sexual abuse → DERS impulsivity → Alcohol use		0.04 (.02)	.03	[0.011, 0.080]**
Sexual abuse → DERS impulsivity → Drug use		0.07 (.03)	.04	[0.027, 0.154]**
Sexual abuse → DERS impulsivity → Condom use		−0.07 (.03)	−.04	[−0.141, −0.023]**
Sexual abuse → DERS impulsivity → Antisocial behavior		0.03 (.01)	.03	[0.011, 0.072]**
Emotional abuse → DERS impulsivity → Alcohol use		0.04 (.01)	.05	[0.012, 0.069]**
Emotional abuse → DERS impulsivity → Drug use		0.08 (.03)	.06	[0.034, 0.137]**
Emotional abuse → DERS impulsivity → Condom use		−0.07 (.02)	−.06	[−0.124, −0.035]**
Emotional abuse → DERS impulsivity → Antisocial behavior		0.03 (.01)	.05	[0.014, 0.064]**
Emotional abuse → DERS goals → Condom use		0.04 (.02)	.04	[0.008, 0.083]*
R^2				
	DERS impulsivity	0.151		
	DERS goals	0.086		
	Alcohol use	0.074		
	Drug use	0.094		
	Condom use	0.056		
	Antisocial behavior	0.227		
Fit indices				
	CFI/TLI:	0.989/0.973		
	RMSEA:	0.036		
	SRMR:	0.033		

Note: DERS – Difficulties in Emotion Regulation Scale.
* $p < .05$.
** $p < .01$.

emotional disengagement when participating in antisocial behaviors (Mikulincer et al., 2003).

The path from verbal abuse directly to alcohol use and the path from emotional abuse to impulsivity are important. Although emotional and verbal abuse are prevalent, they are less likely to be reported by the public or addressed by authorities (Trickett, Mennen, Kim, & Sang, 2009). There is a growing concern about the lack of research attention to child neglect, a child maltreatment type that includes verbal and emotional abuse (Boyce & Maholmes, 2013). One reason neglect has been understudied is partially due to its misconception as a less severe form of maltreatment. Yet, our findings confirm that verbal and emotional abuse are significantly linked to risk behaviors, even after accounting for the effects of other abuse types. Sexual abuse was found to be directly associated with impulsivity, consistent with growing psychophysiological research on the link between traumatic child abuse and limbic system dysfunction, which has shown to generate emotion regulation impairments among adolescent and adult samples (Dackis, Rogosch, Oshri, & Cicchetti, 2012; Teicher et al., 2003).

Impulsivity was the most consistent ER dimension associated with risk behaviors in the current study, supporting research on the role of compromised ability to inhibit inappropriate or impulsive behaviors (e.g., Hoyle, Fejfar, & Miller, 2000). Notably, the DERS subscale does not measure impulsivity analogous to many personality-based notions of impulsivity (e.g., failure to consider potential consequences of actions before choosing a course of action). However, the DERS impulsivity subscale is consistent with the construct of negative urgency from the perspective of the UPPS model of impulsive behavior (Whiteside & Lynam, 2001), where individuals engage in risky behavior when experiencing intense negative affect. Consistent with the current results, negative urgency significantly correlated with increased risk behaviors including substance use (Cyders, Flory, Rainer, & Smith, 2009) and sexual risk taking (Simons et al., 2010).

Supporting our third hypothesis, the indirect paths from child maltreatment to risk behaviors via emotion dysregulation and insecure attachment may allude to a possible unfolding, chain reaction of developmental maladaptation, although these results must be confirmed by longitudinal investigations. Accordingly, chronic stress induced by rearing environments can interfere with the successful resolution of developmental tasks (such as the development of a secure attachment style or ER strategies), which may potentiate a domino effect of deficits resulting in maladaptation during young adulthood.

4.1. Limitations, strengths, and implications

The present study used a college sample to examine the associations between child maltreatment types, attachment styles, ER dimensions, and risk behaviors. The data used in this study are

cross-sectional, hence any inferences on causal pathways are limited. ER may impact and intensify participation in risk behaviors, while the inverse might also be true. However, this study suggests the need for longitudinal and experimental studies to investigate ER development and its role in the mechanisms that mediate the link between diverse types of child maltreatment and risk behaviors among young adults.

In conclusion, the current study suggests that the association between child maltreatment and risk behaviors is not necessarily linear and might be differentially mediated via insecure attachment styles and difficulties with ER. Therefore, targeting young adults who self-report child maltreatment histories might ameliorate intervention efficacy and orient prevention/intervention to vulnerable young adults.

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