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Childhood Exposure to a Parental Suicide Attempt and Risk for Substance Use Disorders

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1. Introduction

A host of childhood factors have been found to be associated with risk for developing a substance use disorder (SUD) in adulthood. Important individual childhood factors that contribute to SUD risk include pre-natal exposure to substances (Stone et al., 2012), genetic and temperament-based factors (DeLisi & Vaughn, 2013), behavioral issues (Hayatbakhsh et al., 2008; King et al., 2004; Timmermans et al., 2008), and psychiatric diagnoses (Flory et al., 2003; Haesey et al., 2002; King et al., 2004; Molina & Pelham, 2003). Familial factors such as parental substance use problems, child maltreatment, and family conflict have also been associated with increased risk of developing an SUD during adulthood (Stone et al., 2012).

It has been well-established that childhood exposure to parental suicidal behavior is linked to a variety of behavioral and mental health outcomes (Kuramoto et al., 2009; Ratnarajah & Schofield, 2007), including suicide attempts (Burke et al., 2010; Kuramoto et al., 2009; Wilcox et al., 2010). However, relatively little is known in terms of the degree to which exposure to parental suicidal behavior may place individuals at increased risk for SUDs during adulthood. In light of research highlighting the role of chronic stress, particularly during early developmental periods, in the etiology of SUDs (Sinha, 2008), it seems reasonable to surmise that the experience of a parental suicide attempt may be associated with the development of SUDs. Drawing from research on cumulative risk exposure (Evans & Kim, 2007), it also seems reasonable that individuals who experience a parental suicide

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attempt in addition to other family stressors (e.g., parental substance use problems, child maltreatment, family conflict) would be particularly at risk for SUDs.

Although there is empirical support for the relationship between childhood exposure to parental suicidal behavior and the development of suicidal behavior (Brent & Melhem, 2008; Bronisch & Lieb, 2008; Kuramoto et al., 2009; Wilcox et al., 2010), studies on the relationship between parental suicidal behavior and the development of SUDs are limited. The most recent WHO World Mental Health Survey study found that parental suicide attempt and/or death only significantly predicted substance abuse in offspring when both parents died of suicide (McLaughlin et al., 2012). Another study of young adults in Sweden found that those who had lost a parent to suicide during childhood were at higher risk for later hospitalization for drug use than those who had not (Wilcox et al., 2010). Other studies have examined the use of licit and illicit substances during adolescence, but did not provide information on the prevalence of SUDs among those exposed to suicidal behavior during childhood (Cerel & Roberts, 2005).

Although research has accrued on the long-term outcomes of children exposed to parental suicidal behavior, few studies have examined outcomes related to substance abuse and dependence (Cerniglia et al., 2014; Ratnarajah & Schofield, 2007; Van Der Wal, 1989). Moreover, those that have tend to be hindered by the use of relatively small and geographically-restricted samples. The use of small samples is problematic given that parental suicidal behaviors and many drug use disorders of interest have low base rates. Consequently, studies utilizing relatively small samples are likely to be severely underpowered (Ellis, 2010). The lack of statistical power makes it difficult to detect differences in prevalence and to examine specific illicit drug use disorders as outcome variables. Additionally, the use of geographically-restricted or non-representative samples creates limitations in terms of the potential scope and generalizability of study findings. Notably, the few studies that have examined exposure to suicidal behavior and the prevalence of SUDs with large data files have relied upon international data and data from European nations, which raises questions about generalizability to the US population. As such, analyses conducted with large, nationally representative samples are needed in order to advance our understanding of these important relationships among individuals in the United States.

The present study aims to fill a gap in the existing literature by examining the relationship between childhood exposure to a parental suicide attempt and development of SUDs in adulthood, with attention to differences across substance type, in a nationally representative sample of adults in the United States. In addition, given the evidence that significant gender differences exist in the development of SUDs (Le-Van et al., 2013; Stone et al., 2012) and the pathways among psychological predictors (Alati et al., 2005; Wu et al., 2010), family predictors (Enoch, 2011; Shand et al., 2010), and substance use, a second aim of this study is to examine whether gender differences also exist in the relationship between childhood exposure and the development of SUDs. Finally, in order to explore the importance of factors that serve to augment SUD-risk among those exposed to parental suicide attempts, we examine the links between parental substance use history, childhood adversity, and

SUDs among the subset of individuals exposed to parental suicide attempts during childhood.

2. Method

2.1 Sample and Procedures

Study findings are based on data from Wave 1 (2002–2003) and Wave 2 (2004–2005) of the NESARC ($n = 34,653$). The NESARC is a nationally representative sample of non-institutionalized U.S. residents aged 18 years and older. Utilizing a multistage cluster sampling design and oversampling minority populations, the study gathered extensive information about substance use and mental disorders from individuals living in all 50 states and the District of Columbia. Data were collected through face-to-face structured psychiatric interviews conducted by U.S. Census workers trained by the National Institute on Alcohol Abuse and Alcoholism and U.S. Census Bureau. A more detailed description of the NESARC design and procedures is available elsewhere (Grant et al., 2003).

2.2 Measures

2.2.1 Exposure to Suicide Attempt—Respondents were classified as having been exposed to a suicide attempt (0 = no, 1 = yes) if they responded affirmatively the following question: “Before you were 18, did a parent or other adult living in your home attempt suicide?”

2.2.2 Substance Use and Mental Disorders—We examined lifetime alcohol, cannabis, cocaine, stimulant, sedative, tranquilizer, and opioid use disorders (abuse or dependence). SUDs were determined using the Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV version (AUDADIS-IV; Grant et al., 1995; Hasin et al., 1997). Lifetime DSM mood, anxiety, and personality disorders were also examined on the basis of diagnoses from the AUDADIS-IV.

2.2.3 Parental Substance Use Problems—Individuals were considered to have a *parent who was an alcoholic/problem drinker* if they reported during the Wave 1 interview that either their “blood or natural father/mother has ever been an alcoholic or problem drinker at any time in his/her life”. Similarly, individuals were coded as having *parents with problems with drugs* if they reported that their “blood or natural father/mother had problems with drugs at any time in his/her life”. For both variables, individuals responding affirmatively were coded as 1, those responding negatively were coded as 0, and individuals who “did not know” were coded as missing.

2.2.4 Childhood Adversity—Two dichotomous (0 = no, 1 = yes) variables related to child maltreatment and family violence were utilized: child physical abuse and family violence. Sample items include, “Were you ever physically attacked, beaten, or injured before the age of 18 by a parent or caretaker?” and “Did you ever witness serious fights at home before the age of 18?”

2.2.5 Control Variables—Sociodemographic variables frequently used as control variables in substance use research using the NESARC data (Grant et al., 2004) were

included as controls: age, gender, race/ethnicity, household income, education level, and marital status. In addition to these sociodemographic variables, we also controlled for lifetime psychiatric morbidity, parental substance use problems, and exposure to childhood adversity in all multivariate analyses.

2.3 Analysis

Statistical analyses were conducted in three primary steps. First, a series of logistic regression analyses were executed to compare the sociodemographic characteristics of adults exposed to suicide attempts as children with those of individuals in the general population. In these analyses, exposure to a suicide attempt was specified as the dependent variable in order to distinguish between those exposed and not exposed in terms of sociodemographic factors. Next, we examined the associations between exposure to suicide attempts during childhood and salient psychosocial factors (i.e., parental substance use history and child adversity) using logistic regression with exposure specified as the dependent variable. Additionally, logistic regression was also used to compare the prevalence of SUDs among those that experienced childhood exposure and individuals in the general population. In these analyses exposure to a suicide attempt was specified as an independent variable in order to test the impact of parental suicide on SUD risk above and beyond other sociodemographic, individual, and parental factors.

We also conducted an exploratory examination of differences in the magnitude of the relationship between childhood exposure and SUDs across gender by examining the overlap (or lack thereof) of the 95% confidence intervals for the adjusted odds ratios. The examination of overlapping/non-overlapping confidence intervals is a relatively common and conservative approach for examining the differences in the magnitude of effects across categorical variables in large epidemiological data files (Cumming & Finch, 2005; Hofman, Richey, Kashdan, & McKnight, 2009). Typically, it is understood that non-overlapping 95% confidence intervals suggest significantly different effects whereas overlapping confidence intervals may point to a non-significant difference in effect size. It should be noted that this approach faces some important limitations, particularly the risk of type 1 errors, and therefore researchers should use interpret findings with appropriate caution (Knol, Pestman, & Grobbee, 2011). Our assessment is that this approach functions as a viable alternative to more traditional (i.e., multiplicative) tests of moderation due to the potential for unequal residual dispersion between groups (Allison, 1999).

Finally, logistic regression analyses were conducted with the subsample of individuals exposed to a suicide attempt ($n = 1,250$) in order to examine the relationship between parental substance use history, childhood adversity, and the diagnosis of SUDs. In this set of analyses, lifetime SUD was specified as the dependent variable. It should be noted that, although the NESARC has two waves of data, it is not a true longitudinal study as many questions included in Wave 1 were not included in Wave 2 (and vice versa). Consequently, while we made use of salient psychosocial and developmental variables from both waves of the NESARC, all statistical analyses were conducted in a cross-sectional manner. Weighted prevalence estimates and standard errors were survey adjusted for clustering and were computed using Stata 13.1 SE software (StataCorp, 2013).

3. Results

3.1 Characteristics of Individuals Exposed to Parental Suicide Attempts

The prevalence of exposure to a parental suicide attempt during childhood was 3.74% (95% CI = 3.61–3.87) among adults 18 years and older in the United States. As illustrated in Table 1, logistic regression analyses revealed that, compared to individuals in the general population, those with exposure were significantly more likely, compared to those 65 years and older, to be between the ages of 18–34 (AOR = 2.21, 95% CI = 1.92–2.55), 35–49 (AOR = 2.47, 95% CI = 2.15–2.82), and 50–64 (AOR = 2.06, 95% CI = 1.80–2.34). Those reporting exposure to a parental suicide attempt during childhood were also significantly more likely, compared to those in households earning more than \$70,000 per year, to reside in households earning less than \$20,000 per year (AOR = 1.26, 95% CI = 1.11–1.43) and between \$20,000–\$34,999 per year (AOR = 1.28, 95% CI = 1.14–1.43). Those exposed to a suicide attempt were significantly less likely to be male (AOR = 0.86, 95% CI = 0.82–0.91), African-American (AOR = 0.54, 95% CI = 0.50–0.59) or Hispanic (AOR = 0.75, 95% CI = 0.68–0.84), to have completed less than a high school education (AOR = 0.71, 95% CI = 0.60–0.83), and to be widowed (AOR = 0.63, 95% CI = 0.49–0.80) or never married (AOR = 0.78, 95% CI = 0.72–0.86). Those reporting exposure were also significantly more likely to have met lifetime diagnostic criteria for DSM mood (AOR = 2.08, 95% CI = 1.96–2.21), anxiety (AOR = 1.86, 95% CI = 1.76–1.97), and personality (AOR = 2.03, 95% CI = 1.90–2.18) disorders.

As shown in Table 2, we also examined the association between parental suicide attempts and variables in the domains of parental substance use history and childhood adversity. Controlling for an array sociodemographic factors, we found that individuals exposed to a parental suicide attempt were significantly more likely to report parental problems with alcohol (AOR = 1.82, 95% CI = 1.70–1.96) and drugs (AOR = 3.67, 95% CI = 3.32–4.05). Those reporting parental suicide attempts were also significantly more likely to report having experienced child maltreatment (AOR = 3.85, 95% CI = 3.43–4.32) and family conflict (AOR = 2.99, 95% CI = 2.77–3.22). The NESARC also includes information on the perceived history of parental depression. Regretfully, however, data for this item is missing for a large proportion of respondents (n = 2,972) as many reported uncertainty about their parent's lifetime history of depression. We conducted supplementary analyses (not shown) with this item which indicated—among respondents who provided data for this question—a significant association between exposure to a parental suicide attempt and parental lifetime history of depression (AOR = 2.96, 95% CI = 2.49–2.92).

3.2 Exposure to Suicide Attempt and Risk for SUDs

Table 3 compares the prevalence of lifetime SUDs among individuals exposed to a parental suicide attempt during childhood with that of individuals in the general population. Individuals exposed to a suicide attempt were significantly more likely to report a lifetime SUD (AOR = 1.09, 95% CI = 1.02–1.18). With respect to particular substances, a more nuanced pattern was observed. Controlling for sociodemographic factors, parental alcohol and drug use problems, lifetime mood, anxiety, and personality disorders, and childhood adversity, we found no significant differences with respect to alcohol, cannabis, and cocaine

use disorders. However, individuals who were exposed to a suicide attempt as children were significantly more likely to have met criteria for stimulant (AOR = 1.40, 95% CI = 1.18–1.67), sedative (AOR = 1.24, 95% CI = 1.04–1.47), tranquilizer (AOR = 1.78, 95% CI = 1.45–2.20), and opioid (AOR = 1.41, 95% CI = 1.19–1.67) use disorders in their lifetime. We also ran additional analyses (not shown) in which we also controlled for reported parental lifetime history of depression. In these supplementary analyses, the odds ratios for all SUDs decreased slightly and the overall association between exposure to a suicide attempt during childhood and meeting criteria for an SUD ceased to be significant. With respect to particular substances, the association with exposure to suicide attempt remained significant for stimulant (AOR = 1.33, 95% CI = 1.10–1.59) and tranquilizer (AOR = 1.61, 95% CI = 1.27–2.04) use disorders; however, the association with sedative and opioid use disorders ceased to be significant at the $p < .05$ level. We also found that exposure to parental suicidal behavior was inversely associated with the likelihood of meeting lifetime criteria for cocaine use disorder (AOR = 0.78, 95% CI = 0.64–0.95).

We also examined the stability of the relationship between childhood exposure to a parental suicide attempt and lifetime SUDs across gender (results not shown). While controlling for the same list of sociodemographic, parental, mental health, and childhood adversity confounds, the relationship between childhood exposure and lifetime SUDs was significant for females (AOR = 1.18, 95% CI = 1.08–1.30), but not for males (AOR = 0.98, 95% CI = 0.87–1.11). Notably, however, as evidenced by the overlapping the 95% confidence intervals, the magnitude of the association between childhood exposure to a parental suicide attempt and lifetime SUDs does not appear to be significantly different across gender. With respect to the use of particular substances, the relationship between parental suicide attempts and lifetime alcohol and cannabis use disorders was not significant for males or females. In terms of lifetime illicit drug use disorders, a significant relationship between parental suicide attempts was identified for females (AOR = 1.31, 95% CI = 1.12–1.53) but not for males (AOR = 1.20, 95% CI = 0.99–1.45). Again, despite the identification of a significant association for females but not for males, the overlapping 95% confidence intervals suggest that the magnitude of this relationship does not differ by gender.

Finally, in a series of supplementary analyses (results not shown), we examined the relationship between parental psychiatric hospitalization during childhood and lifetime diagnoses of SUDs. Controlling for sociodemographic, parental, mental health, and childhood adversity confounds, the pattern of results was quite similar to that of adults exposed to a parental suicide attempt as children. Specifically, individuals who reported parental psychiatric hospitalization during childhood were at increased risk stimulant (AOR = 1.25, 95% CI = 1.09–1.43), sedative (AOR = 1.44, 95% CI = 1.17–1.78), tranquilizer (AOR = 1.73, 95% CI = 1.42–2.11), and opiate (AOR = 1.25, 95% CI = 1.05–1.48) use disorders. No significant differences were observed for alcohol, cannabis, or cocaine use disorder.

3.3 Correlates of SUDs among Adults Exposed to Suicide Attempt in Childhood

Table 4 displays the adjusted odds ratios for the relationship between parental substance use history, childhood adversity, and alcohol, cannabis, and other illicit drug use disorders

among the subsample of adults exposed to a parental suicide attempt in childhood. Among individuals exposed to a parental suicide attempt in childhood, those who reported having a parent who was an alcoholic/problem drinker were significantly more likely to meet criteria for alcohol (AOR = 2.32, 95% CI = 1.97–2.74), cannabis (AOR = 1.45, 95% CI = 1.19–1.75), and other illicit drug use disorders (AOR = 2.03, 95% CI = 1.51–2.72). Those reporting a parent with a drug problem were also significantly more likely to have met criteria for an illicit drug use disorder (AOR = 1.61, 95% CI = 1.20–2.17). In terms of child maltreatment, no significant associations were found with respect to alcohol use disorder. However, those exposed to child maltreatment were significantly more likely to meet criteria for cannabis use disorder (AOR = 1.77, 95% CI = 1.34–2.34) or an illicit drug use disorder (AOR = 1.39, 95% CI = 1.04–1.86). Those reporting family conflict were significantly more likely to have met criteria for cannabis (AOR = 1.93, 95% CI = 1.58–2.37) and other illicit drug use disorders (AOR = 1.29, 95% CI = 1.00–1.66).

4. Discussion

It is now well-established that parental suicidal behavior has important implications with respect to the behavioral and mental health outcomes of offspring (Cerel, Jordan, & Duberstein, 2008). Indeed, much research has accrued in terms of the impact of parental suicidal behavior on outcomes such as mood and anxiety disorders, physical health, social and academic difficulties, and suicidal behavior (Brent & Melhem, 2008; Bronisch & Lieb, 2008; Cerniglia et al., 2014; Kuramoto et al., 2009; Ratnarajah & Schofield, 2007; Van Der Wal, 1989; Wilcox et al., 2010). And yet, our understanding of the relationship between exposure to parental suicidal behavior during childhood and SUDs remains comparatively underdeveloped. In particular, important questions remain in terms of the links between such exposure and the development of particular types of SUDs. Additionally, little is known with respect to the generalizability of the parental suicidal behavior-SUD link among adults in the United States. As such, our study makes a unique contribution by examining the relationship between parental suicide attempts and the development of alcohol, cannabis, cocaine, stimulant, sedative, tranquilizer, and opioid use disorders in a nationally representative study of adults in the United States.

Findings from the present suggest that childhood exposure to a parental suicide attempt is associated with increased risk for the development of SUDs during adulthood. Indeed, even controlling for a host of sociodemographic, parental, mental health, and child adversity confounds, individuals who reported that a parent or other adult living in their home attempted suicide during their childhood were significantly more likely to meet criteria for substance abuse or dependence in their lifetime. Importantly, however, a more nuanced analysis revealed that the nature of this relationship depends, in part, upon the particular substance in question. That is, exposure to a parental suicide attempt was not found to be significantly associated with increased risk for the development of alcohol, cannabis, or cocaine use disorders, but was associated with the increased likelihood of lifetime diagnoses of stimulant, sedative, tranquilizer, and opioid use disorders. This general pattern of findings is consistent with studies examining substance use among individuals exposed to parental suicidal behavior (Cerel & Roberts, 2005) as well as studies conducted in Europe (Wilcox et al., 2010) and internationally (McLaughlin et al., 2012).

The observed differences by substance type are noteworthy as they suggest that childhood exposure to a parental suicide attempt may be a vulnerability factor for low prevalence illicit drugs (i.e. stimulants, sedatives, tranquilizers, opioids), but not for more commonly used substances in the United States (alcohol, cannabis, cocaine). In other words, respondents with parental suicide attempt histories were at just as much risk for the common drugs of abuse as other respondents, and were at additional risk for the abuse of low prevalence drugs, given that the odds ratios for the former do not suggest any meaningful differences between the two groups. Supplementary analyses (results not shown) revealed a very similar pattern among individuals reporting parental psychiatric hospitalization during childhood. This finding stimulates thinking about the possibility that the experience of emotional distress associated with the psychiatric instability of a parent or in-home adult, or perhaps the access to a parent's psychiatric medication with addictive properties in the home, may increase risk for low prevalence illicit drug use relative to their peers who have not had a parent psychiatrically hospitalized.

Despite the fact that this study cannot make causal inferences about the relationship between exposure to parental suicide attempts and risk for SUDs due to the nature of the methodology, it is nevertheless important to consider possible explanations for this relationship. For instance, it should be noted that the primary effects of the use of three of the four substances found to be linked with exposure to a parental suicide attempt—sedatives, tranquilizers, and opioids—all include the amelioration of symptoms commonly experienced by individuals exposed to intense emotional trauma, such as emotional/physical pain and elevated stress and anxiety. Evidence that individuals exposed to a parental suicide attempt were significantly more likely to meet criteria for lifetime mood, anxiety, and personality disorders could possibly be related to the notion that youth may use substances to cope (Galaif et al., 2007; Sher & Zalsman, 2005), particularly in situations where they have lost a parent to suicide and are concurrently coping with psychiatric symptoms. Youth using substances as a means of reducing negative affect in the context of a traumatic stressor, such as a suicide attempt or suicide death of a parent, would be consistent with the self-medication hypothesis (Khantzian, 1985; 1997).

It is well-understood that a variety of psychosocial risk factors influence the likelihood of substance use among individuals in the general population (Hawkins, Catalano, & Miller, 1992; Resnick et al., 1997). As such, beyond examining differences in prevalence, we also looked into the relationship between salient psychosocial factors and the likelihood of SUDs among those reporting exposure to parental suicide attempts as children. In terms of parental substance use history, those reporting that one or more parent had a history of alcoholism or was a problem drinker were significantly more likely to have met criteria for alcohol, cannabis, or other illicit drug use disorders. Notably, those reporting parental problems with illicit drugs were not significantly more likely to report cannabis use disorder, but were more likely to have met criteria for an illicit drug use disorder, again pointing to the potential role that access to illicit drugs may play in conferring risk for later development of SUDs to those specific substances. With respect to childhood adversity, we also found that individuals who reported witnessing serious fights at home were roughly 200% more likely to have met criteria for cannabis use disorder and 25% more likely to have met criteria for an illicit drug use disorder in their lifetime. Child maltreatment was also found to be

associated with increased risk of cannabis use disorder and illicit drug use disorders. Such factors provide clues as to potential mechanisms that may explain why some individuals who are exposed to parental suicide attempts develop SUDs while others do not.

Prior research points to gender differences with respect to the risk factors involved in the development of SUDs (Le-Van et al., 2013; Stone et al., 2012). However, our assessment of gender differences suggests little difference in the magnitude of the relationship between exposure to parental suicide attempts and SUD risk among men and women. Indeed, although gender stratification revealed that the link between exposure to suicide attempts and meeting criteria for at least one SUD was significant among females but not among males, evidence suggests that the magnitude of the relationship was not significantly different across gender. The findings related to gender for SUDs in general mirrored those for illicit drug use disorders. Specifically, while the relationship between exposure to parental suicide attempts and SUDs was significant for females but not for males, results did not point to significant gender moderation. The relative invariance of the associations examined in this study suggests that exposure to parental suicide attempts may have a hand in the etiology of SUDs among both men and women in the United States.

4.1 Study Limitations

Study findings should be interpreted in the context of several limitations. To begin, given that the NESARC is not a true longitudinal investigation, all data were used in a cross-sectional manner. Moreover, our examination of the relationship between exposure to suicide attempts and lifetime SUDs was retrospective in nature. A life course study design would be necessary in order to examine the prospective relationships between study variables. Second, individuals exposed to parental suicide attempts were identified in the basis of a single self-report measure. It is likely that a classification that is also informed by hospital records or parental reports may yield more reliable information. Additionally, the use of a lifetime measure of SUDs is less than optimal as it raises questions about the temporal ordering of childhood exposure to parental suicide attempts and the onset of substance use morbidity. Regretfully, due to our focus on a relatively rare subgroup of individuals as well as the low prevalence of many illicit drug use disorders, the use of a measure of SUDs with a more circumscribed timeframe (e.g., previous 12 months) was not feasible. Finally, the NESARC does not provide a way to distinguish those whose parents attempted but did not die by suicide from those who did die by suicide. As such, we were unable to assess the impact of suicide death in contrast with that of suicide attempts.

5. Conclusions

In conclusion, study findings suggest that, even controlling for a host of sociodemographic, parental, mental health, and childhood adversity confounds, exposure to a parental suicide attempt during childhood is associated with vulnerability to SUDs. Upon closer inspection, however, results reveal a slightly more nuanced story. In particular, individuals exposed to a parental suicide attempt during childhood do not appear to be at increased risk for alcohol, cannabis, or cocaine use disorders. Yet such exposure is associated with the increased likelihood of several lower prevalence drugs of abuse, including stimulants, sedatives, tranquilizers, and opioids. Additionally, we identified several key psychosocial factors,

including parental history of alcohol and drug abuse, family conflict, and childhood maltreatment that appear to place those experiencing childhood exposure to suicide attempts at increased risk for SUDs. In all, evidence suggests that childhood exposure to parental suicide attempts is of relevance to the development of SUDs, but that this relationship is influenced by other psychosocial risk factors and differs by substance type.

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Table 1
Sociodemographic and Psychiatric Characteristics of Adults Exposed to a Parental Suicide Attempt as Children

	“Before you were 18, did a parent or other adult living in your home attempt suicide?”		Unadjusted		Adjusted	
	Yes (n = 1250; 3.74%)					
	No (n = 33,118; 96.26%)	%	95% CI	OR	95% CI	OR (95% CI)
Sociodemographic Factors						
<i>Age</i>						
18–34 years	25.45		(25.1–25.8)	26.69	(25.1–28.4)	2.13 (1.87–2.41) 2.21 (1.92–2.55)
35–49 years	30.83		(30.5–31.1)	38.19	(36.3–40.1)	2.51 (2.21–2.86) 2.47 (2.15–2.82)
50–64 years	24.10		(23.8–24.4)	25.46	(23.9–27.1)	2.14 (1.88–2.44) 2.06 (1.80–2.34)
65+ years	19.62		(19.4–19.9)	9.66	(8.7–10.7)	1.00
<i>Gender</i>						
Female	51.94		(51.6–52.3)	54.95	(53.6–226.3)	1.00
Male	48.06		(47.7–48.4)	45.05	(43.7–46.4)	0.89 (0.84–0.94) 0.86 (0.82–0.91)
<i>Race/Ethnicity</i>						
Non-Hispanic White	70.77		(70.3–71.2)	76.24	(74.8–77.6)	1.00
African American	11.19		(10.8–11.6)	6.86	(6.2–7.5)	0.57 (0.52–0.62) 0.54 (0.50–0.59)
Hispanic	6.38		(6.1–6.6)	6.99	(5.9–8.2)	0.79 (0.72–0.86) 0.75 (0.68–0.84)
Other	11.65		(11.4–11.9)	9.91	(9.2–10.7)	1.02 (0.86–1.20) 0.96 (0.81–1.14)
<i>Household Income</i>						
< \$20,000	19.60		(19.3–19.9)	17.29	(16.1–18.5)	0.82 (0.75–0.90) 1.26 (1.11–1.43)
\$20,000–\$34,999	18.87		(18.5–19.2)	19.24	(17.9–20.6)	0.95 (0.86–1.04) 1.28 (1.14–1.43)
\$35,000–69,999	32.28		(31.9–32.6)	31.94	(30.3–33.6)	0.92 (0.85–0.99) 1.05 (0.96–1.14)
> \$70,000	29.25		(28.9–29.5)	31.53	(30.1–32.9)	1.00
<i>Education Level</i>						
Less than H.S.	14.15		(13.9–14.4)	9.36	(8.2–10.6)	0.60 (0.52–0.70) 0.71 (0.60–0.83)
H.S. Graduate	27.46		(27.1–27.8)	27.37	(26.0–28.8)	0.91 (0.85–0.98) 0.95 (0.88–1.03)
Some College	21.63		(21.3–21.9)	23.10	(21.7–24.5)	0.98 (0.90–1.06) 1.00 (0.92–1.08)
Completed AA, BA, or Technical Degree	36.76		(36.4–37.1)	40.17	(38.8–41.5)	1.00
<i>Marital Status</i>						

		“Before you were 18, did a parent or other adult living in your home attempt suicide?”		Unadjusted		Adjusted	
		Yes (n = 1250; 3.74%)		OR		OR	
		95% CI		95% CI		95% CI	
		No (n = 33,118; 96.26%)		OR		OR	
		%		%		%	
Married/Cohabiting		63.68	(63.3–64.0)	68.28	(66.9–69.6)	1.00	1.00
Separated/Divorced		11.60	(11.4–11.8)	12.87	(11.8–14.0)	1.03	(0.93–1.15) 0.98 (0.86–1.09)
Widowed		7.31	(7.2–7.4)	3.20	(2.6–3.9)	0.41	(0.32–0.51) 0.63 (0.49–0.80)
Never Married		17.41	(17.1–17.7)	15.65	(14.8–16.5)	0.84	(0.78–0.90) 0.78 (0.72–0.86)
Psychiatric Morbidity							
<i>Mood</i>							
No		75.27	(74.9–75.6)	57.80	(56.6–59.0)	1.00	1.00
Yes		24.73	(24.4–25.1)	42.20	(41.0–43.4)	2.22	(2.11–2.34) 2.08 (1.96–2.21)
<i>Anxiety</i>							
No		71.38	(71.0–71.8)	55.71	(54.4–57.1)	1.00	1.00
Yes		28.62	(28.2–29.0)	44.29	(42.9–45.6)	1.98	(1.88–2.09) 1.86 (1.76–1.97)
<i>Personality</i>							
No		80.91	(80.6–81.2)	67.07	(65.5–68.6)	1.00	1.00
Yes		19.09	(18.8–19.4)	32.93	(31.4–34.5)	2.08	(1.95–2.23) 2.03 (1.90–2.18)

Note: Adjusted odds ratios adjusted for age, race/ethnicity, household income, education level, and marital status. Odds ratios and confidence intervals in bold are statistically significant.

Psychosocial Characteristics of Adults Exposed to a Parental Suicide Attempt as Children

Table 2

		“Before you were 18, did a parent or other adult living in your home attempt suicide?”			
		Unadjusted		Adjusted	
		OR	(95% CI)	OR	(95% CI)
No (n = 33,118; 96.26%)					
Yes (n = 1250; 3.74%)					
%		95% CI	%	95% CI	%
Parental Substance Use History					
<i>Problem Drinker</i>					
No	78.41	(78.1–78.7)	65.32	(63.8–66.8)	1.00
Yes	21.59	(21.3–21.9)	34.68	(33.2–36.2)	1.93 (1.80–2.06) 1.82 (1.70–1.96)
<i>Problems with Drugs</i>					
No	96.61	(96.5–96.7)	87.93	(87.0–88.7)	1.00
Yes	3.39	(3.3–3.5)	12.07	(11.2–12.9)	3.91 (3.57–4.28) 3.67 (3.32–4.05)
Childhood Adversity					
<i>Child Maltreatment</i>					
No	96.97	(96.9–97.1)	88.86	(87.8–89.8)	1.00
Yes	3.03	(2.9–3.1)	11.14	(10.2–12.2)	4.01 (3.60–4.47) 3.85 (3.43–4.32)
<i>Family Conflict</i>					
No	90.78	(90.6–91.0)	76.41	(75.1–77.6)	1.00
Yes	9.22	(9.0–9.4)	23.59	(22.4–24.9)	3.04 (2.82–3.28) 2.99 (2.77–3.22)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, household income, education level, and marital status. Odds ratios and confidence intervals in bold are statistically significant.

Table 3
Substance Use Disorders among Adults Exposed to a Parental Suicide Attempt as Children in the United States

Substance Abuse/Dependence (Lifetime)	<i>"Before you were 18, did a parent or other adult living in your home attempt suicide?"</i>					
	No (<i>n</i> = 33,118; 96.26%)			Yes (<i>n</i> = 1250; 3.74%)		
	%	95% CI	%	95% CI	OR	Adjusted AOR (95% CI)
Any Substance Use Disorder						
No	63.52	(63.1–63.9)	53.28	(51.7–54.8)	1.00	1.00
Yes	36.48	(36.1–36.9)	46.72	(45.2–48.3)	1.53	(1.43–1.63)
Alcohol						
No	65.72	(65.3–66.1)	57.73	(56.2–59.3)	1.00	1.00
Yes	34.28	(33.9–34.7)	42.27	(40.7–43.8)	1.40	(1.31–1.50)
Cannabis						
No	90.54	(90.3–90.7)	85.13	(83.9–86.3)	1.00	1.00
Yes	9.46	(9.3–9.7)	14.87	(13.7–16.1)	1.67	(1.51–1.85)
Cocaine						
No	96.90	(96.8–97.0)	95.44	(94.6–86.2)	1.00	1.00
Yes	3.10	(3.0–3.2)	4.56	(3.8–5.4)	1.49	(1.24–1.80)
Stimulants						
No	97.96	(97.8–98.1)	95.02	(94.2–95.7)	1.00	1.00
Yes	2.04	(1.9–2.1)	4.98	(4.3–5.7)	2.51	(2.14–2.95)
Sedatives						
No	98.70	(98.7–98.8)	97.28	(96.9–97.6)	1.00	1.00
Yes	1.22	(1.1–1.3)	2.72	(2.4–3.1)	2.26	(1.93–2.64)
Tranquilizers						
No	98.79	(98.7–98.9)	96.40	(95.7–96.9)	1.00	1.00
Yes	1.21	(1.1–1.3)	3.60	(3.0–4.2)	3.06	(2.50–3.74)
Opioids						
No	98.08	(98.0–98.2)	95.15	(94.4–95.8)	1.00	1.00
Yes	1.92	(1.8–2.0)	4.84	(4.2–5.6)	2.60	(2.23–3.03)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, household income, education level, marital status, urbanicity, parental alcohol and drug use problems, lifetime mood (i.e. major depression, bipolar disorder, dysthymia), anxiety (i.e. generalized anxiety disorder, panic disorder, post-traumatic stress disorder, social phobia, and specific phobia), and personality disorders (i.e.

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antisocial, avoidant, borderline, dependent, narcissistic, histrionic, obsessive compulsive, paranoid, schizoid, and schizotypal), and exposure to child maltreatment and family conflict. Odds ratios and confidence intervals in bold are statistically significant.

Psychosocial Correlates of Substance Use Disorders among Adults Exposed to a Parental Suicide Attempt as Children in the United States

Table 4

	Alcohol Use Disorder (Lifetime)		Cannabis Use Disorder (Lifetime)		Illicit Drug Use Disorder (Lifetime)	
	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Parental Substance Use History						
Alcoholic/Problem Drinker	2.32	(1.97–2.74)	1.45	(1.19–1.75)	2.03	(1.51–2.72)
Problems with Drugs	1.12	(0.94–1.35)	1.20	(0.93–1.53)	1.63	(1.22–2.18)
Childhood Adversity (before age 18)						
Child Maltreatment	1.14	(0.91–1.42)	1.77	(1.34–2.34)	1.39	(1.04–1.86)
Family Conflict	0.97	(0.81–1.16)	1.93	(1.58–2.37)	1.29	(1.00–1.66)

Note: Adjusted odds ratios adjusted for age, gender, race/ethnicity, household income, education level, marital status, mental disorders, and all psychosocial variables. Mood disorders include major depression, bipolar disorder, and dysthymia. Anxiety disorders include generalized anxiety disorder, panic disorder, post-traumatic stress disorder, social phobia, and specific phobia. Personality disorders include avoidant, borderline, dependent, narcissistic, histrionic, obsessive compulsive, paranoid, schizoid, and schizotypal. Odds ratios and confidence intervals in bold are statistically significant.