HHS Public Access

Author manuscript

Addict Behav. Author manuscript; available in PMC 2018 February 01.

Published in final edited form as:

Addict Behav. 2017 February ; 65: 13–18. doi:10.1016/j.addbeh.2016.09.006.

Correspondence Between Adolescent and Informant Reports of Substance Use: Findings from the Philadelphia Neurodevelopmental Cohort

Jason D. Jones[a,*], **J. Cobb Scott**[a,b], **Monica E. Calkins**[a], **Kosha Ruparel**[a], **Tyler M. Moore**[a], **Ruben C. Gur**[a,b], and **Raquel E. Gur**[a]

[a]Neuropsychiatry Section, Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, 3400 Spruce St., 10th Floor, Gates Bldg., Philadelphia, PA 19104, USA

[b]VISN4 Mental Illness Research, Education, and Clinical Center at the Philadelphia VA Medical Center, 3900 Woodland Ave., Philadelphia, PA 19104, USA

Abstract

Inclusion of collateral informant reports is common in adolescent psychopathology research and clinical assessment, yet few studies have examined agreement on ratings of adolescent substance use or factors that may be associated with reporter agreement. The present study aimed to extend prior work on the correspondence between adolescent and informant reports of adolescent substance use with data from a large (n=5,214), diverse, community-based sample of youth aged 11–17 (mean age=14.53, *SD*=1.98; 52% female). Specifically, we examined: (a) agreement between adolescent and collateral informant reports of adolescent use of alcohol, marijuana, cocaine, inhalants, and stimulants and (b) potential correlates of reporter agreement. Agreement ranged from low (κ=.007, *p*=.053) for inhalant use to moderate (κ=.414, *p*<.001) for marijuana use. Disagreements were mainly driven by collateral underestimation of adolescent substance use. Older adolescent age was associated with poorer agreement across all substances (Odds Ratios [*OR*s] ≤ .80, *p*s<.05) except inhalants (*OR*=1.28, *p*<.001). Reporter agreement on alcohol and marijuana use was lower for male than female adolescents (*OR*s≤.85, *p*s<.05). Adolescent psychopathology was associated with poorer agreement on all substances (*OR*s≤.62, *ps*<.01). For alcohol and marijuana, past year frequency of use was associated with better reporter agreement (*OR*s≥1.54, *p*s<.001). For marijuana, older age at first use was related to poorer agreement (*OR*=.81, *p*=.01). Our results suggest that collateral reports of adolescent substance use may be ineffective proxies for adolescent self-reports in community samples, particularly for low base rate substances. Findings also highlight important factors to consider when collecting substance use information from multiple informants.

[*]Corresponding Authors: Jason D. Jones, PhD and Raquel E. Gur, MD, PhD, 3400 Spruce Street, 10th Floor, Gates Bldg, Philadelphia, PA, 19104. jasjones@mail.med.upenn.edu, raquel@mail.med.upenn.edu. Telephone: +1 (215) 662-7119. Fax: +1 (215) 662-7903.

Keywords

adolescent substance use; reporter agreement; collateral informants; substance use assessment; Philadelphia Neurodevelopmental Cohort

1. Introduction

The inclusion of reports from multiple informants has long been considered part of best practices in child and adolescent psychopathology research and clinical assessment. The expectation is that acquiring perspectives from multiple informants will yield a more comprehensive clinical picture that can aid in diagnostic and treatment decisions. However, ratings from different informants do not always converge (Achenbach, McConaughy, & Howell, 1987), and conclusions about the prevalence rates and correlates of psychopathology can differ depending on whose report is used (De Los Reyes & Kazdin, 2005). Therefore, researchers have devoted considerable effort to studying informant discrepancies and identifying factors that might explain *why* informants agree or disagree (see De Los Reyes & Kazdin, 2005, for a review).

In contrast to the sizeable literature on multiple informants' ratings of child and adolescent emotional/behavioral symptoms, few studies have examined agreement on ratings of adolescent substance use. This is surprising for several reasons. First, the high rates of adolescent substance use remain a major public health concern (Kann et al., 2014). Given the high prevalence and the importance of assessment for early problem identification and intervention, issues related to the accurate and reliable measurement of adolescent substance use merit investigation. Second, agreement between adolescent self-reports of substance use and collateral reports may be particularly poor. Given potential legal ramifications and fear of punishment at home, adolescents may be motivated to hide substance use from parents and other adults, resulting in reporter disagreements. Third, adolescence is characterized by increased autonomy and changing family communication patterns (Steinberg, 2008). The combination of increased opportunities for substance use and disrupted family communication may undermine reporter agreement. Consistent with this notion, a meta-analysis found that reporter agreement on emotional/behavioral problems was lower for adolescents compared to children (Achenbach et al., 1987).

Studies of multiple informants' ratings of adolescent substance use have mostly utilized small samples, and results have been heterogeneous, varying by sample type (treatment versus community), substances assessed, and how substance use was assessed. Generally, reporter agreement has been low-to-moderate in community samples (e.g., Cantwell, Lewinsohn, Rohde, & Seeley, 1997; Williams, McDermitt, Bertrand, & Davis, 2003), with slightly better agreement in treatment-seeking or substance abusing samples (e.g., Donohue et al., 2004; McGillicuddy & Eliseo-Arras, 2012). A consistent finding is that collateral informants underestimate adolescent substance use (Williams et al., 2003; Yang et al., 2006).

Few studies have examined factors that may be associated with reporter agreement on adolescent substance use. Since informant discrepancies can have a significant impact on diagnostic and treatment decisions (De Los Reyes & Kazdin, 2005), it is important to

identify factors that may mitigate or exacerbate these discrepancies. For example, agreement on alcohol use has been shown to be lower than agreement on marijuana or tobacco use (Fisher et al., 2006; McGillicuddy, Rychtarik, Morsheimer, & Burke-Storer, 2007); thus, reporter agreement may vary by type of substance. However, studies examining other potential correlates of reporter agreement on adolescent substance use have been limited and yielded inconsistent findings.

1.1. The Present Study

Here, we extend this literature by examining agreement between adolescent and collateral informant reports of adolescent substance use in the Philadelphia Neurodevelopmental Cohort (PNC). The PNC provides a unique opportunity to advance prior work on reporter agreement about adolescent substance use. First, unlike much prior work that focused on treatment-seeking or high-risk samples, the PNC is a community-based sample that was not selected for behavioral or substance use problems. Therefore, agreement estimates in this community-based sample are likely to be more representative of typical adolescent substance users who engage in occasional/recreational use rather than heavy use (although the PNC also includes heavy users). Second, the PNC sample is much larger and more diverse than samples included in previous studies. Prior studies with smaller community samples have been limited to examination of reporter agreement on the most commonly used substances (e.g., alcohol). The large PNC sample enabled us to examine reporter agreement on low base rate substances such as cocaine, inhalants, and stimulants, in addition to more commonly used substances. Third, the PNC's sample size and extensive assessments enabled us to test several potential predictors of reporter agreement. Specifically, we examined: adolescent age, sex, and race; collateral relationship to adolescent; community-inferred socioeconomic status and household environment; past year frequency of substance use and age of first use (for alcohol and marijuana); adolescent psychopathology; and family history of substance abuse.

We predicted that agreement on alcohol and marijuana use would fall in the fair-to-moderate range. Given the lack of prior research on agreement related to adolescent use of cocaine, inhalants, or stimulants in community samples, we did not make specific predictions about the level of agreement on use of these substances. Given the limited research related to factors that may affect agreement on substance use, we did not make predictions about how the various constructs would relate to informant agreement.

2. Method

2.1. Participants

The PNC is a community-based sample of 9,498 youths aged 8 to 21 years. The PNC study design and procedures have been described in detail elsewhere (Calkins et al., 2015). This investigation focused on the 5,214 participants between the ages of 11 and 17 (mean age=14.53, *SD*=1.98; 52% female) because this is the only age group in which both adolescent and collateral reports of adolescent substance use were provided. The sub-sample was racially diverse: 57% White, 32% African American, 10% mixed race, and 1% Asian/Alaska Native/Pacific Islander. Most collateral informants (87%) were the adolescents'

mothers or mother-figures (e.g., stepmother). Ten percent of the collaterals were adolescents' fathers or father-figures. The remaining 3% of collaterals included other family members and legal guardians. Collateral age ranged from 26 to 69 years (mean age=43.58, *SD*=6.57).

2.2. Procedures

After receiving a description of study procedures, adolescents provided written assent and guardians provided written informed consent. Adolescents and collaterals were assessed independently and were informed that all their responses would be kept confidential, including from each other, with the exception of legal reporting requirements related to self/other harm or child abuse. The Institutional Review Boards at the University of Pennsylvania and the Children's Hospital of Philadelphia approved study procedures.

2.3. Measures

2.3.1. Substance use—Participants completed one of two substance use assessments depending on date of entry into the study. The first 2,963 PNC participants completed a computerized, assessor-administered version of the K-SADS substance use screener. This screener includes questions about lifetime substance use. Participants indicated whether or not they had ever used each of the substances. Forty-eight of the adolescents in the current study sample completed this measure.

The remaining 6,298 PNC youth completed an abbreviated and locally computerized version of the Minnesota Center for Twin and Family Research self-report substance use assessment (Han, McGue, & Iacono, 1999). The switch to a self-administered substance use assessment was made to reduce interview duration and facilitate full disclosure of substance use. The self-report assessment queries lifetime use of a variety of substances. In addition to lifetime use, the assessment collects more detailed information about alcohol, marijuana, and tobacco use, including: age at first use, age at onset of daily use, past year frequency/severity of use, and means of obtaining the substances. This scale also includes two fake drug items as validity indicators. In the current study sample, 5,073 adolescents completed the self-report substance use assessment.

All collateral informants completed the K-SADS substance use screening questions to report on their adolescents' substance use.

To facilitate examination of reporter agreement, we compared the wording of items across the two assessments and identified those suitable for comparison across reporters. Using a consensus process among the authors, we removed items that contained clear wording differences that could bias reporter agreement estimates. Following this process, five substances remained for analysis: alcohol, marijuana, cocaine, inhalants, and stimulants (see Table S1 in Supplemental Materials).

2.3.2. Psychopathology—Adolescents were screened for major domains of psychopathology using a computerized, structured interview (GOASSESS; Calkins et al., 2015). GOASSESS evaluates treatment history, lifetime prevalence, symptom frequency/duration, and distress/impairment associated with major domains of psychopathology. Factor

analyses suggest that GOASSESS psychopathology domains can be reduced to a general psychopathology factor score and several sub-factor scores (Calkins et al., 2015). Here, we used the general psychopathology factor.

2.3.3. Family history of substance abuse—Collateral informants were administered an abbreviated version of the Family Interview for Genetic Studies (Maxwell, 1996). Presence/absence of family history of substance use problems and/or treatment were coded from responses to open-ended screening questions. Twenty-one percent of collaterals reported a family history of substance abuse and/or treatment.

2.3.4. Socioeconomic status and household environment—Participant addresses were linked to census data to obtain information about adolescents' neighborhood and inferred household environments. The variables obtained from census data were factor analyzed and reduced to two factors: socioeconomic status (SES) and household environment (Moore et al., 2016). The SES factor reflects percent of residents in poverty, median family income, and percent of residents who are married. The household factor reflects percent of residents with children and percent of residents who are non-English speakers. Notably, the household factor is independent of SES.

2.4. Statistical Analyses

First, we performed tests of agreement for lifetime use of each substance. We relied on kappa as our main agreement outcome, as kappa is less biased than other indices of agreement (Langenbucher, Labouvie, & Morgenstern, 1996). In addition to overall agreement, we examined sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). Second, we performed logistic regressions to examine factors that might be associated with reporter agreement. The dependent variable was a binary indicator of agreement (1) or disagreement (0). Given the number of variables, we grouped constructs together based on conceptual similarity, resulting in four logistic regression models, as detailed below (section 3.3). Excluding the 48 adolescents who completed the K-SADS substance use screener did not appreciably change study results.

3. Results

3.1. Missing Data

Overall, missing data was minimal (≤ 2.5% missing across lifetime substance use variables). Ninety-three adolescents and 97 collaterals (out of approximately 5,000 dyads) were missing all lifetime substance use data. Adolescents missing substance use data did not differ from the rest of the sample in terms of sex, psychopathology, or household environment. However, the group of adolescents missing substance use data was slightly older ($t[5212]=2.77$, $p<.01$), had lower SES factor scores ($t[5212]=3.40$, $p<.01$), and included more non-Whites ($\chi^2[1]=9.79$, $p<.01$) compared to the rest of the sample. Collaterals missing substance use data differed from the rest of the sample only in terms of SES ($t[5212)=4.54$, $p<.001$). Sixty-three adolescents endorsed one or both fake drug items and were excluded from analyses (Derringer, Krueger, McGue, & Iacono, 2008).

3.2. Agreement Indices

Agreement on alcohol and marijuana use was fair-to-moderate (Landis & Koch, 1977). In contrast, agreement on cocaine, inhalant, and stimulant use was low (see Table 1). In addition, for each substance, McNemar's test was significant, indicating that the proportions of adolescents and collaterals reporting use of each substance were significantly different. Sensitivity was strikingly low across all the substances when adolescent-reported use was used as the standard for comparison. Approximately 70% of collaterals were unaware that their adolescents had ever tried alcohol or marijuana, while over 90% of collaterals were unaware that their adolescents had ever tried cocaine, inhalants, or stimulants. On the other hand, specificity was high across all the substances suggesting better agreement about adolescent non-use than about adolescent use. Similarly, with the exception of alcohol, NPV was higher than PPV across all the substances.

3.3. Factors Associated with Reporter Agreement

In Model 1, adolescent age was associated with agreement on all substances (see Table 2). For alcohol, marijuana, cocaine, and stimulants, the odds of reporter agreement decreased as adolescent age increased. For inhalants, however, as adolescent age increased the odds of reporter agreement increased. For alcohol and marijuana, the odds of reporter agreement were lower for male than female adolescents. SES and household environment were unrelated to agreement. In Model 2, the collateral's relationship to the adolescent was unrelated to agreement.

In Model 3, more frequent alcohol and marijuana use were associated with increased odds of reporter agreement. In addition, for marijuana, older age at first use was associated with decreased odds of agreement.

In Model 4, greater psychopathology was associated with decreased odds of reporter agreement on all substances. Family history of substance abuse was unrelated to agreement.

4. Discussion

To the best of our knowledge, this is the largest study to date of the correspondence between adolescent and collateral informant reports of adolescent substance use. The large, diverse sample and extensive assessments enabled us to address novel questions about this longstanding issue in clinical research and treatment.

4.1. Agreement Indices

Consistent with prior work (e.g., Cantwell et al., 1997; Fisher et al., 2006), adolescents and collaterals in the present study showed fair-to-moderate agreement on reports of alcohol and marijuana use, and agreement on alcohol use was slightly lower than agreement on marijuana use. There are several possible explanations for lower agreement on alcohol use. Specificity for alcohol use, although high, was lower than all other substances, indicating that collaterals are reporting false positives. Given the reportedly high rate of adolescent experimentation with alcohol (Kann et al., 2014), collaterals may assume that their adolescent has tried alcohol even if the adolescent has not. The finding that alcohol was the

only substance with a lower NPV than PPV further supports this possibility. Alternatively, alcohol may be more readily available to adolescents and easier to conceal from parents compared to marijuana use.

To the best of our knowledge, our study is the first to examine agreement on use of cocaine, inhalants, and stimulants individually in a community sample of adolescents. We found that reporter agreement on adolescent use of these substances was low. Indeed, the kappa for inhalant use was non-significant. Of note, inhalants are the only class of substances more often abused by younger than older adolescents (National Institute on Drug Abuse [NIDA], 2012). Parents may be less likely to report that a young adolescent has experimented with drugs than an older adolescent, even though the young adolescents are more likely to use inhalants. As a result, agreement about inhalant use may suffer. In addition, frequently used inhalants (e.g., aerosol sprays) are commonly found in homes and are inexpensive. Also, the intoxicating effects of inhalants tend to be short-lived. The easy obtainability and brief effects of use may allow adolescents to conceal inhalant use from parents, resulting in poor agreement about use.

The sensitivity and specificity analyses further elucidate the patterns of agreement. The high specificity estimates and low sensitivity estimates suggest that disagreements largely stem from collateral underestimation of adolescent use. In addition, the PPVs and NPVs indicate that, with the exception of alcohol, collateral reports are more predictive of adolescent non-use than of use. These findings further bolster the results of previous studies suggesting that parents are largely unaware of adolescent substance use (Fisher et al., 2006; O'Donnell et al., 1998; Williams et al., 2003).

4.2. Factors Associated with Reporter Agreement

Investigations into the correlates of reporter agreement in adolescents have been limited and the findings inconsistent. We aimed to shed light on these inconsistencies by using a large, diverse, community-based sample. For alcohol, marijuana, cocaine, and stimulants, older adolescent age was associated with poorer agreement. For inhalants, older adolescent age was associated with better agreement. This pattern of findings is consistent with developmental changes and age-related trends in adolescent substance use. As adolescents get older, they spend more time outside of the home and less time under direct parental supervision (Patterson & Stouthamer-Loeber, 1984; Steinberg & Morris, 2001). In addition, for most substances, the prevalence of use increases from early to late adolescence (Chen & Jacobson, 2012). The increase in substance use and decrease in parental supervision as adolescents get older likely results in less parental awareness of adolescent use and poorer agreement. For inhalants, however, the age-related pattern of use is reversed: more younger adolescents than older adolescents report using inhalants (NIDA, 2012). Since reporter disagreements are largely driven by collateral underestimation, it makes sense that reporter agreement about inhalant use would be better in older adolescents, as fewer older adolescents report inhalant use.

For alcohol and marijuana, we found that reporter agreement was worse for male adolescents. This finding may be due to the fact that female adolescents freely disclose more information to parents than male adolescents (Stattin & Kerr, 2000). In addition, parents

solicit more information from daughters than sons and report possessing more knowledge of their daughters' activities than their sons' (Cottrell et al., 2003; Jones, Ehrlich, Lejuez, & Cassidy, 2015; Stattin & Kerr, 2000) As a result, parents may be more aware of the use or non-use of substances by female adolescents compared to male adolescents.

Among alcohol and marijuana users, a higher frequency of use in the past year was associated with better agreement. In addition, for marijuana, earlier age of first use was associated with better agreement. Earlier age of onset and higher frequency of use are indicators of heavier and potentially more problematic substance use that may be more salient to parents and result in better agreement about use. Consistent with this notion, agreement estimates in treatment-seeking samples tend to be higher than in community samples (Donohue et al., 2004; McGillicuddy & Eliseo-Arras, 2012).

Adolescent psychopathology was associated with poorer agreement on all substances. Adolescent psychopathology is associated with lower quality relationships with parents and poorer communication with parents (Armsden, McCauley, Greenberg, Burke, & Mitchell, 1990; Burke, Pardini, & Loeber, 2008), which may undermine reporter agreement about adolescent substance use. In addition, as psychopathology tends to run in families (Sullivan, Neale, & Kendler, 2000), the parents of adolescents reporting psychological distress could also be suffering from psychological difficulties that interfere with reporter agreement (McGillicuddy et al., 2012).

4.3. Limitations and Future Directions

Several study limitations could be addressed in future research. First, the substance use assessments were brief so that they could be administered to thousands of participants in a short period of time. As a result, we were limited to examination of agreement on dichotomous indices of self-reported lifetime substance use. Future studies could examine reporter agreement on more nuanced aspects of adolescent substance use (e.g., recent use, frequency of use). Further, future research would benefit from the inclusion of biological measures of substance use (e.g., urinalysis). This would enable researchers to examine how objective measures of substance use correspond to adolescent and collateral informant reports of use. Second, although we examined several predictors of reporter agreement in this study, other potentially important predictors, such as parental monitoring/knowledge and parent–adolescent relationship quality, were not included here and should be explored in future studies. Third, substance use was assessed differently in adolescents and collaterals. Although we took precautions to only compare items that had comparable wording across the two assessments, we cannot rule out the possibility that the different assessments and methods of administration affected reporter agreement. Future studies could include identical assessments and methods of administration across reporters. Fourth, given that the small number of participants missing lifetime substance use data differed slightly from the rest of the sample in terms of age, race, and SES, future studies should further evaluate how these factors relate to reporter agreement about adolescent substance use.

4.4. Clinical Implications

The present findings may have important clinical implications. Diagnostic and treatment decisions and the early identification of potentially problematic substance use hinge on accurate and reliable assessment of adolescent substance use. Our results indicate that the conclusions researchers and clinicians reach about adolescent substance use could vary considerably depending on whose report is used. In this study, prevalence estimates of use based on adolescent self-reports were several times higher than estimates based on collateral reports, suggesting that collateral reports of adolescent substance use are not effective proxies for adolescent self-reports in community samples. Our novel examination of agreement related to cocaine, inhalants, and stimulants suggests that collateral informants may be particularly unaware of adolescent use of these less commonly used substances. Thus, researchers and clinicians should be wary of relying solely on collateral reports of adolescent use of these substances. In addition, the predictors of reporter disagreements identified in this study could inform prevention and intervention programs aimed at reducing adolescent substance use through increasing parental awareness and monitoring of adolescents' behaviors (Stanton et al., 2000). For example, educating parents and other caregivers about the underestimation of adolescent substance use and factors that may contribute to reporter disagreements could increase parental awareness of adolescent use. Awareness of use affords parents the opportunity to discuss substance use with their adolescents and intervene if necessary.

4.5. Conclusions

The present study provides novel insights into a longstanding issue in clinical research and treatment. In the largest study to date of agreement between adolescent and collateral informant reports of adolescent use, we found fair-to-moderate reporter agreement about adolescent lifetime alcohol and marijuana use, and low agreement on adolescent use of cocaine, inhalants, and stimulants. In addition, we identified several predictors of reporter agreement that could inform research and clinical practice.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This work was supported by the NIH (RC2 MH089983 and MH089924; K08MH079364; T32MH019112; NIDA supplement to MH089983) and the Dowshen Program for Neuroscience. Dr. Scott's participation was supported by a Department of Veterans Affairs Career Development Award (IK2CX000772). We thank the participants of this study, and all the members of the Recruitment, Assessment, and Data Teams whose individual contributions collectively made this work possible. We also thank William G. Iacono for allowing use, modification, and computerization of the University of Minnesota Center for Twin and Family Research substance use measure, and Emily Bach for coding the family history of substance abuse questions. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs.

References

Achenbach TM, McConaughy SH, Howell CT. Child/ adolescent behavioral and emotional problems: Implications of cross- informant correlations for situational specificity. Psychological Bulletin. 1987; 101:213–232. [PubMed: 3562706]

Armsden GC, McCauley E, Greenberg MT, Burke PM, Mitchell JR. Parent and peer attachment in early adolescent depression. Journal of Abnormal Child Psychology. 1990; 18:683–697. [PubMed: 2074346]

Burke JD, Pardini DA, Loeber R. Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. Journal of Abnormal Child Psychology. 2008; 36:679–692. [PubMed: 18286366]

Calkins ME, Merikangas KR, Moore TM, Burstein M, Behr MA, Satterthwaite TD, Gur RE. The Philadelphia neurodevelopmental cohort: Constructing a deep phenotyping collaborative. Journal of Child Psychology and Psychiatry. 2015; 56:1356–1369. [PubMed: 25858255]

Cantwell DP, Lewinsohn PM, Rohde P, Seeley JR. Correspondence between adolescent report and parent report of psychiatric diagnostic data. Journal of the American Academy of Child & Adolescent Psychiatry. 1997; 36:610–619. [PubMed: 9136495]

Chen P, Jacobson KC. Developmental trajectories of substance use from early adolescence to young adulthood: Gender and racial/ethnic differences. Journal of Adolescent Health. 2012; 50:154–163. [PubMed: 22265111]

Cottrell L, Li X, Harris C, D'Alessandri D, Atkins M, Richardson B, Stanton B. Parent and adolescent perceptions of parental monitoring and adolescent risk involvement. Parenting: Science and Practice. 2003; 3:179–195.

De Los Reyes A, Kazdin AE. Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. Psychological Bulletin. 2005; 131:483–509. [PubMed: 16060799]

Derringer J, Krueger RF, McGue M, Iacono WG. Genetic and environmental contributions to the diversity of substances used in adolescent twins: A longitudinal study of age and sex effects. Addiction. 2008; 103:1744–1751. [PubMed: 18821880]

Donohue B, Azrin NH, Strada MJ, Silver NC, Teichner G, Murphy H. Psychometric evaluation of self- and collateral timeline follow-back reports of drug and alcohol use in a sample of drug-abusing and conduct-disordered adolescents and their arents. Psychology of Addictive Behaviors. 2004; 18:184–189. [PubMed: 15238061]

Fisher SL, Bucholz KK, Reich W, Fox L, Kuperman S, Kramer J, Bierut LJ. Teenagers are right--parents do not know much: An analysis of adolescent-parent agreement on reports of adolescent substance use, abuse, and dependence. Alcoholism: Clinical And Experimental Research. 2006; 30:1699–1710.

Han C, McGue MK, Iacono WG. Lifetime tobacco, alcohol and other substance use in adolescent Minnesota twins: Univariate and multivariate behavioral genetic analyses. Addiction. 1999; 94:981–993. [PubMed: 10707437]

Jones JD, Ehrlich KB, Lejuez CW, Cassidy J. Parental knowledge of adolescent activities: Links with parental attachment style and adolescent substance use. Journal of Family Psychology. 2015; 29:191–200. [PubMed: 25730406]

Kann L, Kinchen S, Shanklin SL, Flint KH, Kawkins J, Harris WA, Zaza S. Youth risk behavior surveillance—United States, 2013. MMWR Surveillance Summary. 2014; 63(SS-3)

Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977; 33:159–174. [PubMed: 843571]

Langenbucher J, Labouvie E, Morgenstern J. Measuring diagnostic agreement. Journal of Consulting and Clinical Psychology. 1996; 64:1285–1289. [PubMed: 8991315]

Maxwell, E. Clinical Neurogenetics Branch, Intramural Research Program. Bethesda, MD: National Institute of Mental Health; 1996. Family Interview for Genetic Studies.

McGillicuddy NB, Eliseo-Arras RK. Parent–adolescent report correspondence on adolescent substance abuse among teens in residential rehabilitation. Addictive Behaviors. 2012; 37:456–462. [PubMed: 22251413]

McGillicuddy NB, Rychtarik RG, Morsheimer ET, Burke-Storer MR. Agreement between parent and adolescent reports of adolescent substance use. Journal of Child & Adolescent Substance Abuse. 2007; 16:59–78. [PubMed: 19180245]

Moore TM, Martin IK, Gur OM, Jackson CT, Scott JC, Calkins ME, Gur RC. Characterizing social environment's association with neurocognition using census and crime data linked to the

Philadelphia Neurodevelopmental Cohort. Psychological Medicine. 2016; 46:599–610. [PubMed: 26492931]

National Institute on Drug Abuse. Inhalants [document on the Internet]. 2012. Retrieved from http://www.drugabuse.gov/publications/drugfacts/inhalants

O'Donnell D, Biederman J, Jones J, Wilens TE, Milberger S, Mick E, Faraone SV. Informativeness of child and parent reports on substance use disorders in a sample of ADHD probands, control probands, and their siblings. Journal of the American Academy of Child & Adolescent Psychiatry. 1998; 37:752–758. [PubMed: 9666631]

Patterson GR, Stouthamer-Loeber M. The correlation of family management practices and delinquency. Child Development. 1984; 55:1299–1307. [PubMed: 6488958]

Stanton BF, Li X, Galbraith J, Cornick G, Feigelman S, Kaljee L, Zhou Y. Parental underestimates of adolescent risk behavior: A randomized, controlled trial of a parental monitoring intervention. Journal of Adolescent Health. 2000; 26:18–26. [PubMed: 10638714]

Stattin H, Kerr M. Parental monitoring: A reinterpretation. Child Development. 2000; 71:1072–1085. [PubMed: 11016567]

Steinberg, L. Adolescence (8th ed.). New York, NY: McGraw-Hill; 2008.

Steinberg L, Morris AS. Adolescent development. Annual Review of Psychology. 2001; 52:83–110.

Sullivan PF, Neale MC, Kendler KS. Genetic epidemiology of major depression: Review and meta-analysis. The American Journal of Psychiatry. 2000; 157:1552–1562. [PubMed: 11007705]

Williams RJ, McDermitt DR, Bertrand LD, Davis RM. Parental awareness of adolescent substance use. Addictive Behaviors. 2003; 28:803–809. [PubMed: 12726793]

Yang H, Stanton B, Cottrel L, Kaljee L, Galbraith J, Li X, Wu Y. Parental awareness of adolescent risk involvement: Implications of overestimates and underestimates. Journal of Adolescent Health. 2006; 39:353–361. [PubMed: 16919796]

Highlights

- Large study of agreement between adolescent and informant reports of substance use
- Agreement ranged from low (κ=.007, inhalants) to moderate (κ=.414, marijuana)
- ~70% of collaterals were unaware of adolescent alcohol or marijuana use
- >90% of collaterals were unaware of adolescent cocaine, inhalant, or stimulant use
- Adolescent age, sex, psychopathology, substance use patterns related to agreement

Table 1

Prevalence of Substance Use by Reporter and Agreement Indices

Substance	N Adolescent Yes (%)		N Collateral Yes (%)		Listwise N	Kappa	Phi Coefficient	McNemar's Test	Sens.	Spec.	PPV	NPV
Alcohol	1550	(31%)	500	(10%)	4946	.296*	.368*	< .001	.27	.97	.81	.75
Marijuana	631	(13%)	227	(5%)	4931	.414*	.476*	< .001	.31	.99	.84	.91
Cocaine	34	(1%)	4	(0.1%)	4956	.056*	.088*	< .001	.03	.99	.25	.99
Inhalants	238	(5%)	4	(0.1%)	4935	.007+	.028+	< .001	.004	.99	.25	.95
Stimulants	105	(2%)	17	(0.3%)	4955	.117*	.170*	< .001	.07	.99	.44	.98

Notes.

*$p < .001$.

+$p = .053$.

Sens. = sensitivity. Spec. = specificity. PPV = positive predictive value. NPV = negative predictive value.

Table 2

Logistic Regression Analyses of Factors Associated with Reporter Agreement

	Alcohol		Marijuana		Cocaine		Inhalants		Stimulants	
	OR	**CI**	**OR**	**CI**	**OR**	**CI**	**OR**	**CI**	**OR**	**CI**
Model 1: Adolescent Characteristics and Environment										
Adolescent Age	.67*	[.65, .70]	.53*	[.49, .57]	.80*	[.66, .96]	1.28*	[1.19, 1.37]	.76*	[.68, .85]
Adolescent Sex (female = ref)	.85*	[.74, .98]	.71*	[.58, .87]	.78	[.39, 1.55]	1.02	[.78, 1.33]	.85	[.57, 1.26]
Adolescent Race (White = ref)										
Black/AA	.81	[.64, 1.02]	.75	[.53, 1.05]	3.97	[.86, 18.35]	1.25	[.80, 1.96]	1.26	[.63, 2.54]
Other	1.02	[.81, 1.30]	.84	[.59, 1.20]	1.16	[.39, 3.49]	1.06	[.67, 1.68]	1.07	[.55, 2.08]
SES	1.05	[.94, 1.17]	1.06	[.91, 1.24]	.89	[.47, 1.67]	1.23[a]	[1.00, 1.50]	.89	[.64, 1.24]
Household Env	1.06	[.99, 1.14]	1.08	[.97, 1.20]	1.23	[.83, 1.82]	.99	[.86, 1.13]	1.08	[.88, 1.33]
	$\chi^2(6) = 503.37$*		$\chi^2(6) = 466.01$*		$\chi^2(6) = 17.58$*		$\chi^2(6) = 53.41$*		$\chi^2(6) = 31.49$*	
	n = 4946		*n* = 4931		*n* = 4956		*n* = 4935		*n* = 4955	
Model 2: Collateral Relation										
Relationship (mother = ref)										
Father	1.09	[.88, 1.36]	1.03	[.74, 1.42]	1.09	[.33, 3.60]	.96	[.62, 1.49]	.80	[.44, 1.48]
Other	1.47	[.95, 2.28]	.65	[.39, 1.08]	.45	[.11, 1.89]	.90	[.42, 1.95]	.44	[.19, 1.01]
	$\chi^2(2) = 3.68$		$\chi^2(2) = 2.55$		$\chi^2(2) = 1.01$		$\chi^2(2) = .095$		$\chi^2(2) = 3.37$	
	n = 4941		*n* = 4926		*n* = 4951		*n* = 4930		*n* = 4950	
Model 3: Frequency and Age of Use										
Alcohol Frequency	1.90*	[1.64, 2.21]								
Alcohol Age of First Use	1.04	[.94, 1.16]								
Marijuana Frequency			1.54*	[1.35, 1.74]						
Marijuana Age of First Use			.81*	[.69, .95]						

	Alcohol		Marijuana		Cocaine		Inhalants		Stimulants	
	OR	**CI**	**OR**	**CI**	**OR**	**CI**	**OR**	**CI**	**OR**	**CI**
	$\chi^2(2) = 77.49$ *		$\chi^2(2) = 75.51$ *							
	n = 748		*n* = 418							
Model 4: Psychopathology /Family History										
Overall Psychopathology	.56 *	[.49, .64]	.45 *	[.37, .55]	.28 *	[.14, .57]	.62 *	[.48, .82]	.27 *	[.18, .40]
Family History (yes = ref)	1.05	[.89, 1.24]	1.21	[.96, 1.53]	1.37	[.62, 3.02]	.97	[.69, 1.36]	1.16	[.72, 1.85]
	$\chi^2(2) = 76.78$ *		$\chi^2(2) = 70.05$ *		$\chi^2(2) = 14.00$ *		$\chi^2(2) = 12.08$ *		$\chi^2(2) = 43.16$ *	
	n = 4562		*n* = 4548		*n* = 4569		*n* = 4550		*n* = 4568	

Notes.

* $p < .05$.

OR = odds ratio. CI = 95% confidence interval. Ref = reference group. SES = socioeconomic status factor, higher factor scores indicate higher SES. Household Env = inferred household environment factor, higher factor scores indicate areas with many large family households (as opposed to non-family cohabitating) that do not speak English as their primary language. AA = African American. *n* = sample size for each analysis.

[a] $p = .046$, but lower end of 95% CI = 1.003, so coefficient is not interpreted as significant.

Family History = family history of drug or alcohol problems.