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Childhood or adolescent parental divorce/separation, parental history of alcohol problems, and offspring lifetime alcohol dependence

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Abstract

Background: This study examined whether the experiences of childhood or adolescent parental divorce/separation and parental alcohol problems affected the likelihood of offspring DSM-IV lifetime alcohol dependence, controlling for parental history of drug, depression, and antisocial behavior problems.

Method: Data were drawn from the 2001–2002 National Epidemiological Survey on Alcohol and Related Conditions (NESARC), a nationally representative United States survey of 43,093 civilian non-institutionalized participants aged 18 and older, interviewed in person. Logistic regression models were used to calculate the main and interaction effects of childhood or adolescent parental divorce/separation and parental history of alcohol problems on offspring lifetime alcohol dependence, after adjusting for parental history of drug, depression, and antisocial behavior problems.

Results: Childhood or adolescent parental divorce/separation and parental history of alcohol problems were significantly related to offspring lifetime alcohol dependence, after adjusting for parental history of drug, depression, and antisocial behavior problems. Experiencing parental divorce/separation during childhood, even in the absence of parental history of alcohol problems, remained a significant predictor of lifetime alcohol dependence. Experiencing both childhood or adolescent parental divorce/separation and parental alcohol problems had a significantly stronger impact on the risk for DSM-IV alcohol dependence than the risk incurred by either parental risk factor alone.

Conclusions: Further research is needed to better identify the factors that increase the risk for lifetime alcohol dependence among those who experience childhood or adolescent parental divorce/separation.

Keywords: Alcohol dependence; Family alcohol history; Childhood or adolescent parental divorce/separation; NESARC

1. Introduction

Alcohol use disorders (alcohol abuse and dependence) are maladaptive patterns of alcohol consumption manifested by symptoms leading to clinically significant impairment or distress with DSM-IV alcohol dependence, in particular, being associated with considerable impairment (Hasin et al., 2007). As alcohol use disorders constitute one of the most prevalent public health problems in the United States, identification of factors that elevate the risk for alcohol dependence is highly important in developing more effective prevention and treatments (Hasin et al., 2007; Li et al., 2007).

Twin studies show that 40–60% of the risk for alcohol dependence is accounted for by genetic factors (Heath et al., 2001; Kendler, 2001). While research on specific genetic variants related to alcohol dependence is progressing rapidly (Edenberg and Foroud, 2006), a substantial amount of the variance in risk for alcohol dependence remains unexplained, suggesting that better information is needed on the influence of environmental risk factors. Several childhood or adolescent stressors (e.g., physical and sexual abuse, household substance use, family dysfunction, terrorism exposure) have been shown to impact drinking and increase the risk for alcohol problems (Anda et al., 2002, 2006; Dube et al., 2001, 2002; Kendler et al., 2000;

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Schiff et al., 2007). However, surprisingly little research has focused specifically on the risk posed by experiencing parental divorce/separation during childhood or adolescence on the risk for a lifetime diagnosis of alcohol dependence.

Experiencing parental divorce during childhood or adolescence is a common disruptive stressor in the United States and many other countries. In recent years, the divorce rate (ratio of annual divorces to marriages) in the United States was .49; with about half of first marriages ending in divorce (Cherlin, 1992; Kelly, 2000; Munson and Sutton, 2006; US Census Bureau, 2007). This affects approximately 1.5 million children and adolescents each year (Summers et al., 1998). Similar divorce rates are found elsewhere, including: .65 in the Russian Federation; .56 in Germany; .54 in the United Kingdom; .49 in Canada; and .43 in Australia (US Census Bureau, 2007).

Prior research has demonstrated that the transition following parental divorce is highly stressful for most children. Children of divorced parents are more likely to exhibit psychological, behavioral, social, and academic problems than children raised in intact two-parent families (Amato, 1993; Kelly, 2000). Many of the problems (e.g., lower educational attainment and earnings, welfare dependency, poor marital quality) persist well into adulthood (Amato and Keith, 1991; Amato et al., 1995; Dube et al., 2001; Dube et al., 2002).

Despite the well-documented detrimental effects of parental divorce on long-term psychosocial outcomes, surprisingly little is known about the effects of childhood or adolescent parental divorce on adult drinking outcomes. One study, using US population survey data (Wolfinger, 1998), found that respondents reporting that they ever drank more than they felt they should were more likely to have experienced childhood parental divorce. In a British birth cohort study, experiencing parental divorce, especially prior to age 16, increased the odds of drinking problems as measured by the four-item CAGE (Hope et al., 1998). Both of these studies utilized large representative samples, but neither controlled for parental alcoholism in the analyses. A third study, based on a mail survey of adult HMO members, showed that childhood parental divorce increased the risk for considering oneself a problem drinker or alcoholic, even after adjusting for parental alcohol problems (Dube et al., 2002).

These earlier studies have provided important suggestive information concerning the potential influence of childhood parental divorce/separation on offspring alcohol problems. However, none of the studies included standardized evaluations of DSM-IV alcohol disorders. Further, only one of the three studies (based on a mailed questionnaire) controlled for parental alcohol problems and none controlled for parental drug, depression, and antisocial behavior problems. Given the pervasiveness of divorce/separation among families with children and the disability associated with alcohol dependence, a better understanding of the relationship between childhood or adolescent parental divorce/separation and alcohol dependence is an important clinical and research issue.

Accordingly, this study uses data from the 2001–2002 National Epidemiological Survey on Alcohol and Related Conditions (NESARC), a nationally representative United States survey, to examine the relationship between childhood or adolescent parental divorce/separation, parental alcohol problems, and offspring DSM-IV lifetime alcohol dependence. We addressed the following questions: (1) after controlling for parental alcohol problems, does childhood or adolescent parental divorce/separation affect the risk for offspring DSM-IV lifetime alcohol dependence? and (2) is there an interaction effect of childhood or adolescent parental divorce/separation and parental alcohol problems on offspring DSM-IV lifetime alcohol dependence?

2. Methods

2.1. Sample

The 2001–2002 NESARC is based on a US representative sample as described elsewhere (Grant et al., 2003, 2004). The target population included those residing in households and group quarters who were aged 18 years and older. Face-to-face interviews were conducted with 43,093 respondents. The survey response rate was 81%. Blacks, Hispanics, and young adults (ages 18–24 years) were oversampled with data adjusted for oversampling and nonresponse (NIAAA, 2007). The weighted data were then adjusted to represent the US civilian population based on the 2000 census. Demographic characteristics of the full sample are presented elsewhere (Hasin et al., 2007). Field methods included extensive home study and structured in person training, supervision, and quality control, including random call-backs to respondents to verify data, described in detail elsewhere (Grant et al., 2003, 2004).

Of the sample, 47.9% were male. In terms of ethnicity, 70.9% were white, 11.1% were black, 2.1% were Native Americans, 4.4% were Asians, and 11.6% were Hispanic. In terms of age, 21.8% were 18–29 years, 30.9% were 30–44 years, 31.1% were 45–64 years, and 16.3% were 65 years or older. In terms of marital status, 61.6% were married or cohabiting, 17.5% were widowed/separated/divorced, and 20.9% were never married. In terms of education, 15.7% had less than high school education, 29.3% had a high school education, and 55.0% had at least some college. In terms of personal income, 47.3% had $0–19,999, 22.7% had $20,000–34,999, 22.0% had $35,000–69,999, and 8.1% had $70,000 or more.

All potential NESARC respondents were informed in writing about the nature of the survey, the statistical uses of the survey data, the voluntary aspect of their participation, and the federal laws that provide for the confidentiality of identifiable survey information. Respondents who gave consent were then interviewed. 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.

2.2. Measures

2.2.1. Assessment of offspring lifetime alcohol dependence. The Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version (AUDADIS-IV) was administered to NESARC participants to measure DSM-IV alcohol dependence (Grant et al., 2003). This fully structured instrument was specifically designed for experienced lay interviewers. Computer diagnostic programs implemented the DSM-IV criteria for diagnosing alcohol abuse and dependence using AUDADIS-IV data. Extensive AUDADIS-IV questions covered DSM-IV criteria for dependence. Consistent with DSM-IV, lifetime diagnoses of alcohol dependence required three or more of the seven DSM-IV dependence criteria within a 12-month period. Test–retest reliability of AUDADIS-IV alcohol dependence diagnoses ranges from good to excellent ($\kappa = 0.70$–0.84). Many types of validation studies, including psychiatrist reappraisal of AUDADIS-IV alcohol dependence diagnoses (Canino et al., 1999), have shown its validity to be good to excellent, as described in detail elsewhere (Grant et al., 2004; Hasin and Grant, 2004).

2.2.2. Assessment of childhood or adolescent parental divorce/separation. Childhood or adolescent parental divorce/separation was assessed with the

following question: "Did your [biological/adoptive] parents get divorced or permanently stop living together before you were 18?"

2.2.3. Assessment of parental history of alcohol and other emotional and behavioral problems. Parental histories of alcohol, drug, depression, and antisocial behavior problems were ascertained in a separate module of the AUDADIS following the module evaluating the respondent's own alcohol history. In assessing family history, interviewers read definitions to respondents that included examples of the respective diagnostic criteria. Rather than reading the full diagnostic criteria, the definitions included readily observable manifestations of the disorder, since these are the mostly likely to be known to family informants and thus increase the sensitivity of the measure (Andreasen et al., 1977; Slutske et al., 1996; Zimmerman and Martinez-Pons, 1998). Interviewers then asked separately whether respondents' biological relatives experienced the condition as defined, covering relatives by category. From this information, variables were created representing parental history of alcohol, drug, depression, and antisocial behavior problems. The test–retest reliability of AUDADIS family history variables is very good to excellent (Grant et al., 1995, 2003; Hasin et al., 1997).

2.2.4. Additional demographics. Five demographic variables were used as controls in multivariate regressions: gender; age (18–29, 30–45, 46–64, 65+); race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Hispanic, Other); education (less than high school, high school, some college or higher); and past-year personal income ($0–19,999, $20,000–34,999, $35,000–69,999, $70,000+). These variables were included as they all have well established associations with lifetime alcohol dependence (Hasin et al., 2007).

2.3. Statistical analysis

The prevalence of respondent lifetime alcohol dependence by childhood or adolescent parental divorce/separation status and parental history of alcohol problems was calculated with cross-tabulations. The simultaneous effect of childhood or adolescent parental divorce/separation and parental history of alcohol problems on offspring lifetime alcohol dependence was calculated using a logistic regression model with an interaction term, first unadjusted and then adjusted for the influence of parental history of drug, depression, and antisocial behavior problems. F-tests were used to estimate the statistical significance of the inclusion of the interaction term in the model. Odds ratios and 95% confidence intervals were derived from the beta estimates in the logistic regression model. 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.

3. Results

Of the sample, 16.0% (S.E. = 0.3) experienced childhood or adolescent parental divorce/separation, 21.3% (S.E. = 0.4) reported a parental history of alcohol problems, and 6.0% (S.E. = 0.2) experienced both parental divorce/separation and parental history of alcohol problems. The age of offspring at the time of parental divorce/separation ranged from 1 to 17 years, with the average age being 9 years and most frequent age being 5 years. Of those reporting childhood or adolescent parental divorce/separation, 18.8% (S.E. = 0.7) met criteria for DSM-IV lifetime alcohol dependence compared to 11.3% (S.E. = 0.4) who did not experience childhood or adolescent parental divorce/separation. Of those with parental history of alcohol problems, 23.1% (S.E. = 0.6) met criteria for DSM-IV lifetime alcohol dependence compared to 9.6% (S.E. = 0.3) who did not experience parental history of alcohol problems. Of those reporting both parental divorce/separation and parental history of alcohol problems, 26.1% (S.E. = 1.1) met criteria for DSM-IV lifetime alcohol dependence.

Table 1
Prevalence and odds ratios (with 95% confidence intervals) of offspring lifetime alcohol dependence by childhood or adolescent parental divorce and parental history of alcohol problems

	Lifetime alcohol dependence				
	% (S.E.)	OR	95% CI	AOR[a]	95% CI
Parental divorce					
Yes (n = 6914)	18.8 (0.7)	1.81	(1.65–1.99)	1.33	(1.20–1.48)
No (n = 36,114)	11.3 (0.4)	1.00	1.00	1.00	1.00
Parental alcohol problems					
Yes (n = 9170)	23.1 (0.6)	2.83	(2.60–3.07)	2.26	(2.08–2.47)
No (n = 33,923)	9.6 (0.3)	1.00	1.00	1.00	1.00

[a] Adjusted for age, gender, race/ethnicity, education, past-year personal income, and other parental emotional and behavioral problems (i.e., drug use problems, antisocial behavior, depressive symptoms).

The additive effects of childhood or adolescent parental divorce/separation and parental history of alcohol problems on the odds of offspring lifetime alcohol dependence are shown in Table 1. After adjusting for demographics and parental history of drug, depression, and antisocial behavior problems, childhood or adolescent parental divorce/separation was a significant predictor of offspring lifetime alcohol dependence (Adjusted Odds Ratio [AOR] = 1.33), as was parental history of alcohol problems (AOR = 2.26).

The interaction effect of childhood or adolescent parental divorce/separation and parental history of alcohol problems on offspring lifetime DSM-IV alcohol dependence was assessed via an interaction term in a logistic regression model adjusted for demographics and parental history of drug, depression, and antisocial behavior problems. This interaction term was significant ($F = -2.9, p = 0.003$). Table 2 presents the prevalence of and odds ratios for offspring lifetime alcohol dependence for those without childhood or adolescent parental divorce/separation or parental history of alcohol problems, those with one or the other, and those with both. After adjusting for demographics and parental history of drug, depression, and antisocial behavior problems, those who endorsed childhood or adolescent parental divorce/separation and parental history of alcohol problems were more than two times as likely to report lifetime alcohol dependence than those from non-divorced/separated families where neither parent had alcohol problems (AOR = 2.37). Those who experienced parental alcohol problems but not childhood or adolescent parental divorce/separation were also more than two times as likely to report lifetime alcohol dependence compared to respondents with neither divorce/separation nor alcohol problems in their parents (AOR = 2.38). Experiencing parental divorce/separation during childhood absent parental history of alcohol problems also remained significantly predictive of offspring lifetime alcohol dependence, increasing the risk of alcohol dependence by about 30% (AOR = 1.33).

Supplemental analyses were conducted to assess whether the age at which parental divorce/separation occurred (childhood or adolescence) affected the results. Offspring who experienced parental divorce/separation were divided into two groups: those who experienced parental divorce/separation up to age

Table 2
Prevalence and odds ratios (with 95% confidence intervals) for interaction effects of childhood or adolescent parental divorce and parental history of alcohol problems on offspring lifetime alcohol dependence

Parental divorce	Parental alcohol problems	*N*	% (S.E.)	OR (95% CI)[a]	AOR (95% CI)[b]
Yes	Yes	2581	26.1 (1.1)	3.58 (3.16–4.06)	2.37 (2.06–2.73)
No	Yes	6584	21.9 (0.7)	2.84 (3.57–3.15)	2.38 (2.16–2.64)
Yes	No	4333	14.1 (0.8)	1.67 (1.46–1.91)	1.33 (1.15–1.53)
No	No	29530	9.0 (0.3)	1.00	1.00

[a] Interaction term significant ($p = 0.007$).
[b] Adjusted for age, gender, race/ethnicity, education, past-year personal income, and other parental emotional and behavioral problems (i.e., drug use problems, antisocial behavior, depressive symptoms); interaction term significant ($p = 0.003$).

12; and those who experienced parental divorce/separation at age 13 or later. The prevalence of lifetime alcohol dependence among those who experienced parental divorce/separation up to age 12 was 19.5% (S.E. = 0.8). The prevalence of lifetime alcohol dependence among those who experienced parental divorce/separation at age 13 or later was 17.8% (S.E. = 1.2). A chi-square test for difference in proportions was not significant ($\chi^2 = 1.67$, d.f. = 1, $p = 0.20$). Thus, age at parental divorce/separation did not appear to influence the likelihood of offspring lifetime alcohol dependence.

4. Discussion

This study indicated that childhood or adolescent parental divorce/separation was significantly related to offspring lifetime alcohol dependence in a large, nationally representative sample of US adults. Further, this relationship was found even after controlling the effect of parental history of alcohol and other emotional and behavioral problems. To our knowledge, this is the first time where the influence of childhood or adolescent parental divorce/separation has been demonstrated on adult alcohol outcomes when measured carefully according to DSM-IV criteria for alcohol dependence.

The finding that the parental divorce rate reported among the NESARC sample was considerably lower than the contemporary US national divorce rate may appear counter-intuitive at first glance. However, this difference may be understood in light of two considerations. First, the current national divorce rate (ratio of annual divorces to marriages) is based upon all divorces and marriages in a given year, including those with and without offspring. Marriages without offspring are probably more likely to end in divorce. By definition, all parents of NESARC respondents had offspring (including the respondents) and so their divorce rate should be lower than a rate that includes couples divorcing without offspring. Second, the age range of NESARC participants spans over seven decades. Thus, the sample included many older respondents whose parents lived during periods when the US divorce rate was much lower than it is now. Both of these factors would give rise to an overall divorce rate lower than the current rate of divorce in the US.

The relationship between childhood or adolescent parental divorce/separation and offspring lifetime alcohol dependence may be due to a number of mediating influences, such as inadequate parenting and other maladaptive parental behaviors. Parental divorce is related to poor parenting skills and inadequate child supervision (Kelly, 2000; Storksen et al., 2006). Parental divorce/separation can also result in lack of affection, high levels of criticism or hostility, lax or inconsistent discipline or supervision, or general lack of involvement (Summers et al., 1998; Wolfinger, 1998). Similarly, parents with alcohol problems may be more likely to exhibit maladaptive behaviors in the household which, in turn, are associated with offspring having expectancies and beliefs which lead to increased risk for alcohol dependence (Jacob and Johnson, 1997). Moreover, maladaptive coping and cognitive styles that deemphasize problem-solving may also be modeled and internalized by offspring.

Longitudinal studies on the development of delinquency have repeatedly identified inadequate parenting in early childhood histories of individuals who subsequently developed antisocial behavior and alcohol abuse during adolescence and adulthood (Fuller et al., 2003). One study that investigated the role of maladaptive parental behavior in the association between parent and offspring psychiatric disorders (Johnson et al., 2001) found that maladaptive parental behavior was associated with increased offspring risk for DSM-IV diagnosed alcohol and drug abuse disorders. These and additional studies suggest that difficulties in the parent–child relationship may be a vital pathway through which various family factors influence child outcomes (Fauber et al., 1990). Future research regarding lifetime alcohol dependence among offspring of divorced/separated parents should explore additional environmental influences occurring before parental divorce/separation (e.g., maternal vs. paternal history of alcohol problems, biological vs. adoptive parental alcohol and other problems, parent conflict, parenting skills, child maltreatment history), during the dissolution period (e.g., meaning of divorce/separation to child), and after parental divorce/separation (e.g., change in income, school, residence, parent–child relationship; parental remarriage; single parent status) that could possibly mediate or moderate offspring lifetime alcohol dependence (Jacob and Johnson, 1997; Jacob et al., 2003; Johnson et al., 2001).

To date, only a few studies have incorporated specific environmental factors into genetic association studies of alcohol phenotypes (Covault et al., 2007; Ducci et al., 2007; Kaufman et al., 2007). One showed that early drinking onset or alcoholism were predicted by childhood maltreatment but that this risk was significantly elevated among those with at least one copy of the s allele of *5-HTTLPR*.40 Another showed that the low-activity variant in MAOA-linked polymorphic region (*MAOA-LPR*) interacted with childhood sexual abuse to predict

antisocial alcoholism in females (Ducci et al., 2007). Family studies often provide preliminary evidence that particular issues merit further study in a genetic context. Results of the present study suggest that childhood or adolescent parental divorce/separation merits investigation as a potential moderator of the effects of specific genetic variants.

4.1. Strengths and limitations

In considering the above findings, both strengths and limitations should be considered. First, concerning limitations, the NESARC is based on respondent self-report which can be affected by recall bias and social desirability. However, measures were of the type commonly used in large epidemiological studies, and the NESARC employed a carefully structured interview to assess aspects of clinical history that agreed well with psychiatrist evaluations (Canino et al., 1999). Second, DSM-IV diagnoses and specific historical criteria for parental alcohol and other disorders (e.g., age of onset and remission) were not obtained. However, the AUDADIS-IV structured interview has shown good to excellent reliability and validity for parental family history measures (Grant et al., 1995, 2003; Hasin et al., 1997). Third, because childhood or adolescent parental divorce and permanent separation were covered in a combined question, any difference in effects of legal divorce compared to permanent separation cannot be determined. While such differences are likely to be small when the event occurs during early childhood (an age when respondents could not understand the legal difference), parental divorce and separation may need to be addressed separately in future studies. Fourth, measures for parental histories of alcohol and other problems combined maternal and paternal problems. Exploring potential differential influences of maternal vs. paternal problems, a complex issue with its own literature, is currently underway, and will be reported separately. Finally, respondents were not asked the reasons that their parents divorced or were permanently separated. While this information may have been informative in some cases, it may not have been possible to ascertain it accurately from all respondents.

This study also had a number of considerable strengths. It is the first study to examine the main and interactive effects of childhood or adolescent parental divorce/separation and parental history of alcohol problems on offspring lifetime alcohol dependence using a large, nationally representative sample where the respondents were all assessed using DSM-IV diagnostic criteria for lifetime alcohol dependence. The research builds on prior findings related to the effects of parental divorce/separation on lifetime alcohol dependence by examining the effects of parental divorce/separation after controlling for parental history of alcohol and other problems in order to clearly identify the effects of childhood or adolescent parental divorce/separation.

4.2. Conclusion

Alcohol prevention and treatment professionals should recognize that children and adolescents who experience parental divorce/separation may be more vulnerable to developing alcohol dependence than those from intact households, and that this vulnerability may be increased when parental alcohol problems are present as well. This underscores the need for comprehensive client and family assessment by clinicians to identify those in particular need of early intervention for alcohol problems. Finally, further research is needed to better identify the specific factors, both environmental and genetic, that increase the risk for lifetime alcohol dependence among those who experience childhood or adolescent parental divorce/separation.

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