The interpretability of family history reports of alcoholism in general community samples: Findings in a Midwestern US twin birth cohort

Mary Waldron, Ph.D.[1,2,†], **Pamela A. F. Madden, Ph.D.**[2], **Elliot C. Nelson, M.D.**[2], **Valerie S. Knopik, Ph.D.**[3], **Anne L. Glowinski, M.D., M.P.E.**[2], **Julia D. Grant, Ph.D.**[2], **Michael T. Lynskey, Ph.D.**[2], **Theodore Jacob, Ph.D.**[4], **Kenneth J. Sher, Ph.D.**[5], **Kathleen K. Bucholz, Ph.D.**[2], and **Andrew C. Heath, D.Phil.**[2]

[1]School of Education, Indiana University, Bloomington, IN

[2]Midwest Alcoholism Research Center, Department of Psychiatry, Washington University School of Medicine, St. Louis, MO

[3]Rhode Island Hospital, Warren Alpert School of Medicine, Brown University, Providence, RI

[4]Family Research Center, Veterans Affairs Palo Alto Health Care System, Menlo Park, CA

[5]Department of Psychological Sciences, University of Missouri-Columbia, Columbia, MO

Abstract

Background—Although there is a long tradition in alcoholism research of using family history ratings, the interpretability of family history reports of alcoholism from general community samples has yet to be established.

Methods—Telephone interview data obtained from a large cohort of female like-sex twins ($N =$ 3787, median age 22) and their biological parents ($N =$ 2928, assessed at twins' median age 15) were analyzed to determine agreement between parent self-report, parent ratings of coparent, and twin narrow (alcohol problems) versus broad (problem or excessive drinking) ratings of each parent.

Results—In European ancestry (EA) families, high tetrachoric correlations were observed between twin and cotwin ratings of parental alcohol problems, between twin and parent ratings of coparent alcohol problems using symptom-based and single-item assessments, as well as moderately high correlations between twin and both mother and father self-reports. In African American (AA) families, inter-rater agreement was substantially lower than for EA families, with no cases where father ratings of maternal alcohol problems agreed with either twin ratings or mother self-report; and both cotwin agreement and mother-twin agreement were reduced. Differences between EA and AA families were not explained by differences in years of cohabitation with father or mother's education; however, underreporting of problems by AA parents may have contributed.

Conclusions—Results support the use of family history ratings of parental alcoholism in general community surveys for European ancestry families, but suggest that family history assessment in African American families requires improved methods.

[†]Please address correspondence to Mary Waldron, Department of Counseling and Educational Psychology, School of Education, Indiana University, 201 N. Rose Avenue, Bloomington, IN 47405. Phone: 812-856-8334. Fax: 812-856-8333. mwaldron@indiana.edu.

Keywords

alcoholism; family history assessment; community samples

Introduction

Family history assessment has long played an important role in both clinical practice, helping to inform differential diagnosis (Goodwin & Guze, 1973), and research (Andreasen et al., 1977, 1986; Thompson et al., 1982). Family history reports are used in high-risk studies contrasting groups at risk by virtue of alcoholism in parents or other relatives, and controls (Sher et al., 1991; Schuckit & Smith, 2000), and in epidemiologic surveys that include family history as a risk-factor or potential moderator of respondent risk (Dawson et al., 1992; Kendler et al., 1997). In genetic studies, family history reports have been used to prioritize families for inclusion (Reich et al., 1998) and to supplement respondent self-report to provide a best-estimate diagnosis (Bucholz et al., 2006).

Limitations of family history data are widely acknowledged, with disagreement between respondent self-report and informant-reported history being common. High false-negative rates (low sensitivity) are often reduced but not eliminated by using diagnostic criteria rather than a global rating to identify affected relatives (Andreasen et al., 1977) or by combining reports from multiple relatives (Rice et al., 1995). False-negative reporting may reflect the informant's ignorance about a respondent's history and/or reluctance to identify a family member as having problems. Disagreement may also reflect a respondent's denial of their own problems, a possibility that may be especially high in individuals with alcohol use disorders (Weinberg, 1976). Of particular concern, within-family comparisons of data from multiple informants raise the possibility of systematic biases that could undermine the utility of family history data (Kendler et al., 1991). If an informant's family history report is influenced by their own experiences or history of psychopathology, associations with reported family history could be overestimated or entirely artefactual (Chapman et al., 1994; Kendler et al., 1991; Roy et al., 1994; Smith et al., 1994).

To date, much of what we know about the performance of family history ratings derives from research on clinically ascertained individuals or their relatives. The potential limitations of family history data are of special concern in general community samples, in part because there exists a continuum of problem severity. For example, in treatment samples, ascertained cases will have more severe problems, and correspondingly a higher proportion of relatives with severe problems (Bucholz et al., 1994b). In general community or survey samples, the majority of individuals with a history of alcohol problems, and the majority of their affected relatives, will have relatively mild problems (Heath et al., 1994). Reduced sensitivity may be especially pronounced in the case of milder problems (Rice et al., 1987), and denial of problems much easier about relatives with no treatment history. In large surveys (e.g., Kessler et al., 1994; Grant et al., 2004), family history assessments are typically, of necessity, based on global ratings rather than the detailed diagnostic assessments that are considered ideal (Andreasen et al., 1977). However, such surveys can be invaluable because of large samples, which together with representative or over-sampling of minority groups provide important opportunities for examination of racial and ethnic differences critical for determination of generalizability.

Sibling reports can be particularly informative for assessing the value of family history assessments in general community samples (Crews & Sher, 1992; Amodeo & Griffin, 2009; Rhea et al., 1993; Sher & Descutner, 1986), and this is especially true of twin siblings. In addition to the availability of two informants, a pair of twins who have grown up together

are likely to have the same exposures to, and the same opportunities to acquire knowledge about, substance use disorders in a relative. Not unsurprisingly, twin research has made significant contributions to the literature on family history assessment (Kendler et al., 1991; Kendler et al., 2002; Slutske et al., 1996). A twin approach is even more powerful when supplemented by parent self-report and accomplished using data from twins whose lives have not long diverged, for whom sharing of knowledge about alcoholism in relatives will be most plausible.

In the present study, we used interview data from a cohort of young adult female twins and their biological mothers and fathers to examine, in European ancestry versus African American families, levels of agreement between (i) cotwin ratings of maternal and paternal alcohol problems, (ii) twin and parent ratings of alcohol problems in the second parent, and (iii) parent self-report and twin or coparent ratings. Differences by zygosity were examined for generalizability of twin data for family history reporting. In subsidiary analyses, differences by years of cohabitation with father and mother's education were also examined.

Materials and Methods

Participants

A cohort of twins was identified in a midwestern US state that includes both urban and rural populations. Female like-sex twin pairs, who were born in-state during the period July 1st 1975–June 30th 1985, survived beyond infancy, and whose parents were state residents at the time of birth, were identified from birth records [N = 370 pairs born to mothers reporting African American ancestry (AA); N = 1999 pairs born to mothers of European or (in rare cases) other ancestry (EA)]. Pairs born to out-of-state residents were excluded to avoid oversampling high-risk twin pregnancies where a mother was brought to the state for medical management of the pregnancy and delivery. Families were assigned for interview at twins' ages 13, 15, 17, or 19 years, during the period 1994–1999, with baseline interviews attempted with both twins and at least one biological parent. A cohort-sequential sampling design was used, with successive 6-month birth cohorts assigned over a two-year period, with continued recruitment of 13 year-old pairs over an additional two-year period. More detailed description of sample recruitment is provided elsewhere (Heath et al., 1999, 2002).

A re-interview ('wave four') was attempted with both twins during the period 2000–2005 at median age 22 years (range 18–29), with standard questions about physical similarity and being mistaken for one another used to confirm earlier zygosity coding (Heath et al., 2002). To minimize sampling biases, twins were eligible for re-interview regardless of whether they or their family had previously participated in the study, provided that they had not withdrawn from the study or otherwise refused further contacts, and that their parents had not refused permission for all future contact. Thus, for some twins, the 're-interview' was their first assessment.

For present analyses, we restrict attention to data obtained in the baseline biological parent interview and 'wave four' twin re-interview. Baseline interviews were obtained with at least one biological parent from 1819 families (1583 EA, 236 AA), including 1732 biological mothers (1512 EA, 220 AA) and 1196 biological fathers (1099 EA, 97 AA). However, interviews with both biological parents were obtained from only 1028 (65%) EA and 81 (34%) AA families. Re-interviews were obtained with at least one twin from 2014 families (1716 EA, 298 AA), including 1518 EA and 255 AA complete pairs. Overall, interview data were obtained from at least one family member for 89.7% of AA and 92.4% of EA families identified from birth records. All participants gave verbal consent after reviewing a detailed consent form using procedures approved by institutional review board at Washington University.

Measures

Parent Interview—The parent interview included a self-report assessment of alcohol dependence and abuse history adapted for telephone administration from the Semi-Structured Assessment of the Genetics of Alcoholism (SSAGA; Bucholz et al., 1994a; Hesselbrock et al., 1999), and a family history assessment of biological coparent's alcohol problems based on the Family History Assessment Module (FHAM; Rice et al., 1995). Separate sections assessed sociodemographic characteristics, including maternal educational attainment and whether each parent was married to the biological coparent of the twins, widowed, divorced or separated, or had never married, and how long each parent lived with the twins.

Self-report history of alcohol dependence and abuse were coded according to DSM-IV criteria (APA, 1994). A 'probable' dependence diagnosis without requiring 12-month clustering of symptoms was also coded for comparability with parent ratings of coparent dependence for which temporal clustering was not assessed. For family history assessment, parents were first asked whether the biological coparent of the twins had ever been an 'excessive drinker.' They were next shown a list of alcohol problems and asked item-by-item to indicate whether the coparent had never experienced these, or experienced them 1–2, 3–10, or 11 or more times in their life. Coding of coparent dependence and abuse followed from preliminary analyses comparing endorsement rates of individual symptoms by self-report and parent ratings of coparent (data not shown). Dependence symptoms were coded positive if they occurred 11 or more times, with the exception of three symptoms (tolerance, persistent desire or unsuccessful efforts to cut down or control use, and using lager amounts or over a longer period than intended), where endorsement rates were much lower for coparent ratings relative to self-report, and thus coded positive if they occurred 3 or more times. Abuse symptoms were coded positive if they occurred 3 or more times, with the exception of one symptom (drinking-related legal problems), which was coded positive based on a single occurrence.

Twin Interview—The twin interview included a screen for parental alcohol problems, but did not assess parental symptoms. Twins were asked whether 'drinking ever caused your biological (mother/father) to have problems with health, family, job or police, or other problems', an item from the Family History Research Diagnostic Criteria assessment (FHRDC; Andreasen et al., 1977), and whether they ever felt that their biological parent was an 'excessive drinker.' We defined both narrow and broad measures of twin reported parental alcohol problems. A narrow measure was coded from twin report of parental alcohol problems without regard excessive drinking. A broad measure was coded from twin report of parental alcohol problems *or* excessive drinking, thus coded positively if either item was endorsed.

Analytic Strategy

All analyses were conducted using SAS version 9.2 (SAS Institute, 2007). We report tetrachoric correlations (ρ) as our primary measure of inter-rater agreement. The tetrachoric correlation is appropriate for a quasi-random sample assuming an underlying normal distribution of alcoholism liability or severity, which is dichotomized when respondents report presence or absence of alcohol problems and/or excessive drinking in a parent. Standard errors of tetrachoric correlations between twin and parent reports were corrected for statistical non-independence of twin-family data using a bootstrap procedure, with correction unnecessary for within-family analyses of cotwin agreement and agreement between parents and coparents. Tetrachoric correlations were estimated separately as a function of race/ethnicity for all analyses, and as a function of zygosity for initial checks on the generalizability of twin to singleton data. Because MZ twinning occurs at random, MZ

twins will represent a near-random sample of genotypes in the general population. In contrast, DZ twinning is weakly associated with factors such as maternal age and socioeconomic status (Bulmer, 1970). Differences across racial/ethnic and zygosity groups were tested for significance within a regression framework, with a sandwich estimator used to correct for non-independence in models of twin-parent agreement.

Results

Rates of reported parental alcohol problems

Of 3229 EA twins and 552 AA twins who were asked questions about biological mother alcohol use, respectively 5 (0.15%) and 2 (0.36%) refused to answer, and 6 (0.19%) and 3 (0.54%) were unable to provide information about maternal drinking history. Of the remaining individuals, respectively 8.6% and 16.0% reported maternal lifetime abstinence; 2.3% and 4.1% reported maternal excessive drinking but no alcohol problems; 1.0% and 1.3% reported maternal alcohol problems but not excessive drinking; and 4.9% and 7.6% reported both maternal excessive drinking and maternal alcohol problems. Overall, AA twins were significantly more likely than EA twins to report maternal alcohol problems by either narrow measure (8.8% vs. 5.9%, $p < 0.01$) or broad measure, i.e., maternal alcohol problems *or* excessive drinking (13.0% vs. 8.2%, $p < 0.001$).

Of 3228 EA twins and 552 AA twins who were asked about biological father alcohol problems, the same 7 individuals refused to answer, and respectively 37 (1.1%) and 27 (4.9%) were unable to provide information about paternal drinking. Of the remaining individuals, 4.7% and 6.7% reported paternal lifetime abstinence; 0.34% and 0.54% knew that their father had used alcohol but had no information about excessive drinking or alcohol problems; 5.8% and 9.2% reported paternal excessive drinking only; 2.5% and 4.3% reported paternal alcohol problems without excessive drinking; and 15.0% and 18.1% reported both paternal excessive drinking and alcohol problems. Consistent with reports of maternal alcohol problems, AA twins were more likely than EA twins to report paternal alcohol problems by either narrow (22.4% vs. 17.6%. $p < 0.001$) or broad measure (31.8% vs. 23.5%, $p < 0.01$).

Within-reporter associations

Correlations between parent self-report of dependence and probable dependence were very high for both mothers and fathers ($\rho > 0.99$, $p < .001$), as might be expected given that all parents who meet DSMIV criteria also report 3 or more dependence symptoms. Correlations between parent report of coparent excessive drinking and history of 3 or more dependence symptoms were also high ($\rho = 0.94$ for maternal family history ratings and $\rho = 0.89$ for paternal family history ratings, both $p < 0.001$). As narrow ratings of parental alcohol problems were included in coding of broad ratings by twins, they too were very highly correlated ($\rho = 0.99$, $p < 0.001$).

Cotwin agreement

Twin pair agreement is shown in Table 1. No effects of zygosity on agreement were found, with a single exception: the narrow measure of maternal alcohol problems in EA families, for which the correlation in MZ pairs was especially high relative to DZ pairs. In EA families, there was comparable agreement for ratings of maternal versus paternal alcohol problems, with the same exception, i.e., an especially high MZ correlation for the narrow measure of maternal alcohol problems. In AA families, there was no consistent trend for stronger or weaker agreement for maternal versus paternal alcohol problems, using either narrow or broad measures. In both EA and AA families, agreement was comparable across narrow and broad measures.

Overall, cotwin agreement was higher in EA compared to AA pairs. Although a single ethnic comparison within zygosity reached statistical significance (for the broad measure of paternal alcohol problems), significant differences were found by pooling across zygosity for broad measures of both maternal alcohol problems ($\rho = 0.88$ vs. 0.75 for EA versus AA families, $p = 0.04$) and paternal alcohol problems ($\rho = 0.88$ vs. 0.74, $p = 0.001$). Despite relatively high tetrachoric correlations, in pairs where at least one twin reported maternal or paternal alcohol problems, a high proportion of cotwins (approximately one third) reported no problems for that parent (e.g., 31 female MZ EA pairs agreed that there was a maternal history of alcohol problems, by narrow measure, but there were 28 additional pairs where only one twin reported a history). Thus, pooling across zygosity, *Kappa* coefficients were fair to moderate, ranging from 0.59–0.67 in EA pairs and 0.45–0.54 in AA pairs.

Twin-parent agreement

Rates of agreement between twins and parents are shown in Table 2. In EA families, acceptably high correlations were found between twin ratings and parent self-report of 3 or more dependence symptoms, as well as self-report of DSM-IV dependence in mothers (i.e., taking into account clustering), with little evidence that parental alcohol abuse was influencing twin ratings. Specifically, agreement between paternal self-report dependence and twin report of paternal alcohol problems was modest ($\rho = 0.54$ and 0.54 for narrow and broad measures, respectively), with reasonably high agreement observed between paternal self-report of 3 or more dependence symptoms and twin report ($\rho = 0.62$, 0.63). Mother ratings of paternal problems were strongly correlated with twin report ($\rho = 0.80$, 0.81), as were mother ratings of paternal excessive drinking ($\rho = 0.78$, 0.79). In contrast, paternal self-report of alcohol abuse was weakly predicted by twin report ($\rho = 0.18$, 0.21), with no significant association between mother ratings of paternal alcohol abuse and twin report of paternal problems.

In EA families, there was strong agreement between maternal self-report dependence and twin report of maternal alcohol problems ($\rho = 0.69$ and 0.69 for narrow and broad measures, respectively), with the correlation between maternal self-report of 3 or more dependence symptoms and twin ratings comparable in magnitude ($\rho = 0.67$, 0.66). Father ratings of maternal problems were strongly correlated with twin report ($\rho = 0.70$, 0.65), as were father ratings of maternal excessive drinking ($\rho = 0.71$, 0.68). As was the case for fathers, maternal self-report of alcohol abuse was weakly predicted by twin narrow or broad ratings ($\rho = 0.20$, 0.18), with modest agreement between father ratings of maternal alcohol abuse and twin report ($\rho = 0.44$, 0.46).

Twin-parent agreement was generally worse in AA families. Modest agreement was observed between twin ratings and father self-report of 3 or more dependence symptoms ($\rho = 0.45$ and 0.52 for narrow and broad measures, respectively) and father self-report dependence ($\rho = 0.46$, 0.50). Relative to EA families, mother-twin agreement about paternal alcohol problems was greatly reduced ($\rho = 0.46$ and 0.56 for mother report of 3 more paternal dependence symptoms, and $\rho = 0.47$ and 0.62 for mother report of paternal excessive drinking). No significant association was observed between twin report, using either narrow or broad measures, and father self-report alcohol abuse or mother ratings of paternal alcohol abuse.

In AA families, agreement was also lower between mother self-report of 3 or more dependence symptoms and twin ratings of maternal alcohol problems ($\rho = 0.46$ and 0.47 for narrow and broad measures, respectively). Reasonable agreement was found between mother self-report dependence and twin report using the narrow versus broad measure ($\rho = 0.64$, 0.52). Where the biological father was interviewed, there were no cases where father report of 3 or more maternal alcohol dependence symptoms agreed with twin report of

maternal alcohol problems using either narrow or broad measures. However, modest agreement between father report of maternal excessive drinking and twin ratings of maternal alcohol problems was observed ($\rho = 0.38, 0.58$). There was no significant association between twin narrow ratings and either mother self-report alcohol abuse or father ratings of maternal alcohol abuse. In contrast, twin report using the broad measure of maternal alcohol problems predicted both mother self-report alcohol abuse ($\rho = 0.40$) and father ratings of maternal alcohol abuse ($\rho = 0.41$).

Parent-parent agreement

Rates of agreement between parents and coparents are shown in Table 3. In EA families, there was reasonable to high agreement between parent self-report dependence, including 3 or more dependence symptoms, and family history ratings by partner (ρ range 0.58–0.72). However, there was little evidence that partners were able to provide accurate information about coparent abuse history. Father self-report alcohol abuse was weakly correlated with maternal report of paternal alcohol abuse ($\rho = 0.16$), maternal report of excessive drinking by father ($\rho = 0.21$), and maternal report of 3 or more dependence symptoms ($\rho = 0.15$). For mother self-report alcohol abuse, there were no significant associations with paternal ratings, with the exception of weak correlation with father report of maternal alcohol abuse ($\rho = 0.28$).

Agreement between parents was substantially worse in AA relative to EA families. Father self-report of 3 or more dependence symptoms was modestly correlated with maternal ratings of paternal excessive drinking ($\rho = 0.48$), with no other significant associations between father self-report dependence, including 3 or more dependence symptoms, and family history ratings by mother. There were no cases where father's report of 3 or more maternal alcohol dependence symptoms agreed with maternal self-report dependence, 3 or more dependence symptoms or abuse, suggesting that father reports of dependence symptoms may have been problematic. In contrast, agreement was high between father report of maternal excessive drinking and mother self-report of 3 or more dependence symptoms ($\rho = 0.75$) and abuse ($\rho = 0.75$), and higher still between father report of maternal abuse and mother self-report of 3 or more dependence symptoms ($\rho = 0.81$).

Impact of parental separation and cohabitation with father

Family non-intactness was much more common in AA than in EA families (respectively, 26% and 65% of biological parents were still together at the time of the baseline parent interview). However, when correlations were stratified by years of cohabitation with father, differences between AA and EA families in mother-twin agreement about paternal alcohol problems persisted. Rates of agreement between mother report, twin report, and father self-report, as a function of years of cohabitation of father and twins, are shown in Table 4. In EA families, strong mother-twin agreement about paternal alcohol problems was observed regardless of the number of years twins cohabited with father (ρ range 0.75–0.81), with roughly comparable agreement between mother report and father self-report of 3 or more dependence symptoms for twins who lived with their father for 6 years or longer (ρ range 0.64–0.75). In AA families, mother-twin agreement about the presence of paternal alcohol problems was consistently lower, with the following exceptions: reasonably high agreement between mother report and twin broad rating with more than 6 years of cohabitation with father (ρ range 0.60–0.79), and twin narrow rating with more than 12 years of cohabiting ($\rho = 0.67$). Thus, the decreased inter-rater agreement about alcoholism history in AA families does not appear to be explained by differences in family structure.

Impact of maternal education

The majority of both EA and AA mothers had completed high school or earned a general equivalency diploma as of the baseline interview (91% and 82%, respectively). As with cohabitation with fathers, when correlations were stratified by maternal educational attainment, differences between AA and EA families in mother-twin agreement about paternal alcohol problems remained. Rates of agreement between mother report, twin report, and father self-report, as a function of maternal education, are shown in Table 5. In EA families, strong mother-twin agreement about paternal alcohol problems was observed regardless of whether mother completed high school or attended college (ρ range 0.64–0.84). Reasonable agreement between mother report and father self-report of 3 or more dependence symptoms was observed for EA families where mother completed at least high school (ρ range 0.62–0.68). In AA families, mother-twin agreement about the presence of paternal alcohol problems was lower across maternal education (ρ range −0.11–0.64), with no significant association between mother report and father self-report of 3 or more dependence symptoms.

Discussion

Our analyses show that, while simple single-item family history ratings of maternal or paternal alcoholism will be of limited use in identifying with a high level of confidence specific individuals as having an alcohol dependence history, they may be very informative in identifying population associations with parental alcoholism. At the individual level, even in the most favorable case of ratings of parental alcoholism by monozygotic twin pairs from European ancestry (EA) families, in one-third of cases where a twin gave a positive report, the cotwin disagreed. Measured in terms of tetrachoric correlations, however, we found substantial cotwin agreement, and between twin and parent rating of coparent, and reasonably high agreement between twin report and parent self-report. Thus for applications of structural equation modeling, or regression analyses of epidemiologic data, such single-item measures are likely to yield valid information, at least in EA families, about the correlates of parental alcoholism. It should be noted that this is not necessarily true for parental alcohol abuse, where the inability of offspring to agree with parent self-report may be yet another indicator of the poor validity of the abuse construct (Hasin et al., 2003).

Relatively high inter-rater agreement, as assessed by the tetrachoric correlation, but uncertain classification of particular individuals (e.g., from low *Kappa* values), is not unexpected, given the task that we are in effect setting for our informants, namely to dichotomize a continuum of severity and classify relatives as being problem-free or having problems. When we contrasted broad versus narrow ratings of parental alcohol problems, in EA families we found no reason to prefer one to the other, obtaining essentially identical inter-rater correlations for most comparisons. More detailed family history assessment of individual symptoms, such as was used to obtain parental report of coparent alcohol problems, would provide a more quantitative family history measure, but at the cost of a lengthier assessment. However, we found little evidence of superiority of the more detailed assessment, including symptom-count measures from self- and coparent report (data not shown). In a comparison of the agreement of twin versus parent ratings with self-report of the second parent, single-item measures performed similarly; and maternal report of coparent excessive drinking agreed as well with coparent self-report dependence as did the more detailed symptom-by-symptom assessment.

While we found good performance of simple screening items for parental alcohol problems or excessive drinking for EA families, this was less true for our African American (AA) families. Our analyses suggest greater problems with both self-report and family history data in these families, with lower twin-cotwin agreement and lower twin-parent agreement

observed. It is plausible that a higher false negative rate in parent reports is contributing to this disagreement. Alternatively, it may be that the AA young women in our sample were using a broader and less discriminating criterion for the presence of parental alcohol problems. Unfortunately, since we did not include detailed assessment of individual parental symptoms of dependence by twin report, we cannot resolve these possibilities. Regardless, increased uncertainty about paternal alcoholism in the daughters of AA fathers is likely a factor. Both EA and AA informants from families with very early separation from biological father showed decreased agreement with maternal report about paternal alcohol problems, although this effect could not explain differences between EA and AA families in parent-offspring agreement. A similar pattern was observed for mother's education, a strong predictor of socioeconomic well-being. Although we did not find better agreement between twin report and maternal compared to paternal self-report in AA families, our estimate of the extent of agreement between twin report and paternal self-report is likely to underestimate the true agreement between twin report and biological parent alcoholism, given low rates of participation by AA fathers.

Finally, certain important limitations of our study must be noted. The relative youth of our twin sample, who in most cases had either only recently left home or were still living with at least one parent, and the fact that our twins were female, makes this a 'best case' scenario for the accuracy of informant reports (c.f., Boice, 1983). A comparable analysis of data from male informants would be important. In addition, our AA sample is predominantly urban and socioeconomically disadvantaged. Given the relatively small numbers of AA twin pairs in the total population from which the sample was ascertained, we cannot meaningfully generalize beyond this group. Thus, we cannot be sure whether the uncertainties that we identified for interpretation of family history data in AA families will apply more generally to national US samples. Clearly, this question should be a research priority. Lastly, it is unlikely that correspondence between an individual's self-report and family history ratings can approach unity since the criterion (i.e., self-report of lifetime alcohol use disorder) is, itself, somewhat unreliable (e.g., Culverhouse et al., 2005), and this inherent unreliability also needs to be considered when examining the validity of family history reports of alcoholism.

Acknowledgments

References

[APA] American Psychiatric Association. Diagnostic and statistical manual of mental health disorders. 4. American Psychiatric Association; Washington, DC: 1994.

Amodeo M, Griffin ML. Sibling agreement on retrospective reports of parental alcoholism and other childhood events. Subst Use Misuse. 2009; 44(7):943–64. [PubMed: 19408183]

Andreasen NC, Endicott J, Spitzer RL, Winokur G. Family History Method Using Diagnostic Criteria - Reliability and Validity. Arch Gen Psychiatry. 1977; 34(10):1229–1235. [PubMed: 911222]

Andreasen NC, Rice J, Endicott J, Reich T, Coryell W. The family history approach to diagnosis. How useful is it? Arch Gen Psychiatry. 1986; 43(5):421–9. [PubMed: 3964020]

Boice R. Observational skills. Psychol Bull. 1983; 93(1):3–29. [PubMed: 6828601]

Bucholz KK, Cadoret R, Cloninger CR, Dinwiddie SH, Hesselbrock VM, Nurnberger JI, Reich T, Schmidt I, Schuckit MA. A New, Semistructured Psychiatric Interview for Use in Genetic-Linkage Studies - a Report on the Reliability of the Ssaga. J Stud Alcohol. 1994a; 55(2):149–158. [PubMed: 8189735]

Bucholz KK, Helzer JE, Shayka JJ, Lewis CE. Comparison of alcohol dependence in subjects from clinical, community, and family studies. Alcohol Clin Exp Res. 1994b; 18(5):1091–9. [PubMed: 7847589]

Bucholz KK, Nurnberger JI Jr, Kramer JR, Hesselbrock VM, Schuckit MA, Bierut LJ. Comparison of psychiatric diagnoses from interview reports with those from best-estimate procedures. J Stud Alcohol. 2006; 67(1):157–68. [PubMed: 16536140]

Bulmer, MG. The biology of twinning in man. Clarendon Press; Oxford: 1970.

Chapman TF, Mannuzza S, Klein DF, Fyer AJ. Effects of informant mental disorder on psychiatric family history data. Am J Psychiatry. 1994; 151(4):574–9. [PubMed: 8147456]

Crews TM, Sher KJ. Using Adapted Short Masts for Assessing Parental Alcoholism -Reliability and Validity. Alcohol Clin Exp Res. 1992; 16(3):576–584. [PubMed: 1626659]

Culverhouse R, Bucholz KK, Crowe RR, Hesselbrock V, Nurnberger JI, Porjesz B, Schuckit MA, Reich T, Bierut LJ. Long-term stability of alcohol and other substance dependence diagnoses and habitual smoking — an evaluation after 5 years. Arch Gen Psychiatry. 2005; 62:753–760. [PubMed: 15997016]

Goodwin, DW.; Guze, SB. Psychiatric diagnosis. 1973.

Grant BF, Hasin DS, Stinson FS, Dawson DA, Chou SP, Ruan WJ, Pickering RP. Prevalence, correlates, and disability of personality disorders in the United States: Results from the national epidemiologic survey on alcohol and related conditions. J Clin Psychiatry. 2004; 65(7):948–58. [PubMed: 15291684]

Hasin DS, Schuckit MA, Martin CS, Grant BF, Bucholz KK, Helzer JE. The validity of DSM-IV alcohol dependence: what do we know and what do we need to know? Alcohol Clin Exp Res. 2003; 27:244–252. [PubMed: 12605073]

Health AC, Bucholz KK, Slutske WS, Madden PAF, Dinwiddie SH, Dunne MP, Statham DB, Whitfield JB, Martin NG, Eaves LJ. The assessment of alcoholism in surveys of the general community: What are we measuring? Some insights from the Australian twins panel interview survey. Int Rev Psychiatry. 1994; 6:295–307.

Heath AC, Howells W, Bucholz KK, Glowinski AL, Nelson EC, Madden PAF. US female adolescent twin cohort for alcohol studies: Assessment of sample representativeness using birth record data. Twin Res Hum Genet. 2002; 5(2):107–112.

Heath AC, Madden PAF, Bucholz KK. Ascertainment of a twin sample by computerized record matching, with assessment of possible sampling biases. Behav Genet. 1999; 29(4):209–219.

Hesselbrock M, Easton C, Bucholz KK, Schuckit M, Hesselbrock V. A validity study of the SSAGA--a comparison with the SCAN. Addiction. 1999; 94(9):1361–70. [PubMed: 10615721]

Kendler KS, Davis CG, Kessler RC. The familial aggregation of common psychiatric and substance use disorders in the National Comorbidity Survey: a family history study. Br J Psychiatry. 1997; 170:541–8. [PubMed: 9330021]

Kendler KS, Silberg JL, Neale MC, Kessler RC, Heath AC, Eaves LJ. The family history method: whose psychiatric history is measured? Am J Psychiatry. 1991; 148(11):1501–4. [PubMed: 1928463]

Kessler RC, Mcgonagle KA, Zhao SY, Nelson CB, Hughes M, Eshleman S, Wittchen HU, Kendler KS. Lifetime and 12-Month Prevalence of Dsm-Iii-R Psychiatric-Disorders in the United-States - Results from the National-Comorbidity-Survey. Arch Gen Psychiatry. 1994; 51(1):8–19. [PubMed: 8279933]

Martin NG, Martin PG. The inheritance of scholastic abilities in a sample of twins. II. Genetical analysis of examinations results. Ann Hum Genet. 1975; 39(2):219–29. [PubMed: 1053249]

O'Malley SS, Carey KB, Maisto SA. Validity of young adults' reports of parental drinking practices. J Stud Alcohol. 1986; 47(5):433–5. [PubMed: 3762165]

Ooki S, Yamada K, Asaka A, Hayakawa K. Zygosity Diagnosis of Twins by Questionnaire. Acta Geneticae Medicae Et Gemellologiae. 1990; 39(1):109–115. [PubMed: 2392887]

Reich T, Edenberg HJ, Goate A, Williams JT, Rice JP, Van Eerdewegh P, Foroud T, Hesselbrock V, Schuckit MA, Bucholz K, Porjesz B, Li TK, Conneally PM, Nurnberger JI Jr, Tischfield JA, Crowe RR, Cloninger CR, Wu W, Shears S, Carr K, Crose C, Willig C, Begleiter H. Genome-

wide search for genes affecting the risk for alcohol dependence. Am J Med Genet. 1998; 81(3):
207–15. [PubMed: 9603606]

Rhea SA, Nagoshi CT, Wilson JR. Reliability of sibling reports on parental drinking behaviors. J Stud
Alcohol. 1993; 54(1):80–4. [PubMed: 8355503]

Rice JP, Endicott J, Knesevich MA, Rochberg N. The estimation of diagnostic sensitivity using
stability data: an application to major depressive disorder. J Psychiatr Res. 1987; 21(4):337–45.
[PubMed: 3440950]

Rice JP, Reich T, Bucholz KK, Neuman RJ, Fishman R, Rochberg N, Hesselbrock VM, Nurnberger JI
Jr, Schuckit MA, Begleiter H. Comparison of direct interview and family history diagnoses of
alcohol dependence. Alcohol Clin Exp Res. 1995; 19(4):1018–23. [PubMed: 7485811]

Roy MA, Walsh D, Prescott CA, Kendler KS. Biases in the diagnosis of alcoholism by the family
history method. Alcohol Clin Exp Res. 1994; 18(4):845–51. [PubMed: 7978094]

SAS Institute. SAS OnlineDoc 9.2. SAS Institute; Cary, NC: 2007.

Schuckit MA, Smith TL. The relationships of a family history of alcohol dependence, a low level of
response to alcohol and six domains of life functioning to the development of alcohol use
disorders. J Stud Alcohol. 2000; 61(6):827–35. [PubMed: 11188488]

Sher KJ, Descutner C. Reports of paternal alcoholism: reliability across siblings. Addict Behav. 1986;
11(1):25–30. [PubMed: 3716913]

Sher KJ, Walitzer KS, Wood PK, Brent EE. Characteristics of children of alcoholics: putative risk
factors, substance use and abuse, and psychopathology. J Abnor Psychol. 1991; 100(4):427–48.

Slutske WS, Heath AC, Madden PA, Bucholz KK, Dinwiddie SH, Dunne MP, Statham DJ, Martin
NG. Reliability and reporting biases for perceived parental history of alcohol-related problems:
agreement between twins and differences between discordant pairs. J Stud Alcohol. 1996; 57(4):
387–95. [PubMed: 8776680]

Smith EM, Przybeck TR, Bradford SE, Gogineni A, Spitznagel EL. Adult offspring of alcoholic
women as family history informants. Alcohol Clin Exp Res. 1994; 18(6):1354–60. [PubMed:
7695030]

Thompson WD, Orvaschel H, Prusoff BA, Kidd KK. An Evaluation of the Family History Method for
Ascertaining Psychiatric-Disorders. Arch Gen Psychiatry. 1982; 39(1):53–58. [PubMed: 7055408]

Weinberg JR. Assessing drinking problems by history. Postgrad Med. 1976; 59(4):87–90. [PubMed:
1264908]

Table 1

Twin pair agreement in rating presence or absence of biological parent alcohol problems for narrow versus broad ratings.

| | TOTAL | Narrow Rating | | | | | | Broad Rating | | | | | |
| | | Concordant Positive | | Discordant | | | | Concordant Positive | | Discordant | | | |
	N^a	N	%	N	%	ρ	S.E.	N	%	N	%	ρ	S.E.
Maternal Alcohol Problems													
MZ Female Pairs - EA	846–848	31	3.7	28	3.3	0.93#	0.03	44	5.2	37	4.8	0.92	0.02
AA	111	5	4.5	7	6.3	0.86	0.10	9	8.1	10	9.0	0.85	0.08
DZ Female Pairs - EA	656–657	18	2.7	35	5.3	0.81	0.06	33	5.0	39	5.9	0.87	0.04
AA	141	6	4.3	15	10.6	0.68	0.14	11	7.8	17	12.1	0.76	0.10
Paternal Alcohol Problems													
MZ Female Pairs - EA	821–829	91	11.1	96	11.7	0.83	0.03	139	16.8	96	11.6	0.88	0.02
AA	100–101	15	15.0	21	21.0	0.69	0.11	25	24.8	27	26.7	0.64*	0.11
DZ Female Pairs - EA	636–642	72	11.3	80	12.6	0.82	0.04	113	17.6	78	12.2	0.88	0.02
AA	130–131	22	17.0	21	16.2	0.80	0.07	30	22.9	24	18.3	0.80	0.07

ρ = tetrachoric correlation; *SE* = standard error;

[a] Ns for narrow-broad ratings;

[#] MZ versus DZ agreement differs significantly by twin pair zygosity, in comparisons within ethnicity groups (EA: 0.93 vs. 0.81, $p < .05$);

[*] agreement differs significantly by ethnicity, in comparisons within zygosity groups (MZ: 0.88 vs. 0.64, $p < .01$).

Table 2

Agreement between twin report and parent self-report and between twin report and coparent report for narrow versus broad ratings of parental alcohol problems.

| | N^a | | Narrow rating | | | | Broad rating | | | |
| | | | EA twins | | AA twins | | EA twins | | AA twins | |
	EA	AA	ρ	S.E.	ρ	S.E.	ρ	S.E.	ρ	S.E.
Paternal alcohol problems										
Self-report:										
Alcohol dependence	1667–1971	158–159	0.54	0.06	0.46	0.19	0.54	0.05	0.50	0.17
3+ dependence symptoms[b]	1667–1971	158–159	0.62	0.04	0.45	0.17	0.63	0.04	0.52	0.14
Alcohol abuse	1667–1971	158–159	0.18	0.06	0.12	0.19	0.21	0.05	0.09	0.19
Mother report:										
3+ dependence symptoms[b]	2594–2604	331–332	0.80	0.02	0.46***	0.12	0.81	0.02	0.56***	0.10
Excessive drinking screen	2574–2584	325–326	0.78	0.02	0.47***	0.10	0.79	0.02	0.62***	0.08
Alcohol abuse	2594–2604	331–332	0.005	0.06	−0.02	0.13	0.06	0.05	0.14	0.12
Maternal alcohol problems										
Self-report:										
Alcohol dependence	2638–2640	352	0.69	0.05	0.64	0.16	0.69	0.05	0.52	0.17
3+ dependence symptoms[b]	2638–2640	352	0.67	0.05	0.46*	0.18	0.66	0.05	0.47*	0.15
Alcohol abuse	2638–2640	352	0.20	0.08	0.05	0.15	0.18	0.08	0.40	0.18
Father report:										
3+ dependence symptoms[b]	1969–1971	160	0.70	0.07	--#	--	0.65	0.07	--#	--
Excessive drinking screen	1963–1965	158	0.71	0.06	0.38	0.18	0.68	0.06	0.58	0.18
Alcohol abuse	1969–1971	160	0.44	0.10	0.23	0.19	0.46	0.09	0.41	0.16

ρ = tetrachoric correlation; SE = standard error;

[a] Ns for narrow-broad ratings;

[b] without clustering criterion;

cases where no inter-rater agreement was observed;

* EA>AA agreement, $p < .05$;

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

****
EA>AA agreement, $p < .001$.

Table 3

Agreement between parent self-report and coparent report of alcohol problems.

	N		Coparent Family History Rating										
			Excessive Drinking				3+ Dependence SX				Abuse			
			EA		AA		EA		AA		EA		AA	
	EA	AA	ρ	S.E.	ρ	S.E.	ρ	S.E.	ρ	S.E.	ρ	S.E.	ρ	S.E.
Parent self-report														
Father														
Alcohol dependence	1018–1021	80	0.64	0.05	0.30	0.23	0.60	0.05	0.13	0.27	0.20	0.08	−0.08	0.30
3+ dependence symptoms [a]	1018–1021	80	0.66	0.04	0.48	0.17	0.64	0.04	0.34	0.21	0.22	0.07	−0.07	0.25
Alcohol abuse	1018–1021	80	0.21	0.06	0.03	0.21	0.15	0.06	0.26	0.22	0.16	0.07	−0.01	0.25
Mother														
Alcohol dependence	1019–1022	80	0.72	0.07	0.53	0.31	0.67	0.09	--[#]	--	0.29	0.12	0.51	0.31
3+ dependence symptoms [a]	1019–1022	80	0.66	0.07	0.75	0.17	0.58	0.09	--[#]	--	0.29	0.11	0.81	0.15
Alcohol abuse	1019–1022	80	0.17	0.11	0.75 [*]	0.20	0.07	0.14	--[#]	--	0.28	0.10	0.51	0.32

ρ = tetrachoric correlation; SE = standard error;

[a] without clustering criterion;

[*] AA > EA agreement, $p < .05$;

[#] cases where no inter-rater agreement was observed.

Table 4

Agreement between maternal report of paternal history of 3+ alcohol dependence symptoms and (a) father self-report, and (b) twin narrow versus broad ratings of paternal alcohol problems, as a function of years of cohabitation of father and twins.

	EA Mothers			AA Mothers			
	N	%[a]	ρ	S.E.	N	%[a]	ρ	S.E.
Father self-report								
Years of cohabitation								
0–5	102	36.8	0.56	0.13	27	22.0	0.12	0.36
6–11	69	50.0	0.75	0.12	8	36.4	0.53	0.50
12+	833	78.7	0.64	0.05	43	62.4	0.43	0.30
Twin rating of father (narrow)								
Years of cohabitation								
0–5	407	93.1	0.75	0.05	175	91.1	0.36*	0.17
6–11	234	99.6	0.76	0.06	35	97.2	0.46	0.28
12+	1095	99.5	0.79	0.03	110	98.2	0.67	0.19
Twin rating of father (broad)								
Years of cohabitation								
0–5	412	94.3	0.75	0.06	175	91.1	0.50	0.14
6–11	234	99.6	0.78	0.06	35	97.2	0.79	0.20
12+	1909	99.7	0.81	0.03	111	99.1	0.60	0.19

ρ = tetrachoric correlation; SE = standard error;

[a] percentage of mother reports that could be compared to a father or twin report;

* EA>AA agreement, $p < .05$.

Table 5

Agreement between maternal report of paternal history of 3+ alcohol dependence symptoms and (a) father self-report, and (b) twin narrow versus broad ratings of paternal alcohol problems, as a function of maternal educational attainment.

	EA Mothers				AA Mothers			
	N	%[a]	ρ	S.E.	N	%[a]	ρ	S.E.
Father self-report								
Maternal education								
< high school	59	40.4	0.43	0.20	11	26.8	0.16	0.47
high school	397	62.1	0.62	0.07	29	31.5	--[#]	--
> high school	564	70.9	0.68	0.06	40	39.2	0.41	0.30
Twin rating of father (narrow)								
Maternal education								
< high school	200	87.7	0.64	0.09	52	86.7	−0.11	0.27
high school	1023	83.4	0.79	0.03	124	86.1	0.46*	0.19
> high school	1366	95.7	0.84	0.03	155	90.1	0.64*	0.14
Twin rating of father (broad)								
Maternal education								
< high school	201	88.2	0.73	0.08	52	86.7	0.34	0.23
high school	1025	93.6	0.81	0.03	124	86.1	0.62*	0.13
> high school	1373	96.1	0.83	0.03	156	90.7	0.61*	0.15

ρ = tetrachoric correlation; *SE* = standard error;

[a] percentage of mother reports that could be compared to a father or twin report;

[#] cases where no inter-rater agreement was observed;

* EA>AA agreement, $p < .01$.