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Adolescent Self-reported Alcohol/other Drug Use Consequences: Moderators of Self and Parent Agreement

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Abstract

While the reliability of assessment instruments designed for use with adults is well established, much less is known about the adequacy of these instruments for adolescent substance abusers. As part of a comprehensive intake evaluation, the Inventory of Drug Use Consequences (InDUC) was administered both to forty adolescents assigned to a probationary substance abuse treatment program and to one of their parents. The correlation was statistically significant between Parent and Adolescent InDUC score(s), but the interrater reliability was relatively low. IQ scores and level of substance use were considered as moderator variables, but neither showed a significant effect. History of head injury, however, significantly moderated this relationship; those adolescents reporting no history of head injury showed little correspondence with Parent InDUC Score(s), whereas those adolescents with a history of head injury showed significant correlations with parent InDUC scores. This suggests that a history of head injury may affect the way in which adolescents perceive substance-related consequences.

Keywords

Alcohol dependence; adolescence; head injury; drug use consequences

The consequences of drug and alcohol use determine the diagnostic boundary between substance abuse and dependence, and substantial effort has focused on the reliable and valid measurement of substance use-related consequences (Miller et al., 1995; Tonigan & Tonigan, 2002). While advances have been made in these areas, little is known about the client characteristics, if any, that may moderate the psychometric properties of consequence

measures. Even less is known about the reliability and validity of such measures for adolescents.

There are reasons to believe that adults and adolescents might have a different perspective on what constitutes risk, the expendability of relationships that may be affected by substance use, or to what extent one might feel “bad” or feel “more mature” through the use of alcohol and drugs. Several excellent and psychometrically evaluated tools are available to measure alcohol- and drug-related consequences among adolescents. Measures such as the 23-item Rutgers Alcohol Problem Index (RAPI; White, 1989) and the 276-item Personal Experience Inventory (PEI; Winters, 1989) are specifically designed to have item content validity for school-aged adolescents. Little is known, however, about the perceived importance placed on similar consequences by different substance abusing age groups, especially when adolescent lifestyles are not traditional (e.g., runaways and school dropouts). Indirect evidence suggests that some measures and interviews, initially developed for adult substance abusers, can be reliably and meaningfully administered to adolescents. Specifically, in a test-retest exercise, Slesnick and Tonigan (2004) assessed the reliability of an adult-based approach to measuring day-by-day substance use (Form 90; Tonigan, Miller, & Brown, 1997) among adolescent substance-abusing runaways. With some minor exceptions, good-to-excellent reliability in self-reported substance use was found.

One instrument designed to specifically assess drug- and alcohol-related consequences is The Inventory of Drug Use Consequences (InDUC; Tonigan & Miller, 2002). The InDUC is a (50-item) self-report scale that provides an overall score and five subscale scores to specifically assess adverse consequences related to drug and alcohol use, including the (a) Impulse Control, (b) Social Responsibility, (c) Physical Consequences, (d) Interpersonal Consequences, and (e) Intrapersonal Consequences subscales. Item examples are “I have taken foolish risks when I have been drinking or using drugs” (Impulse Control), “I have missed days of work or school because of my drinking or drug use” (Social Responsibility), “My physical appearance has been harmed by my drinking or drug use” (Physical), “A friendship or close relationship has been damaged by my drinking or drug use” (Interpersonal), and “I have felt bad about myself because of my drinking or drug use” (Intrapersonal). Tonigan and Miller (2002) determined that four of the five InDUC scales had good-to-excellent test-retest reliability for adult subjects, and recommended that the consequences of drug and alcohol use should be measured directly rather than be inferred from measures of substance use. However, adequacy of the InDUC for use in adolescent populations has yet to be determined.

The current study had three aims: (1) to investigate the convergence between adolescent substance user report (in the juvenile justice system) and parent report of alcohol- and drug-related consequences for the adolescent, (2) to investigate how adolescent-parent convergence in reported consequences may be moderated by demographic and health history variables, and (3) investigate the validity and reliability of the InDUC as a measure of substance-related consequences for adolescents.

Methods

Participants

Forty adolescents who were adjudicated to a substance abuse treatment program under the supervision of the State of Utah Juvenile Justice Division and at least one of their parents participated in this study. The total sample consisted of 8 females and 32 males ranging in age from 12 to 18 years old ($M = 15.9$, $SD = 1.38$). All adolescent offenders were being adjudicated for substance use and were assigned to a substance use treatment program as part of their probation programming. The current data were collected at the time of intake to

the treatment program. Participants were admitted to the study only after parental consent and adolescent participants' assent were obtained. Appropriate review and approval was acquired from the University of Utah Human Subjects Review Committee and from the State of Utah Juvenile Justice Department prior to any data collection.

Procedures

As part of a comprehensive psychological and health history intake evaluation, all adolescents and their parents were administered a structured clinical interview upon entry to the treatment program. The diagnostic instruments included The Inventory of Drug Use Consequences (InDUC; Tonigan & Miller, 2002), which was used to assess the consequences of drug and alcohol use by having the participant answer "yes" or "no" to a list of possible adverse consequences. Parents were administered the collateral form which corresponded to the adolescent form. The Form 90-Drug (Form 90D; Westerberg, Tonigan, & Miller, 1998) was used to assess the adolescents' age at first use, lifetime use, and current use of alcohol and drugs. It is a calendar-based assessment that obtains information including substance use history and use in the past 90-day period. Current use was computed as a proportion, with the number of days in the assessment period in the denominator, and days of alcohol and drug use in the numerator. The Wechsler Abbreviated Scales of Intelligence (WASI; Wechsler, 1997) was administered to estimate intellectual ability. Adolescent demographic information (i.e., age, gender, years of education) and health history information (i.e., medical conditions, history of head injury) were also obtained from parents and adolescents.

Results

As noted, a total of 40 adolescents were recruited into the study, but only 32 adolescent-parent pairs provided sufficient responses to compute the five InDUC scale comparisons. Of these 32 adolescents, 81% were male ($n = 26$) and the mean participant age was 15.85 years ($SD = 1.44$, range 12 to 18). Demographic and substance use variables for the sample are reported in Table 1.

Overall, Parent InDUC Total Score was significantly correlated with Adolescent InDUC Total Score, $r = .64$, $p < .001$. However, while Parent InDUC Total Score was significantly correlated with the adolescent report of drug and alcohol use on the Form 90 ($r = .58$, $p < .001$), the Adolescent InDUC Total Score was not. To test the relative value of parent versus adolescent assessment of the consequences of alcohol and drug use, a stepwise hierarchical regression was used with Form 90D percent days of drug and alcohol use entered as the dependent variable, Parent InDUC Total Score was entered as a first predictor variable into the regression and Adolescent InDUC Total Score was entered as a second predictor variable. There was a significant effect for Parent InDUC Total Score, ($R^2 = .332$, $\beta = .58$, $p = .001$). There was no additional variance explained by addition of the second predictor.

Table 2 shows the bivariate and partial correlations between adolescent self-reported substance-use consequences and parental report of adolescent substance-related consequences. Overall, bivariate correlations between self and parental reported consequences were significant and positive, although they were not of a magnitude to indicate they should be used interchangeably as a measure of adverse consequences (e.g., 50% highest shared variance on the Impulse Control scale). The Intrapersonal Scale was not significantly related between groups, which is understandable given the item content for this scale focuses on subjective reactions to drug use (e.g., "I feel bad about my use of illicit drugs").

Separate partial correlations were used to investigate the extent to which adolescent attributes may moderate the convergence between self and parental report of consequences. After controlling for extent of substance use (percentage of abstinent days; Table 2, column 2) and estimated intelligence (Table 2, column 3), little support was found to suggest (in relation to the bivariate correlations) that the relationships of interest were mediated by these adolescent-specific characteristics.

Paired t-tests were conducted to determine if an adolescent and his or her respective parent reported, on average, different scores on the InDUC scales. No mean differences were found with the exception of the Intrapersonal Scale, on which parents reported, on average, about 1.09 ($SD = 2.58$) subjective consequences while adolescents reported .44 ($SD = 2.36$) adverse subjective consequences ($t(31) = -3.82, p < .001$).

The last two columns in Table 2 show the bivariate correlations between adolescents and their parents by lifetime head injury status of the adolescent (yes/no). The presence of a history of head injury was based on *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DMS-IV*) Postconcussional Disorder symptoms. Adolescent participants were queried about the occurrence of a head injury causing a period of unconsciousness lasting five minutes or more, post-traumatic amnesia, and the presence of other cognitive symptoms (i.e., confusion, disorientation, inattention) following the injury. Only two participants in this sample met criteria for more than a mild traumatic brain injury. Of the total sample, 15 participants (37.5%) met criteria for having suffered a concussion or traumatic brain injury at some point in the past. Of those 15 participants with a history of head injury, InDUC scores were available for 14. As shown, adolescent-parent InDUC score agreement was consistently higher for those dyads who had experienced a head injury. Use of Fisher z tests contrasting the magnitude of the correlations between those dyads with and without a head injury indicated that the extent of agreement was significantly better for dyads who had experienced a head injury on the InDUC Social ($p < .006$) and InDUC Total Scales ($p < .022$) and that trend level mean differences were present on the InDUC Physical ($p < .057$) and Impulse Control ($p < .087$) Scales.

Independent samples t-tests were conducted to determine if there were differences on the Form 90D and InDUC scales between head injury groups. Adolescent report InDUC Total ($t = 2.58, p = .02$), Impulse Control ($t = 3.88, p = .001$) and Social Responsibility ($t = 3.43, p = .002$) Scale scores were all significantly higher for adolescents who had experienced a head injury. Parents in head injury dyads rated their children higher on all InDUC scales (p-values ranging from .02- .05). Table 3 shows correlations between extent of abuse and InDUC Total Scores for adolescents and parents, broken down by head injury group. In the Head Injury Yes group, adolescent- and parent-report InDUC scores predicted extent of substance abuse equally well. In the Head Injury No group, parents' InDUC scores predicted extent of substance abuse significantly better than did adolescent-report scores ($z = -2.58, p = .009$). Additionally, parents of adolescents in the Head Injury Yes group predicted extent of substance use significantly better than parents in the Head Injury No group.

Discussion

For clinicians trying to assess and diagnose adolescents with psychiatric disorders, informant agreement in reporting within the family unit is consistently poor (Grills, 2003). In general, it has been assumed that a multi-informant approach provides the most information regarding the family because different informants highlight different aspects of the problem. However, poor levels of informant agreement at intake have created a dilemma for clinicians trying to select an appropriate method of treatment for several psychiatric disorders, including substance abuse (Yeh and Weisz, 2001).

The current sample consisted of adolescents who were adjudicated for substance abuse treatment and their parents. The extent of agreement between adolescents and their parents in their judgments of the consequences of adolescent substance abuse was statically significant. However the magnitude of agreement was relatively modest, particularly if these scores are to be used for clinical decision-making with any confidence. In a much larger study, Yeh and Weisz (2001, N = 381) reported that 63% of their parent-child pairs failed to agree on a single problem on two well-validated behavioral checklists, suggesting that only 37% of pairs agreed on one or more problems. In the current data, the InDUC parent total score accounted for about 38% of the variance in the child InDUC total score, suggesting some similarity across samples.

It was hypothesized that specific adolescent attributes might explain this lack of convergence between reporters. Level of substance abuse did not significantly moderate the relationship between adolescent self-reported substance-use related consequences and parental report of adolescent consequences, refuting the possibility that heavier using adolescents may have been more deceptive on self-report questionnaires. Another possibility was that adolescents with lower intellectual ability may have been less capable of filling out the assessment instruments, resulting in reduced convergence with parental report of consequences. The fact that intelligence quotient did not statistically moderate the correlation between adolescent and parent reports suggest that this also was not the case.

The convergence of child and parent reports of consequences was significantly moderated by reported history of head injury. That is, those adolescents who reported suffering a clinically significant head injury were also significantly more likely to concur with their parents' assessment of drug and alcohol consequences. Compared to adolescents with no head injury history, adolescents who had experienced a head injury did not report a higher level of substance use, but did rate themselves higher on InDUC scales associated with a lack of social responsibility and impulse control. Their parents rated them higher on all InDUC scales. In addition, parents of children who have suffered a head injury demonstrated a higher correlation between their estimates of the consequences of their adolescent's drinking and self-reported level of substance use than parents whose children did not experience a head injury, suggesting that these parents are particularly well-attuned to their child's behavior and the consequences of that behavior.

It might be expected that a higher level of substance abuse might result in increased substance use consequences (World Health Organization, 2007). In the present sample, parental assessment of consequences was more closely associated with adolescent-reported drug and alcohol use than was adolescents' assessment of the consequences of their behavior. At best, no additional predictive information was added by using the adolescents' assessment of consequences. This lack of predictive concordance between parent and adolescent assessment of consequences may pose a serious challenge for therapists attempting to establish treatment goals. The current data suggest that parents' assessment of consequences may be more reliable than that of adolescents.

Although we are not able to make strong inferences about causal relationships between these variables, that there was no difference in extent of substance abuse between adolescents who had experienced a head injury and those who did not suggests that having a head injury did not make adolescents more prone to more severe substance use. Cherpitel (1993;1999) reported that alcohol consumption is positively correlated with the extent of risk-taking, impulsivity, and sensation seeking dispositions in adults seeking medical care. In adolescents, injury rates are highest among those who use drugs and alcohol and level of use increases the risk of injury Kelly, 2005; Miller, 2001). One possibility is that in this sample,

children with a history of head injury are those that are more likely to engage in risky behaviors in general, and most likely to abuse alcohol and other substances.

Overall, these findings emphasize the importance of gathering data from parents when working with adolescents both in the clinic and in the research lab, and demonstrate that at least one adolescent characteristic, head injury history, moderates the extent to which parents and their adolescent children agree on substance abuse consequences.

There are several limitations to the current study. First, while the authors maintained the highest standard with respect to collection of these data, the study is limited to the extent to which adolescents accurately reported their own substance use information, and to which parents were aware of their children's substance use consequences. The current study was also limited by the small sample size, and the strength of the conclusions presented herein could be improved by replication of these findings in a larger sample. Lastly, more details about parent characteristics might lend information regarding to what extent the parent characteristics and the quality of parent-child relationships might affect data convergence.

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Table 1

Demographic and descriptive statistics regarding sample characteristics (N = 32).

Variable	Mean (M)	Standard Deviation (SD)
Age	15.9	(1.48)
Gender	26 males (6 females)	
Age of first use of alcohol	12.35	(2.34)
Lifetime weeks of alcohol use	84.61	(91.18)
Age of first use of tobacco (n = 26)	10.90	(2.58)
Lifetime weeks of tobacco use	170.35	(159.71)
Age of first use of marijuana (n = 8)	12.8	(1.94)
Lifetime weeks of use of marijuana	94.03	(86.36)
Current Use (percent days use)	31.68	(33.66)

Table 2

Adolescent-Parent Convergence in Adolescent Drug-use Consequences

InDuC Scale	Bivariate	Partial PDA	Partial IQ	Head Injury History
	(N = 32)	(N= 32)	(N=32)	(Yes) (n = 14) (No) (n= 18)
Total Score	.62	.59	.57	.80 .29
Impulse Control	.74	.74	.67	.82 .55
Interpersonal	.46	.42	.41	.59 .23
Intrapersonal	.25	.23	.19	.34 .01
Physical	.44	.33	.38	.68 .20
Social	.65	.63	.60	.85 .26

Correlation Table showing (Column 1) bivariate correlations between adolescent and parent InDuC scores, (Column 2) partial correlations with variance from F90 Percent Days Used removed, (Column 3) partial correlations with the variance from the WASI IQ score removed, (Column 4) bivariate correlations for the Head Injury (Yes) group, and (Column 5) bivariate correlations for the Head Injury (No) group

Table 3

Correlations between extent of abuse and InDUC total scores by Head Injury Group

	InDUC Total Score	Form 90 PDU	Adolescent Parent Comparisons (Fischer z-tests)	Head Injury Group Comparisons (Fischer z-tests)
Head Injury (Yes) (N=14)	Adolescent	r = .19 p = .52	(.52-.19) ns	
	Parent	r = .52 p = .06		
Head Injury (No) (N=18)	Adolescent	r = .43 p = .08	(.81 - .43) z = -2.58, p=.009	(.43-.19) ns
	Parent	r = .81 p < .001		(.81 - .52) Z = -2.13 P = .03