

Teenagers Are Right—Parents Do Not Know Much: An Analysis of Adolescent–Parent Agreement on Reports of Adolescent Substance Use, Abuse, and Dependence

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Background: Previous studies have shown that when assessing child psychopathology, parents tend to report more symptoms than children for externalizing disorders such as attention deficit hyperactivity disorder (ADHD), whereas children tend to report more symptoms for internalizing disorders such as major depression. Whether for clinical or research purposes, parents are also frequently asked to report on their children's experiences with alcohol and drugs. The purpose of this study was to analyze correspondence between adolescent and parent reports of adolescent substance use and abuse or dependence.

Methods: In the current study, 591 subjects 12 to 17 years old were interviewed using the child version of the Semi-Structured Assessment for the Genetics of Alcoholism (C-SSAGA) as part of the Collaborative Study on the Genetics of Alcoholism (COGA). One parent was also interviewed about each adolescent using the parent version of the C-SSAGA. Sensitivities, specificities, and κ coefficients were calculated to assess parental agreement with adolescent reports of lifetime substance use and *Diagnostic and Statistical Manual of Mental Disorders—Third Revision* substance abuse or dependence.

Results: The results indicate that parents are somewhat knowledgeable about their children's use of substances, particularly those that are used most commonly. For example, 55% of adolescents who had smoked cigarettes, 50% who had used alcohol, and 47% who had used marijuana had a parent who knew that they used. However, parents were less aware of substance-related problems experienced by their offspring, agreeing with adolescent reports only 27% of the time for diagnoses of alcohol abuse or dependence and 26% of the time for diagnoses of marijuana abuse or dependence. Parent reports added few cases of substance use for 12- to 13 year-olds and essentially no cases for 16- to 17-year-olds. Parent reports added a nominal number of diagnoses of substance abuse or dependence for older adolescents.

Conclusions: Whether for clinical or research purposes, the results emphasize the importance of directly assessing adolescents regarding alcohol and other substance use disorders. Furthermore, investigators should consider the specific disorder(s) being investigated and the ages of the children being studied when determining whether to include parent reports as part of study design.

Key Words: Adolescents, Parental Ratings, Substance Abuse or Dependence, Alcohol, Marijuana.

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A LARGE BODY of literature supports the conclusion that multiple informants are preferable when assessing adolescent psychopathology (Andrews et al., 1993; Comer and Kendall, 2004; Grills and Ollendick, 2003; Seiffge-Krenke and Kollmar, 1998). However, research has consistently found that correspondence between adolescent and parent reports is mixed overall. In general, studies have found that adolescents tend to report more internalizing symptoms than their parents, including mood and anxiety symptoms (Edelbrock et al., 1986; Herjanic and Reich, 1997; Jensen et al., 1999; Seiffge-Krenke and Kollmar, 1998; Sourander et al., 1999; Verhulst and van der Ende, 1992). However, the opposite has been found for attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD), with parents reporting many more cases than adolescents (Cantwell et al., 1997; Grills and Ollendick, 2003; Herjanic and

Reich, 1997; Jensen et al., 1999). This difference is not surprising when considering that symptoms of ADHD and ODD have clear, observable behavioral manifestations that are likely to be noticed by parents or brought to their attention by teachers. Furthermore, as noted by Lahey et al. (2004), the assessment of ADHD and ODD requires the ability to draw conclusions about one's behavior in relation to others—something that might be difficult for children to do. In keeping with this, studies have found improved agreement between parent and adolescent reports if the symptoms being reported on are observable, factual, and severe, such as trouble with the police or being expelled or suspended from school (Herjanic and Reich, 1997; Kramer et al., 2004; Rowe and Kandel, 1997).

A review of the literature indicates that studies of parent-child agreement most often focus on the psychopathology of internalizing and externalizing disorders, with less emphasis on adolescent substance use, abuse, or dependence. Yet, recent data suggest that alcohol and drug use and abuse are widespread among American teens. For example, in the most recent report from the Monitoring the Future study, which surveys approximately 50,000 U.S. secondary school students annually, 32% of 12th graders reported being drunk in the past 30 days, as did 18% of 10th graders and 6% of 8th graders (Johnston et al., 2005). For illicit drugs (including marijuana), 23% of 12th graders, 18% of 10th graders, and 8% of 8th graders reported using during the past month. Furthermore, in a community-based sample of 3,072 adolescents between the ages of 12 and 18, Young et al. (2002) reported that approximately 10% of the entire sample met criteria for *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV)* alcohol abuse by self-report, and 3.5% met criteria for alcohol dependence.

Given these prevalence rates, it is important for researchers and clinicians to know whom to question when assessing adolescent substance use and problem use. There are some data to suggest that parents might not be the best informants in this context. For example, the 2004 Parental Attitude Tracking Survey by the Partnership for a Drug-Free America found that the percentage of parents reporting that they never talk to their children about drugs increased from 6% in 1998 to 12% in 2004 (Partnership for a Drug-Free America, 2005). The survey also found that parents underestimated the degree of marijuana use by their teenagers. Of the 1,205 parents surveyed, only 18% reported that their teen had tried marijuana, whereas 37% of teens actually had tried it.

Other studies that have looked at agreement between adolescent and parent reports of adolescent substance use have consistently found that parents underreport use and, especially, substance-related problems. For example, O'Donnell et al. (1998) examined parent-child correspondence for psychoactive substance use disorders in a sample of 348 boys aged 12 to 17 (108 ADHD probands, 68 normal control probands, and 172 siblings). With the

exception of cigarette smoking and alcohol dependence, adolescents (irrespective of ADHD status) reported higher rates of psychoactive substance use disorders, including alcohol abuse and drug abuse and dependence, than was reported about them by their mothers.

In another study of adolescent psychopathology, Cantwell et al. (1997) interviewed 281 parent-adolescent pairs. They found that adolescent-reported rates of alcohol and substance abuse or dependence were significantly higher than parent-reported rates (6.4% vs 0.7%, respectively, for alcohol and 7.5% vs 2.5%, respectively, for other psychoactive substances). Likewise, in a study of adolescents admitted to medical emergency departments for non-substance-related injuries, Chung et al. (2003) found that 10.3% of adolescents reported cannabis abuse or dependence compared with only 2.6% of parents. Similarly, the rate for adolescent-reported alcohol abuse or dependence was 10%, compared with 1.9% as reported by parents. Finally, Winters et al. (2000) found that even among children who were referred for a drug treatment evaluation, mothers tended to underreport the extent to which their children were involved with drugs and their children's drug-related problems.

The high teen prevalence rates of substance use and problem use, along with previous studies that demonstrate the tendency for parents to underreport, emphasize the importance of accurately assessing adolescent substance use and abuse or dependence. A variety of factors may potentially affect correspondence between parent and child reports of child psychopathology, including the nature of the problem or disorder being reported on; age, ethnicity, and gender of the child; and psychopathology of the parent. The purpose of the present study was to investigate parent-adolescent agreement to increase understanding of factors that affect parental awareness of adolescent substance use and abuse or dependence. Specifically, age, ethnicity, and gender of the adolescent and lifetime substance dependence of the parent were examined in a large, multisite sample of individuals who participated in the Collaborative Study on the Genetics of Alcoholism (COGA). The current study extends the findings from previous investigations by examining parent-adolescent agreement for use and abuse or dependence of multiple substances in a large sample of adolescents that includes both sexes and multiple ethnicities. To more precisely understand the nature of parent-adolescent agreement or disagreement, a detailed analysis of sensitivity and specificity was conducted using the adolescent report as the standard. κ coefficients (Fleiss, 1971) were also computed to allow for cross-study comparison.

MATERIALS AND METHODS

Sample

The sample includes a total of 591 adolescent-parent pairs who participated in the COGA study between the years of 1991 and 1998.

A total of 438 of the pairs were from families with a history of alcoholism (with at least 1 member who sought treatment) and 153 of the pairs were from community-based comparison families. All adolescents, 51% of whom were male, were between the ages of 12 and 17 years at the time of the interview, with ages evenly distributed across the range (31% aged 12–13; 34% aged 14–15; and 35% aged 16–17). The majority of adolescents were European American (76.3%), followed by African American (22.5%), with 1.2% reporting another race. The parent report was provided by the biological mother in 85.5% of cases, by the biological father in 12.9% of cases, and by another parent figure (e.g., step-parent, grandparent) in 1.7% of cases. Some parents reported on more than 1 child. A total of 428 parents reported on the 591 adolescents.

Procedure

The Collaborative Study on the Genetics of Alcoholism is a multicenter family study that was initiated in 1989 with funding from the National Institute on Alcohol Abuse and Alcoholism (Begleiter et al., 1995). Index participants (proband) were recruited from inpatient and outpatient alcohol treatment centers. To be included in the study, probands were required to meet the criteria for DSM-III-R alcohol dependence (APA, 1987) and Feighner criteria for “definite” alcoholism (Feighner et al., 1972). The mates and first-degree relatives of probands were also recruited. Pedigrees with 3 or more alcohol-dependent individuals were extended to include the mates and first-degree relatives of all affected members. In addition, community-based comparison families were randomly ascertained using a variety of sources, including driver’s license records, medical clinics, and dental clinics. Comparison families were required to have 2 living parents and 3 offspring aged 14 or older.

The protocol was reviewed and approved by the institutional review board at each data collection site. After obtaining assent from children and permission from parents, children were assessed with an adolescent version of the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA). After obtaining informed consent, 1 parent figure was also interviewed about each adolescent using a parent version of the SSAGA. Participants were assured that their answers would be kept confidential and would not be shared with family members except when necessary to prevent harm to the participant or someone else. Interviews were administered by research assistants who received extensive training before beginning data collection. Interviewers also participated in monthly conference calls to minimize drift and maintain quality.

Instrument

The SSAGA is a structured, polydiagnostic instrument that was developed specifically for COGA. A comprehensive, lifetime psychiatric history is obtained including substance abuse and dependence, in addition to mood disorders, anxiety disorders, conduct disorder, antisocial personality disorder, ODD, and ADHD. Adolescent and parent versions of the SSAGA were also developed based on the adult version (C-SSAGA-A and C-SSAGA-P, respectively). All diagnoses reported in the current study are based on DSM-III-R criteria. Test–retest studies of the SSAGA have indicated high reliability for DSM-III-R diagnoses of substance dependence (Bucholz et al., 1994), as well as good reliability for individual alcohol dependence criterion items (Bucholz et al., 1995). In addition, Kuperman et al. (2001) reported good test–retest reliability for the adolescent and parent versions of the SSAGA, with a κ coefficient of 0.86 for the diagnosis of DSM-III-R alcohol dependence and a mean κ coefficient of 0.72 for other DSM-III-R diagnoses. Finally, the SSAGA has also been shown to be valid compared with other diagnostic instruments and best-estimate diagnoses made by clinicians (Bucholz et al., 2006; Hesselbrock et al., 1999).

Substances assessed separately include tobacco, alcohol, and marijuana. In addition, the SSAGA assesses 6 drug categories, which were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and “other” drugs (e.g., ecstasy, inhalants). Definitions of substance use are as follows: smoking a tobacco cigarette at least once, consuming at least 1 drink of alcohol, using marijuana at least once, and using a drug at least once. Daily smoking was defined as smoking tobacco cigarettes nearly every day for a month or more. Finally, alcohol intoxication was queried and included a description of being unable to talk clearly and having difficulty keeping one’s balance.

Subjects had to report repeated use of a substance to be asked diagnostic questions for DSM-III-R abuse and dependence. Repeated use for alcohol, marijuana, and drugs was defined as having used the substance 7 or more times in their lifetime. Data on tobacco dependence are not reported, as the original version of the SSAGA did not include the questions necessary for diagnosis.

Data Analysis

Lifetime prevalence rates were calculated for the entire sample of 12- to 17-year-olds. Sensitivity and specificity of the parent report was examined using the adolescent report as the standard. We chose this method of assessing correspondence because we felt that an analysis of sensitivity and specificity more explicitly characterized the patterns of agreement and disagreement between parents and adolescents. However, to allow for cross-study comparison of adolescent–parent correspondence, κ coefficients are also reported.

Additional analyses stratified the adolescents into 3 age groups: 12- to 13-year olds, 14- to 15-year olds, and 16- to 17-year olds. Prevalence rates, sensitivities and specificities, and κ coefficients were also calculated separately for African Americans and European Americans and for male and female adolescents. To assess whether parents with a history of alcohol or drug dependence would exhibit greater agreement with their children, sensitivities, specificities, and κ coefficients were compared for parents who were positive and negative for any lifetime diagnosis of DSM-III-R alcohol or drug dependence.

Additional analyses were conducted to ensure that correspondence was not influenced by recruitment source (alcohol-dependent families vs community-based comparison families). We also conducted an analysis that limited the sample to 1 report per parent to examine whether a few informants with multiple children were biasing results. For those parents who reported on multiple children, we randomly selected the report that was included in the analysis.

Chi squares were used to evaluate the significance of between-group differences in sensitivities and specificities. Owing to the multitude of comparisons conducted, significant findings are reported at the level of $p < 0.01$.

Finally, the percentage of adolescent cases added by parent report was determined for all categories of substance use and abuse or dependence. Percentage of cases added by parent report (i.e., child report negative, parent report positive) was computed as follows: (cases reported by parent only)/(total cases reported by child or parent).

RESULTS

A comparison of adolescent and parent reports for the entire sample of 12- to 17-year olds is shown in Table 1. Specifically, the table displays the percentage of cases falling into the following categories: (1) negative by both adolescent and parent report; (2) positive by parent report only; (3) positive by adolescent report only; and (4) positive by both adolescent and parent report. Row totals represent the percentage of cases negative and positive by

Table 1. Correspondence Between Adolescent and Parent Reports of Adolescent Substance Use and Lifetime DSM-III-R Abuse or Dependence, Measures of Agreement Between Adolescent and Parent Reports^a

Adolescent report	Parent report			Sensitivity	Specificity	κ
	Negative (%)	Positive (%)	Row total (%)			
<i>Alcohol use</i>				0.50	0.93	0.41
Negative (%)	42.4	3.2	45.6			
Positive (%)	27.1	27.3	54.4			
Column total (%)	69.5	30.5	100			
<i>Alcohol intoxication</i>				0.30	0.99	0.38
Negative (%)	75.5	0.9	76.4			
Positive (%)	16.4	7.2	23.6			
Column total (%)	91.9	8.1	100			
<i>Cigarette use</i>				0.55	0.95	0.52
Negative (%)	53.3	2.7	56.0			
Positive (%)	19.7	24.3	44.0			
Column total (%)	73.0	27.0	100			
<i>Daily smoking</i>				0.66	0.99	0.72
Negative (%)	80.5	1.0	81.5			
Positive (%)	6.3	12.2	18.5			
Column total (%)	86.8	13.2	100			
<i>Marijuana use</i>				0.47	0.97	0.51
Negative (%)	74.6	2.5	77.1			
Positive (%)	12.2	10.7	22.9			
Column total (%)	86.8	13.2	100			
<i>Other drug use^b</i>				0.28	0.99	0.38
Negative (%)	90.8	0.7	91.5			
Positive (%)	6.1	2.4	8.5			
Column total (%)	96.9	3.1	100			
<i>Alcohol abuse or dependence</i>				0.27	0.99	0.37
Negative (%)	90.8	0.7	91.5			
Positive (%)	6.2	2.3	8.5			
Column total (%)	97.0	3.0	100			
<i>Marijuana abuse or dependence</i>				0.26	0.99	0.35
Negative (%)	95.3	0.7	96.0			
Positive (%)	3.0	1.0	4.0			
Column total (%)	98.3	1.7	100			
<i>Other drug abuse or dependence^b</i>				0	1.0	0
Negative (%)	98.8	0	98.8			
Positive (%)	1.2	0	1.2			
Column total (%)	100	0	100			

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis. $N = 560$ to 591 .

^bIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

adolescent report, and column totals represent the percentage of cases negative and positive by parent report.

Adolescent-reported rates of substance use and abuse or dependence were higher than parent-reported rates for every category queried. Alcohol was the most commonly used substance as reported by adolescents, with 54.4% of the entire sample having consumed at least 1 drink of alcohol in their lifetime and 23.6% reporting having been intoxicated. Parent-reported rates were much lower: 30.5% for alcohol use and 8.1% for intoxication. Tobacco was the second most commonly used substance according to adolescent reports (44%), followed by marijuana (22.9%). In comparison, only 27 and 13.2% of adolescents were implicated by parent report for tobacco and marijuana use, respectively. Rates for use of illicit drugs other than marijuana were much lower than for other substances: 8.5% by adolescent report and only 3.1% by parent report.

Parents were clearly less aware of the substance abuse or dependence problems experienced by their children. For the entire sample, 3% of adolescents met the diagnosis for alcohol abuse or dependence by parent report, compared with 8.5% by self-report. The rates for marijuana abuse or dependence were 1.7 and 4%, by parent and adolescent report, respectively. Only 1.2% of adolescents reported drug abuse or dependence, and no diagnoses of drug abuse or dependence were made by parent report.

Sensitivities, specificities, and κ coefficients for the entire sample are also shown in Table 1. For calculation of sensitivity and specificity, the adolescent report was used as the standard. A review of the specificities indicates that parents were quite accurate at reporting negative cases, with values ranging from 0.93 to 1.0. That is, when an adolescent reported never using a substance, the probability was very high that the parent report would agree. However, an examination of sensitivities shows a much

lower level of accuracy for positive cases. That is, when an adolescent reported using a substance, his or her parent was much less likely to agree. Not surprisingly, the highest agreement was for daily smoking ($S_n = 0.66$, $\kappa = 0.72$), a repeated behavior likely to be noticed by parents. When an adolescent reported cigarette, alcohol, or marijuana use, the parent also reported this approximately 50% of the time. The agreement between adolescent and parent reports was lower for more deviant behavior such as alcohol intoxication and substance abuse or dependence, with sensitivities ranging from 0.30 for intoxication to 0 for drug abuse or dependence and κ 's ranging from 0.38 for intoxication and drug use to 0 for drug abuse or dependence.

Sensitivity for parental reports of substance use improved when limiting the sample to only those adolescents who reported abuse or dependence ($S_n = 0.86$ for alcohol use; $S_n = 0.65$ for marijuana use). However, even among this most severe group of adolescents, there were still a number of parents who were not aware of their child's substance use. Of the 49 adolescents who endorsed alcohol abuse or dependence, 14% of their parents did not know that they had ever had a drink of alcohol. Even more striking, among the 23 adolescents who met diagnosis for marijuana abuse or dependence, 35% of their parents did not know they had used marijuana.

Although few in number, some parents were aware of their children's problems with alcohol and marijuana. To more fully understand factors that might enhance parental awareness, data were examined to determine the individual DSM-III-R diagnostic symptoms that parents reported. For both alcohol and marijuana, the symptom most commonly reported by parents was frequent intoxication in hazardous situations or when expected to fulfill major role obligations (2.4% of parents endorsed for alcohol, 2.6% for marijuana). Examples of behaviors that met this criterion included missing school or work because of being hung over and engaging in activities that could result in injury while drunk (e.g., driving a car, riding a bike). This was also one of the most frequently reported symptoms by adolescents (9.2% for alcohol; 3.4% for marijuana). However, adolescents just as often reported tolerance, with 10.9% endorsing tolerance for alcohol and 3.3% for marijuana. In contrast, only 1% of parents reported alcohol tolerance, and less than 1% reported marijuana tolerance.

There were 13 adolescent-parent pairs who agreed on the diagnosis of alcohol abuse or dependence and 6 pairs who agreed on the diagnosis of marijuana abuse or dependence. An examination of the symptoms endorsed, however, indicated that even when there was agreement for overall diagnosis, there was not necessarily agreement for individual symptoms. For both substances, the sensitivity of parent reports was high for frequent intoxication in hazardous situations or when expected to fulfill important role obligations ($S_n = 0.89$ for alcohol; $S_n = 1.0$ for marijuana). Sensitivity was lower for more subjective symptoms such as tolerance and continued use despite

knowledge of recurrent social, psychological, or physical problems caused or exacerbated by the substance. For alcohol, the sensitivity of parent reports was 0.43 for tolerance and 0.62 for continued use; for marijuana, the sensitivity was 0.25 for tolerance and 0.50 for continued use. In some cases, sensitivity was high, but specificity was low, indicating that parents were endorsing symptoms when their children were denying. For example, the sensitivity was 0.83 for using alcohol in greater amounts or over longer periods than intended, whereas the specificity was only 0.33.

Table 2 shows lifetime prevalence rates for 3 age groups: 12- to 13-year-olds, 14- to 15-year-olds, and 16- to 17-year-olds. Adolescent-reported rates were once again higher than parent-reported rates for all categories queried across age groups. Rates of use and abuse or dependence increased steadily with age according to both adolescent and parent reports.

Sensitivities, specificities, and κ 's were calculated separately for the 3 age groups to assess whether agreement varied as a function of adolescent age. As shown in Table 3, specificities were very high across adolescent age, again indicating high levels of agreement for negative cases. Sensitivities and κ 's, however, were generally low to moderate across adolescent age, with the most notable exception being daily smoking among 16- to 17-year-olds ($S_n = 0.80$, $\kappa = 0.81$). Interestingly, an age-related pattern emerged for sensitivity, with values increasing as adolescents grew older. With the exception of alcohol intoxication, sensitivity values were lower for 12- to 13-year olds than for 14- to 17-year-olds for every category of substance use. Sensitivities increased gradually with adolescent age for cigarette, alcohol, and marijuana use, but the only significant differences were for cigarette and alcohol use, with parents exhibiting higher agreement with 16- to 17 year-olds than with 12- to 13-year-olds. However, for daily smoking there was a much more pronounced increase in sensitivity across age groups, with adolescent-parent agreement significantly higher for 16 to 17-year-olds compared with 12- to 13-year-olds and 14- to 15-year olds.

Not surprisingly, adolescent-parent agreement on diagnoses of substance abuse or dependence was weaker than for cases of substance use, although the number of cases was low, especially among younger adolescents. As noted above, no adolescents of any age were diagnosed with drug abuse or dependence by parent report.

As displayed in Table 4, European American adolescents reported higher rates than African American adolescents for every category assessed except marijuana use. In adolescent-parent correspondence, there were no significant differences in the sensitivity of reports provided by African American and European American parents. Sensitivities were similar for use of alcohol, cigarettes, and marijuana, as well as for daily smoking (see Table 4). For alcohol intoxication, other drug use, and substance abuse or dependence, sensitivity values were very low for both

Table 2. Lifetime Prevalence Rates (%) of Adolescent Substance Use and DSM-III-R Substance Abuse or Dependence by Reporter and Adolescent Age^a

	Ages 12 to 13 ^b			Ages 14 to 15 ^c			Ages 16 to 17 ^d		
	Child report	Parent report	Child or parent report	Child report	Parent report	Child or parent report	Child report	Parent report	Child or parent report
<i>Substance use</i>									
Alcohol use	22.4	12.0	27.3	55.2	27.4	58.2	82.0	50.0	84.0
Alcohol intoxication	3.9	1.1	3.9	19.7	5.9	21.8	45.4	16.5	45.9
Cigarette use	29.3	14.9	32.6	45.7	25.6	47.7	55.4	39.2	58.3
Daily smoking	7.2	3.9	8.3	18.1	10.1	18.6	28.9	24.5	30.4
Marijuana use	5.5	4.9	8.2	22.9	13.4	25.9	38.4	20.4	40.3
Other drug use ^e	4.9	0.6	4.9	4.0	1.5	4.5	15.9	6.8	17.4
<i>Substance abuse or dependence</i>									
Alcohol abuse or dependence	1.1	0	1.1	3.1	1.0	3.6	20.6	7.5	22.1
Marijuana abuse or dependence	0	0	0	1.0	0	1.0	10.7	5.1	12.8
Other drug abuse or dependence ^e	0.6	0	0.6	1.0	0	1.0	1.9	0	1.9

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis.

^bN = 178 to 183.

^cN = 188 to 201.

^dN = 194 to 207.

^eIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

European and African American parents (ranging from 0.33 to 0). κ values were moderate to low for these categories (ranging from 0.45 to -0.02).

For specificity, there was one significant ethnic difference in correspondence: for alcohol intoxication, the reports provided by European American parents were more specific than those of African American parents. Therefore, African American parents were more likely to report that their children had been intoxicated when the children themselves denied intoxication.

As shown in Table 5, both self-reported and parent-reported rates of substance use and abuse or dependence

were similar for male and female adolescents. Moreover, there were no significant gender-related differences in the sensitivity or specificity of parent reports.

Adolescent–parent correspondence was also analyzed according to the reporting parent's lifetime history of substance dependence. Parents were categorized based on whether or not they met lifetime DSM-III-R diagnosis for alcohol or drug dependence by personal interview with the SSAGA. The sample was fairly evenly split, with 301 reports given by parents who were negative for substance dependence and 289 reports given by parents who were positive. As shown in Table 6, in general

Table 3. Correspondence Between Adolescent and Parent Reports of Adolescent Substance Use and Lifetime DSM-III-R Abuse or Dependence by Adolescent Age^a

	Ages 12 to 13 ^b			Ages 14 to 15 ^c			Ages 16 to 17 ^d		
	Sensitivity	Specificity	κ	Sensitivity	Specificity	κ	Sensitivity	Specificity	κ
<i>Substance use</i>									
Alcohol use	0.32*	0.94	0.30	0.44	0.93	0.35	0.59	0.89	0.28
Alcohol intoxication	0.29	1.0	0.43	0.19	0.97	0.22	0.35	0.99	0.36
Cigarette use	0.40*	0.95	0.41	0.52	0.96	0.50	0.65	0.93	0.57
Daily smoking	0.39*	0.99	0.47	0.53**	0.99	0.63	0.80	0.98	0.81
Marijuana use	0.40	0.97	0.39	0.46	0.96	0.49	0.48	0.97	0.49
Other drug use ^e	0.11	1.0	0.19	0.25	0.99	0.35	0.33	0.98	0.41
<i>Substance abuse or dependence</i>									
Alcohol abuse or dependence	0	1.0	0	0.17	0.99	0.24	0.29	0.98	0.36
Marijuana abuse or dependence	No cases	1.0	No cases	0	1.0	0	0.29	0.98	0.34
Other drug abuse or dependence ^e	0	1.0	0	0	1.0	0	0	1.0	0

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis.

^bN = 178 to 183.

^cN = 188 to 201.

^dN = 194 to 207.

^eIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

* $p < 0.01$, significant difference between 12- to 13-year-olds and 16- to 17-year-olds.

** $p < 0.01$, significant difference between 14- to 15-year-olds and 16- to 17-year-olds.

Table 4. Lifetime Prevalence Rates (%) of Adolescent Substance Use and DSM-III-R Substance Abuse or Dependence and Correspondence Between Adolescent and Parent Reports by Ethnicity^a

	African American 12- to 17-year-olds ^b						European American 12- to 17-year-olds ^c					
	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ
<i>Substance use</i>												
Alcohol use	48.1	25.6	51.9	0.45	0.93	0.39	56.4	31.8	59.3	.51	.93	.42
Alcohol intoxication	17.5	6.4	20.6	0.18	0.96*	0.19	25.3	8.7	25.5	0.33	0.99	0.42
Cigarette use	29.3	16.5	33.1	0.44	0.95	0.44	48.2	30.2	50.7	0.57	0.95	0.53
Daily smoking	7.5	6.0	8.3	0.70	0.99	0.76	21.6	15.1	22.7	0.65	0.99	0.71
Marijuana use	28.6	15.0	31.6	0.42	0.96	0.44	21.1	12.2	23.3	0.47	0.97	0.53
Other drug use ^d	3.0	0	3.0	0	1.0	0	10.0	4.0	10.9	0.31	0.99	0.41
<i>Substance abuse or dependence</i>												
Alcohol abuse or dependence	5.3	1.5	6.1	0.14	0.99	0.20	9.1	3.2	9.8	0.28	0.99	0.38
Marijuana abuse or dependence	3.0	1.5	4.5	0	0.98	-0.02	4.1	1.8	4.6	0.33	0.99	0.45
Other drug abuse or dependence ^d	0.8	0	0.8	0	1.0	0	1.3	0	1.3	0	1.0	0

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis.

^bN = 126 to 133.

^cN = 427 to 451.

^dIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

*p < 0.01.

adolescent-reported prevalence rates were slightly higher among adolescents whose reporting parent had a history of substance dependence.

For sensitivity, there was a tendency for parents with a history of substance dependence to exhibit greater agreement with adolescent reports of positive cases. However, the only difference that reached significance was for cigarette use, with reports of parents with a history of substance dependence being more sensitive than those of parents without a history of substance dependence.

Conversely, the reports of parents without a history of substance dependence tended to be more specific, with differences reaching significance for alcohol use and

marijuana use. Thus, parents who themselves had experienced problems with alcohol or drugs were more likely to implicate their children as having used alcohol and marijuana when the children themselves reported never using these substances. κ values were very similar for the 2 groups for all categories.

Data were also analyzed to determine the percentage of cases of substance use and abuse or dependence added by parent report (i.e., child report negative, parent report positive). For the entire sample of 12- to 17-year-olds, parent reports added very few cases of substance use and abuse or dependence (see Table 7). Fewer than 10% of cases were added by parent report for all categories of

Table 5. Lifetime Prevalence Rates (%) of Adolescent Substance Use and DSM-III-R Substance Abuse or Dependence and Sensitivity and Specificity of Parent Reports by Adolescent Gender^a

	Male 12- to 17-year-olds ^b						Female 12- to 17-year-olds ^c					
	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ
<i>Substance use</i>												
Alcohol use	52.8	32.9	55.8	0.57	0.94	0.49	56.1	28.0	59.5	0.44	0.92	0.34
Alcohol intoxication	25.2	7.7	26.6	0.25	0.98	0.30	21.9	8.4	22.3	0.37	0.99	0.46
Cigarette use	41.8	26.3	45.1	0.55	0.94	0.52	46.3	27.9	48.4	0.56	0.96	0.53
Daily smoking	17.9	13.1	18.5	0.70	0.99	0.77	19.2	13.2	20.6	0.62	0.98	0.68
Marijuana use	25.3	16.3	28.6	0.51	0.96	0.53	20.4	10.0	22.1	0.41	0.98	0.47
Other drug use ^d	9.9	3.3	10.3	0.30	0.99	0.42	6.9	2.8	8.0	0.25	0.99	0.33
<i>Substance abuse or dependence</i>												
Alcohol abuse or dependence	9.6	2.7	10.3	0.21	0.99	0.30	7.4	3.2	8.1	0.33	0.99	0.44
Marijuana abuse or dependence	5.1	1.7	5.4	0.27	0.99	0.38	2.8	1.8	3.9	0.25	0.99	0.29
Other drug abuse or dependence ^d	1.3	0	1.3	0	1.0	0	1.0	0	1.0	0	1.0	0

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis.

^bN = 286 to 302.

^cN = 274 to 289.

^dIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

Table 6. Lifetime Prevalence Rates (%) of Adolescent Substance Use and DSM-III-R Substance Abuse or Dependence and Sensitivity and Specificity of Parent Reports by Parent's Lifetime Diagnosis of DSM-III-R Substance Dependence^a

	Parent negative for substance dependence ^b						Parent positive for substance dependence ^c					
	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ	Child report	Parent report	Child or parent report	Sensitivity	Specificity	κ
<i>Substance use</i>												
Alcohol use	53.2	25.9	54.5	0.46	0.97*	0.42	55.9	35.4	61.1	0.54	0.88	0.40
Alcohol intoxication	22.7	7.3	23.4	0.29	0.99	0.37	24.5	8.8	25.6	0.31	0.99	0.38
Cigarette use	41.2	20.8	42.9	0.46*	0.97	0.47	47.1	33.6	50.9	0.63	0.93	0.57
Daily smoking	15.6	9.2	16.0	0.56	0.99	0.67	21.4	17.3	23.2	0.73	0.98	0.76
Marijuana use	19.6	8.0	20.6	0.36	0.99*	0.44	26.4	18.8	30.6	0.55	0.94	0.55
Other drug use ^d	8.3	2.0	8.3	0.24	1.0	0.37	8.7	4.2	10.0	0.32	0.98	0.40
<i>Substance abuse or dependence</i>												
Alcohol abuse or dependence	6.5	2.1	6.9	0.26	0.99	0.38	10.5	3.9	11.6	0.27	0.99	0.35
Marijuana abuse or dependence	4.1	1.7	4.7	.25	0.99	0.34	3.9	1.8	4.3	0.27	0.99	0.36
Other drug abuse or dependence ^d	1.3	0	1.3	0	1.0	0	1.0	0	1.0	0	1.0	0

^aCases where either child or parent report was missing were omitted from the analysis for that particular diagnosis.

^b $N = 286$ to 301.

^c $N = 273$ to 289.

^dIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

* $p < .01$.

substance use and abuse or dependence, with the exception of marijuana abuse or dependence (15.3%).

When stratifying adolescents by age, results indicated that although sensitivity was the lowest for the 12- to 13-year-olds, the percentage of cases added by parent reports was the greatest for this age group for use of cigarettes, alcohol, and marijuana. For 12- to 13-year-olds, parent reports increased cases of cigarette use by 10.2%, alcohol use by 17.9%, and marijuana use by 33.4% as compared with 5, 2.3, and 4.8%, respectively, for 16- to 17-year olds. However, these percentages are based on very low baseline prevalence rates among 12- to 13-year-olds, so the actual number of cases added was very small. There were few cases of drug use or substance abuse or dependence reported for 12- to 15-year-olds, making it difficult to compare the benefit of parent reports across age groups for these categories. For 16- to 17-year-olds, however, parent reports were not particularly informative for these diagnoses, adding 6.8% of cases of alcohol abuse or dependence, 16.3% of cases of marijuana abuse or dependence, and no cases of drug abuse or dependence.

Additional analyses were conducted to ensure that correspondence was not influenced by recruitment source (alcohol-dependent families vs community-based comparison families). There were no significant differences in sensitivities or specificities based on family type.

A separate analysis was also conducted that limited the sample to 1 report per parent ($n = 428$) to examine whether a few parents who reported on multiple children were biasing results. For those parents who reported on more than 1 child, we randomly selected the report that was included in the analysis. There were no significant differences between sensitivities and specificities when using all

Table 7. Percentage of Cases Added by Parent Reports for Adolescent Substance Use and Lifetime DSM-III-R Substance Abuse or Dependence (by Adolescent Age)^a

	Ages 12 to 17	Ages 12 to 13	Ages 14 to 15	Ages 16 to 17
<i>Substance use</i>				
Alcohol use	5.5	17.9	5.1	2.3
Alcohol intoxication	3.8	0	9.7	1.2
Cigarette use	5.8	10.2	4.2	5.0
Daily smoking	5.2	13.5	2.7	4.9
Marijuana use	9.9	33.4	11.5	4.8
Other Drug use ^b	7.0	0	11.6	8.4
<i>Substance dependence</i>				
Alcohol abuse or dependence	7.7	0	15.0	6.8
Marijuana abuse or dependence	15.3	No cases	0	16.3
Other drug abuse or dependence ^b	0	0	0	0

^aCases added by parent reports = (cases diagnosed by parent report only)/(cases diagnosed by child or parent report).

^bIncludes 6 drug categories that were combined for analysis: cocaine, other stimulants, sedatives, opiates, hallucinogens, and other drugs, not including marijuana.

parent reports ($N = 591$) and when limiting the analysis to 1 report per parent.

DISCUSSION

In the current study, adolescents of all ages reported higher rates of substance use and abuse or dependence than their parents for every type of substance assessed. Parents were somewhat knowledgeable regarding their children's use of cigarettes, alcohol, and marijuana, substantiating adolescent reports about 50% of the time. However, the results indicated that parents were largely

unaware of other drug use and of problems experienced because of substance use.

It is important to note that although we reported rates of substance abuse or dependence for the overall sample, discrepancies in agreement between parent and adolescent reports still remained if reports of abuse or dependence were made conditional on parental knowledge of use. For example, for alcohol abuse or dependence, overall prevalence rates were 3% by parent report and 8.5% by adolescent report. When we restricted the sample to only those who reported alcohol use, rates of alcohol abuse or dependence increased to 9.4% by parent report and 15.3% by adolescent report. The results were similar for marijuana. Although both adolescent and parent-reported rates of alcohol and marijuana abuse or dependence increased when made conditional on knowledge of use, parents still substantially underreported problem use in their children. Furthermore, no parents reported any drug abuse or dependence in their children.

A number of factors were examined that could potentially affect agreement between adolescent and parent reports of substance use and abuse or dependence. There were no differences in correspondence based on adolescent gender. Although there were a few significant differences found for ethnicity and parental substance dependence, it is questionable whether these differences were meaningful. It is our conclusion that age of the adolescent is the only factor that appears to affect adolescent–parent correspondence for reports of substance use and abuse or dependence.

Sensitivities increased with adolescent age, indicating a tendency for greater agreement between the reports of parents and older adolescents for substance use and problem use. With the exception of alcohol intoxication, sensitivities were lowest for 12- to 13-year-olds for every category of substance use. The greatest age-related difference in sensitivity was observed for daily smoking, with adolescent–parent agreement significantly higher for 16- to 17-year-olds than for 12- to 15-year-olds. This finding perhaps reflects a greater willingness to smoke in front of parents as the adolescent approaches adulthood. Unlike marijuana, use of tobacco is not illegal, and unlike alcohol, there are no age restrictions on its use (although there are age restrictions on the purchase of tobacco products).

It is possible that frequency of use and severity of use are moderating the age-related differences in adolescent–parent agreement. The trend for increased agreement between the reports of parents and older adolescents may in part be due to the fact that older adolescents have used substances more often, thereby presenting greater opportunity for parents to become aware of their use.

For severity, there is evidence that older adolescents have experienced more substance-related problems than younger adolescents. For example, when restricting the sample to only those adolescents who endorsed alcohol use, we found that a higher percentage of 16- to

17-year-olds also endorsed intoxication (52.1%) and abuse or dependence (24.3%) compared with 12- to 13-year-olds (17.1 and 4.9%, for intoxication and abuse or dependence, respectively). Thus, the higher sensitivity of parental reports for 16- to 17-year-olds might be because the older adolescents have a more severe syndrome.

In keeping with this, sensitivity for parental reports of adolescent alcohol *use* improved when looking only at those adolescents who reported abuse or dependence (i.e., the most severe group). For example, of the 49 adolescents who endorsed alcohol abuse or dependence, nearly 86% of parents reported that their child had used alcohol. Furthermore, 3 adolescents reported receiving treatment for their drinking. All parents of these teens reported that their child had been intoxicated. Although this was a very small number, parent reports for alcohol abuse or dependence were much more sensitive among this severely affected group than for the entire sample ($S_n = 0.67$ vs $S_n = 0.27$, respectively). Adolescents were not asked whether they had ever received treatment for marijuana or other drugs.

Another potential explanation for why sensitivities were the lowest among the youngest adolescents is that the 12- to 13-year-olds may be less reliable reporters than the older adolescents. In addition to low sensitivity, we also found that parent reports added a higher percentage of cases of alcohol, cigarette, and marijuana use for this age group compared with the others. That is, compared with 14- to 17-year-olds, there was a greater probability that parents would implicate 12- to 13-year-olds for use when the children themselves denied use. If the age-related differences were only due to lack of awareness on the part of parents of 12- to 13-year-olds, then they likely would not be reporting use when their children denied. Given the small number of cases among 12- to 13-year-olds, however, these age-related results must be interpreted with caution.

Regardless of the reason, the low sensitivity of parent reports for young adolescents is troublesome considering that early onset of alcohol and drug use is a risk factor for future development of abuse and dependence (Grant and Dawson, 1998; Grant et al., 2001). In addition, early-onset smoking has been found to be a significant predictor of lifetime drinking and development of alcohol abuse and dependence (Grant, 1998). Unfortunately, the current data demonstrate that parents are unaware of early-onset smoking and alcohol and drug use in their young adolescent children who are at high risk for future abuse and dependence.

There were essentially no differences in the sensitivity and specificity of reports for European American and African American families. There was only one statistically significant difference between ethnic groups, with reports of European American parents being more specific than those of African American parents for alcohol intoxication. However, given the small number of cases this finding is based on, it is not clear whether this is a meaningful difference.

The sensitivity of parental reports was not different for sons and daughters. This is not surprising given that underage drinking and use of illegal drugs are behaviors that both genders are likely to hide from parents. Other studies that have looked at the effect of adolescent gender on parent-child agreement have not yielded consistent findings. Some investigators have found no differences in parent-child agreement based on gender of the child (Cantwell et al., 1997; Choudhury et al., 2003), but others have reported greater parental agreement with daughters (e.g., Seiffge-Krenke and Kollmar, 1998) and yet others with sons (Sourander et al., 1999; Waters et al., 2003).

Given the small percentage of parent reports provided by biological fathers, we did not have adequate power to test the potential effects of parent's gender on agreement. However, we did conduct a separate analysis of adolescent gender using only reports provided by mothers ($n = 505$). Results were unchanged when reports provided by biological fathers and other parent figures were excluded from the analysis.

Finally, the effect of the reporting parent's psychopathology on agreement was examined. As noted by Rowe and Kandel (1997), parents might project their own symptomatology onto their children. For example, studies of maternal depression have shown that depressed mothers tend to overreport symptoms of depression in their children (Fergusson et al., 1993). Alternatively, parents who themselves have experienced substance-related problems might be better able to recognize the signs and symptoms in their children, thus resulting in higher levels of agreement for reports of use and abuse or dependence.

In the current study, we found some evidence to support both of these hypotheses. Parents with a history of substance dependence had significantly higher levels of agreement with their children for reports of cigarette use, suggesting heightened awareness. However, they were also significantly more likely than parents without a history of substance dependence to implicate their children for alcohol and marijuana use when their children denied use. When taken overall, parental substance dependence does not appear to be a major factor affecting adolescent-parent correspondence. This is in keeping with a previous study by O'Donnell et al. (1998), which found that parental psychoactive substance use disorder was not a significant predictor of parental awareness of substance use disorder in sons.

The current findings have obvious methodological implications for investigators conducting research on adolescent substance use disorders. One potential benefit of obtaining reports from parents in addition to adolescents is that parents might increase the number of cases of a particular diagnosis, due to underreporting on the part of the child. In the current study, parent reports added few cases of substance use or abuse or dependence, particularly compared with nonsubstance-related diagnoses. For example, Cantwell et al. (1997) found that among a

sample of 14- to 18-year-olds, parent reports added 64.3% of ADHD diagnoses and 58.3% of ODD diagnoses. For purposes of comparison, we also looked at a few non-substance-related diagnoses. We found that parent reports added a substantial percentage of cases for both externalizing and internalizing disorders: ADHD (71.2%), ODD (56.2%), anxiety disorders (36.6%), and major depression (27.9%). In contrast, for substance use the percentage of cases added by parent report was only 5.8% for cigarettes, 5.5% for alcohol, and 9.9% for marijuana. For substance abuse or dependence, parent reports added 7.7 and 15.3% of cases for alcohol and marijuana, respectively. Although adolescent-reported rates of other drug abuse or dependence were low, no cases were added by parent report. Thus, these data do not support the notion that a large number of cases of substance use and problem use are missed when parent reports are not obtained.

The current study also has implications for clinicians and researchers assessing adolescents with substance use disorders. In the current study, parents were most likely to be aware of overt, observable symptoms of substance abuse or dependence, such as intoxication in hazardous situations or when expected to fulfill role obligations, and they were virtually unaware of more subjective symptoms such as tolerance. Thus, parents do report some symptoms of substance use disorders; however, adolescent reports add important, less observable symptoms. In addition, although the validity of adolescent self-reports of substance use in clinical settings is well established (Waldron et al., 2001; Winters et al., 1990/1991, 1997, 2002), the current findings provide even further support for using self-report as a preferred method in assessments of adolescent substance use in community-based settings.

One limitation of the current study is that we do not know which informant is telling the "truth." The assumption herein is that adolescents are accurately reporting their experiences and that parents are underreporting due to lack of awareness. The possibility exists, however, that adolescents are exaggerating their use of substances and that parent reports are more accurate. Although possible, we do not think that this is probable given that the lifetime prevalence rates reported by adolescents in the current study are consistent with or, in many cases, lower than, those reported by adolescents in the Monitoring the Future study (Johnston et al., 2005) during the same time period (1991-1998). In addition, Young et al. (2002) reported rates of DSM-IV alcohol abuse or dependence as follows: 0.4% for 12- to 13-year-olds, 3.5% for 14- to 15-year-olds, and 18.4% for 16- to 17-year-olds. These rates are very similar to the DSM-III-R rates of alcohol abuse or dependence reported in the current study: 1.1, 3.1, and 20.6%, for 12- to 13-year-olds, 14- to 15-year-olds, and 16- to 17-year-olds, respectively.

Another limitation of the study is that the majority of parent reports were provided by biological mothers

(85.5%), with only 12.9% provided by biological fathers. Given the low number of reports from fathers, we were not able to analyze the potential effects of parent's gender or interactions between gender of the parent and gender of the child.

Finally, a large portion of participants in the current study was recruited from families with one or more alcohol-dependent members (at least one of whom sought treatment for their alcoholism). Although this was not a representative sample, findings are consistent with those from previous studies of adolescent-parent agreement.

To summarize, when assessing adolescent substance use and abuse or dependence, the current findings suggest that researchers and clinicians must question adolescents directly, regardless of age, ethnicity, gender, or parental history of substance dependence. Furthermore, investigators could save time and resources by limiting the number of questions asked of parents so that only basic information regarding substance use is obtained or by omitting parent reports about substance use altogether, particularly for older adolescents. Although parent reports did add some information about adolescent substance use and abuse or dependence, the gain was minimal when considering the amount of time and effort involved in obtaining the information.

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