



Published in final edited form as:

*Suicide Life Threat Behav.* 2015 August ; 45(4): 431–447. doi:10.1111/sltb.12141.

## Suicidal Behavior Outcomes of Childhood Sexual Abuse: Longitudinal Study of Adjudicated Girls

**Sara M. Rabinovitch, BA,**

University of Oregon

**David C. R. Kerr, PhD,**

Oregon Social Learning Center, Oregon State University

**Leslie D. Leve, PhD, and**

University of Oregon, Oregon Social Learning Center

**Patricia Chamberlain, PhD**

Oregon Social Learning Center

### Abstract

Childhood sexual abuse (CSA) histories are prevalent among adolescent girls in the juvenile justice system (JJS) and may contribute to their high rates of suicidal behavior. Among 166 JJS girls who participated in an intervention trial, baseline CSA and covariates were examined as predictors of suicide attempt and non-suicidal self-injury (NSSI) reported at long-term follow-up (7–12 years later). Early forced CSA was related to lifetime suicide attempt and NSSI history, and (marginally) to post-baseline attempt; effects were not mediated by anxiety or depressive symptoms. Findings suggest that earlier victimization and younger entry into JJS are linked with girls' suicide attempt and NSSI.

---

Adolescent girls in the juvenile justice system (JJS) show exceptionally high rates of suicidal behaviors. In samples of detained or adjudicated girls (e.g., Abram, Choe, Washburn, Teplin, King, & Dulcan, 2008) 27–58% have been found to have histories of suicide attempt, compared to 10% of adolescent girls in community samples (Lewinsohn, Rohde, & Seeley, 1998). A quarter of young women who were involved in the JJS as adolescents also report a history of non-suicidal self-injury (NSSI; Kerr, Gibson, Leve, & DeGarmo, in press), a behavior associated with later risk for suicidal behavior, particularly

---

Correspondence concerning this article should be addressed to David Kerr, 213 Reed Lodge, School of Psychological Science, Oregon State University, Corvallis, OR 97331; readers should direct inquiries regarding clinical aspects of Multidimensional Treatment Foster Care and its implementation to Patricia Chamberlain, Oregon Social Learning Center, 10 Shelton McMURPHEY Boulevard, Eugene, OR 97401. david.kerr@oregonstate.edu or pattic@oslc.org.

<sup>1</sup>Prior studies using this sample indicated that intervention group and the cohort by intervention interaction did not predict suicide attempt (Kerr, DeGarmo, Leve, & Chamberlain, in press). Preliminary analyses confirmed these predictors also were not significant predictors of suicidal behavior or NSSI (either as lifetime, or post-baseline outcomes). Thus, to maximize power and simplify models, these terms were not considered further here. Cohort was retained as a predictor given its association with some baseline predictors and given that follow-up period differed by cohort; follow-up period did not further predict the outcomes or interact with cohort to do so, and thus was not controlled in models.

### Disclosure

Patricia Chamberlain is an owner/partner in TFC Consultants, Eugene, Oregon, the organization that disseminates Multidimensional Treatment Foster Care.

among young females (Zahl & Hawton, 2004). Given these elevated rates, JJS girls are a critical population to target in suicide and NSSI prevention. Better understanding of risk factors will help guide prevention development efforts.

For decades, research has documented that child maltreatment, and childhood sexual abuse (CSA) in particular, are related to suicidal thoughts and behaviors and NSSI in the general population (Fergusson, Woodward, & Howard, 2000; Maniglio, 2011). Several theories may explain why CSA victims show elevated rates of suicidal behavior and NSSI. The interpersonal-psychological theory of suicide asserts that individuals develop a wish to die when they perceive they are burdensome to others and do not belong (Joiner, 2009). These ideas connect with Finkelhor and Browne's (1985) conceptualization of stigmatization and betrayal as two traumagenic dynamics that are consequences of CSA. More specifically, the stigmatization and betrayal associated with CSA can lead to grief, shame, guilt, and feelings of extreme disconnection from others, all of which can undermine the victim's sense of value and belongingness (Finkelhor & Browne, 1985).

Thus, this part of the interpersonal-psychological theory may explain how CSA increases the desire to die. According to this theory, individuals who die by suicide also must possess the capability to enact lethal self-harm. This capacity can be acquired through repeated exposure to painful events and provocative experiences that reduce sensitivity to pain and fear of death. Consistent with interpersonal-psychological theory, sexual victimization, particularly when it is repeated and forced, may lead to habituation to pain and fear, and thereby increase risk for suicide attempt through acquired capacity.

Separate mechanisms may explain the association CSA has with NSSI. Nock and Prinstein's (2004) functional model supports a regulatory function of self-harm, whereby NSSI serves to reduce psychophysiological tension or other negative affective states. This notion was supported by Klonsky's (2007) meta-analysis of self-harm studies. This model also is consistent with Linehan's (1993) theories of self-harm. Linehan postulates that early invalidating experiences, such as those that are characterized by abuse, may teach negative coping strategies. Individuals from invalidating environments may lack the skills to regulate affect, which in turn leads them to engage in NSSI as a maladaptive emotion-regulation strategy. Self-harm may also represent enactments of extreme self-directed anger and self-deprecation (Klonsky, Oltmanns, & Turkheimer, 2003). Thus, prominent theories of suicidal behavior and NSSI are useful in explaining why CSA may increase risk for these behaviors.

This prior empirical and theoretical work is highly relevant to girls in the juvenile justice and foster care systems for whom CSA histories are highly prevalent. For example, estimated prevalence of past abuse among delinquent girls is 92%, with 56% of girls reporting sexual abuse (Acoca, 1998). Among children in foster care, 44% have verified cases of CSA (Sedlack & Broadhurst, 1996). Given associations CSA has with risk for suicide attempt and NSSI in general populations, JJS girls' abuse histories may partially explain their elevated risk.

Several cross-sectional studies of delinquent girls or young women have found relations between CSA and suicidal behavior (Cuellar & Curry, 2007; Evans, Albers, Macari, &

Mason, 1996; Goodkind, Ng, & Sarri, 2006). However, longitudinal data on JJS-involved girls are lacking. Using prospective rather than fully retrospective methods to establish the link between recollected CSA and suicide attempt and NSSI would increase confidence in the temporal direction of the associations and demonstrate whether or not CSA confers ongoing risk over time. Furthermore, prospective designs are well-suited for testing potential mechanisms through which childhood experiences may influence later suicidal behavior.

Chief among these candidate mechanisms is that CSA increases risk for suicidal behavior and NSSI through effects on symptoms of psychopathology that increase suicide risk; namely, anxiety and depression. Several community-based longitudinal studies support such pathways. For example, physical and sexual abuse prior to age 18 have been associated with symptoms of depression and anxiety and risk for suicidal ideation and attempts in a 17-year period from adolescence to early adulthood (Silverman, Reinherz, & Giaconia, 1996). Similarly, Bergen, Martin, Richardson, Allison, and Roeger (2003) found that sexual abuse was both directly and indirectly associated with community adolescents' suicide-related outcomes through hopelessness and depressive symptoms; and associations were particularly strong among girls. Likewise, Fergusson and colleagues (2000) reported that observed effects of childhood abuse on both suicidal ideation and suicide attempt were mediated in part by depression and anxiety disorders in adolescence. Longitudinal studies of JJS samples are needed to replicate findings beyond community samples. Findings may suggest whether or not directly targeting these emotional sequelae of CSA will prevent suicidal behavior and NSSI.

Another way in which the consequences of CSA can be better understood is if studies untangle and identify the aspects of CSA that are most harmful. CSA includes a broad array of negative experiences, the effects of which may range from distressing to traumatic. Some research demonstrates that greater severity of abuse, number of additional traumas, younger age of abuse, and forced-contact (e.g., penetration) versus non-contact abuse may predict worse adulthood outcomes (Whitelock, Lamb, & Rentfrow, 2013; Meiselman, 1978; Lesserman, Drossman, Toomey, Nachman, & Glogau, 1996.) Finkelhor and Araji (1986) found that force by an abuser explained more of the victim's negative reactions than any other variable. Additionally, the age at which CSA occurs has been associated with negative outcomes in some but not all studies. Some studies suggest that pre-pubertal children are more vulnerable to trauma from CSA than children who are abused after puberty (Meiselman, 1978). However, other studies have not identified significant relationships between age at onset of abuse and impact of abuse (Bagley & Ramsay, 1986; Finkelhor & Araji, 1986). Research that uncovers whether specific features of CSA might differentially predict later suicide-related and NSSI outcomes may aid in identifying youth at highest risk.

The present study seeks to determine whether different forms of CSA predict suicide attempt and NSSI in JJS girls followed for up to 12 years, and to identify mediators between earlier predictors and these two outcomes. We focused on adolescent girls who were mandated to out-of-home care due to chronic delinquency and participated in a randomized controlled efficacy trial of Multidimensional Treatment Foster Care (MTFC; Chamberlain, 2003), an intervention designed to reduce delinquency and substance abuse (e.g., Chamberlain, Leve, & DeGarmo, 2007). This sample is particularly high-risk because participants had

involvement in both the juvenile justice and foster care systems, which are each associated with increased suicide risk (Corneau & Lanctôt, 2004; Hjern, Vinnerljung, & Lindblad, 2004). The high-risk sample and the unusually long-term follow-up design offer a unique opportunity to examine predictors of otherwise relatively low-frequency events.

Two primary research questions are addressed. First, we tested whether specific types of CSA would predict suicide attempt and NSSI. Informed by past research, we hypothesized that histories of early forced CSA would have stronger associations with these outcomes than would non-specific measures of CSA, such as documented sexual abuse or a range of unwanted sexual experiences that differ in terms of developmental timing and severity. Of note, it can be challenging to discern the contributions of CSA to risk for suicide attempt and NSSI given the number and severity of other potent contextual and developmental risk factors these girls often experience. Thus, we tested whether hypothesized associations would persist after accounting for other suicide risk factors. Foremost, we controlled for histories of physical abuse to distinguish the deleterious effects of multiple types of maltreatment. Additionally, we considered criminal referral history and aggression as potential confounds, given prior studies of community samples (e.g., Kerr & Capaldi, 2011; Thompson, Ho, & Kingree, 2007); whether severity of delinquency and aggression would increase suicide risk *within* a delinquent sample was unknown. Furthermore, we controlled for age at study entry, as prior studies with this sample indicate that younger age at baseline is associated with suicide attempt (e.g., Kerr et al., 2014), perhaps because it signifies earlier JJS and child welfare involvement and therefore more severe delinquency, maltreatment, and other contextual disadvantages (Leve & Chamberlain, 2004).

Our second research question concerned whether effects of CSA on suicide attempt and NSSI would be at least partially explained by effects CSA had on subsequent anxiety or depressive symptoms. We hypothesized CSA would have both direct effects on the outcomes and indirect effects through effects on anxiety or depressive symptoms. Such a pattern might suggest that CSA increases suicide risk by worsening psychopathology in addition to independent unmeasured processes suggested by our theoretical model.

## Method

### Participants

Participants were 166 adolescent girls (ages 13–17) who participated in a randomized controlled trial of the efficacy of MTFC ( $n = 81$ ) versus group care (GC) treatment-as-usual ( $n = 85$ ) in one of two consecutively run cohorts ( $n = 81$  and  $85$  in Cohorts 1 and 2, respectively). Girls from the Pacific Northwestern United States were recruited between 1997 and 2006. Participants were recruited if they had been mandated to community-based out-of-home care due to chronic delinquency and were enrolled within 12 months of criminal referral. Girls who were pregnant during the recruitment phase were excluded from participation. Girls provided assent and their legal guardians provided consent to participate. The study coordinator randomly assigned girls to MTFC or GC. In Cohort 2, the MTFC condition also included a module targeting substance abuse and health risking sexual behavior. Descriptions of MTFC, GC, and the additional treatment module added to MTFC in Cohort 2 are described in Chamberlain (2003) and Kerr, DeGarmo, Leve, & Chamberlain

(2014). Prior to condition placement, participants completed the baseline assessment. Girls received treatment for six months on average, and duration did not differ by condition.

Participants were 13–17 years old at baseline ( $M = 15.31$ ,  $SD = 1.17$ ). Participants self-identified as follows: 68.1% Caucasian, 1.8% African-American, 11.4% Hispanic, 0.6% Native American, and 0.6% Asian. Additionally, 16.9% of the girls endorsed “multiracial,” and 0.6% answered “other/unknown.” At baseline, 63% reported living with single-parent families, and 54% reported family incomes of less than \$10,000.

As part of the original RCT, girls completed assessments at baseline and 12, and 24 to 36 months post-baseline. In 2009 a long-term follow-up study was funded and investigators attempted to re-contact all participants. Of the 164 participants still living (1 died by suicide), 90% ( $n = 148$ ) participated in the assessment of lifetime history of suicidal behavior and NSSI. The timing of this long-term follow-up study assessment differed by cohort; specifically, Cohorts 1 and 2 completed the assessment approximately 12 and 7 years, respectively, after baseline, and thus were ages [mean ( $SD$ )] 27.42 (2.05) and 22.38 (1.57) years, respectively.

## Measures

Control variables considered included *intervention group assignment*, *cohort*, and *age at baseline*. Intervention group assignment was coded as  $-1$  (GC) or  $1$  (MTFC). Cohort was coded as  $-1$  (Cohort 1) or  $1$  (Cohort 2). Age at baseline was computed using birth date and the date on which the baseline assessment took place.

**Baseline criminal referrals**—Counts of criminal referrals by baseline were collected on all 166 girls using state police records and circuit court data. Counts were log-transformed to reduce skew.

**Baseline aggressive behavior**—Parents (96%) or caseworkers (4%) completed the Child Behavior Checklist for ages 6-18 years (Achenbach & Rescorla, 2001). The Aggressive Behavior subscale is an 18-item summed score ( $\alpha = .93$ ). Items include “physically attacks people,” “cruelty, bullying, or meanness to others,” “gets in many fights,” and “sudden changes in mood or feelings;” respondents used a 3-point scale (0 = *Not True* to 2 = *Very True of Often True*) to indicate whether each item described the youth currently or in the past 6 months. Scores were available on 161 girls.

**Depressive symptoms**—Symptoms were measured at baseline for 161 girls, and again at 12, and 24 to 36 months post-baseline (sample sizes varied by cohort, see below) using the Center for Epidemiologic Studies, Depression scale (CES-D; Radloff, 1977.) CES-D is a 20-item self-report questionnaire designed to measure depressive symptoms in the general population. Participants rated the frequency of events during the previous week using a 4-point likert scale (0 = *Rarely or none of the time* and 3 = *Most or all of the time*). Depression scores ranged from 0–60 and were derived from summing item scores ( $\alpha = .83$ –.90). Sample items include, “I felt sad,” “My sleep was restless,” and “I felt hopeful about the future.” The CES-D does not include items on suicidal ideation, attempt, or NSSI.

**Anxiety symptoms**—Symptoms were measured at 12 and 24 to 36 months post-baseline (but not at baseline for one cohort) using the self-report anxiety sub-scale from the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1993). The BSI is shown to have strong test-retest and internal consistency reliabilities (SCL-90-R; Derogatis, 1983.) The anxiety sub-scale is the sum of six items (e.g., “suddenly scared for no reason”;  $\alpha = .85-.86$ ). Participants rated each item based on symptom severity in the past 7 days using a 5-point likert scale (0 = *symptom not present* and 4 = *extremely severe*).

To minimize missing data, the mean of CES-D scores from the follow-up assessments (or one score if the other was missing) was used to represent post-baseline depressive symptoms for 154 participants; these scores were correlated [ $r(112) = .347, p < .001$ ] and were not significantly different from each other [ $t(111) = .443$ ]. Similarly, for 150 participants, post-baseline anxiety symptoms were based on the mean of BSI anxiety scores at these two time points or one score if the other was missing; the scores were correlated [ $r(107) = .247, p = .010$ ] and were not different from each other [ $t(106) = .111$ ]; a log-transformation reduced skewness.

Mediating variables (depressive and anxiety symptoms) were constructed using measures collected at 12 to 36 months post-baseline rather than earlier or later for several reasons. First, anxiety was not measured in both cohorts at baseline. Second, participants' symptoms at 12–36 months post-baseline may be more representative of their long-term internalizing psychopathology than were their baseline symptoms, which may have been acutely elevated due to baseline circumstances of recent criminal referral and impending out-of-home placement. Indeed, prior research with this sample (e.g., Harold et al., 2013) has shown very high levels of baseline depressive symptoms that decrease dramatically by 12 months post-baseline. Third, including measures of symptoms after 36 months post-baseline would be more likely to violate the temporal ordering of the mediator and the outcomes given that our preliminary analyses indicated most suicide attempts occurred during the first three years post-baseline.

**Documented childhood abuse**—Accounts of childhood sexual (on  $n = 161$  girls) and physical (on  $n = 157$ ) abuse were obtained through baseline child welfare case worker reports. Histories of sexual abuse and physical abuse each were coded dichotomously (1 = yes, 0 = no) to indicate the presence or absence of each form of abuse.

**Self-reported childhood sexual abuse**—Self-reports were collected at baseline from all 166 girls using a modified version of the Childhood Sexual Experiences Questionnaire (Zaidi, Schnurr, Knutson, Kriegler, Blanke, and Bremner, 1991). The modified 14-item questionnaire contains a list of sexually coercive events, including forced contact (e.g., *forced oral sex*) and non-contact (e.g., *asked to watch sex acts*). Participants responded using a yes/no format as to whether or not they were subjected to these events; if they had, they recorded the age at which the event first occurred. For the purposes of examining the impact of experiencing early forced-contact sexually coercive events, we created a composite variable—*number of types of forced contact sexual experiences by age 13*—based on the age of first occurrence of the following items: [anyone ever] “touched your intimate body part,” “rubbed their genitals against you,” “forced you to kiss,” “forced oral sex,” and “tried but



did not have intercourse with you.” This variable was dichotomized (1 = yes, 0 = no) to indicate the occurrence or non-occurrence of early forced contact. This was done because the items did not give any indication of the number of times each experience occurred; there was no a priori basis for determining the timing and combination of these four items that would be most detrimental; and the variable was not well-distributed due to many zero values.

**Suicide attempt and non-suicidal self-injury (NSSI)**—Histories of these acts were assessed using the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2008; 2011) lifetime version. Coding, reliability, and convergent and divergent validity of these ratings for the present sample are described in Kerr, Gibson, Leve, and DeGarmo (2014). Assessment staff used standardized prompts to elicit information about all acts that potentially met criteria for an “actual suicide attempt,” which Posner et al. (2008) defined as “a potentially self-injurious act committed with at least some wish to die, as a result of the act.” Interviewers used further standardized prompts to determine whether each reported act constituted an actual attempt versus another behavior, such as an “interrupted attempt” (Posner et al., 2008). Acts of self-harm for which participants explicitly denied any wish to die as a result of the act were classified as NSSI. Throughout this article, suicide attempt refers to behaviors labeled “actual suicide attempts” by Posner et al. (2008).

Suicide attempts and NSSI were also categorized as pre- or post-baseline using participants’ recollected ages at the time of the acts, birth dates, and study entry dates. Behaviors that occurred within the year of baseline were categorized as pre-baseline if participants were unable to recall enough information to categorize it as pre- versus post-baseline. Post-baseline suicide attempt and NSSI histories were recoded to 1 = yes or 0 = no. The participant who died by suicide was coded as having a positive lifetime and post-baseline history of suicide attempt; however, NSSI and pre-baseline attempt histories were missing for this individual.

### Analysis Plan

To address our first research question, we planned to identify associations CSA had with suicide attempt and NSSI. We first focused on testing associations that CSA histories measured in adolescence had with lifetime histories of suicide attempt and NSSI that were collected in adulthood. Then we repeated these models using a methodologically stronger approach of testing associations baseline CSA histories had with post-baseline suicide attempt and NSSI. We then used this model as the basis for testing our second research question regarding potential mediation of the link between CSA and post-baseline suicide attempt and NSSI through post-baseline anxiety and depressive symptoms.

In all models it was necessary to account for covariates—variables that might better account for the hypothesized associations between CSA and suicide attempt or NSSI. We balanced this need against the danger of unduly weakening statistical power to predict low prevalence outcomes in a small sample by, for example controlling for non-explanatory, dichotomous covariates. Thus, we selected covariates by first inspecting correlations among study

variables, and further considering only variables that correlated at  $p < .10$  with the primary predictors and outcomes.

The two primary research questions were tested using multivariate path models run in Mplus Version 6.12 (Muthen and Muthen, 2011) using the full sample ( $n = 166$ ). All predictors were first allowed to covary, and then covariances that did not approach statistical significance ( $p > .10$ ) were fixed at zero. Probit regression and the default WLSMV estimator were used. Of note, model chi-square for WLSMV cannot be used in the typical way to compare nested models; given that model fit was not of interest here, fit statistics are not emphasized. For ease of interpretation, estimated outcome probabilities were calculated from probit parameter estimates at meaningful levels of primary predictors. For a binary outcome, probability (P) of the outcome at a given value [ $u = 1$ ; e.g., suicide attempt (1) vs. no attempt (0)] of a predictor (x) can be estimated from parameter estimates (b) using the standard normal distribution function F, as follows (Muthen & Muthen, 2006):  $P(u = 1 | x) = F [(-1) * \text{threshold} + b * x]$ . To evaluate question two, indirect (i.e., mediated), direct (i.e., unmediated) and total (indirect plus direct) pathways from CSA to history of suicide attempt or NSSI involving the mediators were estimated. Mediation was supported when a significant total path from CSA to the outcome could be decomposed into a significant indirect path through the mediator and either a non-significant direct path indicating full mediation, or a remaining significant direct path supporting partial mediation.

## Results

### Preliminary Analyses

Means, standard deviations, and frequencies of variables are reported in Table 1; statistics are provided for the total sample and in groups defined by lifetime histories of suicide attempt and NSSI. On the baseline aggressive behavior scale, 54% and 19% of participants had clinically significant or borderline clinically significant symptoms, respectively. For the outcomes, lifetime, pre-, and post-baseline rates, respectively, were: 46% ( $n = 69$ ), 35% ( $n = 51$ ), and 20% ( $n = 30$ ) for suicide attempt; and 25% ( $n = 37$ ), 18% ( $n = 27$ ), and 10% ( $n = 15$ ) for NSSI. About 25%, 50%, and 75% of the first post-baseline suicide attempts occurred by 1, 2, and 3 years post-baseline, respectively.

Correlations among study variables are reported in Table 2. Suicide attempt was not consistently related to NSSI, a surprising result but one that further justified our separate consideration of this outcome. Baseline depressive symptoms were not related to any of the outcomes; and aggressive behavior was not associated with any predictors or outcomes. Baseline criminal referrals were modestly negatively associated with suicide attempt, Total sex acts were not associated with the outcomes. Notably, a history of early forced sexual acts was associated with most other negative concurrent and future circumstance, such as younger age at study entry, depressive and anxiety symptoms, suicide attempt, and NSSI. Documented CSA was only associated with lifetime history of suicide attempt, but not with NSSI or either outcome post-baseline. Documented physical abuse was unrelated to sexual abuse variables but was correlated with lifetime suicide attempt history. Taken together, the patterns of association had two implications for the primary study models we would pursue next: 1) a history of early forced sex acts was the only sexual abuse variable that needed to



be considered further as a predictor of the outcomes; and 2) baseline age, criminal referrals, physical abuse, and cohort<sup>1</sup> needed to be controlled and allowed to covary with other predictors. Regarding the hypothesized mediating variables, post-baseline (12–36 month) depressive and anxiety symptoms were associated with baseline early forced sex and suicide attempt. Because these symptoms were not associated with NSSI they could not mediate any associations with early forced sex acts.

### Question 1: Does CSA predict suicide attempt and NSSI?

**Models predicting lifetime history of attempt and NSSI**—As shown in the path model in Table 3 baseline histories of early forced sex acts and documented physical abuse each predicted lifetime history of suicide attempt. More specifically, holding all other predictors (including physical abuse) constant at their means, the probability of suicide attempt was 33% among girls who did not experience early forced sex acts compared to 47% among those who did. Similarly, holding all other predictors including early forced sex acts constant, the probability of suicide attempt was 36% among girls without documented physical abuse histories, compared to 46% among those with such histories. Also shown in Table 3 are the significant covariances among the predictors in the model. Specifically, a history of early forced sex was more common among girls who participated in the first cohort, and among those who were younger at study entry; and girls who were older at study entry had more pre-baseline criminal referrals.

Next, the same predictors were used to predict lifetime NSSI (see Table 3). The overall model did not explain significant variance in NSSI. Still, a history of early forced sexual acts significantly predicted NSSI; physical abuse did not. Holding all else constant, the probability of NSSI was 31% among women with histories of early forced sexual acts and 14% among others.

**Models predicting post-baseline history of suicide attempt**—The same model was run using the methodologically stronger outcomes of post-baseline suicide attempt. Such a model could not be run for post-baseline NSSI because rates of NSSI at some levels of the predictors were too low; for example, only 2 of 47 women who denied early forced sexual acts reported subsequent NSSI compared to 13 of 101 who reported early forced sexual acts.

The effect of early forced sexual acts on post-baseline suicide attempt was only marginally significant ( $p < .10$ ), though this coefficient was comparable in magnitude to the one in the lifetime model (see Table 3). Older age at baseline was associated with a decreased probability of post-baseline suicide attempt. Physical abuse was not associated with attempt<sup>2</sup>.

<sup>2</sup>An exploratory model was run controlling for pre-baseline suicide attempt history. Attempt history covaried with physical abuse [Est (SE) = .05 (.02), standardized Est (SE) = .22,  $p < .01$ ], but did not predict post-baseline suicide attempt [Est (SE) = .22 (.25),  $\beta$  (SE) = .11 (.12),  $p = .37$ ]. This pattern suggests the association physical abuse had with lifetime history of attempt owed to its association with pre-baseline attempt. Incidentally, the pattern does not support a mediation process whereby pre-baseline physical abuse confers post-baseline risk for attempt through prior suicide attempt.

**Question 2: Do depressive or anxiety symptoms mediate predictions of suicide attempt?**

Finally, in two separate models we tested whether the association between early forced sex and post-baseline suicide attempt was mediated through depressive or anxiety symptoms measured 12–36 months post-baseline. That is, we considered whether: (a) forced sex predicted the mediator, (b) the mediator predicted the outcome, and (c) the previous marginally significant association between forced sex and the outcome was (d) reduced significantly when the mediator was controlled; that is, there was a reduced direct effect and a significant indirect effect via the mediator. To simplify these models, we omitted physical abuse history and pre-baseline suicide attempt given the lack of predictive utility in prior models.

There was no evidence that 12–36 month depressive symptoms mediated the (marginal) link between a history of early forced sexual acts and subsequent suicide attempt. Specifically, a history of forced sexual acts did not predict depressive symptoms, the association between depressive symptoms and suicidal behavior did not reach significance, and the association that early forced sexual acts had with later suicide attempt was scarcely reduced in magnitude. The total, direct, and indirect effects of forced sexual acts on suicide attempt were  $\beta = .23, .22, \text{ and } .01, p = .07, .09, \text{ and } .58$ , respectively.

Patterns differed somewhat in the model that tested mediating effects of 12–36 month post-baseline anxiety. A history of early forced sexual acts predicted higher anxiety symptoms ( $\beta = .20, p < .05$ ), that in turn were marginally associated with increased risk for post-baseline suicide attempt ( $\beta = .19, p = .06$ ). Still, the primary path of interest was reduced only in significance and not in magnitude; specifically, total, direct, and indirect effects of early forced sexual acts:  $\beta = .23, .19, \text{ and } .04, p = .07, .14, \text{ and } .17$ , respectively.

**Discussion**

This study examined whether childhood sexual abuse (CSA) predicted suicide attempt and NSSI in a sample of delinquent adolescent girls followed for up to 12 years. This research contributes to the extant suicide literature by reporting on a particularly high-risk and understudied population of girls. Study strengths included the prospective and multi-method design, strong retention, and assessment using rigorous recommended definitions of suicide attempt and NSSI (Crosby, Ortega, & Melanson, 2011).

Consistent with prior studies of JJS girls (e.g., Goodkind et al., 2006), we found very high rates of childhood physical and sexual abuse, suicide attempt, and NSSI. Specifically, nearly 70% of our sample reported a forced sexual experience prior to age 13, 55% had a documented history of sexual abuse, and 61% had documented physical abuse. Nearly 20% of participants attempted suicide post-baseline, and 75% of those attempts occurred within the first 3 years. As reported previously (Kerr et al., 2014), 25% reported ever engaging in NSSI, and 10% reported NSSI after baseline. These rates highlight the importance of the present focus, and underscore the need to examine early predictors of suicide-related outcomes and potential mechanisms underlying these effects.

This study addressed two primary research questions. Consistent with our first hypothesis, a history of early forced CSA was associated with lifetime and subsequent suicide attempt and NSSI. Conversely, a more general measure of CSA with no specification of force or developmental timing of abuse did not predict these outcomes. Additionally, documented CSA was not a consistent correlate of suicide attempt or NSSI. Also important was that the associations that early forced CSA had with suicide attempt and NSSI persisted when effects of documented physical abuse were controlled. Taken together, these findings bolster the interpretation that force and timing of CSA increase risk for suicide attempt and NSSI, and do not simply reflect general maltreatment. Notably, a documented history of physical abuse was associated with lifetime history of suicide attempt. However, unlike early forced CSA, physical abuse was unrelated to NSSI and did not predict post-baseline suicide attempt.

Findings are consistent with those from past research on the impact of CSA in clinical samples of females. Prior findings have demonstrated that CSA involving force or penetration is a particularly traumatic form of abuse leading to worse long-term symptom trajectories (Lesserman et al., 1996). Thus, our findings may be interpreted within the context of theories of traumatic etiology that posit that lacking control during physically and psychologically threatening events, such as CSA encounters involving force, can cause significant distress and lead to life-threatening behaviors. Findings from this study are also in line with past research showing that CSA occurring at an earlier age has more detrimental effects over time (Meiselman, 1978). Our results highlight the need to examine prognostically important characteristics of CSA when intervening with female victims of CSA.

Although null findings must be interpreted with caution, findings from this study may suggest self-reported experiences of CSA are more informative of suicide risk in this population than documented reports. This is important, as an understandable assumption may be that documented reports are more objective or indicate more severe abuse. Other research with delinquent females has found that experiential measures of trauma are most relevant for clinicians. For example, Smith, Leve, and Chamberlain (2006) found that experiential but not diagnostic reports of trauma were significant predictors of delinquency and involvement in sexually risky behaviors. Assessments that capture CSA victims' subjective experiences have potential to identify females who may be particularly at risk for suicide, and inform optimal courses of treatment.

Our second research question concerned whether depressive or anxiety symptoms would help explain, through partial mediation, associations that CSA had with later suicide attempt. Such a model could not be tested for NSSI due to limited variability and was not supported for suicidal attempt. Specifically, early forced CSA did not predict higher depressive symptoms 1–3 years later once other baseline covariates were controlled, and these symptoms were not uniquely associated with suicide attempt. The anxiety model was more interesting; early forced CSA predicted higher levels of anxiety that in turn were associated with post-baseline suicide attempt. Still, anxiety scores did not mediate the association between early forced CSA and subsequent suicide attempt. Thus, our findings suggest that early forced CSA portends higher levels of anxiety later in life that in turn may increase risk for suicide and NSSI. However, greater anxiety symptoms did not explain the relationship

between early forced CSA and later suicide attempt. Theories of trauma suggest that post-traumatic anxiety symptoms such as dissociation and hyperarousal, and specific depressive symptoms such as guilt and lack of self-worth, seem to be most implicated in self-harm (Putnam, 2003; Finkelhor and Browne, 1985). Therefore, future studies that assess trauma-specific anxiety symptoms or relevant cognitive features of depression such as hopelessness, may build on our findings.

The association that early forced CSA had with NSSI deserves additional discussion. Drawing from trauma theories, early forced CSA may lead to NSSI and suicide attempt through different mechanisms. Nock and Prinstein's (2005) functional model strongly indicates that NSSI often functions as a means of self-regulating emotional and physiological distress. In contrast, Joiner's interpersonal-psychological theory of suicide proposes separate mechanisms for suicide attempt; that is high sense of burdensomeness, low belongingness, and the ability to carry out suicide. As the ability to attempt suicide can be incurred by repeated exposure to self-harm and habituation to injury, it may be that CSA increases general risk for self-injury, which in combination with other liabilities, increases risk for suicide attempt. The present study serves as an important step in theory development on the impact of CSA on suicide-related outcomes by demonstrating that force and early timing of CSA play significant roles in NSSI and suicide attempt. Whereas well-developed models have been established for the consequences of CSA and processes through which trauma leads to NSSI and suicide attempt separately (Finkelhor & Browne, 1985; Nock & Prinstein, 2004; Klonsky, 2007; Joiner, 2009), the literature lacks a conceptualization of the overlap and independence of pathways from early forced CSA to NSSI and suicide attempt. Our study underscores the importance of elucidating these processes, and supports a need for integrated theoretical models of forced and early CSA in particular. Further investigation of several mechanisms proposed in existing theoretical models may be an important next step. For example, better understanding the nuanced experiences of females with early histories of forced CSA, including their emotional, cognitive and physiological responses to the abuse may be fruitful. Understanding how reactions to forced CSA might contribute to feelings of burdensomeness and lack of belongingness that Joiner (2009) has found to be associated with heightened suicide risk is also important. Finally, examining how repeated self-injury may contribute to habituation to pain and fear, which have also been linked to increased suicide risk may shed light on the overlap in pathways between forced CSA and NSSI and suicide attempt.

This work has several implications for prevention and intervention efforts. Younger age at study entry predicted suicide attempt and was associated with a greater likelihood of having experienced CSA. Prior work with this sample suggests that girls who are facing a mandated out of home placement at a younger age have more significant problems, contextual challenges, and disrupted developmental trajectories (Leve & Chamberlain, 2004). Younger children with elevated delinquency behaviors often have myriad individual, contextual, and familial risk factors in addition to CSA; these may include higher levels of impulsivity and aggression, and higher rates of neighborhood poverty, caregiver transition, and parental antisocial behavior, depression and substance abuse (Loeber & Farrington, 2000). Thus, in addition to evidence-based interventions (e.g., MTFC) for their delinquency, younger female offenders may need increased safety monitoring and specialized treatments developed to

address trauma and suicide risk. The National Center for Mental Health and Juvenile Justice proposed a comprehensive model of safety monitoring, which emphasizes general and emergency mental health screening during each point of contact with JJS in addition to other recommendations. For a detailed report, see Skowrya & Coccozza (2007). Targeted interventions for suicide and NSSI risk that augment other interventions being delivered in foster homes, community-based group care institutions, and juvenile detention centers may be critical. For example, subsamples of girls who are identified at highest risk for suicidal behavior and NSSI due to younger age, early forced sex history, and/or prior history of suicidal behavior may benefit from supplementary skills-based interventions that follow or are integrated into their primary intervention services.

Consistent with this rationale, Smith, Chamberlain and Deblinger (2012) developed an intervention (MTFC+T) that integrates trauma-focused cognitive behavior therapy with MTFC for girls with co-occurring delinquency and trauma histories. Findings from their pilot study indicated that girls receiving MTFC+T had fewer mental health symptoms after 12 months relative to girls assigned to group care. Further research in this area is warranted to determine whether MTFC+T outperforms standard MTFC, and whether integrated treatment of delinquency and trauma symptoms may reduce rates of suicidal behavior and NSSI.

Dialectical Behavior Therapy (DBT) is another treatment modality that specifically targets suicidal behavior and self-harm and has been adapted for adolescents (Miller, Rathus, Linehan, Wetzler & Leigh, 1997). DBT incorporates a variety of skills training techniques to assist youth in reducing self-harming, impulsive and aggressive behaviors, and has been effectively used to reduce problem behavior among incarcerated female juvenile offenders in residential settings (Trupin, Stewart, Beach & Boesky, 2002). The extent to which pairing a DBT-informed skills module with MTFC or other established treatments for problem behavior may reduce suicidal behavior and self-harm among JJS girls deserves evaluation.

This study has several limitations. First, the reliance on long-term retrospective reports of suicide attempt, NSSI, and CSA is a limitation. The long time period between these acts of retrospection offsets some concerns and increases confidence in the temporal separation between CSA events and post-baseline suicidal and NSSI events. Relatedly, the mediators may have been assessed after suicide attempt and NSSI occurred in some cases. On the other hand, the logic of the model rested more on the temporal separation of the child maltreatment variables from the mediators, and in this we can have more confidence. Another limitation is that we did not measure some features of CSA that have been shown to predict more negative consequences. For example, degree of closeness between the perpetrator and victim (Anderson, Martin, Mullen, Romans, & Herbison, 1993), and perceived participation and resistance to the abuse (Steel, Sanna, Hammond, Whipple, & Cross, 2004) relate to short- and long-term negative outcomes. Additionally, the importance of age of abuse and forcible nature of abuse were confounded. Future studies should further examine the unique impact of features of abuse on delinquent girls. Another weakness is that potentially important baseline characteristics such as psychiatric diagnoses; impulsive traits and impulsive aggression and mediators such as hopelessness were not assessed or were not measured identically in the two cohorts. Some final limitations relate to generalizability. The

sample was predominantly White and from the Pacific Northwest region of the U.S. and, thus findings may not generalize to ethnically diverse females in other geographical regions and urban areas. Additionally, given that girls had to be mandated to out of home care to be eligible, participants were more seriously delinquent than the broader population of JJS girls, potentially limiting external validity.

In conclusion, findings from this study indicate that distinct forms of CSA may differentially impact suicide-related outcomes in delinquent female populations. Our findings suggest early forced sexual trauma and early entry into the juvenile justice and child welfare systems are associated with past and future suicidal behavior, and indicate that supplemental services and greater safety monitoring are needed. Future research exploring the mechanisms linking CSA to later suicide-related and NSSI outcomes is needed to inform suicide prevention with high-risk populations.

## Acknowledgments

This project was supported by the Oregon Youth Authority and by Grants R01 DA024672, R01 DA015208, and P50 DA035763 from the National Institute on Drug Abuse, and by Grants R01 MH054257 and R03 MH091611 from the National Institute of Mental Health, National Institutes of Health, U.S. Public Health Service (Principal Investigators: Patricia Chamberlain, Leslie Leve, and David Kerr). The authors wish to acknowledge the efforts of Priscilla Havlis for project management, Brandon Gibson for data management, Michelle Baumann for editorial assistance, Peter Sprengelmeyer and Rohanna Buchanan for risk management consultation, the team of interviewers and data management staff, and the study participants, parents, and foster parents.

## References

- Abram KM, Choe JY, Washburn JJ, Teplin LA, King DC, Dulcan MK. Suicidal ideation and behaviors among youths in juvenile detention. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2008; 47(3):291–300. [PubMed: 18216737]
- Achenbach, TM.; Rescorla, L. ASEBA School-Age Forms & Profiles. Burlington: Aseba; 2001.
- Acoca L. Outside/inside: The violation of American girls at home, on the streets and in the juvenile justice system. *Crime & Delinquency*. 1998; 44:561.
- Anderson J, Martin J, Mullen P, Romans S, Herbison P. Prevalence of childhood sexual abuse experiences in a community sample of women. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1993; 32(5):911–919. [PubMed: 8407763]
- Bagley C, Ramsay R. Sexual abuse in childhood: Psychosocial outcomes and implications for social work practice. *Journal of Social Work & Human Sexuality*. 1986; 4(1–2):33–47.
- Bergen HA, Martin G, Richardson AS, Allison S, Roeger L. Sexual abuse and suicidal behavior: A model constructed from a large community sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2003; 42:1301–1309. [PubMed: 14566167]
- Brown J, Cohen P, Johnson JG, Smailes EM. Childhood abuse and neglect: specificity of effects on adolescent and young adult depression and suicidality. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1999; 38(12):1490–1496. [PubMed: 10596248]
- Chamberlain P. The Oregon multidimensional treatment foster care model: Features, outcomes, and progress in dissemination. *Cognitive and Behavioral Practice*. 2003; 10(4):303–312.
- Chamberlain P, Leve LD, DeGarmo DS. Multidimensional treatment foster care for girls in the juvenile justice system: 2-year follow-up of a randomized clinical trial. *Journal of Consulting and Clinical Psychology*. 2007; 75(1):187. [PubMed: 17295579]
- Chapman JF, Ford JD. Relationships between suicide risk, traumatic experiences, and substance use among juvenile detainees. *Archives of Suicide Research*. 2008; 12:50–61. [PubMed: 18240034]
- Corneau M, Lanctôt N. Mental health outcomes of adjudicated males and females: The aftermath of juvenile delinquency and problem behaviour. *Criminal Behaviour and Mental Health*. 2004; 14(4): 251–262. [PubMed: 15614328]



- Crosby, AE.; Ortega, L.; Melanson, C. Self-directed violence surveillance: Uniform definitions and recommended data elements. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention; 2011.
- Cuellar J, Curry TR. The prevalence and comorbidity between delinquency, drug abuse, suicide attempts, physical and sexual abuse, and self-mutilation among delinquent Hispanic females. *Hispanic Journal of Behavioral Sciences*. 2007; 29(1):68–82.
- Derogatis, L. *The SCL-90-R Manual II: Administration, scoring, and procedures*. Baltimore: Clinical Psychometric Research; 1983.
- Derogatis, LR.; Spencer, PM. *Brief Symptom Inventory: BSI*. Upper Saddle River, NJ: Pearson; 1993.
- Evans W, Albers E, Macari D, Mason A. Suicide ideation, attempts and abuse among incarcerated gang and nongang delinquents. *Child and Adolescent Social Work Journal*. 1996; 13(2):115–126.
- Fergusson DM, Woodward LJ, Horwood LJ. Risk factors and life processes associated with the onset of suicidal behaviour during adolescence and early adulthood. *Psychological Medicine*. 2000; 30(01):23–39. [PubMed: 10722173]
- Finkelhor D, Araji. Explanations of pedophilia: A four factor model. *Journal of Sex Research*. 1986; 22:145–161.
- Finkelhor D, Browne A. The traumatic impact of child sexual abuse: A conceptualization. *American Journal of Orthopsychiatry*. 1985; 55(4):530–541. [PubMed: 4073225]
- Goodkind S, Ng I, Sarri RC. The impact of sexual abuse in the lives of young women involved or at risk of involvement with the juvenile justice system. *Violence Against Women*. 2006; 12(5):456–477. [PubMed: 16617171]
- Harold GT, Kerr DC, Van Ryzin M, DeGarmo DS, Rhoades KA, Leve LD. Depressive symptom trajectories among girls in the juvenile justice system: 24-month outcomes of an RCT of Multidimensional Treatment Foster Care. *Prevention Science*. 2013; 14(5):437–446. [PubMed: 23417664]
- Hjern A, Vinnerljung B, Lindblad F. Avoidable mortality among child welfare recipients and intercountry adoptees: a national cohort study. *Journal of Epidemiology and Community Health*. 2004; 58(5):412–417. [PubMed: 15082742]
- Joiner, T. *Why people die by suicide*. Cambridge: Harvard University Press; 2009.
- Kerr DC, Capaldi DM. Young men's intimate partner violence and relationship functioning: long-term outcomes associated with suicide attempt and aggression in adolescence. *Psychological Medicine*. 2011; 41(4):759–769. [PubMed: 20540815]
- Kerr DC, DeGarmo DS, Leve LD, Chamberlain PC. Juvenile justice girls' depressive symptoms and suicidal ideation nine years after Multidimensional Treatment Foster Care. *Journal of Consulting and Clinical Psychology*. (in press).
- Kerr DC, Leve LD, Chamberlain P. Pregnancy rates among juvenile justice girls in two randomized controlled trials of multidimensional treatment foster care. *Journal of Consulting and Clinical Psychology*. 2009; 77(3):588. [PubMed: 19485598]
- Kerr DCR, Gibson B, Leve LD, DeGarmo DS. Young adult follow-up of adolescent girls in juvenile justice using the Columbia Suicide Severity Rating Scale. *Suicide and Life-Threatening Behavior*. 2014
- Klonsky ED, Oltmanns TF, Turkheimer E. Deliberate self-harm in a nonclinical population: Prevalence and psychological correlates. *American Journal of Psychiatry*. 2003; 160(8):1501–1508. [PubMed: 12900314]
- Klonsky ED. The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review*. 2007; 27(2):226–239. [PubMed: 17014942]
- Leserman J, Drossman DA, Li Z, Toomey TC, Nachman G, Glogau L. Sexual and physical abuse history in gastroenterology practice: how types of abuse impact health status. *Psychosomatic Medicine*. 1996; 58(1):4–15. [PubMed: 8677288]
- Leve LD, Chamberlain P. Female juvenile offenders: Defining an early-onset pathway for delinquency. *Journal of Child and Family Studies*. 2004; 13:439–452.
- Leve LD, Chamberlain P. Association with delinquent peers: Intervention effects for youth in the juvenile justice system. *Journal of Abnormal Child Psychology*. 2005; 33(3):339–347. [PubMed: 15957561]

- Leve LD, Chamberlain P. A randomized evaluation of Multidimensional Treatment Foster Care: Effects on school attendance and homework completion in juvenile justice girls. *Research on Social Work Practice*. 2007; 17(6):657–663. [PubMed: 18159224]
- Leve LD, Chamberlain P, Reid JB. Intervention outcomes for girls referred from juvenile justice: effects on delinquency. *Journal of Consulting and Clinical Psychology*. 2005; 73(6):1181–1184. [PubMed: 16392991]
- Lewinsohn PM, Rohde P, Seeley JR. Major depressive disorder in older adolescents: prevalence, risk factors, and clinical implications. *Clinical Psychology Review*. 1998; 18(7):765–794. [PubMed: 9827321]
- Linehan, M. *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press; 1993.
- Loeber R, Farrington DP. Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development and Psychopathology*. 2000; 12(04):737–762. [PubMed: 11202042]
- Maniglio R. The role of child sexual abuse in the etiology of suicide and nonsuicidal self injury. *Acta Psychiatrica Scandinavica*. 2011; 124(1):30–41. [PubMed: 20946202]
- Martin G, Bergen HA, Richardson AS, Roeger L, Allison S. Sexual abuse and suicidality: gender differences in a large community sample of adolescents. *Child Abuse & Neglect*. 2004; 28(5):491–503. [PubMed: 15159067]
- Meiselman, KC. *Incest: A psychological study of causes and effects with treatment recommendations*. Jossey-Bass; 1978.
- Messman TL, Long PJ. Child sexual abuse and its relationship to revictimization in adult women: A review. *Clinical Psychology Review*. 1996; 16(5):397–420.
- Miller AL, Rathus JH, Linehan MM, Wetzler S, Leigh E. Dialectical behavior therapy adapted for suicidal adolescents. *Journal of Psychiatric Practice*. 1997; 3(2):78.
- Muthén, LK.; Muthén, BO. *Mplus (version 6.12)[computer software]*. Author; Los Angeles: 2011.
- Nock MK, Prinstein MJ. Contextual features and behavioral functions of self-mutilation among adolescents. *Journal of Abnormal Psychology*. 2005; 114(1):140. [PubMed: 15709820]
- Posner, K.; Brent, D.; Lucas, C.; Gould, M.; Stanley, B.; Brown, G.; Mann, J. *Columbia suicide severity rating scale*. New York, NY: Columbia University; 2008.
- Posner K, Brown GK, Stanley B, Brent DA, Yershova KV, Oquendo MA, Mann JJ. The Columbia–Suicide Severity Rating Scale: initial validity and internal consistency findings from three multisite studies with adolescents and adults. *American journal of psychiatry*. 2011; 168(12):1266–1277. [PubMed: 22193671]
- Putnam FW. Ten-year research update review: Child sexual abuse. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2003; 42(3):269–278. [PubMed: 12595779]
- Putnins AL. Correlates and predictors of self-reported suicide attempts among incarcerated youths. *International Journal of Offender Therapy and Comparative Criminology*. 2005; 49(2):143–157. [PubMed: 15746266]
- Radloff LS. The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1(3):385–401.
- Rohde P, Seeley JR, Mace DE. Correlates of suicidal behavior in a juvenile detention population. *Suicide and Life-Threatening Behavior*. 1997; 27(2):164–175. [PubMed: 9260299]
- Sedlak, AJ.; Broadhurst, DD. *Executive summary of the third national incidence study of child abuse and neglect (NIS-3)*. National Center on Child Abuse and Neglect (DHHS); Washington, DC: 1996.
- Silverman AB, Reinherz HZ, Giaconia RM. The long-term sequelae of child and adolescent abuse: A longitudinal community study. *Child Abuse & Neglect*. 1996; 20(8):709–723. [PubMed: 8866117]
- Skowrya, KR.; Coccozza, JJ. *Blueprint for change: A comprehensive model for the identification and treatment of youth with mental health needs in contact with the juvenile justice system*. Delmar: National Centre for Mental Health and Juvenile Justice; 2007.
- Smith DK, Chamberlain P, Deblinger E. Adapting multidimensional treatment foster care for the treatment of co-occurring trauma and delinquency in adolescent girls. *Journal of Child & Adolescent Trauma*. 2012; 5(3):224–238.

- Smith DK, Lave LD, Chamberlain P. Adolescent girls' offending and health-risking sexual behavior: The predictive role of trauma. *Child Maltreatment*. 2006; 11(4):346–353. [PubMed: 17043319]
- Steel J, Sanna L, Hammond B, Whipple J, Cross H. Psychological sequelae of childhood sexual abuse: Abuse-related characteristics, coping strategies, and attributional style. *Child Abuse & Neglect*. 2004; 28(7):785–801. [PubMed: 15261472]
- Thompson MP, Ho CH, Kingree JB. Prospective associations between delinquency and suicidal behaviors in a nationally representative sample. *Journal of Adolescent Health*. 2007; 40(3):232–237. [PubMed: 17321423]
- Trupin EW, Stewart DG, Beach B, Boesky L. Effectiveness of a dialectical behaviour therapy program for incarcerated female juvenile offenders. *Child and Adolescent Mental Health*. 2002; 7(3):121–127.
- Tufts New England Medical Center, Division of Child Psychiatry. Sexually exploited children: Service and research project (Final report for the Office of Juvenile Justice and Delinquency Prevention). Washington, DC: U.S. Department of Justice; 1984.
- Whitelock C, Lamb M, Rentfrow P. Overcoming trauma: Psychological and demographic characteristics of child sexual abuse survivors in adulthood. *Clinical Psychology*. 2013
- Zahl DL, Hawton K. Repetition of deliberate self-harm and subsequent suicide risk: long-term follow-up study of 11 583 patients. *The British Journal of Psychiatry*. 2004; 185:70–75. [PubMed: 15231558]
- Zaidi, LY.; Schnurr, P.; Knutson, JF.; Kriegler, J.; Blanke, D.; Bremner, D. Childhood Sexual Experiences Questionnaire. Iowa City: National Center for PTSD and University of Iowa; 1991.

Table 1

## Descriptive Statistics on Primary Study Variables.

	Total (n = 166)	Lifetime suicide attempt history		Lifetime NSSI history	
		Yes (n = 69)	No (n = 80)	Yes (n = 37)	No (n = 111)
Baseline, mean (SD)					
Age in years	15.30 (1.17)	15.08 (1.17)	15.46 (1.15)	15.21 (0.98)	15.32 (1.22)
Depressive symptoms	24.53 (12.95)	25.18 (12.76)	24.16 (12.96)	25.30 (14.38)	24.52 (12.31)
Criminal referrals	12.46 (9.33)	11.52 (9.38)	12.74 (9.24)	12.62 (9.02)	12.08 (9.44)
Log of criminal referrals	0.98 (0.33)	0.94 (0.34)	1.00 (0.32)	1.00 (0.31)	0.96 (0.34)
Aggressive behavior	17.27 (8.85)	18.75 (1.21)	16.54 (8.43)	18.67 (9.33)	17.12 (9.07)
Self-reported sexual acts	6.66 (4.06)	7.38 (3.87)	6.28 (4.25)	7.59 (3.52)	6.56 (4.26)
Baseline, % yes (n yes/total)					
Documented sexual abuse	55% (89/161)	67% (44/66)	50% (39/78)	56% (20/36)	58% (62/107)
Documented physical abuse	61% (96/157)	69% (45/65)	51% (39/76)	51% (19/37)	63% (65/103)
Forced sexual act by age 13	68% (112/166)	80% (55/69)	59% (47/80)	84% (31/37)	63% (70/111)
12–36 month, mean (SD)					
Depressive symptoms	18.33 (10.41)	20.33 (9.93)	16.17 (9.94)	19.38 (10.54)	17.84 (10.02)
Anxiety symptoms (log)	0.16 (0.14)	0.21 (0.15)	0.12 (0.12)	0.18 (0.14)	0.16 (0.15)

Note. SD = standard deviation; NSSI = non-suicidal self-injury. Samples sizes differed somewhat by measure. To avoid redundancy, statistical significance of group differences in Table 1 are reported in Table 2 only.

Table 2

Correlations Among Study Variables

<i>Baseline</i>	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age (years)	-.07	-.01	.21**	.05	-.18*	-.11	.04	-.11	-.03	-.27**	-.09	-.16 <sup>†</sup>	-.04
2. Depressive symptoms		.05	-.10	.25**	.25**	.19*	.09	.24**	.13	.00	.10	.04	.03
3. Aggressive behavior			-.04	.00	.02	-.01	.04	.02	-.02	.06	-.00	.12	.07
4. Log of lifetime referrals				-.02	-.05	.06	-.01	-.07	-.00	-.14 <sup>†</sup>	.13	-.10	.05
5. Total sex acts					.64 <sup>a</sup>	.25**	.16 <sup>†</sup>	.10	.21*	.03	.07	.13	.11
6. Early forced sex						.29***	.07	.18*	.21*	.20*	.13	.23**	.19**
7. Doc. sexual abuse							.09	.03	.07	.09	-.03	.17*	-.02
8. Doc. physical abuse								.15 <sup>†</sup>	.12	.00	.00	.18*	-.11
<i>12–36 mo post-baseline</i>													
9. Depressive symptoms									.51***	.12	.00	.21*	.07
10. Log anxiety symptoms										.19*	.08	.32***	.05
<i>Post-baseline history</i>													
11. Suicide attempt											.06	.54 <sup>a</sup>	.15 <sup>†</sup>
12. NSSI												.01	.58 <sup>a</sup>
<i>Lifetime history</i>													
13. Suicide attempt													.13
14. NSSI													

Note.

<sup>a</sup>One variable is a subset of the other, and therefore the two are correlated by definition.

NSSI = Non-suicidal self-injury; Doc.= documented. Variables 6–8 and 11–16 were coded yes (1) or no (0).

<sup>†</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*\*  $p < .01$ .

$p < .001$   
\*\*\*

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript



**Table 3**

Results of Probit Regression Path Models (n = 166) Predicting Suicide Attempt and NSSI

	Lifetime Suicide Attempt Model		Lifetime NSSI Model		Post-baseline Suicide Attempt Model	
	Estimate (SE)	$\beta$ or $r$ (SE)	Estimate (SE)	$\beta$ or $r$ (SE)	Estimate (SE)	$\beta$ or $r$ (SE)
<i>Baseline Predictors</i>						
Early forced sex	.51 (.21)*	.24 (.10)	.60 (.25)*	.28 (.12)	.48 (.27) <sup>†</sup>	.23 (.13)
Documented physical abuse	.46 (.20)*	.22 (.10)	-.29 (.22)	-.14 (.11)	-.01 (.25)	-.00 (.12)
Age	-.12 (.09)	-.14 (.10)	-.02 (.11)	-.02 (.12)	-.27 (.09)**	-.32 (.10)
Referrals (log-transformed)	-.28 (.31)	-.09 (.10)	.23 (.36)	.07 (.12)	-.37 (.32)	-.12 (.10)
Cohort	-.08 (.10)	-.08 (.10)	-.00 (.12)	-.00 (.12)	-.16 (.11)	-.16 (.11)
Threshold	-1.36 (1.33)	-1.36 (1.33)	.81 (1.64)	.81 (1.64)	-3.39 (1.41)*	-3.39 (1.41)
<i>Covariances<sup>a</sup></i>						
Early forced sex with age	-.10 (.04)*	-.18 (.08)	-.10 (.04)*	-.18 (.08)	-.10 (.04)*	-.18 (.08)
Early forced sex with cohort	-.10 (.03)**	-.22 (.07)	-.10 (.03)**	-.22 (.07)	-.10 (.03)**	-.22 (.07)
Age with referrals	.08 (.03)*	.21 (.08)	.08 (.03)*	.21 (.08)	.08 (.03)*	.21 (.08)

Note.

<sup>a</sup> Covariances not listed were not significant ( $p > .10$ ) and were fixed to zero.

Lifetime attempt model  $\chi^2$  ( $df=7, n=166$ ) = 2.397,  $p = .9346$ . Explained variance in outcome: Estimated  $R^2 = .167, p = .04$ .

Post-baseline attempt model  $\chi^2$  ( $df=7, n=166$ ) = 2.397,  $p = .9346$ . Explained variance in outcome: Estimated  $R^2 = .250, p = .02$ .

Lifetime NSSI model  $\chi^2$  ( $df=7, n=166$ ) = 2.397,  $p = .9346$ . Explained variance in outcome: Estimated  $R^2 = .105, p = .13$ .

<sup>†</sup>  $p < .10$ .

\*  $p < .05$ .

\*\*  $p < .01$ .