

# The Role of Depression in the Differential Effect of Childhood Parental Divorce on Male and Female Adult Offspring Suicide Attempt Risk

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**Abstract:** In previous studies by our group, we found that female offspring of parental divorce and parental remarriage are more susceptible to suicide attempt than male offspring. In this study, we examine whether these findings remain even after controlling for offspring depression. The sample consists of respondents from the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions. Multivariable regressions controlled for offspring depression, parental depression, age, race/ethnicity, income, and marital status. Our previous findings that female offspring of parental divorce and parental remarriage are more likely to report a lifetime suicide attempt than male offspring remained even after controlling for offspring depression. Findings suggest that focusing on engaging female offspring who demonstrate symptoms of depression is not sufficient to reduce suicide attempt risk in this group as many at risk individuals will remain unrecognized.

**Key Words:** Parental divorce, adult offspring, suicide attempt, offspring depression, parental remarriage.

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In a previous study by our group (Lizardi et al., 2009), results indicated that, compared with their male counterparts, female offspring of divorced parents are at increased risk of suicide attempt, even after controlling for parental depression. In a second study (Lizardi et al., in press), we found that parental remarriage was significantly associated with suicide attempt among female, yet not male, offspring. Together, these studies suggest that female offspring of parental divorce are more susceptible to suicidality than male offspring.

In these studies, however, we did not control for offspring depression. Because it is well recognized that depression is associated with an increased risk of suicidality (Oquendo et al., 2006; Scocco et al., 2000) and that females more often suffer from depression than males (Nolen-Hoeksema, 2001), perhaps our previous findings of an elevated risk of suicide attempt among adult female offspring of parental divorce reflect the differential rate of depression among female as compared with male offspring.

In this article, whereas controlling for offspring depression, we examine the following: (1) the effect of parental divorce on

offspring suicide attempt, (2) whether residing with the same sex parent as compared with an opposite sex parent post parental divorce results in differences in the risk of suicide attempt for female and male offspring, and (3) whether parental remarriage is differentially associated with suicide attempt for male and female offspring. This will be the first study to examine the effect of parental divorce on the risk of suicide attempt among adult offspring, whereas controlling for both parental and offspring depression in a nationally representative sample using diagnostic criteria.

## METHODS

### Sample

The sample consists of participants in the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a nationally representative US survey of 43,093 civilian noninstitutionalized individuals aged 18 and older, interviewed in person. Field methods of the survey are fully described elsewhere (Grant et al., 2003) as are details regarding sociodemographic characteristics of the sample (Lizardi et al., in press). The research protocol, including informed consent procedures, received full ethical review and approval from the US Census Bureau and US Office of Management and Budget.

### Measures

The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS; Grant et al., 2003) was administered to all NESARC participants. The AUDADIS is a structured diagnostic interview specifically designed for lay interviewers.

### Assessment of Offspring Depression

Offspring depression was assessed in a module of the AUDADIS that focused on questions regarding low mood (see Heiman et al. (2008) for details). Subjects were asked whether they had ever experienced a time in their lives when they felt sad, blue, depressed, or down most of the time for at least 2 weeks. They were then asked whether they ever had a time, lasting at least 2 weeks, when they did not care about the things that they usually cared about, or did not enjoy the things they usually enjoyed. If respondents answered affirmatively to either of these questions, they were then asked follow-up questions regarding the details of their experience during the time when their mood was low including, duration, frequency, timing, and severity of symptoms. Questions also focused on DSM criteria such as anhedonia, sleep, appetite, and concentration.

### Assessment of Suicide Attempt

Lifetime suicide attempt was assessed among those respondents who screened into the major depression section of the survey. Individuals screened into the major depression section of the interview whether they reported feeling sad, blue, depressed, or down most of the time for at least 2 weeks, or feeling anhedonic for at least 2 weeks ever in their lifetime ( $N = 13,753$ ). Of these, a total of 1074 respondents reported attempting suicide in their lifetime. Individuals who screened into the depression section but did not report a suicide attempt history, as well

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as those who did not screen into the depression section, constituted the reference group for lifetime suicide attempt. Although it is possible that this screening method resulted in the exclusion of individuals with a history of suicide attempt who did not experience depression, suicide attempts are most often associated with mood disorders as compared with other psychiatric disorders (Bostwick and Pankratz, 2000). Therefore, it is likely that the large majority of persons at risk for attempting suicide were included. Furthermore, to examine the effects that limiting inquiries regarding suicide attempt history to those who reported 2 weeks of depressed mood or anhedonia may have had on our results, we compared our data with another source of data, the National Longitudinal Alcohol Epidemiologic Survey (NLAES) survey (Grant, 1997). Similar to the NESARC, the US Bureau of the Census administered the NLAES to a nationally representative sample of 42,862 respondents in the contiguous US and District of Columbia in 1991–1992 and used a similar design and interview (Grant, 1997). The NLAES examined lifetime risk of suicidal behavior in all respondents. Analyses of these data showed that of the respondents who did not screen into the depression section ( $N = 26,534$ ), only 0.1% ( $N = 30$ ) reported a suicide attempt. Thus, this limitation in the NESARC was not likely to have a large effect on the results.

### Assessment of Childhood Parental Divorce and Remarriage

Childhood experience of parental divorce was assessed with the question: “Did your [biological/adoptive] parents get divorced or permanently stop living together before you were 18?” To assess for parental remarriage, a follow-up question was asked which ascertained whether the respondent lived with a stepparent before the age of 18. Because the NESARC does not ask respondents the age at which they attempted suicide, to better establish that parental divorce preceded a suicide attempt, individuals whose parents divorced when the respondent was between the ages of 13 to 17 were excluded from the analysis ( $N = 1556$ ) as suicide attempt among prepubertal youth is extremely rare (National Center for Health

Statistics, 2000). To more clearly understand the effect of residing primarily with a parent of the same or opposite sex post parental divorce, only respondents primarily living mother or father were considered ( $N = 4895$ ).

### Statistical Analysis

The prevalence of offspring depression by gender of offspring was calculated with cross-tabulations. The effects of offspring depression on adult offspring suicide attempt by gender was calculated using a logistic regression model, first unadjusted and then adjusted for sociodemographic and clinical characteristics. Specifically, based on baseline analyses that showed associations with offspring suicide attempt, the following demographic variables were used as controls in multivariable regressions: age (18–24, 25–44, 45–64, 65+), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other), family income (<\$20,000, \$20–34,999, \$35–69,999, \$70,000+), and marital status (never married, widowed/separated/divorced, married).

Odds ratios (ORs) and 95% confidence intervals (CIs) were derived from the beta estimates in the logistic regression models. F-tests were used to estimate the statistical significance of the inclusion of interaction terms in the model, and ORs and confidence interval estimates were calculated using the beta estimate for the interaction. To adjust for the complex sample characteristics of the NESARC, all analyses were conducted using SUDAAN (Research Triangle Institute, 2004). This software adopts Taylor series linearization to take into account the design effects of the NESARC.

## RESULTS

Controlling for offspring depression had minimal effect on the differential odds of suicide attempt found between female and male offspring of parental divorce and remarriage found in previous studies. Table 1 reports the main and interaction effects of parental divorce and offspring gender on lifetime suicide attempt, adjusting

**TABLE 1.** Adjusted and Unadjusted Odds Ratios for Parental Divorce, Parent Gender, and Parental Remarriage

Experience With Parents		N	% (SE)	OR (95% CI) <sup>a</sup>	AOR (95% CI)
Parental divorce					
No		36049	2.1 (0.1)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Yes		5194	4.0 (0.3)	1.95 (1.58–2.40)*	1.29 (1.02–1.62)**
Offspring gender					
Male	Parental divorce				
	No	15502	1.5 (0.1)	1.00 (1.00–1.00)	1.00 (1.00–1.00) <sup>b</sup>
Female	Yes	2174	2.2 (0.4)	1.48 (1.00–2.19)**	0.96 (.063–1.48) <sup>b</sup>
	No	20547	2.6 (0.2)	1.00 (1.00–1.00)	1.00 (1.00–1.00) <sup>b</sup>
Yes	Yes	3020	5.6 (0.5)	2.19 (1.74–2.75)*	1.46 (1.14–1.88) <sup>b*</sup>
	No				
Offspring gender					
Male	Custodial parent				
	Father	392	2.1 (0.8)	1.00 (1.00–1.00)	1.00 (1.00–1.00) <sup>c</sup>
Female	Mother	1653	2.2 (0.5)	1.05 (0.45–2.46)	0.84 (0.37–1.90) <sup>c</sup>
	Father	506	9.4 (1.7)	4.77 (2.00–11.40)*	2.87 (1.63–5.04) <sup>c*</sup>
Yes	Mother	2344	4.7 (0.5)	2.27 (1.00–5.14)**	1.39 (0.86–2.24) <sup>c**</sup>
	No				
Offspring gender					
Male	Parental remarriage				
	No	1041	2.0 (0.5)	1.00 (1.00–1.00)	1.00 (1.00–1.00) <sup>d</sup>
Female	Yes	1003	2.5 (0.5)	1.26 (0.65–2.46)	1.04 (0.53–2.04) <sup>d</sup>
	No	1458	4.1 (0.6)	2.12 (1.14–3.95)**	1.38 (0.73–2.62) <sup>d</sup>
Yes	Yes	1391	6.9 (0.8)	3.72 (2.03–6.83)*	2.10 (1.14–3.88) <sup>d*</sup>

<sup>a</sup>Adjusted for age, sex, race/ethnicity, family income, marital status, parental depression, and offspring depression.

<sup>b</sup>Interaction of gender and divorce trended toward significance in unadjusted ( $t = 1.80, p = 0.08$ ) and adjusted models ( $t = 1.54, p = 0.13$ ).

<sup>c</sup>Interaction of custodial parent and offspring gender not significant in unadjusted ( $t = 1.65, p = 0.10$ ) model, significant at a trend level in adjusted model ( $t = 1.95, p = 0.06$ ).

<sup>d</sup>Interaction of lived with stepparent and offspring gender not significant in unadjusted ( $t = 0.86, p = 0.35$ ) model, significant at a trend level in adjusted model ( $t = 0.60, p = 0.37$ ).

\* $p < 0.01$ .

\*\* $p < 0.05$ .

SE indicates standard error; CI, confidence interval; AOR, adjusted odds ratio.

for offspring depression. Females who experienced parental divorce were 1.46 times as likely (95% CI: 1.14–1.88) to report a suicide attempt than those who did not experience parental divorce. This association was not found among male offspring. In addition, there was a trend toward a significant interaction between parental divorce and gender in predicting lifetime suicide attempt ( $t = 2.40, p = 0.13$ ), providing preliminarily evidence that the effect of childhood parental divorce on the odds of offspring suicide attempt may vary between male and female offspring.

The main and interaction effects offspring gender and custodial parent gender on lifetime suicide attempt, adjusting for offspring depression are also presented in Table 1. The prevalence of suicide attempt among women who lived with their mothers was 4.7% (standard error [SE] = 0.5), compared with 9.4% ( $SE = 1.7$ ) among women who lived with their fathers. In adjusted logistic regression, women who lived with their fathers after parental divorce were significantly more likely to make suicide attempts (OR = 2.87, 95% CI: 1.63–5.04) compared with men who lived with their fathers. Women who lived with their fathers were significantly more likely to report a suicide attempt than women who lived with their mothers (OR = 2.10, 95% CI: 1.29–3.43). There was a trend toward significance in the interaction between gender of the parent and gender of the respondent in predicting lifetime suicide attempt ( $t = 3.80, p = 0.06$ ).

The prevalence of suicide attempt by offspring gender and parental remarriage is also presented in Table 1. Among women whose parent remarried, the prevalence of suicide attempt was 6.9% ( $SE = 0.8$ ) compared with 4.1% ( $SE = 0.6$ ) among women whose parent did not remarry. In adjusted logistic regression, women whose parent remarried were more likely to report suicide attempt than men whose parent remarried (OR = 1.98, 95% CI: 1.16–3.37). In addition, women whose parent remarried were significantly more likely to report a lifetime suicide attempt than women whose parent did not remarry (OR = 1.54, 95% CI: 1.04–2.28). Parental remarriage was not significantly associated with suicide attempt among men. Interaction of parental remarriage and offspring gender was not significant in adjusted models ( $t = 0.94, p = 0.34$ ).

## DISCUSSION

Consistent with prior studies conducted by our group, the results of this study found increased odds of suicidality among female as compared with male offspring, even after controlling for offspring depression. These findings reinforce that female offspring of parental divorce may be at greater risk for suicidality than once considered and risk assessment targeting this group should be integrated into standard clinical practice.

In our study, female offspring of parental divorce were more likely to report a lifetime suicide attempt than male offspring, even after controlling for depression. It is suggested that women who face negative events, such as parental divorce, are faster than men at retrieving memories of other negative events, experiencing these memories and their accompanying negative feelings in greater detail and to greater degrees (Appleby et al., 1999). Males, on the other hand, have been found to be more dismissive of negative emotions (Koestner et al., 1991; Scharfe and Bartholomew, 1994). Perhaps, the manner in which females process and experience negative events, independent of depression, contributes to why female offspring of divorce are at greater risk of suicide attempt than male offspring.

In this study, we found that female offspring who experience parental remarriage have greater odds of suicide attempt than those who do not. This is consistent with prior research that indicates that repeated exposure to negative situations where one has little control, such as parental remarriage, increases feelings of helplessness and depression (Milkulincer, 1994; Peterson et al., 1993). Women are

more likely than men to experience situations where they are made to feel helpless, such as through sexual abuse and single parent situations, and, thus are more likely to develop a sense that they are not in control of their environments. This increases the likelihood depression and in turn, the risk of suicide attempt (Ehnvall et al., 2008; Nolen-Hoeksema, 2001).

## Limitations

Methodological limitations need to be considered. First, the NESARC is based on respondent self-report that can be affected by recall bias and social desirability. However, most large epidemiological studies use self-report measures and the NESARC used a carefully structured interview to assess aspects of clinical history that agreed well with psychiatrist evaluations. Second, because childhood parental divorce and permanent separation were covered in a combined question, any difference in effects of legal divorce compared with permanent separation cannot be determined. Whereas any differences may be small, especially when the event occurs during early childhood when respondents did not understand the legal difference, the issue should be addressed in future studies. Third, the NESARC did not ask respondents for the date of their suicide attempts. Therefore, temporality of suicide attempt in relation to parental divorce cannot be definitively established. However, to address this, we included only respondents whose parents divorced before they were 13 as few suicide attempts occur before that age. Fourth, only subjects who screened into the major depression section of the interview (by reporting ever experiencing at least 2 weeks of depression or anhedonia) were asked about suicidality. However, as mentioned, this limitation was likely to result in fewer than 1% of individuals with a history of suicide attempt being excluded from the study. Therefore, this is a minor limitation.

This study also has notable strengths. First, the study used a large, nationally representative sample. Second, assessments were based on DSM-IV diagnostic criteria. Third, the research builds on prior findings concerning parental divorce and offspring suicide attempt by examining the differential effect of childhood parental divorce on male and female adult offspring.

## CONCLUSION

Female offspring experience increased odds of suicide attempt as compared with male offspring, even after controlling for offspring depression. Suicide prevention efforts should aim to engage female offspring of parental divorce, a group formerly believed to be at low risk for suicide attempt. Such targeted efforts may lead to a decrease in suicide rates as individuals previously unrecognized to be at risk will finally receive the attention they require.

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