

Internalizing and Externalizing Behaviors of Children of Alcoholics
in Heterogeneous Family Structures

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Abstract

Children of alcoholics (COAs) are at risk for elevated internalizing and externalizing symptoms (Zucker, 2006). While researchers have been focused on identifying the heterogeneity markers of COAs' problems, little research has investigated COAs living in heterogeneous family structures. We used wave 1 (aged 3-5) and wave 4 (aged 12-15) data from the Michigan Longitudinal Study to investigate 1) the socio-demographic characteristics and parental symptomatology among alcoholic families prior to and after divorce ; 2) the internalizing and externalizing problems of COAs among intact, single-parent and step alcoholic families after adjusting for confounding variables. Prior to divorce, alcoholic families that would later become stepfamilies had lower family SES, lower paternal education, and higher parental baseline antisocial comorbidity than intact alcoholic families. Alcoholic families who would later become single-parent families had higher maternal antisocial problems. After divorce, both step and single-parent alcoholic families had more family crisis than intact alcoholic families. In addition, COAs in stepfamilies but not in single-parent families had significantly higher levels of child-reported internalizing, and parent-reported externalizing symptoms compared to those in intact families, even after controlling for socio-demographic characteristics, baseline parental antisocial problems, concurrent parental drinking, and maternal depression problems. Familial stressors mediated the effect of living in step families for externalizing but not internalizing problems. Our findings highlight the importance of identifying the heterogeneity among COAs in different family structures. COAs in stepfamilies are at high risk for adjustment problems, which may be explained by parental psychopathology and living under conditions of adverse environments.

Keywords: Children of alcoholics, divorce, family structure, internalizing, externalizing, parental antisocial problems

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Pathway to alcoholism: externalizing and internalizing symptoms

It is well-established that children of alcoholics (COAs) are at risk for adult alcoholism and the development of alcohol use disorder (AUD). Understanding the developmental trajectories of COAs is important to identify early predictors and risk factors for the etiology of later alcoholism. One of the strong predictors for early onset and later problematic drinking is the development of childhood's externalizing symptomatology: a broad domain describing children's behavioral disinhibition characterized by antisocial behaviors, aggressiveness, impulsivity, delinquency and sensation seeking. Although the microlevel process and mechanism of how externalizing/disinhibition is linked to adult alcohol problems is still under scrutiny (Zucker, 2008), several national sample longitudinal studies have demonstrated the relationship of early externalizing behaviors to later AUD outcomes. For instance, results from the Columbia County Longitudinal Study found that aggression and behavioral undercontrol at age 8 predicted later externalizing characteristics at age 19, which in turn predicted later drinking behaviors at age 30 and then alcoholic symptomatology at age 48 (Dubow et al., 2008). Similar findings from the Minnesota Longitudinal study showed that higher levels of externalizing behaviors at age 9 increased the likelihood of developing AUD in adulthood, which was mediated by adolescent alcohol use (Englund et al., 2008). Results also suggested that externalizing symptoms predicted early onset drinking in adolescence (King, Iacono, & McGue, 2004; Mayzer et al., 2002). In addition, findings are also consistent across gender and other non-US national samples (Masse & Tremblay, 1997; Pitkanen et al., 2008), thus suggesting the robustness of externalizing behavior as a risk factor for the pathway to adult alcoholism.

A less consistent predictor of alcoholic problems is internalizing symptomatology. Internalizing behaviors are characterized by children's emotional disturbance and inhibition such as being anxious or depressed, social withdrawal, attention and thought problems. Studies from COAs and other non-COAs community samples have found an internalizing cluster of behavioral inhibition, shyness and social anxiety predicted problematic alcohol use in adolescence and adulthood (Dubow et al., 2008; Zimmermann et al., 2003; Zucker, 2006). Similarly, results from longitudinal studies of non-clinical children also found internalizing symptoms (depression) were associated with early onset drinking at age 14 (King et al., 2004). However, research from other longitudinal studies have found opposite results. For instance, recent findings from the Britain National Child Development Study (NCDS) has shown alcohol use at age 23 and 33 predicted fewer internalizing symptoms at age 7 and 11 (Maggs et al., 2008). Other studies have found gender and age specific results, and some research has found no association (Englund et al., 2008; Hussong et al., 1998; Windle & Barnes, 1988). The inconsistent findings across studies may be attributed to the different methodology of each study. For example, reviews from Zucker et al., (2006) found that a positive relationship between internalizing and alcohol problems mostly looked at changes over time. Moreover, few studies have used multiple reporters. Given that relying on single source of reporting may create subjective bias, it is possible that internalizing symptoms may not be truly reflected by an individual reporter.

Parental alcoholism on COAs' externalizing and internalizing symptoms

Previous research has shown that parental alcoholism is a robust predictor of children's externalizing behaviors, even after adjusting for comorbid parental depression and antisocial personality disorder (Chassin, Rogosch, & Barrera, 1991). For instance, several longitudinal

studies have confirmed the direct effect of parental alcoholism on COAs' impulsivity and broadband measures of externalizing behaviors (Hussong et al., 2007; Hussong et al., 2010; Loukas et al., 2003). Convergent results also found in twin studies indicating a common genetic link may underlie parental AUD and externalizing syndromes (Knopik, Heath, Bucholz, Madden, & Waldron, 2009; Krueger et al., 2002). Indeed, COAs' undercontrol temperament can be seen as early as at preschool age, suggesting that parental alcoholism may reflect a genetic liability for early difficult temperament (Fitzgerald et al., 1993).

A body of evidence has shown that COAs are also at risk for elevated internalizing problems (Fitzgerald et al., 1993; Hussong, Cai, et al., 2008; Zucker, 2006). However, the underlying mechanisms of how parental alcoholism influences COAs' internalizing behaviors are not fully understood. Studies, for example, have found that parental alcoholism predicted elevated internalizing symptoms, above and beyond the effect of comorbid parental psychopathology (Hussong, Flora, Curran, Chassin, & Zucker, 2008), but failed to find a time-varying effect of parental alcoholism on COAs' internalizing behaviors (Hussong, et al., 2008). In other words, COAs' fluctuation of internalizing symptoms may not depend on parental alcoholic-related consequences, indicating that other heterogeneous risk factors may underlie COAs' internalizing trajectories. Some studies also suggest that maternal drinking problems may have a greater influence on COAs' internalizing problems than paternal drinking problems (Connell & Goodman, 2002; Fitzgerald et al., 1993).

Heterogeneity in alcoholic family structure

While extensive research has focused on identifying the markers of heterogeneity in COAs' development of internalizing and externalizing symptoms, however, most of the studies have ignored the fact that these children may come from heterogeneous family structure (i.e., single-

parent or stepfamilies). Insofar, the majority of what we know are based on findings from COAs in intact families or the assumption that they are residing in two-parent biological families. Ironically, research has shown that alcoholism is one of the major causes of marital dissolution (Amato & Previti, 2003), and about 40% of those who have divorced or separated at least once suffer from AUD (Helzer et al, 1991). In fact, alcohol consumption predicts divorce even after controlling for confounding variables including demographic characteristics, mood, and marital dissatisfaction, indicating that alcohol problems are a robust and independent predictor for marital dissolution (Collins, Ellickson, & Klein, 2007). Thus, COAs are at high risk for living in divorced families. However, little is known about the developmental trajectories of COAs living in these divorced families and how their behavioral outcomes differ from COAs from intact families.

Furthermore, although COAs have been identified as a high risk group for later developmental psychopathology, a majority of COAs do not show elevated problems during adulthood (Zucker & Wong, 2005). Therefore, identifying the heterogeneous phenotypes is essential to understand the mechanisms underlying their risky trajectories. The current study thus investigates the effects of heterogeneity in family structure among alcoholic families.

Divorce and remarried as risk for children

Findings from non-alcoholic samples have shown that children living in divorced families have elevated risks for adjustment problems. In Amato's meta-analysis of 67 articles (2001), 42% suggested the well-being for children from divorced families was significantly lower than those from intact families. Overall, studies have found that children in divorced families have more externalizing problems including substance use, delinquency and lower academic performance. They are also more likely to have social adjustment and internalizing problems when compared

to children living in intact families (Amato, 2001; Kelly, 2000; Lansford, 2009). In these children, more consistent effect is seen for externalizing symptoms than internalizing symptoms (Kelly & Emery, 2003). A gender effect is also found in some studies, but not all (Amato, 2001; Dunn, et al., 1998; Simons, Lin, Gordon, Conger, & Lorenz, 1999), with boys prone to more behavioral problems while girls prone to more internalizing problems after parental separation. But the effect also depends on the timing of the divorce, with more pernicious and longer impact for younger children (i.e., elementary school) (Lansford, 2009).

Moreover, remarriage does not necessarily alleviate the increased risk of behavioral problems for children of divorce (Hetherington & Kelly, 2003). In fact, some studies have shown that children from stepfamilies are twice as likely to exhibit emotional and behavioral problems than children in nondivorced families (Cherlin & Furstenberg Jr, 1994).

Although empirical research confirms that divorce increases the risk for adjustment problems in children and adolescents, the majority of children show resilience to divorce rather than dysfunction (Hetherington & Stanley-Hagan, 1999; Kelly & Emery, 2003). Moreover, researchers have suggested divorce is a dynamic process and that the decline of well-being can be seen prior to the divorce (Cherlin et al., 1991; Kelly, 2000), suggesting that divorce per se may not be the culprit for the increase of adjustment problems. Rather, it is the underlying family processes prior to and after divorce that contribute to the variability in children adjustment's outcomes. In the next section, we discuss some of the consistent risk factors that researchers have identified across alcoholic and divorced families.

Parental symptomatology

Parental symptomatology has been a robust predictor for children's elevated problems in both alcoholic families and divorced families. Studies on alcoholic families have consistently

found that parental antisocial personality problems (ASP) and depression are robust markers to identify the heterogeneity among COAs. Findings from cross-sectional and longitudinal studies have shown that COAs living in alcoholic families comorbid with ASP showed elevated externalizing and internalizing symptoms when compared to children from non-antisocial alcoholic families and non-alcoholic families (Hussong et al., 2007; Wong, Zucker, Puttler, & Fitzgerald, 1999; Zucker, Ellis, Bingham, & Fitzgerald, 1996). Studies also have shown that infants from alcoholic families with comorbid depression showed elevated internalizing problems at 18 months (Edwards, Leonard, & Eiden, 2001).

Similar findings are also seen in childhood and adolescence (Chassin et al., 1991; Hussong et al., 2008), suggesting that negativity of parental depression persevered throughout the developmental trajectories.

With regard to children of divorce, a mother's history of delinquent behavior has shown to mediate between parental divorce and children's externalizing behaviors. Also, children living with single mothers with depression and anxiety after divorce is also associated with longer emotional and social problems (Kline et al., 1991; Johnston, 1995).

Familial stressors

Higher levels of stressors and family stressors in particular, have been reported by both alcoholic and divorced families (Hetherington & Stanley-Hagan, 1999; Hussong, Bauer, et al., 2008; Kelly & Emery, 2003). In alcoholic families, parental psychopathology may be associated with the contextual stressors which mediate children's adjustment outcomes. For instance, antisocial behaviors and internalizing behaviors have been linked to higher family hostility, abuse, and living in more chaotic neighborhoods (Buu et al., 2007; Floyd, Cranford, Daugherty, Fitzgerald, & Zucker, 2006). Similar to the effect found in COAs, divorced children are also at

higher risk to experience familial stressors such as marital hostility, economic instability, and a decline in parent-and-child interaction, prior to and after divorce (Fine & Harvey, 2006; Pong & Ju, 2000). For example, some studies have suggested that the adjustment problems found in divorced children may be partially explained by their experience with higher familial stressors after divorce, the substantial decline of living standard in the custodial home, and the reduced access to resources such as good neighborhoods and schools (Hetherington & Kelly, 2003; Lansford, 2009). Indeed, some studies have found no difference in children of divorce when compared to children from intact families after controlling for these confounders (Dunn et al., 1998).

The current study

In sum, heterogeneity exists among children of alcoholics and their problems can be directly and indirectly accounted by the effect of parental alcoholism, parental symptomatology, and familial stressors. However, little is known about the adjustment of COAs living in divorced families. The current study thus focuses on identifying the effects of heterogeneity in family structure (intact, step, and single-parent families) among COAs.

First, we investigate how family resources, parental symptomatology, and familial and environmental stressors differ among intact alcoholic, step alcoholic, single-parent alcoholic and non-alcoholic intact families. Specifically, we focus on a) socio-demographic information including family socioeconomic status at baseline (pre-divorce), parental education, and post-divorce annual household income; b) biological parents' baseline antisocial personality problems, post-divorce drinking problems, and post-divorce maternal depression; and c) post-divorce familial stressors measured by serious family crisis. Baseline measures allow investigation of how alcoholic families differ prior to family disruption.

Second, we focused on examining the internalizing and externalizing symptoms of COAs among different family structures. While the majority of studies on COAs have focused on the broadband syndromes of internalizing and externalizing problems, this may not fully capture specific problems that COAs may encounter. Therefore, besides focusing on the broadband syndromes, we also utilize eight specific narrowband syndromes to provide a more in-depth assessment of children's social and emotional functioning. In addition, research has consistently found that different reporters vary on rating children's problems (Achenbach, McConaughy, & Howell, 1987; Bingham, Loukas, Fitzgerald, & Zucker, 2003). Therefore, we incorporate parent, teacher and child's reports to gain a more objective measurement of COAs' problems.

Third, we investigate the unique role of family structure in altering COAs' problems by adjusting potential confounding variables including socio-demographic variables, child's gender, parental symptomatology and familial stressors.

Finally, evidence relying on cross-sectional comparisons is difficult to determine whether problems found in heterogeneous family structure are causes or consequences (or both) of marital separation. Moreover, cross-sectional designs can only provide limited information on family processes and individual adjustment prior to family separation. Given that divorce is a dynamic process and problems often occur prior to marital separation, (Amato, 2000; Kelly, 2000), parental divorce can be seen as an outcome resulting from a combination of preceding factors such as higher interparental hostility, family conflict, and other potential risk factors. Therefore, to gain a better understanding of how living in heterogeneous family structures influences the behavioral and emotional adjustment of both COAs and their parents, our final question focuses on the *change* of parental and child's symptomatology before and after parent's separation. More specifically, we compared the change of parental drinking problems and children's internalizing

and externalizing problems within and between different family structures using longitudinal data. Because of the initial recruitment criteria, all male target children are residing with two-parent biological families at wave 1, thus comparing problems from wave 1 (pre-divorce/separation) to wave 4 (post-divorce/separation) can indicate an individual adjustment trajectory before and after family disruption.

Method

Participants and Procedure

Participants for the present study were drawn from the Michigan Longitudinal Study (MLS) ---an ongoing multi-wave study which is tracking the prospective developmental trajectories of children of alcoholics who were being raised in high-risk environments characterized by alcohol abuse and related comorbidities (Zucker et al., 2000). The first group of alcoholic fathers was identified through a network covering all district courts in a 4-county area who were convicted of drunk driving with blood alcohol content of at least 0.15% (or at least 0.12% with previous drinking-related arrest). The alcoholic families had to meet 3 criteria in order to be included in the study. Families were required to: a) have fathers who met the Feighner Diagnostic criteria (Feighner et al., 1972) for probable or definite alcoholism; b) have at least 1 male target child who was 3-5 years old and showed no evidence of fetal alcohol syndrome, and c) be intact families living with the target child at the initial recruitment stage (wave 1) of the study. Given that the alcoholic status of the mother within these families was not a selection criteria, their alcoholic status was free to vary. An intermediate-risk group of alcoholic fathers was also recruited from the neighborhoods in which the alcoholic fathers resided using door to door canvassing. In contrast to the first group, the community-based group did not show any history of alcohol-related legal problems during initial recruitment. Non-alcoholic families (control

groups) were also recruited through community canvas from the same neighborhood as the alcoholic families but had no lifetime substance use disorders for either parent. A more detailed description of the method is provided in Zucker et al., (2000).

Participants (265 male and 29 female) were from 253 non-Hispanic White families. Every three years, the families completed extensive self-report instruments and were interviewed by trained project staff at participants' homes. Trained project staff was blinded of family diagnostic status (alcoholic or nonalcoholic) to reduce subjective bias. In addition, at each wave of data collection following school entry, teachers who had significant contact with the child rated children's behavior problems. Initially only male target children were recruited in the study as they were the highest risk group to develop behavioral and emotional problems. Because of extended funding, starting from wave 2, female target children and male target children's siblings were also included in the study.

The present study used data from wave 1 and wave 4 in which participants were at age 3-5 and 12-15 respectively. Because of the recruitment criteria of the study, all male target children were living with 2 biological parents at wave 1. Thus the family structure was coded based on child's household status at wave 4. To ensure the reliability and accuracy of our family structure coding system, we used three different sources of information 1) children self-report of demographic background reporting whether they were living with both of the biological parents last year, as well as the list of people they were living with at wave 4, 2) biological parents' report of wave 4 marital status (married, separated, divorced from target child's biological father) and living situation (living with/without original partner and child), and 3) case notes written by trained interviewers during personal interviews at participants' homes, if there were discrepancies between reporters or if no self-reported information was provided. Families were

coded as intact families if both of the biological parents of the target child remained married and stayed together in the same household. Families were coded as single-parent families if the target child resided with a divorced parent who remained single and did not cohabit with a partner. Families were coded as stepfamilies if the target child was living in step or cohabiting-step families in which their biological parent remarried or was cohabiting with a partner. For the purpose of our study, we eliminated 5 participants who lived alone or resided with relatives or non-relatives. We also excluded 9 participants who were living in joint custody in which they resided alternatively with both of their biological parents. Due to the small amount of participants residing in step and single-parent control (non-alcoholics) families (9 from step control families; 12 from single-parent control families), we also did not include those children in our analysis. Thus, our sample consisted of 161 COAs from 141 two-parent biological families, 41 COAs from 36 stepfamilies, and 28 COAs from 24 single-parent families. 64 children from 52 control (non-alcoholic) intact families were also included for our analysis discussed in the later section. For children living in stepfamilies, the majority (93%) resided in a biological mother and stepfather (or mother' cohabitating partner) household. For children living in single-parent families, 86% resided with their biological mothers.

Measures

Parent alcoholism diagnosis. DSM-IV lifetime alcoholism diagnosis was used to classify families into different subtypes (alcoholic and non-alcoholic). Positive diagnosis of alcohol abuse or dependence was assessed using the Drinking and Drug History Questionnaire (DDH; Zucker, Fitzgerald, & Noll, 1990), the National Institute of Mental Health Diagnostic Interview Schedule-Version IV (DIS-IV; Robins, Helzer, Croughan, & Ratcliff, 1981), and the Short Michigan Alcoholism Screening Test (SMAST; Louis van Rooijen, 1975), at the first wave of

data collection. The SMAST is a 13-item screening inventory that assesses alcohol problems. Evidence indicates that the SMAST has good internal consistency, test-retest reliability, and concurrent validity (Dyson et al., 1998). The DDH contains a series of questions asking about alcohol and other drug use and alcohol-related consequences over the past 6 months. The DDH incorporates consumption items from the American Drinking Practices Survey (Cahalan, Cisin, & Crossley, 1969) and a series of 22 problem items from the V. A. Medical Center Research Questionnaire (Schuckit, 1978), to which the respondent answers in a yes/no format, and also provides the age of first and most recent experiences of problem, for every item that is responded to positively. These items have been extensively used in a variety of survey and clinical settings. The DIS-IV is a structured diagnostic interview that collects extensive information about physical, alcohol- and drug-related symptoms, and other psychiatric symptoms. Reliability and validity of the alcohol section of the DIS appear to be acceptable (Erdman et al., 1992). For the purposes of analysis, either parent's diagnosis was sufficient for a family classification of "alcoholic". Overall, there were 201 families that met the definition of family alcoholism: 117 (58.2%) families with only the biological father meeting alcohol diagnosis, 77 (38.3%) in which mother and father were lifetime alcoholics, 7 (3.5%) families with only the mother having lifetime alcohol diagnosis, and 52 families with no parent having lifetime alcohol diagnosis.

Family socio-demographics. Family demographics information was measured from a questionnaire assessing family annual incomes, parental education and occupation. Because the majority of children from non-intact families (single-parent and step families) resided with the biological mother after parental separation, annual family incomes were measured based on maternal report. For participants who resided with biological father, family incomes were measured based on paternal report. Family socioeconomic status (SES) was calculated using the

Duncan TS12 Socioeconomic Index based on occupational prestige at baseline (Mueller & Parcel, 1981). The index was a continuous scale ranging from 0 (unemployed) to 904 (law professor).

Parental symptomology and familial problems

Parent drinking problems. In addition to the dichotomous measure of parental alcoholism diagnosis at baseline, we also utilized the Lifetime Alcohol Problems Score (LAPS; Zucker, et al., 1997) ---a continuous measure to assess alcoholic problems at two different waves (wave 1 and wave 4). The LAPS score encompassed three different components: a) the primacy of alcohol problems component using the age of first drunkenness, as earlier onset drinking implies potential greater intractability to reverse a pattern of drinking problems; b) the variety of symptomatology components by assessing the number of different alcohol related problems (i.e., work, family, etc.) reported by an individual; and c) the life percentage component is the duration between the most recent and the first drinking problems which reflected problem stability. The LAPS score was derived from information gathered from the administration of DDH Questionnaire, DIS-IV and SMAST. LAPS showed adequate external and discriminant validity. Higher LAPS scores reflected more drinking related problems (i.e., psychopathology, antisocial behaviors etc.).

Parental antisocial behavior. The Antisocial Behavior Checklist (ASB; Zucker, Ellis, Fitzgerald, Bingham, & Sanford, 1996) was used to assess parent antisocial behavioral problems at wave 1. The 46-item ASB measured the frequency of parent's participation in a variety of aggressive and antisocial behaviors in both childhood and adulthood. Participants rated each item using a 4-point scale ranging from 0 (Never) to 3 (often). Higher scores indicated more antisocial behavior problems. A series of reliability and validity studies with populations have shown

adequate test-retest reliability (.91 over 4 weeks) and internal consistency (alphas =.67 to .93). The instrument differentiates between individuals with histories of antisocial behavior (e.g., convicted felons) versus individuals with minor offenses, versus university students (Zucker et al. 1994). The instrument also discriminates alcoholic from nonalcoholic adult males (Fitzgerald et al. 1991).

Maternal depression. The Beck Depression Inventory (Beck et al., 1996) was used to assess the cognitive, emotional, motivational and physical manifestations of mother's depression. The instrument included 21 items and each item consisted of four evaluative self-statements in order of increasing severity (score ranges from 0 to 3). A sample question included "I do not feel sad (0), I feel sad (1), I am sad all the time and I can't snap out of it (2), and I am so sad or unhappy that I can't stand it (3)". A meta-analysis of 25 years data on the BDI yielded an internal consistency mean coefficient alpha of .86 for psychiatric patients and .81 for nonpsychiatric subjects (Beck, Steer, & Carbin, 1988).

Family stressors. A modified version of The Family Crisis list (Patterson, 1982) was used to measure parent's report of serious family crisis in the past 6 months. This 40-item list of family troubles was developed by the staff of the Oregon Social Learning Center to record family related stressors, and to document the interaction between stress and patterns of family coerciveness (Patterson, 1982). From this list, 28 items were chosen which had face validity as serious crises; items were summed (yes/no) to provide a Family Crisis Score. For instance, in the household crisis subscale, "Meal burned/ruined" was discarded and "Got evicted" was retained as a serious crisis. The reliability of this measure was 0.77. Higher scores indicated more serious crisis.

Child's symptomatology

The Child Behavior Checklist (CBCL; Achenbach, 1991a) was used to evaluate children's problems in terms of eight narrowband syndromes as well as two broadband factors reflecting internalizing and externalizing behaviors. The eight narrowband syndromes include subscales of Anxious-Depressed, Social Withdrawal, Thought Problems, Social Problems, Attention Problems, Somatic Complaints, Delinquent Behavior and Aggressive Behavior. The Internalizing Problems Broadband score combines the Social Withdrawal, Somatic Complaints, and Anxiety/Depression scales, while Externalizing combines the Delinquent Behavior and the Aggressive Behavior scales. Including narrow band syndromes provides a more in-depth assessment of the target child's specific social and emotional functioning. Although the combination of paternal and maternal rating provides a more complete representation of the severity and level of child's behavior problems, due to the majority of children residing with the biological mother following parental separation, paternal reports may not truly reflect children's problems in single-parent and stepfamilies. Thus, maternal report was used if children resided in intact families, single-mother families, and step families in which biological mother was the primary caregiver. For children who resided with single-father and step families headed by biological father, we utilized paternal report. However, given that parental report may be subjected to bias, we also adapted two other sources of report: 1) the Teacher Report Form (TRF; Achenbach, 1991b) rated by the target child's academic teachers, and 2) Youth Self Report Form (YSR; Achenbach, 1991c) in which the child reported on his/her own behaviors to provide a more objective rating of children's behavior. The 118-item CBCL, the TRF, and the YSR all showed adequate test-retest reliability. The CBCL has a range from .95 at a one-week interval, to .84 at a three-month interval. Inter-rater agreement was moderate for teachers seeing pupils

under different conditions ($r = .54$ for problem scores). Test-retest reliability coefficients for the various scales of youth self-report range from .50 to .80.

Handling missing data

Table 1 presents the percentage of missing data for each variable. Missingness ranged from a low of 1% for measures in YSR to a high of 19% for measures in TRF. Little's (1988) MCAR test was performed to determine whether the data was missing completely at random (MCAR). Results showed that data was missing completely at random ($\chi^2 = .00$, $df=896$, $p > .05$). This indicates that the probability of missingness does not depend on the value of study variables and the data available would be equivalent to a random subset of the entire sample. In other words, MCAR data will not yield any substantial bias in parameter estimation (Allison, 2002). Therefore, we first adapted the complete case analysis method to compare sociodemographic characteristics, parental and children's problems among different family structures using Univariate analyses of variance (ANOVA). On the other hand, complete case analysis can result in a loss of statistical power (Graham, 2009). Thus, to ensure we have enough statistical power to detect the effects of interest for hierarchical regression analysis, we performed a multiple imputation (MI) using PROC MI, set by the Markov Chain Monte Carlo (MCMC) method of imputation implemented in SAS 9.2 to generate 10 imputed data sets. Besides including all the independent and dependent variables in the MI analytical model, we also utilized auxiliary variables including parent's annual family income and maternal depression at wave 3 and 5, all narrowband syndromes and broadband factors of children's problems from parent report at wave 3, and all three reporters at wave 5 to improve the quality of the imputed data.

Results

Sociodemographic characteristics of the samples

Family structure in all analyses was determined by marital status at wave 4 (T4). All analyses use data from biological parents who were living together at wave 1 (T1). Means and standard deviations of socio-demographic information are summarized in Table 2. Univariate analyses of variance (ANOVA) was conducted on each of the variables. The results showed significant relationships between familial subtype for baseline (T1) family SES, baseline paternal education and T4 annual family income. Post hoc comparisons with Tukey-Kramer adjustment at $p = .05$ showed that intact alcoholic families had significantly less baseline paternal education compared to control families. On the other hand, alcoholic stepfamilies had lower family SES at T1 and also less family annual income at T4 than control and intact alcoholic families, with no significant differences between the latter groups. Moreover, biological mothers from future alcoholic stepfamilies had significantly less baseline education when compared to intact alcoholic families and marginally less when compared to control families, $t(284) = -2.31$, $p = .09$. In addition, biological fathers from future alcoholic stepfamilies had the least education among familial subtypes and significantly differed from control, intact alcoholic and single-parent alcoholic families. Finally, single-parent alcoholic families had the lowest post-divorce family income at T4 among familial subtypes and significantly differed from all other familial subtypes.

Comparisons of alcoholic intact, step, single-parent and control families:

Parent's symptomatology

Table 2 also presents a summary of parental psychopathology and familial crisis for the sample. Univariate analysis of variance (ANOVA) revealed that the four groups significantly differed on the measures of baseline maternal ASP, baseline paternal ASP, maternal drinking

problems at T4, paternal drinking problems at T4, and serious family crisis in the past 6 months at T4.

At wave 1, Tukey post hoc comparisons indicated that alcoholic families, regardless of familial subtypes, showed significantly higher levels of baseline maternal and paternal ASP than control families. Among alcoholic families, biological mothers and fathers from future alcoholic stepfamilies had significantly higher baseline ASP than those in intact alcoholic families, whereas biological mothers but not fathers from future single-parent alcoholic families had significantly higher baseline ASP than those from intact alcoholic families.

At wave 4, mothers and fathers from alcoholic families, regardless of familial subtypes, showed significantly higher drinking problems and had more serious crises in the family than those from control families. On the other hand, paternal and maternal LAPS were not significantly different among alcoholic familial subtypes. However, both step and single-parent alcoholic families had more severe family crises in the past 6 months at T4 when compared to intact alcoholic families.

Children's symptomatology

Parent report. Table 3 presents the eight narrowband syndromes along with the two broadband factors of internalizing and externalizing syndromes of children rated by parent at T4. ANOVA with Tukey post hoc comparisons indicated that children of alcoholics (COAs) living in stepfamilies were scored significantly higher on 5 syndrome scales: anxious-depressed, attention problems, delinquency, aggressive behaviors and overall externalizing behaviors than children from control families and from intact alcoholic families. No significant difference was found between children from intact alcoholic families versus children from control families. Children

from single-parent alcoholic families were also not significantly different from those in control and intact alcoholic families.

Teacher report. Comparisons of children's emotional and behavioral problems among family structures rated by teachers are shown in Table 4. Results using ANOVA and post hoc comparisons indicated that COAs from intact families had higher scores on attention problems than children from control families. On the other hand, COAs from stepfamilies scored higher on withdrawn behavior and delinquency than those from control families, and had higher scores on thought problems, attention problems, aggressive behaviors and overall externalizing behaviors than children from control and intact alcoholic families. Finally, COAs from single-parent families were scored higher on attention problems and externalizing behavior than children from control families, and higher on delinquency than those from control and intact alcoholic families.

Child report. Table 5 presents children's reports of their own problems. ANOVA and post hoc comparisons indicated that COAs from stepfamilies reported significantly more problems on withdrawn, thought, attention, delinquency, and overall internalizing behaviors than children from control families. In addition, they also reported higher anxious-depressed problems than those from single-parent alcoholic families, and more withdrawn and overall internalizing behaviors than those from intact alcoholic families. No significant difference was found among alcoholic intact, single-parent and control families.

Multivariate analysis

To examine whether family structure is still significantly related to COAs' problems after adjusting for sociodemographic characteristics, parental symptomatology and family crisis, we conducted six separate hierarchical multiple regressions (two for each reporter) for internalizing and externalizing behavior problems as the respective dependent variables from parent, teacher

and child reports. Predictors consisted of ten independent variables, with family structure (stepfamily and single-parent alcoholic family) entered in Step 1, sociodemographic characteristics (child's sex, annual family income, maternal and paternal education) entered in Step 2, baseline parental problems (maternal and paternal baseline ASP) entered in Step 3, concurrent parental problems (maternal and paternal alcoholic problems, and maternal depression) entered in Step 4, and finally concurrent family crisis entered in Step 5. As discussed above, multiple imputation was performed to take advantage of all the available data.

Internalizing symptoms

Tables 6-8 present unstandardized pooled regression coefficients from the 10 imputed data sets for internalizing problems rated by parent, teacher and the child.

For parent report, the model was marginally significant ($p=.06$) with family structure contributing approximately 2% of the variance in the first step such that COAs from stepfamilies displayed higher internalizing behavior (see Table 6). Living in stepfamily was no longer predictive for internalizing behavior after adding socio-demographic variables at step 2. In addition, both maternal drinking problems and maternal depression remained significant in the final model at step 5, suggesting higher maternal drinking and depression problems were associated with higher COAs' internalizing problems.

For teacher report, the only significant predictor across steps was paternal education in which lower paternal education was associated with higher internalizing behaviors (Table 7).

For child report (Table 8), living in stepfamily significantly predicted higher internalizing problems at Step 1 (accounting for approximately 3% of the variance in step 1) and remained significant after adjusting for sociodemographic variables (step 2), baseline and concurrent

parental problems (steps 3 and 4), and family crisis in the final model. In fact, living in stepfamily was the only predictor for internalizing behaviors in the final model.

Externalizing symptoms

Unstandardized pooled coefficient estimates for externalizing problems rated by the three reporters are also presented in tables 6-8. For parent report (table 6), living in step alcoholic families accounted for approximately 5% of the variance in the first step and was predictive of higher externalizing behavior after adjusting for sociodemographic variables and baseline and concurrent parental problems in steps 2 to 4. The addition of family crisis in the final step allowed investigation of the influence of family crisis as a potential mediator of the relationship between living in stepfamily and externalizing behavior. Results indicated that living in stepfamily became non-significant after adding family crisis in the final step, suggesting that family crisis served as a mediator between living in stepfamily and the elevated externalizing problems. Moreover, higher baseline paternal ASP, concurrent maternal drinking problems, maternal depression, and family crisis significantly predicted higher levels of externalizing symptoms in the final model.

For teacher report (table 7), living in stepfamily predicted externalizing behaviors at step 1 and 2, but became marginally significant ($p=.09$) after adding in parental baseline problems (Step 3), and became non-significant after adding in concurrent problems (Step 4). Paternal baseline ASP predicted externalizing problems at step 3, but became non-significant after adding in concurrent parental problems. Furthermore, maternal drinking problems (but not family crisis) remained a robust predictor for higher externalizing behaviors while lower paternal education marginally predicted externalizing behavior in the final model.

For child report, family structure did not predict externalizing problems. Similar to teacher report, paternal baseline ASP became non-significant at step 3. In addition, both maternal and family crisis remained robust predictors for externalizing behaviors in the final step.

Changing trajectories of parent and child's problems among family structures

To further investigate the effect of family structure on parental and child symptomatology, we used repeated measures data from T1 and T4. Because of the initial recruitment design of the study, all male target children at T1 were living in two parent biological families. Thus comparing parent and child problems from T1 (before any separation occurred) to T4 (after parental separation occurred) allows us to examine how the change of family structure (i.e., from intact to single-parent or stepfamilies) was related to parental drinking and child's behavioral problems.

Four separate general linear models with correlated errors were fitted to measure the change in paternal drinking problems, maternal drinking problems, child's internalizing and externalizing behaviors (reported by parent) for male target children and their parents using T1 and T4 data. Specifically, a heterogeneous first-order autoregressive covariance structure (ARH(1)) was modeled for the errors, allowing the error variance to vary across the two waves, and allowing the errors within individuals to be correlated. Alternative covariance structures were considered for the errors, and the ARH(1) structure was found to have the lowest AIC criterion (indicating the best fit with the fewest parameters) in models estimating parental drinking problems. Fixed effects of wave, family structure, and the interaction between wave and family structure were included in these models, and PROC MIXED implemented in SAS 9.2 was used to estimate all the model parameters, using restricted maximum likelihood (REML) estimation.

Results indicated that there was a significant main effect of wave, $F(1, 203)=16.35$, $p <.001$, and family structure, $F(3, 258)=45.19$, $p <.001$ for paternal drinking problems. A marginally significant main effect of wave, $F(1, 228)=2.92$, $p =.09$, and a significant main effect of family structure $F(3, 258)=9.94$, $p <.001$ were found for maternal drinking problems. No interaction was found to be significant in both models.

After model parameters were estimated and tested, post-hoc multiple comparisons of the least squares means in different groups were performed, using a Tukey-Kramer adjustment for multiple testing. Results indicated that paternal drinking problems were not significantly different among alcoholic families at T1. All alcoholic families, regardless of familial subtype showed higher paternal drinking problems than control families at T1 and T4 (See figure 1). While no significant change of paternal drinking problems (from T1 to T4) was found for control and step-alcoholic families, significant increases of paternal drinking problems were found for fathers from intact families, $t(203)= -3.32$, $p <.001$, and single-parent families, $t(203)=-1.50$, $p <.001$ (See figure 1).

For maternal LAPS, result indicated that alcoholic families, regardless of familial subtype showed higher maternal LAPS at wave 1 and wave 4 (See figure 2). Although no significant change survived after Tukey adjustment for all groups from wave 1 to wave 4, we saw an accelerated trend of drinking patterns for mothers from step families before Tukey adjustment ($p <.05$) (See figure 2), suggesting a potential effect of changing family structure on mothers in stepfamilies.

Child's internalizing behavior was fitted in the third GLM model, with autoregressive covariance structure modeled for the errors. Results indicated that there was a main effect of family structure, $F(3, 258)=4.83$, $p <.01$. No significant interaction was found in the model.

Post-hoc comparisons indicated that COAs living in step-alcoholic families had significantly higher internalizing behaviors than intact and control families at wave 1 and wave 4. No change was found in any groups across waves (See figure 3).

A final GLM model with autoregressive covariance structure was fitted to estimate externalizing behaviors. Results revealed that there was a significant main effect of family structure, $F(3, 258)=9.49$, $p <.001$ and wave $F(1, 222)=30.56$, $p <.001$. No significant interaction was found in the model. Post hoc comparisons indicated that COAs from stepfamilies showed elevated externalizing behaviors compared to control and intact alcoholic families at each wave. Also, COAs living in intact and stepfamilies, and children from control families had a significant decrease in externalizing behavior from wave 1 and wave 4. COAs' living in single-parent families also had a marginally significant ($p=.06$) decrease in internalizing behavior over time (See figure 4).

Discussion

To our knowledge, this is one of the first studies to investigate how heterogeneous alcoholic family structures (intact, single-parent and stepfamilies) differ in terms of sociodemographic characteristics, parental symptomatology, and children of alcoholics' internalizing and externalizing problems. This study also examines alcoholic family adjustment outcomes prior to and after divorce. There are several important findings. First we will discuss the demographic characteristics and parental symptomatology before and after divorce in alcoholic stepfamilies and single-parent families. Then we will focus on COAs' adjustment outcomes in these heterogeneous families.

Alcoholic stepfamily adjustment outcomes

First, we found that prior to parental separation, alcoholic families who would later become stepfamilies had significantly lower family SES and lower levels of paternal education than non-alcoholic families and alcoholic families that would remain intact. Inadequate familial resources have been linked to familial instability (Fine & Harvey, 2006). For example, families with lower SES and less education are more likely to be working in lower-status jobs accompanied with poorer working environments. They are also more likely to have limited access to community resources or to become the victim of unemployment. This economic instability may in turn lead to more marital conflicts. Moreover, biological fathers and biological mothers in stepfamilies showed a significantly higher level of baseline antisocial problems before divorce than those in non-alcoholic and intact alcoholic families. Our findings are consistent with previous research showing that parental psychopathology is one of the robust predictors for marital disruption (Amato & Previti, 2003; Kessler, Walters, & Forthofer, 1998) and the relationship between parental psychopathology and later separation may be mediated by the higher level of distress and hostile behaviors found in antisocial alcoholic families (Floyd et al., 2006). These preexisting risks may help explain the higher incidence of marital disruption in these alcoholic families.

After divorce, alcoholic stepfamilies (mostly headed by biological mothers and stepfathers in our sample) continued to have less family income and showed a significantly higher level of family stress than intact alcoholic and non-alcoholic families. However, we did not find a significant change of maternal and paternal drinking problems before and after divorce, suggesting that divorce per se may not affect the drinking problems of custodial mothers and non-custodial fathers in stepfamilies.

Several factors may contribute to the adverse environment found in post-divorce stepfamilies. One of the contributors may be due to assortive mating. Because of assortive mating, biological mothers might more likely to remarry or cohabit with spouses similar to their ex-spouses (alcoholic husband) who are also characterized by lower family SES, lower education and more drinking and antisocial problems. Higher familial stress in stepfamilies may be explained by the pertinent risk factors (mother's baseline antisociality and lower family income) that directly and indirectly contribute to more chaotic family environments. Other possible predictors include mothers' conflicts with ex-spouses (Kelly & Emery, 2003) or that these families are still in their transitional adjustment phase to cope with the painful event of divorce (Hetherington, 1989). Further investigation is required to examine the complex mechanisms underlying these problematic outcomes. Nevertheless, our findings do indicate that remarrying or cohabitating may not be a buffering factor for divorced mothers. Rather, it creates potential risks for divorced mothers to live in high stress environments, even after separating from alcoholic fathers.

Alcoholic single-parent families' adjustment outcomes

Prior to divorce, alcoholic families who would later separate and become single-parent households did not show lower baseline family SES compared to non-alcoholic and intact alcoholic families. However, we found a higher level of parental antisociality among these families prior to separation, with biological fathers' baseline ASP higher than non-alcoholic families, and biological mothers' ASP higher than non-alcoholic and intact alcoholic families. Indeed, biological mothers who later became single-mothers had the highest baseline antisocial problems among all other familial subtypes. Given that previous research has consistently linked

antisocial problems to higher marital hostility and poor marital outcomes, it is not surprising that these families are also at risk for later marital disruption.

Similar to the findings for alcoholic stepfamilies, after divorce, single-parent alcoholic families (mostly single-mother households in our sample) also had less family income and more serious family stress. Indeed, single-parent alcoholic families had the lowest family income after divorce among all familial subtypes. This is convergent with previous findings suggesting that divorce often leads to a drastic decline in the economic situation in single-mother families (Bartfeld, 2000; Hetherington, Bridges, & Insabella, 1998). Consequently, the financial instability along with high antisocial problems may create or intensify familial stressors, given that single-parents often lack emotional and financial support from their ex-spouses.

Moreover, we found that non-custodial alcoholic fathers in single-parent families showed a rapid increase in drinking problems after marital separation (See figure 1). Studies on divorced families have found that non-residential father often exhibited higher level of psychological distress, alcohol abuse and lower mortality (Fine & Harvey, 2006). This may be partially moderated by the fact that men are less successful than women at seeking and establishing social support networks that buffer the stress accompanying divorce (Umberson, Chen, House, Hopkins, & Slaten, 1996). Taken together, non-custodial alcoholic fathers' drinking problems may be exacerbated by their poor psychological adjustment outcomes.

COAs' problems in stepfamilies

Overall, our findings suggested that COAs living in stepfamilies are the most vulnerable group for elevated internalizing (mother-and self-reported) and externalizing (mother-and teacher-reported) symptoms compared to non-alcoholic children and COAs residing in intact families. Specifically, compared to children in non-alcoholic families, they were scored higher

on anxious-depressed problems (parent-reported), social withdrawal, thought problems (teacher-and-self reported), aggressiveness (parent-and-teacher reported), attention problems and delinquency (all three reporters). Moreover, compared to COAs in intact families, they were scored higher on anxious-depressed problems (parent-reported), thought problems (teacher-reported), attention problems, aggressiveness (parent-and-teacher reported), and delinquency (all three reporters).

Several factors may contribute to our findings. First, our longitudinal data revealed that COAs residing in stepfamilies showed higher levels of externalizing and internalizing behaviors than those in non-alcoholic and alcoholic intact families before divorce (at wave 1), suggesting that these children may have early preexisting risk for later behavioral problems. This early risk may be attributed to the lower family SES and higher paternal and maternal antisocial comorbidities found in these alcoholic families prior to separation (See table 2). Additionally, COAs' difficult temperament may further strengthen the link between parental psychopathology and COAs' internalizing and externalizing symptoms; studies have shown that COAs are more likely to have difficult temperament if they come from families where the alcoholic fathers are lower in SES and higher in antisocial comorbidity (Zucker, Ellis, Bingham, & Fitzgerald, 1996).

However, parental alcoholic-specific and non-alcoholic specific psychopathology alone cannot be fully accounted for the fact that these children still showed elevated parent-reported externalizing problems after adjusting for parental psychopathology (See table 6). Therefore, besides the direct pernicious effect of parental symptomatology, COAs' continuity of living in higher adverse environments (lower income and higher family stressors) after moving into stepfamilies may in turn explain their elevated externalizing problems. Congruent evidence comes from our results showing that living in stepfamily no longer predicted parent-reported

externalizing symptoms after controlling for family stress, indicating that the elevated externalizing symptoms found in COAs in stepfamilies may be mediated by the family adversity they encountered. Indeed, our findings are consistent with previous research showing that families with higher parental psychopathology, lower family resources and higher adverse environments are the highest-risk group for externalizing symptoms (Zucker, 2006; Zucker, Wong, Puttler, & Fitzgerald, 2003).

A more complex mechanism may underlie the elevated internalizing symptoms found in COAs living in stepfamilies. For instance, while living in stepfamilies no longer predict parent-report of internalizing symptoms after controlling for socio-demographic characteristics, living in stepfamilies remained a robust predictor for elevated child-reported internalizing symptoms, even after adjusting for socio-demographic characteristics, baseline and concurrent parental symptomatology, and family stressor. In fact, living in stepfamilies is the only significant predictor for elevated child-reported internalizing problems, suggesting that living in stepfamilies is a unique predictor for elevated internalizing symptoms.

The greater effect found in child's report but not parent and teacher's report may be explained by the characteristic of internalizing symptoms. Given that internalizing symptoms are subjective and internal emotional feelings, parents and teachers may not be sensitive enough to detect the presence of child's problems. In addition, living in stepfamilies may be susceptible to other environmental and familial risks that are not measured in this study. For instance, researches on remarried families have suggested that the increase in negativity may be in part explained by the decrease in quality of parent-child relationships and the authoritative parenting found after parental separation and the formation of stepfamilies (Amato & Gilbreth, 1999; Hetherington, 1989). Some studies also suggested that stepfathers often provided less warmth

and support (Pasley, Dollahite, & Ihinger-Tallman, 1993), and children often reported less positive interaction with stepfathers compared to biological fathers (Hetherington et al., 1998; Dunn et al., 1998). Moreover, studies have found that children living in stepfamilies are at a greater risk for abuse (Daly & Wilson, 1985; Daly & Wilson, 1994), which in part may be explained by the non-biological relationship between children and the stepfathers (O'Connor & Boag, 2010). Thus, further research should investigate what are the underlying mechanisms that mediate the elevated internalizing symptoms found in COAs in stepfamilies.

COAs' problems in single-parent families

In contrast to COAs living in stepfamilies, COAs residing in single-parent families did not show significantly higher levels of externalizing or internalizing problems than those from non-alcoholic and alcoholic intact families (from all three reporters). Alternatively, they were scored higher on teacher-reported attention problems than children in non-alcoholic families, and were scored higher on teacher-reported delinquency than children in non-alcoholic and alcoholic intact families.

Although COAs living in single-parent families did not show a statistically significant higher level of externalizing symptoms, readers should be aware that our results did reveal that COAs in single-parent families had overall higher means of narrowband and broadband externalizing symptoms than those from non-alcoholic and alcoholic intact families, and this was consistent across different reporters. Moreover, the reason that we found a significantly higher level of delinquency but not externalizing symptoms (in teacher report) may be due to the higher variability in the latter.

Nevertheless, our results do indicate that COAs living in single-parent families is a less vulnerable group to develop internalizing and externalizing symptoms compared to COAs living

in stepfamilies. In fact, we also found that they showed patterns of internalizing and externalizing symptoms similar to alcoholic intact families (See figures 3 and 4). On the other hand, we also found that these children were predisposed with higher maternal antisocial problems and were under conditions of more adverse environments (greater family stressors and lower family income), similar to those found in stepfamilies.

Several reasons may explain these seemingly paradoxical findings. First, it is plausible that COAs had reduced contacts with their non-custodial antisocial alcoholic fathers after divorce, which served as a buffering effect. Studies from non-alcoholic families, for example, have shown that while the involvement of non-custodial fathers improved children's adjustment outcomes after divorce (Aquilino, 2006; King & Sobolewski, 2006), the benefit also depended on fathers' absence of psychopathology. Frequent contacts with non-custodial fathers with high antisociality and substance use have been shown to increase the risk of children's psychopathology and substance use (D'Amico, Ellickson, Collins, Martino, & Klein, 2005; Jaffee, Moffitt, Caspi, & Taylor, 2003). Thus, COAs separated from alcoholic fathers may counter-balance or alleviate the pernicious effect of adverse living environments. Second, COAs living in single-parent families may be subjected to fewer marital or interparental conflicts after the separation with their ex-spouses. Yet, our findings may also suggest that divorce per se does not affect COAs' adjustment outcomes. Rather it is the circumstances or characteristics of children and their parents that are presented long before the separation influencing their outcomes. Such evidence can be seen from the lack of significant changes in COA's problems before and after divorce.

Interestingly, our findings also did not find statistically significant difference between COAs in intact families and children in non-alcoholic families in most of our measures (except attention problems). One of the reasons may be due to the fact that parents from intact families

had a relatively lower level of antisociality compared to other alcoholic familial subtypes. Given that research has consistently used parental antisociality to identify the heterogeneity among COAs (Zucker, Ellis, Bingham, & Fitzgerald, 1996), thus separating intact alcoholic families by parental level of antisociality may yield a different result.

Strengths and limitations

There are several strengths in this study. Firstly, our study included both cross-sectional and longitudinal data to look at the adjustment outcomes for parents and children. Including baseline measures of symptomatology for these families prior to divorce can provide readers a better understanding of family problems before and after separation, thus allowing us to eliminate selection bias. Secondly, we utilized three different sources of reporters to provide a more objective assessment of children's outcomes. As shown in our results, while parents and teachers were more likely to identify children's externalizing problems, children's report might be more sensitive to internalizing symptoms. Thirdly, besides using broadband factors, we also included narrowband syndromes to gain a more in-depth assessment of children's problems. Including narrowband syndromes allows researchers to gain a better understanding of the heterogeneity among externalizing and internalizing problems. It also allows practitioners to target specific domains of problems during intervention. Finally, our usage of multiple imputation to handle missing data strengthens the power of our findings.

However, some limitations of the current study must be acknowledged. First, our sample is overly represented by white male children and thus the findings may not be generalizable to children from other ethnic groups. Similarly, we also did not compare gender difference in children's adjustment outcomes due to our predominant male sample in the study. Second, studies have shown that while children of divorced overall showed lower well-being than

children from intact families, the effects tended to diminish over time (Fine & Harvey, 2006; Hetherington & Stanley-Hagan, 1999). Thus our lack of control for the timing effect of divorce on each child does not allow us to eliminate lengths of separation as a confounder on COAs' problems. However, given that we see elevated problems in COAs prior to parental divorce at wave 1 and that the effects are consistent over time at wave 4, such confounding effect does not seem to lessen the importance of our findings. Third, due to the limited numbers of COAs living in cohabitating households after parental divorce, we did not separate COAs living in stepfamilies and cohabitating stepfamilies. Some studies have shown that children living in cohabiting households may experience lower levels of well-being (Manning & Lamb, 2003). This study cannot address this claim. Finally, while some studies have suggested that the involvement of resident stepfathers and non-custodial fathers are important predictors for children's adjustment outcomes (Amato & Gilbreth, 1999; Hetherington & Stanley-Hagan, 1999; King & Sobolewski, 2006), this study cannot address the roles that non-custodial and resident fathers play in explaining COAs' externalizing and internalizing symptoms. Therefore, not only do we urge for replication of our findings, we also hope that future research can focus on identifying the complex underlying mechanisms that mediate the relationship between heterogeneous familial groups and their problems.

Conclusion

Researchers have suggested families that are the most vulnerable for transmission of genetic risks are also households with higher incidence of family conflicts and violence, low family resources (SES and educational attainment), and more parental psychopathological comorbidity (ASP, depression) (Zucker, 2006). Our study further validates these findings by showing that COAs living in stepfamilies are the group at high risk for these factors. We also found that these

problems existed prior to parental separation, suggesting that COAs' postdivorce adjustment difficulties can be traced to predivorce family processes and early childhood maladjustment. Therefore, rather than viewing divorce as the culprit and outcome for children's problems, studies should focus on understanding the underlying factors that contribute to marital disruption and COAs' adjustment problems. Moreover, we hope that in the future researchers will be more aware of the importance of differentiating the heterogeneity in family structure among COAs, as family structure provided an additional marker of heterogeneity to identify the vulnerable phenotypes among COAs. Furthermore, our findings can alert practitioners to specifically target COAs living in stepfamilies for early remediation, as they are high risk groups for elevated internalizing and externalizing symptoms which may lead to later alcoholism.

References

- Achenbach, T. (1991a). *Manual for the Child Behavior Checklist / 4-18 and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T. (1991b). *Manual for the Teacher's Report Form and 1991 Profile*. Burlington, VT: University Associates in Psychiatry.
- Achenbach, T. (1991c). *Manual for the Youth Self-report Form and 1991 Profile*. Burlington, VT: University Associates in Psychiatry.
- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: implications of cross-informant correlations for situational specificity. *Psychological bulletin*, *101*(2), 213.
- Allison, P. D. (2002). Missing data: Quantitative applications in the social sciences. *British Journal of Mathematical and Statistical Psychology*, *55*, 193–196.
- Amato, P. R. (2000). The consequences of divorce for adults and children. *Journal of marriage and family*, *62*(4), 1269–1287.
- Amato, P. R. (2001). Children of divorce in the 1990s: an update of the Amato and Keith (1991) meta-analysis. *Journal of family psychology*, *15*(3), 355.
- Amato, P. R., & Gilbreth, J. G. (1999). Nonresident fathers and children's well-being: A meta-analysis. *Journal of Marriage and the Family*, *557–573*.
- Amato, P. R., & Previti, D. (2003). People's reasons for divorcing. *Journal of Family Issues*, *24*(5), 602–626.
- Aquilino, W. S. (2006). The noncustodial father-child relationship from adolescence into young adulthood. *Journal of Marriage and Family*, *68*(4), 929–946.

- Bartfeld, J. (2000). Child support and the postdivorce economic well-being of mothers, fathers, and children. *Demography*, *37*(2), 203–213.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and-II in psychiatric outpatients. *Journal of personality assessment*, *67*(3), 588–597.
- Beck, A. T., Steer, R. A., & Carbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical psychology review*, *8*(1), 77–100.
- Bingham, C. R., Loukas, A., Fitzgerald, H. E., & Zucker, R. A. (2003). Parental ratings of son's behavior problems in high-risk families: Convergent validity, internal structure, and interparent agreement. *Journal of personality assessment*, *80*(3), 237–251.
- Buu, A., Mansour, M. A., Wang, J., Refior, S. K., Fitzgerald, H. E., & Zucker, R. A. (2007). Alcoholism effects on social migration and neighborhood effects on alcoholism over the course of 12 years. *Alcoholism: Clinical and Experimental Research*, *31*(9), 1545–1551.
- Cahalan, D., Cisin, I. H., & Crossley, H. M. (1969). American drinking practices: A national study of drinking behavior and attitudes (Monograph No. 6). New Brunswick, NJ: Publications Division, Rutgers Center of Alcohol Studies.
- Chassin, L., Rogosch, F., & Barrera, M. (1991). Substance use and symptomatology among adolescent children of alcoholics. *Journal of Abnormal Psychology*, *100*(4), 449.
- Cherlin, A. J., & Furstenberg Jr, F. F. (1994). Stepfamilies in the United States: A reconsideration. *Annual review of sociology*, 359–381.

- Cherlin, A. J., Furstenberg Jr, F. F., Chase-Lansdale, L., Kiernan, K. E., Robins, P. K., Morrison, D. R., & Teitler, J. O. (1991). Longitudinal studies of effects of divorce on children in Great Britain and the United States. *Science*, 252(5011), 1386–1389.
- Collins, R. L., Ellickson, P. L., & Klein, D. J. (2007). The role of substance use in young adult divorce. *Addiction*, 102(5), 786–794.
- Connell, A. M., & Goodman, S. H. (2002). The association between psychopathology in fathers versus mothers and children's internalizing and externalizing behavior problems: a meta-analysis. *Psychological bulletin*, 128(5), 746.
- D'Amico, E., Ellickson, P. L., Collins, R. L., Martino, S., & Klein, D. J. (2005). Processes linking adolescent problems to substance-use problems in late young adulthood.
- Daly, M., & Wilson, M. (1985). Child abuse and other risks of not living with both parents. *Ethology and sociobiology*, 6(4), 197–210.
- Daly, M., & Wilson, M. I. (1994). Some differential attributes of lethal assaults on small children by stepfathers versus genetic fathers. *Ethology and sociobiology*, 15(4), 207–217.
- Dyson, V., Appleby, L., Altman, E., Doot, M., Luchins, D. J., & Delehant, M. (1998). Efficiency and validity of commonly used substance abuse screening instruments in public psychiatric patients. *Journal of Addictive Diseases*, 17, 57-76.
- Dubow, E. F., Boxer, P., & Huesmann, L. R. (2008). Childhood and adolescent predictors of early and middle adulthood alcohol use and problem drinking: the Columbia County Longitudinal Study. *Addiction*, 103, 36–47.
- Dunn, J., Deater-Deckard, K., Pickering, K., O'Connor, T. G., & Golding, J. (1998). Children's Adjustment and Prosocial Behaviour in Step-, Single-parent, and Non-stepfamily Settings:

- Findings from a Community Study. *Journal of Child Psychology and Psychiatry*, 39(8), 1083–1095.
- Englund, M. M., Egeland, B., Oliva, E. M., & Collins, W. A. (2008). Childhood and adolescent predictors of heavy drinking and alcohol use disorders in early adulthood: a longitudinal developmental analysis. *Addiction*, 103, 23–35.
- Erdman, H. P., Klein, M. H., Greist, J. H., Skare, S. S., Husted, J. J., Robins, L. N. et al. (1992). A comparison of two computer-administered versions of the NIMH Diagnostic Interview Schedule. *Journal of Psychiatric Research*, 26, 85-95.
- Feighner, J. P., Robins, E., Guze, S. B., Woodruff Jr, R. A., Winokur, G., & Munoz, R. (1972). Diagnostic criteria for use in psychiatric research. *Archives of General Psychiatry*, 26(1), 57.
- Fine, M. A., & Harvey, J. H. (2006). *Handbook of divorce and relationship dissolution*. Lawrence Erlbaum.
- Fitzgerald, H. E., Sullivan, L. A., Ham, H. P., Zucker, R. A., Bruckel, S., Schneider, A. M., & Noll, R. B. (1993). Predictors of Behavior Problems in Three-Year-Old Sons of Alcoholics: Early Evidence for the Onset of Risk. *Child Development*, 64(1), 110–123.
- Floyd, F. J., Cranford, J. A., Daugherty, M. K., Fitzgerald, H. E., & Zucker, R. A. (2006). Marital interaction in alcoholic and nonalcoholic couples: Alcoholic subtype variations and wives' alcoholism status. *Journal of abnormal psychology*, 115(1), 121.
- Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, 60, 549–576.
- Hetherington, E. M. (1989). Coping with family transitions: Winners, losers, and survivors. *Child development*, 1–14.

- Hetherington, E. M., Bridges, M., & Insabella, G. M. (1998). What matters? What does not? Five perspectives on the association between marital transitions and children's adjustment. *American Psychologist; American Psychologist*, *53*(2), 167.
- Hetherington, E. M., & Kelly, J. (2003). *For better or for worse: Divorce reconsidered*. WW Norton & Company.
- Hetherington, E. M., & Stanley-Hagan, M. (1999). The adjustment of children with divorced parents: A risk and resiliency perspective. *Journal of child psychology and psychiatry*, *40*(1), 129–140.
- Hussong, A. M., Bauer, D. J., Huang, W., Chassin, L., Sher, K. J., & Zucker, R. A. (2008). Characterizing the life stressors of children of alcoholic parents. *Journal of family psychology*, *22*(6), 819.
- Hussong, A. M., Cai, L., Curran, P. J., Flora, D. B., Chassin, L., & Zucker, R. A. (2008). Disaggregating the distal, proximal, and time-varying effects of parent alcoholism on children's internalizing symptoms. *Journal of abnormal child psychology*, *36*(3), 335–346.
- Hussong, A. M., Curran, P. J., & Chassin, L. (1998). Pathways of risk for accelerated heavy alcohol use among adolescent children of alcoholic parents. *Journal of Abnormal Child Psychology*, *26*(6), 453–466.
- Hussong, A. M., Flora, D. B., Curran, P. J., Chassin, L. A., & Zucker, R. A. (2008). Defining risk heterogeneity for internalizing symptoms among children of alcoholic parents. *Development and psychopathology*, *20*(01), 165–193.

- Hussong, A. M., Huang, W., Curran, P. J., Chassin, L., & Zucker, R. A. (2010). Parent alcoholism impacts the severity and timing of children's externalizing symptoms. *Journal of abnormal child psychology, 38*(3), 367–380.
- Hussong, A., Wirth, R., Edwards, M., Curran, P., Chassin, L., & Zucker, R. (2007). Externalizing symptoms among children of alcoholic parents: Entry points for an antisocial pathway to alcoholism. *Journal of abnormal psychology, 116*(3), 529.
- Jaffee, S. R., Moffitt, T. E., Caspi, A., & Taylor, A. (2003). Life with (or without) father: The benefits of living with two biological parents depend on the father's antisocial behavior. *Child development, 74*(1), 109–126.
- Kelly, J. B. (2000). Children's adjustment in conflicted marriage and divorce: A decade review of research. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(8), 963–973.
- Kelly, J. B., & Emery, R. E. (2003). Children's adjustment following divorce: Risk and resilience perspectives. *Family Relations, 52*(4), 352–362.
- Kessler, R. C., Walters, E. E., & Forthofer, M. S. (1998). The social consequences of psychiatric disorders, III: probability of marital stability. *American Journal of Psychiatry, 155*(8), 1092–1096.
- King, S. M., Iacono, W. G., & McGue, M. (2004). Childhood externalizing and internalizing psychopathology in the prediction of early substance use. *Addiction, 99*(12), 1548–1559.
- King, V., & Sobolewski, J. M. (2006). Nonresident Fathers' Contributions to Adolescent Well-Being. *Journal of Marriage and Family, 68*(3), 537–557.
- Knopik, V. S., Heath, A. C., Bucholz, K. K., Madden, P. A. F., & Waldron, M. (2009). Genetic and environmental influences on externalizing behavior and alcohol problems in

- adolescence: A female twin study. *Pharmacology Biochemistry and Behavior*, *93*(3), 313–321.
- Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology*, *111*(3), 411.
- Lansford, J. E. (2009). Parental divorce and children's adjustment. *Perspectives on Psychological Science*, *4*(2), 140–152.
- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, 1198–1202.
- Louis van Rooijen, M. (1975). A self-administered short Michigan alcoholism screening test (SMAST). *Journal of studies on alcohol*, *36*(1).
- Loukas, A., Zucker, R. A., Fitzgerald, H. E., & Krull, J. L. (2003). Developmental trajectories of disruptive behavior problems among sons of alcoholics: Effects of parent psychopathology, family conflict, and child undercontrol. *Journal of Abnormal Psychology*, *112*(1), 119.
- Maggs, J. L., Patrick, M. E., & Feinstein, L. (2008). Childhood and adolescent predictors of alcohol use and problems in adolescence and adulthood in the National Child Development Study. *Addiction*, *103*, 7–22.
- Manning, W. D., & Lamb, K. A. (2003). Adolescent Well-Being in Cohabiting, Married, and Single-Parent Families. *Journal of Marriage and Family*, *65*(4), 876–893.
- Mâsse, L. C., & Tremblay, R. E. (1997). Behavior of boys in kindergarten and the onset of substance use during adolescence. *Archives of general psychiatry*, *54*(1), 62.

- Mayzer, R., Puttler, L., Wong, M., Fitzgerald, H., & Zucker, R. (2002). Predicting early onset of first alcohol use from behavior problem indicators in early childhood. *Alcoholism: Clinical and Experimental Research, 26*, 124.
- McGue, M., Iacono, W. G., Legrand, L. N., Malone, S., & Elkins, I. (2001). Origins and Consequences of Age at First Drink. I. Associations With Substance-Use Disorders, Disinhibitory Behavior and Psychopathology, and P3 Amplitude. *Alcoholism: Clinical and Experimental Research, 25*(8), 1156–1165.
- Mueller, C. W., & Parcel, T. L. (1981). Measures of socioeconomic status: Alternatives and recommendations. *Child Development, 13–30*.
- O'Connor, A., & Boag, S. (2010). Do Stepparents Experience More Parental Antagonism Than Biological Parents? A Test of Evolutionary and Socialization Perspectives. *Journal of Divorce & Remarriage, 51*(8), 508–525.
- Patterson, G. R. (1982). *Coercive family process*. Eugene, OR: Castalia.
- Pasley, K., Dollahite, D. C., & Ihinger-Tallman, M. (1993). Bridging the gap: Clinical applications of research findings on the spouse and stepparent roles in remarriage. *Family Relations, 315–322*.
- Peterson Edwards, E., Leonard, K. E., & Eiden, R. D. (2001). Temperament and behavioral problems among infants in alcoholic families. *Infant mental health journal, 22*(3), 374–392.
- Pitk änen, T., Kokko, K., Lyyra, A. L., & Pulkkinen, L. (2008). A developmental approach to alcohol drinking behaviour in adulthood: a follow-up study from age 8 to age 42. *Addiction, 103*, 48–68.

- Pong, S. L., & Ju, D. B. (2000). The effects of change in family structure and income on dropping out of middle and high school. *Journal of Family Issues, 21*(2), 147–169.
- Robins, L. N., Helzer, J. E., Croughan, J., & Ratcliff, K. S. (1981). National Institute of Mental Health diagnostic interview schedule: its history, characteristics, and validity. *Archives of general psychiatry, 38*(4), 381.
- Schuckit, M. A. (1978). *Research questionnaire*. San Diego, CA: Alcoholism Treatment Program, V. A. Medical Center, University of California, San Diego.
- Simons, R. L., Lin, K. H., Gordon, L. C., Conger, R. D., & Lorenz, F. O. (1999). Explaining the higher incidence of adjustment problems among children of divorce compared with those in two-parent families. *Journal of Marriage and the Family, 1020–1033*.
- Umberson, D., Chen, M. D., House, J. S., Hopkins, K., & Slaten, E. (1996). The effect of social relationships on psychological well-being: Are men and women really so different? *American sociological review, 837–857*.
- Windle, M., & Barnes, G. M. (1988). Similarities and differences in correlates of alcohol consumption and problem behaviors among male and female adolescents. *Substance Use & Misuse, 23*(7), 707–728.
- Wong, M. M., Zucker, R. A., Puttler, L. I., & Fitzgerald H. E. (1999). Heterogeneity of risk aggregation for alcohol problems between early and middle childhood: Nesting structure variations. *Development and Psychopathology, 11*(04), 727–744.
- Zimmermann, P., Wittchen, H., Hofler, M., Pfister, H., Kessler, R., & Lieb, R. (2003). Primary anxiety disorders and the development of subsequent alcohol use disorders: a 4-year community study of adolescents and young adults. *Psychological Medicine, 33*(7), 1211–1222.

- Zucker, R. A. (2006). Alcohol use and the alcohol use disorders: A developmental-biopsychosocial systems formulation covering the life course.
- Zucker, R. A. (2008). Anticipating problem alcohol use developmentally from childhood into middle adulthood: what have we learned? *Addiction*, *103*, 100–108.
- Zucker, R. A., Davies, W., Kincaid, S. B., Fitzgerald, H. E., & Reider, E. E. (1997). Conceptualizing and scaling the developmental structure of behavior disorder: The Lifetime Alcohol Problems Score-as an example. *Development and psychopathology*, *9*(02), 453–471.
- Zucker, R. A., Ellis, D. A., Bingham, C. R., & Fitzgerald, H. E. (1996). The development of alcoholic subtypes: Risk variation among alcoholic families during the early childhood years. *Alcohol Health & Research World*.
- Zucker, R. A., Ellis, D. A., Fitzgerald, H. E., Bingham, C. R., & Sanford, K. (1996). Other evidence for at least two alcoholisms II: Life course variation in antisociality and heterogeneity of alcoholic outcome. *Development and Psychopathology*, *8*(04), 831–848.
- Zucker, R. A., Fitzgerald, H. E., & Noll, R. B. (1990). *Drinking and drug history* (Version 4, rev. ed.). Unpublished instrument, Department of Psychology, Michigan State University, East Lansing.
- Zucker, R. A., Noll, R. B., Ham, H. P., Fitzgerald, H. E., & Sullivan, L. S. (1994). *Assessing antisociality with the Antisocial Behavior Checklist: Reliability and validity studies*. Unpublished manuscript, Department of Psychiatry, University of Michigan, Ann Arbor, and Department of Psychology, Michigan State University, East Lansing.

Zucker, R. A., Fitzgerald, H. E., Refior, S. K., Puttler, L. I., Pallas, D. M., & Ellis, D. A. (2000).

The Clinical and Social Ecology of Childhood for Children of Alcoholics. *Children of addiction: Research, health, and public policy issues*, 109.

Zucker, R. A., & Wong, M. M. (2005). Prevention for children of alcoholics and other high risk groups. *Recent developments in alcoholism*, 299–320.

Zucker, R. A., Wong, M. M., Puttler, L. I., & Fitzgerald, H. E. (2003). Resilience and vulnerability among sons of alcoholics. *Resilience and vulnerability: Adaptation in the context of childhood adversities*, 76–103.

Table 1

Percentage of missingness of all study variables among family structures

Variable	Family alcoholism subtype				Total N=294
	Intact n=161	Step n=41	Single-parent n=28	Control n=64	
Family SES (T1)	2.48	7.31	0	0	2.38
Family income	4.97	7.31	3.57	1.56	4.42
Mothers' education	1.86	7.31	0	0	2.04
Fathers' education	1.86	7.31	0	0	2.04
Maternal LAPS (T1)	3.10	7.31	0	0	2.72
Paternal LAPS (T1)	3.10	7.31	0	0	2.72
Maternal LAPS (T4)	4.35	2.44	14.29	1.56	4.42
Paternal LAPS (T4)	9.31	41.46	28.57	4.69	14.63
Maternal ASP (T1)	1.86	7.31	0	0	2.04
Paternal ASP (T1)	1.86	9.76	0	0	2.38
Maternal Depression	4.97	0	7.14	1.56	3.74
Serious Family Crisis	6.83	0	3.57	4.69	4.42
Parental report of child's behavior	6.21	7.31	3.57	1.56	5.10
Teacher's report of child's behavior	19.88	21.95	21.43	15.63	19.39
Self-report of behavior	1.24	2.44	0	0	1.02

Note: SES=socioeconomic status; LAPS= lifetime alcoholic problems score; ASP= antisocial personality problem

Table 2

Background characteristics and parental symptomatology of intact alcoholic, step alcoholic, single-parent alcoholic, and control intact families.

Family alcoholism subtype (defined by T4)						
	Intact Mean (SD)	Step Mean (SD)	Single-parent Mean (SD)	Control Mean (SD)	<i>df</i>	Univariate <i>F</i>
Background characteristics						
Family SES (T1)	330.84(125.87)	264.72(106.17) _{a,b}	313.30(149.61)	364.03(131.40)	(3, 283)	4.99**
Maternal education in years (T1)	13.39(2.08)	12.45(2.23)	13.14(2.19)	13.41(1.66)	(3, 284)	2.40 [†]
Paternal education in years (T1)	13.55(2.07) _a	12.29(2.32) _{a,b}	13.93(2.65)	14.70(2.02)	(3, 284)	10.39***
Family income in dollars (T4)	56.41(25.58)	39.64(22.48) _{a,b}	26.67(18.47) _{a,c}	62.82(21.24)	(3, 277)	19.85***
Parental and familial problems						
Maternal ASP (T1)	10.54(6.61) _a	13.89(7.77) _{a,b}	15.25(5.85) _{a,c}	7.61(4.53)	(3, 284)	13.20***
Paternal ASP (T1)	19.08(10.87) _a	27.20(19.23) _{a,b}	22.11(13.64) _a	9.72(6.97)	(3, 283)	19.23***
Maternal LAPS (T4)	10.30(2.33) _a	11.25(2.75) _a	10.95(2.77) _a	8.69(1.84)	(3, 277)	12.24***
Paternal LAPS (T4)	10.90(1.88) _a	11.22(1.82) _a	11.83(2.17) _a	7.71(1.57)	(3, 247)	52.57***
Maternal Depression (T4)	6.10(6.57)	5.59(4.65)	5.62(3.63)	5.82(6.05)	(3, 279)	.12
Serious Family Crisis (T4)	2.61(2.31) _a	4.55(3.36) _{a,b}	4.06(3.15) _{a,c}	1.64(1.60)	(3, 275)	14.13***

Note: Annual family income is presented in thousand dollars. SES, socioeconomic status; LAPS, Lifetime alcohol problems score; ASP, antisocial personality problems. *df*, degree of freedom; SD, standard deviation.

^a alcoholic families differed from control families, ^b alcoholic stepfamilies differed from alcoholic intact families, ^c alcoholic single-parent families differed from alcoholic intact families

[†]*p* <.10 ***p* <.01; ****p* <.001

Table 3

Parental report of behavioral problems among children in different family structures (N=279)

Variable	Family alcoholism subtype				F(3, 275)
	Intact (n=151)	Step (n=38)	Single (n=27)	Control (n=63)	
Anxious-depressed	Mean (SD) 2.70(2.76)	Mean (SD) 4.76(3.68) _{a,b}	Mean (SD) 2.89(3.69)	Mean (SD) 2.64(2.81)	5.17*
Withdrawn	1.97(2.23)	2.42(2.67)	1.78(1.78)	1.64(1.84)	1.08
Thought problem	.39(0.67)	.68(1.44)	.26 (.53)	.44 (.76)	1.74
Social problem	1.60(2.05)	1.84(1.75)	1.81(2.34)	1.49(1.98)	.32
Attention problem	2.96(2.78)	5.42(4.04) _{a,b}	3.52(3.23)	2.67(3.02)	7.57**
Somatic problem	1.38(1.63)	1.00(1.32)	1.22(1.40)	1.05(1.90)	.95
Delinquency	1.84(2.40)	3.11(2.80) _{a,b}	2.56(2.53)	1.28(1.72)	5.56**
Aggressive behavior	7.16(5.54)	10.58(6.72) _{a,b}	8.26(4.45)	5.94(5.72)	5.68***
Internalizing behavior	5.90(5.14)	7.79(5.89)	5.70(5.44)	5.15(5.17)	2.04
Externalizing behavior	9.00(7.42)	13.68(9.05) _{a,b}	10.81(6.50)	7.21(7.16)	6.34***

Note. †p <.10, *p <.01, **p <.001; ^a COAs differed from children in control families, ^b COAs in stepfamilies differed from COAs in intact families

Table 4

Teacher's report of behavioral problems among children in different family structures (N=237)

Variable	Family alcoholism subtype				F(3, 234)
	Intact (n=129) Mean (SD)	Step (n=32) Mean (SD)	Single (n=23) Mean (SD)	Control (n=54) Mean (SD)	
Anxious-depressed	2.54(3.76)	3.47(3.33)	2.63(3.86)	2.55(3.77)	.57
Withdrawn	2.18(3.25)	2.84(2.78) _a	2.59(3.79)	1.13(1.53)	2.87*
Thought problem	.29(.92)	.84(1.36) _{a,b}	.39(1.27)	.22 (.50)	3.31*
Social problem	2.04(2.90)	2.63(2.27)	2.43(4.30)	1.16(2.12)	2.27 [†]
Attention problem	8.50(9.26) _a	14.91(10.62) _{a,b}	10.69(10.11) _a	3.84(5.71)	10.96***
Somatic problem	.50(1.38)	.69(1.06)	.52(1.31)	.13(.52)	1.83
Delinquency	1.09(1.86)	2.05(2.10) _a	2.33(3.41) _{a,c}	.50(1.21)	6.86***
Aggressive behavior	5.29(7.92)	9.42(9.08) _{a,b}	7.35(11.43)	3.07(5.76)	4.57**
Internalizing behavior	4.96(6.53)	6.56(4.91)	5.27(7.71)	3.68(4.47)	1.57
Externalizing behavior	6.38(9.29)	11.47(10.58) _{b,c}	9.68(14.23) _a	3.57(6.60)	5.39**

Note. [†]p <.10, *p <.05; **p <.01; ***p <.001; ^a COAs differed from children in control families, ^b COAs in stepfamilies differed from COAs in intact families, ^c COAs in single-parent differed from COAs in intact families

Table 5

Child's report of behavioral problems among children in different family structures (N=291)

Variable	Family alcoholism subtype				<i>F</i> (3, 287)
	Intact (n=159) Mean (SD)	Step (n=40) Mean (SD)	Single (n=28) Mean (SD)	Control (n=64) Mean (SD)	
Anxious-depressed	3.58(4.33)	5.15(3.50) _d	2.57(2.69)	3.28(3.57)	2.85*
Withdrawn	2.21(2.01)	3.18(2.15) _{a,b}	2.36(1.93)	2.14(2.02)	2.69*
Thought problem	1.67(2.16)	2.40(2.09) _a	1.76 (2.22)	1.18(1.63)	2.94*
Social problem	2.31(2.09)	2.68(2.07)	2.43(1.81)	1.89(1.80)	1.39
Attention problem	4.34(3.25)	5.33(2.84) _a	4.75(2.93)	3.67(2.97)	2.48 [†]
Somatic problem	2.46(2.71)	3.38(2.97)	2.64(2.48)	2.16(2.07)	1.89
Delinquency	2.79(2.84)	3.55(3.11) _a	3.21(3.24)	1.89(1.82)	3.53*
Aggressive behavior	8.39(5.74)	8.98(5.09)	8.58(5.49)	7.05(5.12)	1.30
Internalizing behavior	8.03(7.63)	11.33(7.09) _{a,b}	7.46(6.13)	7.41(6.23)	2.93*
Externalizing behavior	11.18(8.01)	12.53(7.11)	11.80(8.07)	8.94(6.47)	2.23 [†]

Note. [†]*p* <.10, **p* <.05, ***p* <.01, ****p* <.001; ^aCOAs differed from children in control families, ^bCOAs in stepfamilies differed from COAs in intact families, ^cCOAs in single-parent differed from COAs in intact families, ^dCOAs in stepfamilies differed from COAs in single-parent families

Table 6.

Hierarchical Regression models for internalizing and externalizing problems rated by parent (N=230)

Variables entered	<u>Internalizing Problems</u>					<u>Externalizing Problems</u>				
	b1	b2	b3	b4	b5	b1	b2	b3	b4	b5
(Intact alcoholic families)										
1. Single-parent alcoholic	-.38	-.18	-.30	-.11	-.15	1.51	1.51	.94	1.13	.81
Step alcoholic	1.76 [†]	1.33	1.14	1.31	1.14	4.63***	3.50*	2.87*	2.83*	1.72
2. Child's sex (female)		-.62	-.51	-.60	-.56		1.01	1.20	1.23	1.52
Family income (T4)		.08	.12	.05	.09		-.12	.01	-.11	.17
Maternal education (T1)		-.27	-.26	-.22	-.25		-.39	-.30	-.28	-.47
Paternal education (T1)		-.19	-.11	-.09	-.08		-.51*	-.31	-.27	-.21
3. Maternal baseline ASP			.01	-.10	-.10			.10	-.08	-.10
Paternal baseline ASP			.04	.05	.04			.10*	.11*	.09*
4. Maternal LAPS (T4)				.38*	.37*				.90***	.84***
Paternal LAPS (T4)				-.05	-.06				-.28	-.31
T4 Maternal depression				.26***	.25***				.25**	.18*
5. Family crisis (T4)					.13					.86***
R ² at each step	.02	.04	.05	.17	.17	.05	.10	.14	.25	.31
F-value	2.02	1.55	1.44	3.68***	3.45***	5.76**	3.92***	4.04***	5.72***	7.28***
Intercept	6.08	12.73	10.07	6.20	5.99	9.30	20.52	12.06	6.35	4.95

Note: Reference category for variables is presented in parentheses. Pooled unstandardized coefficients are presented. ASP= antisocial personality problem. LAPS=lifetime alcohol problems score. R² is the pooled R² of the 10 imputed data sets

[†]p<.07, * p<.05, ** p<.01, *** p<.001.

Table 7.

Hierarchical Regression models for internalizing and externalizing problems rated by teacher (N=230)

Variables entered	<u>Internalizing Problems</u>					<u>Externalizing Problems</u>				
	b1	b2	b3	b4	b5	b1	b2	b3	b4	b5
(Intact alcoholic families)										
1. Single-parent alcoholic	.47	.46	.52	.65	.61	2.78	2.44	2.07	1.93	1.84
Step alcoholic	1.22	.78	.78	.75	.61	5.05**	3.99*	3.43 [†]	3.24	2.94
2. Child's sex (female)		2.06	2.11	2.19	2.23		2.91	3.19	3.18	3.26
Family income (T4)		-.20	-.21	-.22	-.19		-.47	-.37	-.49	-.42
Maternal education (T1)		.39	.37	.38	.36		.72	.76	.72	.67
Paternal education (T1)		-.53*	-.52*	-.53*	-.52*		-1.06**	-.85*	-.79 [†]	-.77 [†]
3. Maternal ASP (T1)			-.02	-.06	-.06			.03	-.14	-.14
Paternal ASP (T1)			.01	.02	.02			.12*	.10	.09
4. Maternal LAPS (T4)				.18	.17				.91**	.90**
Paternal LAPS (T4)				-.26	-.26				.15	.14
Maternal depression (T4)				.05	.04				.08	.06
5. Family crisis (T4)					.11					.23
R ² at each step	.01	.01	.05	.06	.06	.04	.10	.12	.16	.17
F-value	.54	1.51	1.15	1.01	.94	3.87*	3.28**	2.93**	2.97***	2.76**
Intercept	5.88	5.68	5.69	6.36	6.21	7.76	10.93	3.54	-5.18	-5.55

Note: Reference category for variables is presented in parentheses. Pooled unstandardized coefficients are presented. ASP= antisocial personality problem. LAPS=lifetime alcohol problems score. R² is the pooled R² of the 10 imputed data sets

[†]p<.10, * p<.05, ** p<.01, *** p<.001.

Table 8.

*Hierarchical Regression models for internalizing and externalizing problems rated by child
(N=230)*

Variables entered	Internalizing Problems					Externalizing Problems				
	b1	b2	b3	b4	b5	b1	b2	b3	b4	b5
(Intact alcoholic families)										
1. Single-parent alcoholic	-.56	-.93	-.68	-.65	-.67	.53	-.16	-.45	-.52	-.76
Step alcoholic	3.13*	2.65*	2.81*	2.73*	2.69*	1.44	.53	.10	.02	-.79
2. Child's sex (female)		-2.91 [†]	-2.84	-2.80	-2.78		-1.13	-.91	-.92	-.70
Annual family income		-.08	-.12	-.17	-.16		-.25	-.17	-.26	-.06
Maternal education		.06	.01	.01	.00		-.35	-.32	-.33	-.47
Paternal education		-.28	-.29	-.28	-2.76		-.20	-.04	.00	.05
3. Maternal baseline ASP			-.07	-.15	-.15			.03	-.09	-.10
Paternal baseline ASP			-.00	.00	-.00			.09*	.08	.06
4. Maternal LAPS				.38	.39				.62**	.57**
Paternal LAPS				-.13	-.13				.09	.06
Maternal depression				.07	.06				.08	.03
5. Family crisis					.04					.62**
R ² at each step	.03	.05	.05	.07	.07	.01	.04	.06	.10	.13
F-value	3.30*	1.92 [†]	1.54	1.48	1.35	.57	1.43	1.63	1.99	2.62**
Intercept	8.08	17.25	19.24	16.98	16.90	11.19	22.89	17.19	11.21	10.18

Note: Reference category for variables is presented in parentheses. Pooled unstandardized coefficients are presented. ASP= antisocial personality problem. LAPS=lifetime alcohol problems score. R² is the pooled R² of the 10 imputed data sets

[†]p<.07, * p <.05, ** p<.01, *** p<.001.

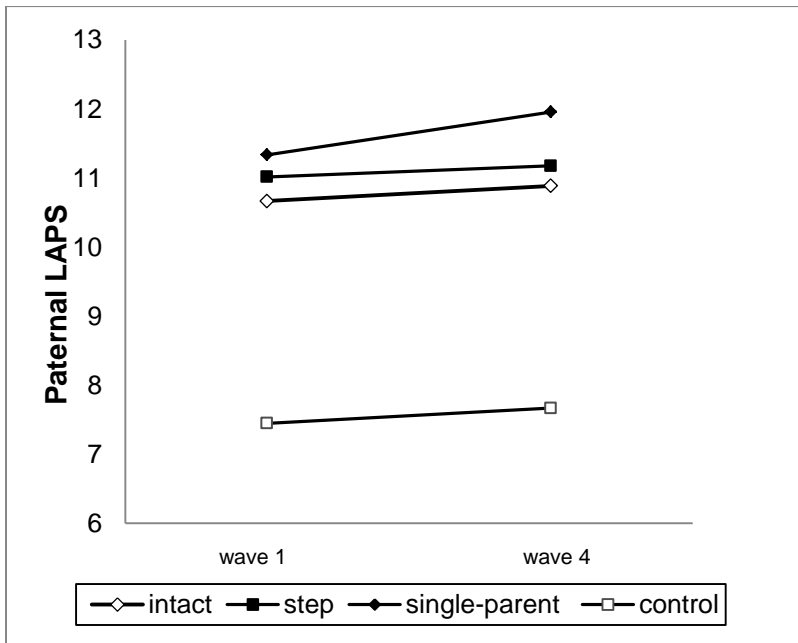


Figure 1. Paternal lifetime drinking problems at wave 1 (pre-divorce) and wave 4 (post-divorce) among different alcoholic familial subtypes

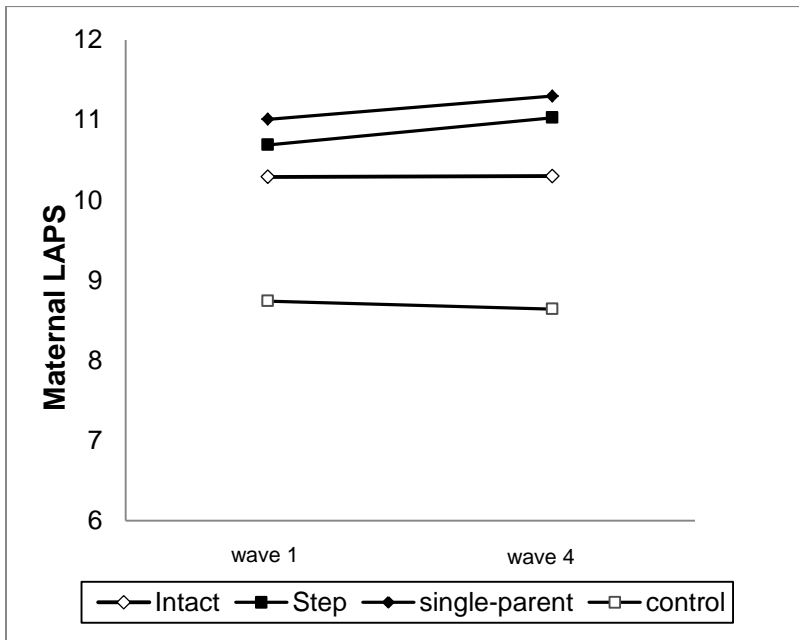


Figure 2. Maternal lifetime drinking problems at wave 1 (pre-divorce) and wave 4 (post-divorce) among different alcoholic familial subtypes

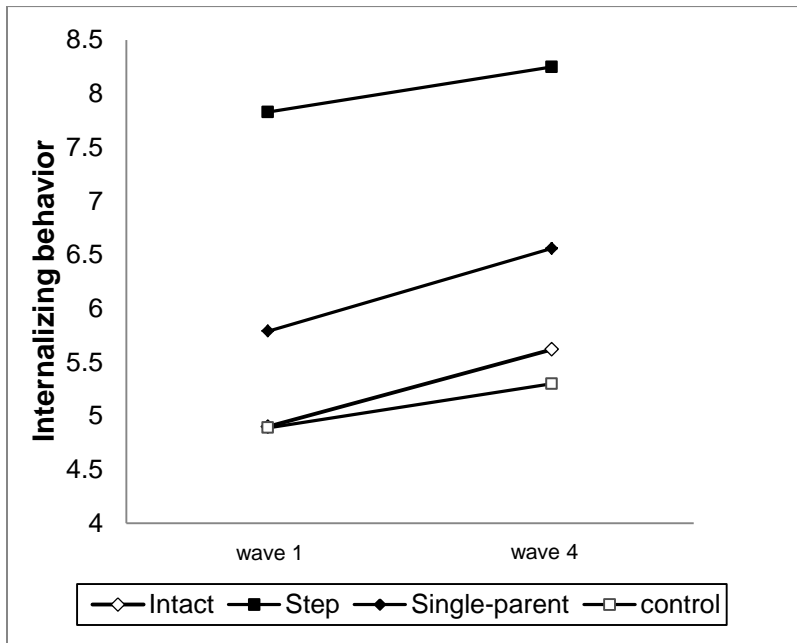


Figure 3. Internalizing behavior at wave 1 (pre-divorce) and wave 4 (post-divorce) among COAs living in different familial subtypes

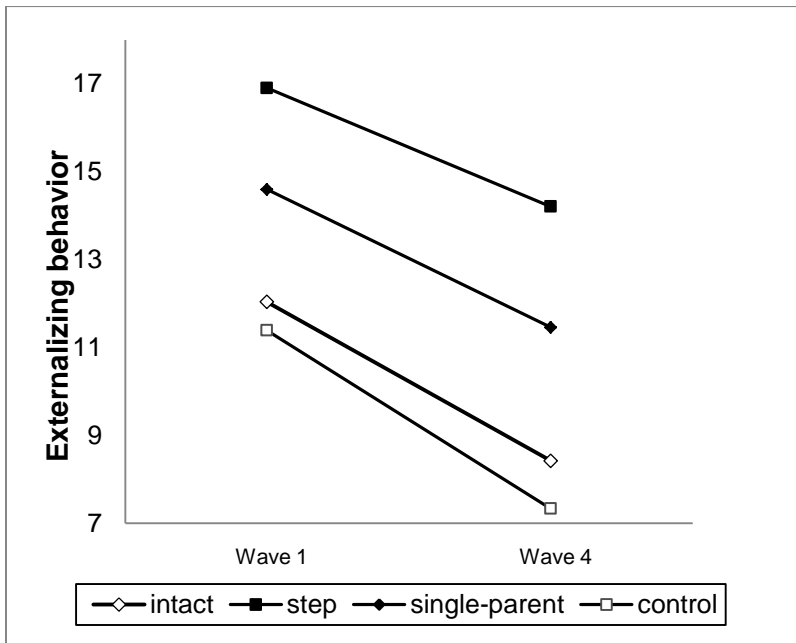


Figure 4. Externalizing behavior at wave 1 (pre-divorce) and wave 4 (post-divorce) among COAs living in different familial subtypes