Parental Awareness of Substance Use Among Youths in Public Service Sectors*

AMY E. GREEN, PH.D., NICOLE M. BEKMAN, PH.D.,[†] ELIZABETH A. MILLER, B.A., JENNIFER A. PERROTT, B.A., SANDRA A. BROWN, PH.D.,[†] AND GREGORY A. AARONS, PH.D.[†]

Department of Psychiatry, University of California, San Diego, 9500 Gilman Drive (MC 0812), La Jolla, California, 92093-0812

ABSTRACT. Objective: When asked about substance use, youths typically endorse higher levels of use than parents, suggesting that parents are often unaware of their child's drug and alcohol use. This study sought to examine the level of concordance between reports of youths enrolled in public sectors of care and their parents, and identify potential predictors of parental awareness of substance use and related problems. **Method:** Youths receiving services in one or more public sectors of care ($N = 985$; 67% male) and their parents were interviewed about the youths' substance use and substance use problems, as well as associated demographic, parental, and youth factors. **Results:** As has been found in other studies, youths generally reported higher rates of substance use and substance use problems compared with parents. Rates of agreement ranged from $\kappa = .24$ (sedatives) to $\kappa = .67$ (marijuana) and

were higher for drug problems ($\kappa = .47$) than for alcohol problems ($\kappa = .34$). Predictors of parental awareness of drug problems included youth gender (male), race (White compared with Hispanic), and higher ratings of youth's functional impairment. Predictors of parental awareness of alcohol problems included race (White compared with Hispanic), lower levels of youth-reported parental monitoring, lower levels of parental depression, and higher ratings of youth functional impairment. **Conclusions:** In this high-risk population, a significant proportion of parents are unaware of their child's alcohol (30%) and substance use (50%) problems. Services geared toward enhancing parental awareness, especially for parents of Hispanic and female youths, may increase communication and treatment seeking. (*J. Stud. Alcohol Drugs*, 72, 44-52, 2011)

ALTHOUGH THERE HAVE BEEN RECENT minimal declines in the prevalence of youth substance use (Johnston et al., 2009), levels remain high and represent a significant public health concern. Roughly 47% of youths report lifetime illicit drug use, and 72% report consuming alcohol before the end of high school (Johnston et al., 2009). Parental monitoring, family communication, and perceived family sanctions have consistently been found to be protective of youth substance use (Chilcoat and Anthony, 1996; Dishion et al., 2003; Kelly et al., 2002; Steinberg et al., 1994). Parents' awareness of their child's substance involvement is imperative, because parents have the potential to modify their parenting practices or seek professional assistance.

Correspondence between parental and youth report of substance use

General population studies have consistently found only moderate levels of agreement for substance use, with higher rates of reported use among youths compared with their parents (Cantwell et al., 1997; Fisher et al., 2006; Friedman,

1988; O'Donnell et al., 1998; Substance Abuse and Mental Health Services Administration, 2008; Williams et al., 2003). Williams and colleagues (2003) found that 46% of youths reported past-month alcohol use and 11% of youths reported past-month drug use, compared with parents' reports of 18% and 2% for alcohol and drug use, respectively ($\kappa = .33$ for alcohol use, $\kappa = .20$ for illicit drug use). Other research found that parents were aware of their child's drug and alcohol use in only half of reported cases (Fisher et al., 2006).

Similarly, there are generally low levels of agreement between parents and children when reporting symptoms of youth alcohol and substance use disorders, with higher reports of the youth abuse/dependence symptoms from youths than from their parents. This is similar to literature describing low parent-youth agreement for symptoms of other forms of youth psychopathology (Achenbach et al., 1987; Cantwell et al., 1997). Cantwell and colleagues (1997) found that youths and parents had the lowest level of agreement when reporting alcohol abuse/dependence symptoms ($\kappa = .19$) and an average level of agreement about substance abuse/dependence ($\kappa = .41$) compared with other major psychiatric diagnostic categories assessed in this study (overall $\kappa = .42$). Fisher et al. (2006) found comparable rates of agreement for alcohol abuse/dependence ($\kappa = .37$) and marijuana abuse/dependence ($\kappa = .35$), whereas O'Donnell et al. (1998) found moderate rates of diagnostic agreement for alcohol abuse/dependence ($\kappa = .44$) and low agreement for drug abuse/dependence ($\kappa = .29$). Despite differing levels of agreement, most studies consistently find greater levels of substance-related problems among youth reporters compared

Received: April 18, 2010. Revision: June 21, 2010.

*This research was supported by National Institutes of Health grants U01MH055282 and R01MH072961.

[†]Correspondence may be sent to Gregory A. Aarons at the above address or via email at: gaarons@ucsd.edu. Nicole M. Bekman and Sandra A. Brown are also with the Department of Psychology, University of California, San Diego, La Jolla, CA.

with their parents (Cantwell et al., 1997; Fisher et al., 2006; O'Donnell et al., 1998).

Although it would be expected that parents may be more aware of their child's alcohol and substance use if they are receiving treatment, studies focusing on youth substance use in treatment populations have found similar levels of parent-youth agreement (Donohue et al., 2004; McGillicuddy et al., 2007). McGillicuddy and colleagues (2007) found low to moderate agreement for reporting of youth alcohol ($\kappa = .21$), marijuana ($\kappa = .43$), and other illicit drug use ($\kappa = .31$) in the past 180 days among a sample of youths whose parents enrolled in a study designed to examine stress associated with their child's substance use. Although levels of agreement remained low, the percentage of youths and parents reporting that the youth had used was high and comparable (i.e., 90% of youths and 86% of parents reported that the youth used alcohol in the past 180 days). Donohue and colleagues (2004) found moderate interclass correlations of .43-.53 between parental and youth report of youth's past-month daily use of alcohol, marijuana, and hard drugs upon entering an outpatient treatment facility for substance use problems.

Predicting parental awareness of youth report of substance use and substance use disorders

Overall, past studies suggest that parents are often not aware of youth substance use and of symptoms of substance use disorders that their child is experiencing. Only a few studies, however, have addressed this discordance by examining predictors of parental awareness (Bogenschneider et al., 1998; McGillicuddy et al., 2007; O'Donnell et al., 1998; Williams et al., 2003). These studies have generally focused on parent- and child-level predictors but have been limited in the ethnic/racial composition of their samples, suggesting the need for replication with larger diverse groups.

Demographic predictors. Although there is a lack of data on the effects of race as a predictor variable, prevalence rates of parental awareness suggest that parents of White youths are more likely to be aware that their child was drinking while out than parents of Black youths (Beck et al., 1999). In addition, research with Hispanic families suggests that differences in acculturation between parents and children lead to decreased communication and increased risk for youth substance use (Martinez, 2006). Although males have significantly higher substance use rates (Johnston et al., 2009), youth gender has typically failed to differentiate aware from unaware parents in predictive models to date (Bogenschneider et al., 1998; McGillicuddy et al., 2007; Williams et al., 2003). Mixed results have been found regarding youth age; younger age has been related to parental awareness of youth substance use disorder (O'Donnell et al., 1998), whereas older youth age has been related to awareness of past-month use of alcohol (Williams et al., 2003) and concordance of daily substance use (McGillicuddy et al., 2007).

Child-level predictors. In addition to the demographic characteristics of the child, higher levels of youth functional impairment, as measured by the Global Assessment of Functioning score (O'Donnell et al., 1998), have been found to predict greater parental awareness of youth substance use disorder. The presence of co-occurring bipolar disorder also has been related to increased parental awareness of youth substance use disorders (O'Donnell et al., 1998), whereas co-occurring conduct disorder has been associated with awareness of illicit drug use (Williams et al., 2003).

Parent-level predictors. Parental substance use and distress have also been examined as predictors of youth substance use awareness. Higher levels of parental distress (McGillicuddy et al., 2007) have been related to decreased parental awareness of daily substance use. Mixed results have been found with regard to parental substance use, with one study finding parental alcohol or marijuana use to increase awareness of youth alcohol use (Williams et al., 2003), whereas another found parental alcohol use to negatively predict awareness of daily substance use (McGillicuddy et al., 2007).

Discrepant results have also been found with regard to parental monitoring. Williams et al. (2003) failed to find a significant relationship between parental monitoring and parental awareness of past-month alcohol use, whereas McGillicuddy and colleagues (2007) found higher levels of parent-reported monitoring predicted smaller differences between youth and parental report of youth's daily substance use. The latter study, however, relied on reports from parents who self-referred to the project based on stress related to their child's substance use, limiting the generalizability of the findings. A third study examining the differences between aware and unaware parents with regard to youth alcohol use found significantly higher mean levels of mothers' reported parental monitoring among unaware parents (Bogenschneider et al., 1998). This variable was not significant once entered into multivariate analyses, however. These results concur with findings that parents who report higher levels of parental monitoring are more likely to underestimate youth risk behaviors (Yang et al., 2006). However, these studies all relied on parents' perceptions of their monitoring behaviors, which may be limited if parents are poor judges of how well they monitor their youth's behavior (Williams et al., 2003).

Current study

Past research suggests that parents are often unaware of the extent to which their children use substances. These findings hold true in both general population samples and for families with youths involved in substance use treatment. The present study examined this relationship among a high-risk group of youths and parents to determine both the level of agreement for substance use and substance use

problems, as well as factors related to parental awareness of youth-reported substance use problems. This information is particularly valuable in families whose children are receiving care in the public sector because these youths have such high rates of alcohol and substance use (Aarons et al., 2001; McClelland et al., 2004; Pilowsky and Wu, 2006).

We hypothesized that parents of older and male youths would have greater awareness of their child's substance use given the increased likelihood of use among these populations. Following from past research on the base rates of parental awareness of substance use (Yang et al., 2006), we expected parents of White youths to be more aware of their child's substance use than parents of Black or Hispanic youths. We also hypothesized that greater levels of youth-reported parental monitoring and significant levels of parent-reported youth functional impairment would predict awareness. Parental depression and parental substance use were hypothesized to reduce parents' ability to be aware of problems in their offspring. Lastly, although differences in sample size do not allow us to examine specific differences among the five sectors of care, we hypothesized that parents of youths who were involved in more than one service sector would be more aware of their substance use, as a result of increased monitoring and feedback by service providers and higher levels of child impairment.

Method

Participants

Participants were drawn from a representative group of youths ages 11-18 ($N = 1,418$) who were receiving care in one or more San Diego County, CA, public sectors of care (alcohol/drug treatment, child welfare, juvenile justice, mental health, and serious emotional disturbance in the public schools) at time of enumeration. For 80% of the cases, both adult and youth respondents were available; for 15%, only adult informant data concerning the youth were obtained; and for 5%, only youth informant data were obtained. The resulting final sample comprised 985 dyads with substance use data available from both respondents. Of the eligible sample, 67% were male; 35% were White (non-Hispanic), 31% were Hispanic, 22% were Black, and 12% were classified as "other" (Asian/Pacific Islander, American Indian, biracial, or other). The mean age at the time of the interview was 15.5 ($SD = 2.25$) years old. About a third (34%) of the sample was involved in more than one sector of service at enumeration. Five percent were active in alcohol and drug services, 53% in mental health, 30% in special education, 30% in juvenile justice, and 23% in child welfare. Biological parents, adoptive parents, and stepparents were the primary adult respondents (80%), followed by close relatives (10%), and foster parents (8%). The term *parent* will be used in the current study to describe this set of caregivers, because

parents comprised a large majority of adult respondents. The sample was stratified by service sector affiliation, race/ethnicity, and level of restrictiveness of treatment setting (i.e., home vs. aggregate care setting). As described in the analyses section, the sample is representative of youths involved with these service sectors in San Diego County.

Measures

Outcome variables

COMPOSITE INTERNATIONAL DIAGNOSTIC INTERVIEW—SUBSTANCE ABUSE MODULE (CIDI-SAM): The CIDI-SAM (Cottler et al., 1989) is a highly structured diagnostic interview that provides diagnoses for tobacco, alcohol, marijuana, and other substance use disorders, according to criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994). Interrater reliability, test-retest reliability, and diagnostic validity have been well documented, specifically with regard to substance use disorders (Cottler and Compton, 1993; Cottler et al., 1989). Minor modifications were made to a few questions to make them more appropriate for younger youths. Lifetime youth substance abuse/dependence was determined based on DSM-IV criteria and categorized as either alcohol use disorder (met lifetime criteria for alcohol dependence or abuse) or drug use disorder (met lifetime criteria for cannabis, cocaine, opiate, methamphetamine, or hallucinogen dependence or abuse).

PERSONAL EXPERIENCE INVENTORY: The Personal Experience Inventory (PEI) is a standardized alcohol and drug use and problem severity inventory (Winters and Henley, 1989). It was developed specifically for use with clinical and community samples of youths, and good psychometric properties have been demonstrated for the instrument. The PEI was used both as a measure of lifetime substance use for alcohol, marijuana, cocaine, heroin, amphetamine, and hallucinogens and as a screening tool. Participants who reported any lifetime substance use on the PEI completed the full CIDI-SAM. Lifetime substance use was dichotomized for each substance as (0) never used or (1) used at least once.

PARENTAL REPORT OF CHILD SUBSTANCE USE: This measure, designed for the current study, mirrors the youth-reported PEI. For the parental report of child substance use, the stem "Have you ever used..." was changed to "Has your child ever used..." alcohol, marijuana, cocaine, heroin, amphetamines, and hallucinogens. The measure also asks parents whether their child has ever had problems related to their drug or alcohol use at school, at work, or with the police, family, or friends. Responses to these questions were used to designate parental report of youth alcohol problems and youth drug problems. Lifetime substance use was dichotomized for each substance as (0) never used or (1) used at least once.

Predictor variables

DEMOGRAPHIC INFORMATION: Data regarding youth's age, gender, race, and service sector at enumeration were compiled from administrative data. For youth race/ethnicity, participants were classified as White (non-Hispanic), Hispanic, Black, or other (biracial, Asian American, Pacific Islander, American Indian, other). A dichotomous variable was created to identify youths who were involved in multiple service sectors.

PARENTAL MONITORING: Youth-reported parental monitoring was assessed using five items from the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study's Service Utilization and Risk Survey to examine youth's perception of their parent's knowledge and regulation of their activities in and outside the home ($\alpha = .77$).

PARENTAL DEPRESSION: The Center for Epidemiological Studies–Depression (CES-D) scale is a 20-item scale developed as an epidemiological tool for assessing depressive symptomatology in community studies (Radloff, 1977). CES-D scores range from 0 to 60. A cutoff score of >16 can be used to estimate clinical depression. The scale was found to be reliable in the current sample ($\alpha = .92$), and scores were dichotomized to indicate clinical levels of depression.

PARENT-RATED YOUTH FUNCTIONAL IMPAIRMENT: The Columbia Impairment Scale is a brief scale of functional impairment designed for epidemiological studies because it does not require clinical judgment and thus can be administered by "lay" interviewers (Bird et al., 1993). The instrument measures impairment across four areas of functioning: (a) interpersonal relations, (b) psychopathology, (c) functioning in work or school, and (d) use of leisure time. Factor analysis revealed that these subscales can be combined to assess a single factor of overall impairment ($\alpha = .88$). The 13 items are scored on a Likert-type scale, ranging from (0) no problem to (4) a very big problem. A cutoff score of >15 on the Columbia Impairment Scale has been recommended to discriminate those with definite impairment (Bird et al., 1996) and was used to dichotomize impairment in the current sample.

PARENTAL SUBSTANCE USE PROBLEMS: Data on parental substance use problems were adapted from the MECA Family History section of the Service Utilization and Risk Factors Interview (Lahey et al., 1996). For alcohol and substance use problems, parents were asked to report on whether they had ever been thought to have an alcohol or drug problem.

Procedures

Bachelor's-level interviewers completed approximately 100 hours of training that included administration of structured interviews, specific training on the CIDI-SAM, and cultural competence. Bimonthly quality assurance checks

were conducted. Informed consent was obtained from parents and assent from youths. Parents were interviewed about the child's demographics, psychological symptoms, service use history, and exposure to risk factors. Youths also reported on their psychological symptoms and service use history. Parents were paid \$40, and youths were paid \$15 for their participation. This study was approved by the appropriate institutional review boards.

Analyses

Prevalence and agreement. The McNemar test, which accounts for matched-pair data (McNemar, 1969), was used to compare the proportion of youth- and parent-reported lifetime substance use and problems. Kappa statistics were computed to determine level of agreement on types of substance use (alcohol, marijuana, cocaine, opiate, hallucinogens, amphetamines, sedatives, and inhalants), lifetime alcohol use problems, and lifetime drug use problems that youths may have experienced. Confidence intervals (95%) surrounding kappa values were created using the standard errors to allow for the comparison of significant differences in levels of agreement. Kappa values without overlapping confidence intervals are significantly different at $p < .05$. Sensitivity and specificity analyses were also conducted using youth's report as the standard in order to elucidate the patterns of agreement beyond that provided by the kappa statistic for each substance and substance use disorder category.

Predictors of parental awareness. We conducted analyses to predict when parents were aware of their child's self-report of lifetime substance use problems. This subsample consists of all youths who reported either a lifetime drug use disorder or alcohol use disorder. Logistic regression analyses were used to predict the likelihood of parental awareness of a youth-reported drug or alcohol problem. Potential predictors included (a) demographic factors (age, gender, minority status), (b) child-level factors (functional impairment, multisector involvement), and (c) parent-level factors (parental monitoring, parental depressive symptoms, parental substance use problem).

Weighting. A poststratification weighting procedure was used to ensure that the data reflected the proportions of groups in the total population of service users (Henry, 1990). Sample weights were applied in all analyses. We report both the actual n and adjusted proportions.

Results

Substance use prevalence and agreement

Table 1 summarizes the prevalence and agreement of lifetime substance use from the PEI questions, as well as the presence of lifetime substance use problems based on youth CIDI-SAM diagnosis and parental report of youth problems

from drug or alcohol use. The lifetime reports of alcohol use, marijuana use, opiate use, and hallucinogen use were all significantly higher in youth self-report than parental report. Reports on the youth's use of cocaine, amphetamines, and inhalants were comparable between parents and youths. By contrast, youth heroin use was reported significantly more frequently by caregivers than youths. Specificity values indicate that parents were generally accurate in reporting when youths reported never using a substance, with values for alcohol use (.81) lower than other categories (.90-.94). Sensitivity values were lower and more variable, however, indicating that parents have more difficulty detecting when youths have used various substances. Highest kappa agreement and sensitivity rates were found for marijuana and amphetamine use. Similar to previous studies, all kappa values were low to moderate in size (.24-.67). Youths were significantly more likely to meet criteria for an alcohol or drug use disorder than their parents were to report problems related to offspring alcohol or drug use. Parents were more likely to identify their child's drug problem than alcohol problem; however, differences in kappa only approached significant levels.

Relationships between parental awareness of youth alcohol and drug problems

Examination of youth who met criteria for both alcohol abuse/dependence and drug abuse/dependence ($n = 140$) revealed that 55% of parents were aware of drug use problems versus 29.3% being aware of alcohol use problems among these youth. When examining conditional probabilities, 92.7% of parents who were aware of their child's alcohol problem were also aware of their child's drug problem, whereas 49.4% of parents who were aware of their child's drug problem were also aware of their child's alcohol problem. However, these results should be examined in combination with the overall decreased prevalence of parental

awareness of youths with alcohol problems compared with drug problems in this sample.

Predicting parental awareness of youth alcohol problems

Parental awareness was examined using the subset of the sample for which youth report indicated an alcohol abuse or dependence diagnosis was warranted ($n = 196$). Parents stating that their child had problems resulting from alcohol use were classified as aware (30.4%), whereas those stating that their child did not have problems resulting from alcohol use were classified as unaware. Binary logistic regression analyses were conducted to determine the influence of the seven hypothesized predictor variables on parental awareness of youth-reported alcohol problems.

In terms of overall fit of the model, the Homer-Lemeshow goodness-of-fit test was not significant, $\chi^2(8) = 6.55$, $p = .59$, indicating that the model fit was adequate. To examine outliers to the model, values of the analog to Cook's D , deviance residuals, and Pearson's residuals were examined. This resulted in the identification of four outliers. Data were analyzed again without these observations as a form of sensitivity analysis. Deletion of the four outliers resulted in comparable findings. Results for the model with all observations are presented in Table 2.

Race was a significant predictor of awareness, with parents of White (non-Hispanic) children 6.8 times more likely to be aware of their child's self-reported alcohol problem compared with Hispanic parents, despite similar point prevalence rates (White youths: 26% alcohol abuse/dependence, 22% drug abuse/dependence; Hispanic youths: 23% alcohol abuse/dependence, 24% drug abuse/dependence). The presence of parental depression decreased the odds of parental awareness of their child's alcohol abuse/dependence by a factor of 0.37. Higher levels of parent-perceived youth functional impairment also predicted parental awareness of their child's reported alcohol problem. Contrary to prediction,

TABLE 1. Youth and parental report of the lifetime prevalence of alcohol and substance use and related problems, and agreement between these reports ($n = 954$)

Variable	Youth report %	Parental report %	McNemar test p	+Youth +CG %	+Youth -CG %	-Youth +CG %	-Youth -CG %	κ	95% CI	Sens.	Spec.
Alcohol use	55.6	47.0	<.001	38.6	17.0	8.4	36.0	.50	[.44-.55]	.69	.81
Marijuana use	49.9	43.2	<.001	38.4	11.5	4.8	45.3	.67	[.62-.72]	.77	.90
Cocaine use	14.6	12.9	.20	6.5	6.4	8.1	79.0	.39	[.31-.47]	.58	.91
Opiate use	3.1	10.6	<.001	2.0	1.2	8.6	88.3	.25	[.15-.35]	.63	.91
Hallucin. use	19.5	16.0	<.01	10.1	9.4	5.9	74.7	.48	[.41-.55]	.51	.93
Amphet. use	21.8	22.8	.45	16.4	5.5	6.4	71.8	.66	[.60-.72]	.75	.92
Sedative use	13.0	10.0	.03	3.8	9.2	6.3	92.8	.24	[.15-.33]	.29	.94
Inhalant use	13.2	12.3	.49	5.8	7.5	6.5	80.3	.37	[.28-.46]	.43	.93
Alcohol probs.	22.2	9.3	<.001	6.8	15.4	2.6	75.2	.34	[.27-.41]	.31	.97
Drug probs.	22.0	17.5	<.01	11.2	10.6	6.3	72.0	.47	[.40-.54]	.51	.91

Notes: McNemar test compares the proportion of youth vs. parental reports of lifetime substance use. +Youth = youth endorsed; -Youth = youth did not endorse; +CG = parent endorsed; -CG = parent did not endorse; sens. = sensitivity; spec. = specificity; hallucin. = hallucinogen; amphet. = amphetamine; probs. = problems.

however, youth report of parental monitoring was inversely related to parental awareness of youth alcohol problems.

Predicting parental awareness of youth drug problems

Comparable binary logistic regressions were used to examine predictors of parental awareness of youth-reported drug abuse or dependence ($n = 198$, 51.5% aware of youth drug use). Overall model fit was adequate; Homer-Lemeshow goodness-of-fit was nonsignificant, $\chi^2(8) = 6.78$, $p = .56$. Examination of the analog to Cook's D , deviance residuals, and Pearson's residuals resulted in the identification of one outlier. Deletion of this outlier resulted in comparable findings. Results for the model with all observations are presented in Table 2. Gender and race were the strongest predictors of parental awareness. Parents of male youths were three times more likely to be aware of their child's substance use problems; however, males were also more likely to be diagnosed with a substance use disorder in this sample (28% of males vs. 10% of females). Parents of White (non-Hispanic) youths were 3.4 times more likely to be aware of their child's substance use problems relative to parents of Hispanic youths. Last, parents who reported significant youth functional impairment were 2.8 times more likely to be aware of their child's drug problem.

Exploratory analyses

Exploratory moderator and mediator analyses were conducted in an attempt to reveal additional patterns in the data. Specifically, the interactions of Hispanic ethnicity and gender with each of the parent- and child-level variables were examined; however, no significant moderating relationships were

found. In addition, the potential mediating role of each of the child and parental variables on the relationship between Hispanic ethnicity and parental awareness was examined. No variables served as partial or full mediators.

Discussion

In this sample of youths involved in at least one public sector of care, we found that youth report of alcohol and drug use was proportionally higher than parental report. Agreement between youth and parental report of substance use and problems varied depending on the type of substance and presence of problems. Sensitivity and specificity analyses suggested that although parents were generally accurate in agreeing when their child reported abstinence from substance use (81%-97%), there were lower levels of agreement when the child reported positive for substance use (29%-77%). These results are consistent with other studies, which have found that parents underestimate their children's substance use with high levels of specificity and lower levels of sensitivity (e.g., O'Donnell et al., 1998). We extended these findings to include high-risk youths involved in public systems of care. Similar to previous studies, alcohol and marijuana were the most frequently used substances by youths, with half of youths having used them at least once in their lifetime, and parent-youth agreement was highest for marijuana use (Fisher et al., 2006; Langhinrichsen et al., 1990; McGillicuddy et al., 2007). Psychiatric research pointing to higher agreement among disorders with more observable behaviors (Achenbach et al., 1987) may explain the higher agreement for marijuana use, because the odors and residues associated with marijuana may be more evident to parents. The present study went beyond most studies of

TABLE 2. Binary logistic regression analyses examining the influence of hypothesized predictor variables on parental awareness of youth-reported alcohol and drug problems

Predictor	Parental awareness of youth alcohol prob. ($n = 196$) ^a		Parental awareness of youth drug prob. ($n = 198$) ^b	
	OR	CI	OR	CI
Demographic				
Gender (female = reference)	0.57	[0.24-1.36]	3.08**	[1.26-7.54]
Race (White = reference)				
Black	0.54	[0.19-1.54]	0.16	[0.21-1.29]
Hispanic	0.15**	[0.06-0.41]	0.29**	[0.14-0.62]
Other	0.48	[0.16-1.41]	1.96	[0.67-5.74]
Age	1.04	[0.74-1.47]	0.99	[0.72-1.36]
Child level				
Youth functional impairment	3.03**	[1.46-6.27]	2.83**	[1.46-5.50]
Multisector service use	0.66	[0.32-1.35]	0.80	[0.31-1.16]
Parent level				
Parental monitoring	0.60*	[0.39-0.93]	1.10	[0.75-1.60]
Parental depression	0.37**	[0.17-0.79]	0.64	[0.33-1.23]
Parental lifetime SU problems	1.24	[0.52-2.93]	0.64	[0.70-3.50]

Notes: Prob. = problem; OR = odds ratio; CI = confidence interval; SU = substance use. ^aHomer-Lemeshow = n.s., $\chi^2(8) = 6.55$, $p = .59$; ^bHomer-Lemeshow = n.s., $\chi^2(8) = 6.78$, $p = .56$.

* $p < .05$; ** $p < .01$.

drug use agreement by examining use of amphetamines (e.g., crystal meth) and agreement on amphetamine use. Although we found high rates of agreement, we were unable to compare these rates with previous studies, because illicit drugs other than marijuana are typically combined into one category.

Previous research examining predictors of agreement has failed to include diverse populations, thus limiting the ability to compare findings regarding race/ethnicity and gender differences in parental awareness of youth substance use with earlier work. Significant differences in parental awareness were found for White and Hispanic youths, in that parents of Hispanic youths were significantly less likely to be aware of their child's alcohol or drug problems. This is consistent with literature suggesting that Hispanic youths are at higher risk for substance use because of an acculturation gap existing between parents and teens (Martinez, 2006). This risk is thought to be explained, in part, by higher levels of familial conflict and lower levels of communication (Gil et al., 2000). In addition, parents of male youths were more than three times as likely to be aware of drug problems. These findings highlight the need for increasing parental awareness of substance use in Hispanic families and among parents of female youths to increase rates of recognition, action, and recovery among these at-risk youths. This is particularly important for female and minority substance users, who experience more physical and social adverse consequences as a result of their substance use (Johnson et al., 2005; Mann et al., 2005; National Institute on Drug Abuse, 2003).

Parental perception of youth functional impairment was also a significant predictor of parental awareness for both alcohol and drug problems. This finding may point to a lack of vigilance or inattention to relevant cues or behaviors related to their child's substance involvement when there is less obvious impairment. These findings suggest a need for increased efforts to assist parents in identifying less overt or milder indicators of alcohol and drug use and problems and to help enhance parental support and monitoring of youths.

The current study also found that parental depression suppressed parents' ability to detect youth alcohol use problems. Although global parental distress is related to decreased parental awareness of substance use problems (McGillicuddy et al., 2007), the current study is the first to identify a relationship specific to parental depression. This pattern is consistent with research demonstrating that parental depression decreases attention and involvement in upbringing of one's child (Lovejoy et al., 2000), as well as research pointing to reduced agreement between caregiver and child reports of youth internalizing and externalizing symptoms among depressed caregivers (Youngstrom et al., 2000).

Contrary to our hypothesis, youth-reported parental monitoring negatively predicted awareness. Higher level of parental monitoring was associated with lower parental awareness of youth alcohol use disorders. These results suggest that

when parents make efforts to monitor their child's behavior, they may have a false sense of security. That is, these parents may assume that they know what their child is doing and believe that their current level of monitoring protects their child. However, they actually may be less vigilant and less aware of their child's substance use and problems because of this assumption.

Although mixed results have characterized studies of the impact of parental monitoring on parental awareness of substance use (McGillicuddy et al., 2007; Williams et al., 2003), most studies have relied on parental report of their own level of monitoring. Williams and colleagues hypothesized that their lack of significant results was related to parents' inaccurate assessment of how well they monitored their child's behavior. In the current study, youth report of their parent's monitoring behaviors was used to address this issue. These results continue to be mixed, however, because there were no significant effects for predicting awareness of youth drug problems and significant effects in the opposite predicted direction for youth alcohol use. Given the current findings, mixed results regarding the role of parental monitoring of youth substance use may, in fact, represent the nature of the relationship rather than an artifact of reporter bias. Although an attempt to explore mediating and moderating relationships was made, no significant results were found in the current data set. Future studies may benefit from an increased focus on mechanisms and situations affecting the relationship between parental monitoring and parental awareness of substance use.

Older youth age has been found to be a significant predictor of parental awareness (McGillicuddy et al., 2007; Williams et al., 2003); however, the current data yielded no significant findings with regard to age. This result is consistent with Cantwell et al.'s (1997) study of youth and parental report of psychiatric diagnostic data. The complexity of these findings may be, in part, because although parents of older youths may more accurately suspect that alcohol or drug use has occurred, parents of younger youths may monitor their children's activities more closely and have more specific knowledge of their children's behavior.

Overall, Hispanic ethnicity and parent-reported youth functional impairment emerged as the most important predictors for awareness of both drug and alcohol use disorders. However, although the prediction profiles both relied heavily on these two variables, there were discrepancies (e.g., gender being predictive of only drug problems and parental depression and monitoring predictive of only alcohol problems). In addition, parents were more accurate in reporting youth drug use disorders than alcohol use disorders, both in cases where the two were mutually exclusive and when considering only comorbid youths. Differences in agreement and prediction profiles across the two domains point to the need to continue examining these disorders separately rather than as one category of substance use disorders.

Limitations

Comparable parental and youth measures of lifetime use of individual substances were available, but we did not have parent-level diagnostic data. Thus, we used a more global assessment of parental awareness of their child's alcohol or drug involvement that did not allow for a more precise appraisal of diagnostic concordance. It is likely, however, that the use of a more conservative approach (e.g., parental report of specific symptoms) would have resulted in even lower agreement than the rates assessed in the current study.

Youth report of alcohol and substance use was selected as the reference with which parental report was compared. Studies using objective measures of youth substance use have found mixed results regarding the accuracy of youth report. Whereas some have found acceptable agreement between youth report and objective measures (Burleson and Kaminer, 2006; Gignac et al., 2005), others have found 28% of reports to be uncorroborated by biochemical assessments (Williams and Nowatzki, 2005). Most sources, however, indicate that self-report is an underestimate of use.

Lastly, these findings are limited to youths ages 11-18 enrolled in public sector(s) of care from one geographic location (albeit a large service system). These youths differ from the general population in that they are at a lower socioeconomic level and have higher levels of functional impairment. The issues related to parental awareness likely span service sectors and communities, however.

Future directions

Despite these limitations, this study has important implications for the detection and treatment of substance use disorders among youths in public sectors of care. The failure of parents to identify substance use problems among youths already receiving services represents a serious concern. It diminishes parents' ability to intervene and deter their children from substance use as well as their ability to identify the need for treatment. Given the high levels of substance use and problems in this sample and the low levels of parental awareness, future research should examine ways to increase parental identification of their child's substance use, particularly among parents of Hispanic and female youths.

Unlike much of the previous work surrounding awareness of youth substance use, the current population is unique in that each individual had at least one contact with a public service sector. Such contacts should serve to increase identification of youth problem behaviors, including alcohol and drug use. Although we did not access information from service providers regarding the presence of youth substance use and problems, these findings suggest that there may be a lack of awareness among these providers and/or a disruption in communication between these providers and parents. Service systems should take steps to screen and assess for substance

use problems for all pre-adolescents and adolescents entering a care episode. Indeed, the county involved in this study has taken such a step by including a brief assessment of youth substance use problems in the standardized intake form for the mental health system. However, the data used in the present study predated this change in the intake process. Future work should examine these issues to determine the best way to increase awareness and subsequent enrollment in appropriate drug/alcohol services among this high-risk population. It is incumbent on caregivers, including parents and service systems, to be proactive in addressing youth substance use through better monitoring, identification, and services for at-risk youths.

References

- Aarons, G. A., Brown, S. A., Hough, R. L., Garland, A. F., & Wood, P. A. (2001). Prevalence of adolescent substance use disorders across five sectors of care. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 419-426.
- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 101, 213-232.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Beck, K. H., Shattuck, T., Haynie, D., Crump, A. D., & Simons-Morton, B. (1999). Associations between parent awareness, monitoring, enforcement and adolescent involvement with alcohol. *Health Education Research*, 14, 765-775.
- Bird, H. R., Andrews, H., Schwab-Stone, M., Goodman, S., Dulcan, M., Richters, J., . . . Gould, M. S. (1996). Global measures of impairment for epidemiologic and clinical use with children and adolescents. *International Journal of Methods in Psychiatric Research*, 6, 295-307.
- Bird, H. R., Shaffer, D., Fisher, P., Gould, M. S., Staghezza, B., Chen, J., & Hoven, C. (1993). The Columbia Impairment Scale (CIS): Pilot findings on a measure of global impairment for children and adolescents. *International Journal of Methods in Psychiatric Research*, 3, 167-176.
- Bogenschneider, K., Wu, M.-Y., Raffaelli, M., & Tsay, J. C. (1998). "Other teens drink, but not my kid": Does parental awareness of adolescent alcohol use protect adolescents from risky consequences? *Journal of Marriage and the Family*, 60, 356-373.
- Burleson, J. A., & Kaminer, Y. (2006). Adolescent alcohol and marijuana use: Concordance among objective-, self-, and collateral-reports. *Journal of Child & Adolescent Substance Abuse*, 16, 53-68.
- Cantwell, D. P., Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1997). Correspondence between adolescent report and parent report of psychiatric diagnostic data. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 610-619.
- Chilcoat, H. D., & Anthony, J. C. (1996). Impact of parent monitoring on initiation of drug use through late childhood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 91-100.
- Cottler, L. B., & Compton, W. M. (1993). Advantages of the CIDI family of instruments in epidemiological research of substance use disorders. *International Journal of Methods in Psychiatric Research*, 3, 109-119.
- Cottler, L. B., Robins, L. N., & Helzer, J. E. (1989). The reliability of the CIDI-SAM: A comprehensive substance abuse interview. *British Journal of Addiction*, 84, 801-814.
- Dishion, T. J., Nelson, S. E., & Kavanagh, K. (2003). The family check-up with high-risk young adolescents: Preventing early-onset substance use by parent monitoring. *Behavior Therapy*, 34, 553-571.

- Donohue, B., Azrin, N., Strada, M., Silver, N., Teichner, G., & Murphy, H. (2004). 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 parents. *Psychology of Addictive Behaviors, 18*, 184-189.
- Fisher, S. L., Bucholz, K. K., Reich, W., Fox, L., Kuperman, S., Kramer, J., . . . Bierut, L. J. (2006). 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, 30*, 1699-1710.
- Friedman, A. S. (1988). What mothers know about their adolescents. *Journal of Drug Education, 18*, 155-167.
- Gignac, M., Wilens, T., Biederman, J., Kwon, A., Mick, E., & Swezey, A. (2005). Assessing cannabis use in adolescents and young adults: What do urine screen and parental report tell you? *Journal of Child and Adolescent Psychopharmacology, 15*, 742-750.
- Gil, A. G., Wagner, E. F., & Vega, W. A. (2000). Acculturation, familism, and alcohol use among Latino adolescent males: Longitudinal relations. *Journal of Community Psychology, 28*, 443-458.
- Henry, G. (1990). *Practical sampling*. Thousand Oaks, CA: Sage.
- Johnson, P. B., Richter, L., Kleber, H. D., McLellan, A. T., & Carise, D. (2005). Telescoping of drinking-related behaviors: gender, racial/ethnic, and age comparisons. *Substance Use & Misuse, 40*, 1139-1151.
- Johnston, L., O'Malley, P., Bachman, J., & Schulenberg, J. (2009). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2008* (NIH Publication No. 09-7401). Bethesda, MD: National Institute on Drug Abuse.
- Kelly, K. J., Comello, M. L. G., & Hunn, L. C. P. (2002). Parent-child communication, perceived sanctions against drug use, and youth drug involvement. *Adolescence, 37*, 775-787.
- Lahey, B. B., Flagg, E. I., Bird, H. R., Schwab-Stone, M., Canino, G., Dulcan, M., . . . Regier, D. A. (1996). The NIMH methods for the epidemiology of child and adolescent mental disorders (MECA) study: Background and methodology. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*, 855-864.
- Langhinrichsen, J., Lichtenstein, E., Seeley, J. R., Hops, H., Ary, D. V., Tildesley, E., & Andrews, J. (1990). Parent-adolescent congruence for adolescent substance use. *Journal of Youth and Adolescence, 19*, 623-635.
- Lovejoy, M. C., Graczyk, P., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review, 20*, 561-592.
- Mann, K., Ackermann, K., Croissant, B., Mundle, G., Nakovics, H., & Diehl, A. (2005). Neuroimaging of gender differences in alcohol dependence: Are women more vulnerable? *Alcoholism, Clinical and Experimental Research, 29*, 896-901.
- Martinez, C. R., Jr. (2006). Effects of differential family acculturation on Latino adolescent substance use. *Family Relations, 55*, 306-317.
- McClelland, G., Elkington, K., Teplin, L., & Abram, K. (2004). Multiple substance use disorders in juvenile detainees. *Journal of the American Academy of Child and Adolescent Psychiatry, 43*, 1215-1224.
- McGillicuddy, N. B., Rychtarik, R., Morsheimer, E., & Burke-Storer, M. (2007). Agreement between parent and adolescent reports of adolescent substance use. *Journal of Child & Adolescent Substance Abuse, 16*, 59-78.
- McNemar, Q. (1969). *Psychological statistics*. Hoboken, NJ: John Wiley & Sons.
- National Institute on Drug Abuse (Division of Epidemiology, Services & Prevention Research). (2003). *Drug use among racial/ethnic minorities*. National Institute on Drug Abuse. Bethesda, MD: Author.
- O'Donnell, D., Biederman, J., Jones, J., Wilens, T. E., Milberger, S., Mick, E., & Faraone, S. V. (1998). 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 and Adolescent Psychiatry, 37*, 752-758.
- Pilowsky, D. J., & Wu, L. T. (2006). Psychiatric symptoms and substance use disorders in a nationally representative sample of American adolescents involved with foster care. *The Journal of Adolescent Health, 38*, 351-358.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.
- Steinberg, L., Fletcher, A., & Darling, N. (1994). Parental monitoring and peer influences on adolescent substance use. *Pediatrics, 93*, 1060-1064.
- Substance Abuse and Mental Health Services Administration (Office of Applied Studies). (April 24, 2008). The NSDUH Report: Parental awareness of youth use of cigarettes, alcohol, and marijuana. Rockville, MD: Author.
- Williams, R. J., McDermitt, D. R., Bertrand, L. D., & Davis, R. M. (2003). Parental awareness of adolescent substance use. *Addictive Behaviors, 28*, 803-809.
- Williams, R. J., & Nowatzki, N. (2005). Validity of adolescent self-report of substance use. *Substance Use & Misuse, 40*, 299-311.
- Winters, K. C., & Henley, G. A. (1989). *Personal experience inventory (PEI) test and manual*. Los Angeles, CA: Western Psychological Services.
- Yang, H., Stanton, B., Cottrel, L., Kaljee, L., Galbraith, J., Li, X., . . . Wu, Y. (2006). Parental awareness of adolescent risk involvement: Implications of overestimates and underestimates. *The Journal of Adolescent Health, 39*, 353-361.
- Youngstrom, E., Loeber, R., & Stouthamer-Loeber, M. (2000). Patterns and correlates of agreement between parent, teacher, and male adolescent ratings of externalizing and internalizing problems. *Journal of Consulting and Clinical Psychology, 68*, 1038-1050.