Psychosocial Functioning of Adults who Experienced Substance Use Disorders as Adolescents

Paul Rohde,
Oregon Research Institute

Peter M. Lewinsohn,
Oregon Research Institute

John R. Seeley,
Oregon Research Institute

Daniel N. Klein,
Stony Brook University

Judy A. Andrews, and
Oregon Research Institute

Jason W. Small
Oregon Research Institute

Abstract

We examined whether substance use disorder (SUD) before age 19 was associated with functioning at age 30 in 773 individuals assessed twice during adolescence, and at ages 24 and 30. Eight of 14 adult measures were associated with adolescent SUD: education, unemployment, income, risky sexual behavior, suicide attempt, coping, stressful life events, and global adjustment. Controlling for adolescent comorbidity and functioning and adult SUD, education and unemployment remained associated, and three variables emerged as significant: being a parent (significant only for participants without adult SUD), and being currently married and decreased life satisfaction (significant only for participants with adult SUD). Adolescent SUD is associated with numerous functioning difficulties at age 30, some of which appear to be related to recurrent SUD, comorbid adolescent disorders, or functioning problems already evident in adolescence.

The transition from adolescence to adulthood is a critical period when young people are expected to assume a number of new responsibilities that often include completing one's education, obtaining a job and launching a career, becoming financially independent, developing romantic relationships, getting married, becoming a parent, developing an adult social support system, and maintaining good physical health. The degree to which experiencing a substance use disorder (SUD; i.e., psychoactive substance abuse or dependence) during adolescence is associated with difficulties in accomplishing these tasks and responsibilities during the transition into adulthood is the focus of the present study.

Although the consequences of drug experimentation or low level substance use in adolescence may be relatively harmless (e.g., Shedler & Block, 1990), the development of SUD in adolescence appears to be associated with deleterious and costly impairments across multiple domains. In the areas of academic and occupational functioning, adolescent substance abuse has been associated with school drop-out (Jennison, 2004; Krohn, Lizotte, & Perez, 1997; Newcomb & Bentler, 1988), delayed entry into the labor force (Kandel, Mossel, & Kaestner, 1987), job instability (Kandel et al., 1986), and job dissatisfaction (Newcomb, Galaif, & Carmona, 2001). Adolescent substance use has been related to early marriage (Martino, Collins, & Ellickson, 2004), and divorce (Newcomb, 1994). Adolescent substance abuse has been associated more broadly with impaired relationships with family and friends (e.g., Dishion & Owen, 2002; Newcomb & Bentler, 1988), and with becoming a parent early in life (e.g., Kellogg, Hoffman, & Taylor, 1999; Krohn et al., 1997).

Functioning also encompasses physical health and well-being. Although most of the deleterious physical health effects associated with SUD have been found after long-term abuse, some health consequences are detectable after only a few years of use (Aarons et al., 1999; Brick, 2004; Newcomb & Bentler, 1988). In addition, SUD impacts a person's health due to increased risks of traffic accidents and other accident-related injuries (e.g., Weber et al., 2002), risky sexual behavior and HIV infection (e.g., O'Hara, Parris, Fichtner, & Oster, 1998), and suicide attempts (e.g., Brent, 1995; Duncan, Alpert, Duncan, & Hops, 1997; Wu et al., 2004).

There is little research examining the degree to which adolescent SUD negatively impacts the psychosocial adjustment of adults more broadly. Although increased stress (Wills, Vaccaro, & McNamara, 1992), reduced life satisfaction (Zullig, Valois, Huebner, Oeltmann, & Drane, 2001), and inadequate coping skills (Spooner, 1999) are known to be correlates of adolescent substance use, we were interested in the degree to which adolescent SUD predicted adult difficulties in these domains. Stressful life events have been examined primarily as a risk factor for the *onset* of psychopathology, especially depression, but Hammen (1991) expanded the role of stress in relation to depression by proposing processes in which depressed individuals generate higher levels of interpersonal stressful life events, which in turn contribute to depression recurrences. This "stress generation" effect may be particularly salient for depressed individuals with comorbid psychopathology (Daley et al., 1997), which suggests that other forms of psychopathology may have an impact. Although the stress generation hypothesis was developed in relation to depression, we examined in the present study whether a similar process occurred among those who had experienced SUD, hypothesizing that individuals with past SUD generate more stressful life events.

Demonstrating that adolescent SUD is associated with later psychosocial functioning is consistent with the possibility of a causal effect, in which substance abuse is responsible for the development of negative psychosocial outcomes. However, a positive association could also reflect several alternative models (Fergusson, Horwood, & Swain-Campbell, 2002). For example, the associations between substance abuse and later psychosocial adjustment could be due to "third factor" variables (e.g., social disadvantage, academic problems) that lead to both drug use and psychosocial impairments. In addition, the causal arrow could run in the opposite direction, with psychosocial adjustment difficulties themselves causing subsequent substance abuse rather than the converse.

The present study examined data from the Oregon Adolescent Depression Project (OADP; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Lewinsohn, Rohde, Klein, & Seeley, 1999), in which a large randomly selected cohort of high school students was assessed in high school (T1), approximately one year later (T2), at age 24 (T3), and at age 30 (T4). Our analytic strategy was to first examine the associations of adolescent SUD (defined as occurring before

age 19) with functioning at age 30, controlling for the fixed effects of adolescent demographic factors associated with SUD. Second, because adolescent SUD may be associated with different patterns of functioning problems in men and women (Newcomb & Jack, 1995; Robbins, 1989), including SUD-related health effects (Blume, 1990), we examined whether gender moderated the associations between adolescent SUD and later functioning.

The third issue we addressed dealt with the temporal precedence of reduced psychosocial functioning and adolescent SUD (Newcomb, Vargas-Carmona, & Galaif, 1999). Given that a subset of our psychosocial functioning indices were also assessed in adolescence, we examined whether differences in functioning detected in adulthood had already been present in adolescence.

Many adolescents with SUD have comorbid psychiatric disorders (e.g., Costello, Erkanli, Federman, & Angold, 1999), each of which may also be associated with subsequent impairments in adult functioning. Consequently, our fourth issue examined the degree to which impaired adult psychosocial functioning remained associated with adolescent SUD controlling for the occurrence of comorbid adolescent psychopathology.

The fifth issue examined whether differences in adult functioning remained associated with adolescent SUD after controlling for SUD in adulthood. It is possible that the continued occurrence of SUD during adulthood could account for the problems in functioning, rather than adolescent SUD (Jessor, Donovan, & Costa, 1991). Thus, we tested the relation between adolescent SUD and psychosocial functioning in adulthood, after controlling for the presence of adult SUD.

To summarize, the focus of the present is on the associations between adolescent SUD and adult functioning. Distinguishing characteristics include the use of a large community sample, the rigorous diagnosis of SUD and other psychiatric disorders, the broad range of examined functioning indices, and the repeated assessments at different developmental periods.

Method

Participants and Procedures

Participants were randomly selected in three cohorts from nine senior high schools representative of urban and rural districts in western Oregon. A total of 1,709 adolescents (ages 14-19) completed the initial (T1) interview and questionnaires between 1987 and 1989, with an overall participation rate of 61%. Half of the T1 sample (53%) was female, with an average age of 16.6 years (SD = 1.2). A total of 9% were nonwhite or Hispanic, and 53% were living with two biological parents (the remaining 47% were either living with a single biological parent, with a biological parent and step-parent, with adoptive parents, or in other settings). The representatives of the T1 sample was assessed using several approaches; differences between the sample and the larger population, and between participants and those who declined to participate were very small (Lewinsohn et al., 1993). Approximately one year later (M = 13.8 months, SD = 2.3), all T1 participants were invited to complete a second (T2) assessment. A total of 1,507 participants (88%) returned for a re-administration of the questionnaire and interview assessments. Mean age of T2 participants was 17.7 years (SD = 1.2; range = 15-21).

Between 1994 and 1999, as participants reached their 24th birthday, a third wave of questionnaires and interviews (T3) was obtained from all participants with a history of psychopathology at T2 and a randomly selected subset of participants with no history of mental disorder (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2003). On the basis of T1-T2 diagnostic information, three groups were selected for T3: (a) 351 participants with a T2 lifetime history of major depressive disorder, (b) 293 participants with a T2 history of nonaffective disorder,

and (c) 457 participants with no history of mental disorder at T2. The participants with no history of mental disorder were randomly selected from 863 T2 participants with no disorder (although all non-White T2 participants were retained in the sample to enhance the representativeness of the sample). Of the 1,101 participants eligible for the T3 assessments, 941 (85%) completed the T3 mailer questionnaire and diagnostic interview. The mean interval between T2 and T3 assessments was 6.8 years ($SD = 1.4$).

As participants reached their 30th birthday, a fourth wave of questionnaire and interview assessments (T4) was conducted with all participants who completed T3. Of the 941 eligible participants, 816 (87%) completed T4. Of the T4 participants, 480 (59%) were women. Most participants were White (89%) with 1% African American, 3% Hispanic, 3% American Indian, 3% Asian, and 2% "other." Slightly more than half (53%) were married at the time of T4 and 41% had a bachelor's degree or higher. Participants' mean age was 30.6 years ($SD = 0.6$). The mean interval between T3 and T4 was 5.4 years ($SD = 0.9$). Written informed consent was obtained from participants (and guardians, if applicable) to conduct all assessments.

Biases Due to Attrition

At T2, small but statistically significant differences due to attrition were noted between adolescents who did not participate and those who did (Lewinsohn et al., 1993). Attrition was associated with lower socioeconomic status, smaller household number, male gender, lifetime and current cigarette use, past diagnosis of disruptive behavior disorders and past SUD in males. Although women were more likely than men to complete the T3 assessments (89% vs. 81%); $\chi^2(1, N = 1101) = 13.55$, $p < .001$, T3 participation differences as a function of other demographic variables or T2 diagnostic status (including SUD) were nonsignificant (Lewinsohn et al., 1999). For the T3 to T4 period, significantly higher attrition rates were noted for men than women (16% vs. 11%); $\Pi^2 (1, N = 941) = 5.98$, $p < .05$, and for participants with SUD (17% vs. 11% for those with no lifetime substance use disorder); $\Pi^2 (1, N = 941) = 5.98$, $p < .05$. Given that greater T4 attrition was associated with T3 SUD, we compared T3 SUD participants who completed T4 to T3 SUD participants who dropped out of the study on global functioning level (DSM-IV Global Assessment of Functioning); the T3 SUD participants who discontinued participation did not have poorer functioning than T3 SUD participants who continued; $t(371) = -.99$, $p > .10$.

Diagnostic Interviews

T1 and T2 participants were interviewed with a version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982) that included items for most disorders as per DSM-III-R criteria (American Psychiatric Association, 1987). The T3 interview was expanded to assess DSM-IV (American Psychiatric Association, 1994) disorders. Follow-up assessments at T2-T3 were jointly administered with the Longitudinal Interval Follow-up Evaluation (LIFE; Keller et al., 1987). The K-SADS/LIFE procedure provided information regarding the onset and course of disorders since the previous interview. Inter-rater reliability of diagnoses for T1-T3 has been shown previously to be very good to excellent (Lewinsohn et al., 1993). The T4 interview consisted of a joint administration of the LIFE along with the Structured Clinical Interview for DSM-IV, non-patient version (SCID-NP; Spitzer, Williams, Gibbon, & First, 1990) to probe for new or continuing psychiatric episodes since T3. Although the T1 and T2 assessments were based on DSM-III-R criteria, sufficient information was collected at both time points to ascertain SUD symptoms according to DSM-IV criteria, which were used in the present study.

Diagnostic interviewers were carefully selected, trained, and supervised. Interviewers had advanced degrees in a mental health discipline and completed a 70-hour course in diagnostic interviewing for the SCID-NP and LIFE procedures at T4. Prior to conducting interviews,

interviewers were required to demonstrate a minimum kappa of .80 across all symptoms for at least two consecutive training interviews and on one videotaped interview of a participant with evidence of psychopathology. Interviewer performance was carefully monitored to minimize drift and maintain reliability during the study. T4 interviews were audiotaped and 15% (*n* = 124) were randomly selected for reliability purposes. Interrater reliability for SUD diagnoses, as evaluated by kappa, was moderate to excellent for alcohol abuse/dependence (6 = .79), cannabis abuse/dependence (6 = .90), and hard drug abuse/dependence (6 = .73).

Assessment of Psychosocial Functioning

An extensive battery of psychosocial measures was administered to participants at each of the four assessments (e.g., Lewinsohn et al., 1994; Lewinsohn, Klein, Durbin, Seeley, & Rohde, 2003). Measures of adult functioning in the present study are based on data obtained at the T4 (age 30) assessment.

Academic and occupation functioning at age 30 was assessed by three variables: (a) number of years of school completed; (b) Unemployment during the past year (6 categories; 1 = 0 weeks, 2 = 1-13 weeks, etc.); and (c) annual household income (6 categories ranging from "no income" to "$50,000 or more").

Interpersonal functioning at age 30 was assessed by four variables: (a) marital status (defined as never married, married/never divorced, or ever divorced/separated); (b) being a parent (having given birth to one or more children); (c) relationship quality with family members and friends (α = .90; 20 items; Procidano & Heller, 1983); and (d) social adjustment over the past two weeks, as assessed by mean item score on the 54-item Social Adjustment Scale-Self Report (α = .70; Weissman & Bothwell, 1976; higher scores indicate poorer adjustment).

Health and psychological functioning was assessed by three variables: (a) poor physical health (α = .50; self-rated physical health, treatment for illness or injury in past year, number of treatment visits, distress over chronic medical problems, medication use in past year); (b) risky sexual behavior (9 items assessing risky sexual behavior in the past 12 months, including multiple sex partners of the opposite or same sex, sex with injection drug user, sex with person not well known, inconsistent condom usage; α = .61; adapted from Rahdert, 1991); and (c) attempted suicide between T3-T4 (obtained in the K-SADS/SCID).

Additional measures of functioning included four variables: (a) life satisfaction (α = .89; 15 items chosen from Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976; higher scores indicate lower satisfaction); (b) coping skills (α = .77; 17 items described in Rohde, Lewinsohn, Tilson, & Seeley, 1990); (c) stressful life events (α = .71; 33 major life events occurring to the participant in the past 12 months, based on the Social Readjustment Rating Scale; Holmes & Rahe, 1967, and the Psychiatric Epidemiology Research Inventory; Dohrenwend, Levav, & Shrout, 1986); and Hammen et al., 1987; and (d) global level of functioning (DSM-III-R/DSM-IV Global Assessment of Functioning).

Nine of the 14 T4 variables also had been administered at T2: years of completed education, marital status, being a parenting, quality of relationship with family and friends, physical health, suicide attempt, coping skills, stressful life events, and global level of functioning. Thus, we were able to examine these functional outcomes in adulthood (i.e., T4) controlling for their status in older adolescence (i.e., T2).

Participant Groups

Of the 816 individuals who completed the T4 diagnostic interview, 773 (95%) completed the accompanying mailer questionnaire. Given our focus on functioning measures contained in the questionnaire, these 773 individuals formed the sample for the present study. Data from their

T1–T4 assessments were combined to create a longitudinal record of DSM-IV psychiatric history from childhood to age 30. SUD episodes beginning before age 19 were considered to have had an adolescent onset. Of the 773 T4 participants, 179 had experienced adolescent SUD (119 had alcohol, 102 had cannabis, and 61 had hard drug use disorders; numbers exceed 179 due to comorbidity; 71 of the SUD participants had two or more SUD diagnoses).

Of the participants with adolescent SUD, 122 (68%) also had another disorder occurring before age 19, and 142 (79%) continued to have SUD between the ages of 19 and 30. Regarding the remaining 594 participants who had not experienced adolescent SUD, 161 (27%) developed an SUD between 19 and 30 years of age.

Analytic Strategy

We first examined whether T1 demographic variables were associated with adolescent SUD; all analyses controlled for the fixed effects of demographic variables associated with adolescent SUD group status. Hierarchical logistic and linear regression models were used to examine the five issues described above. For each regression model, covariates were entered in five blocks. The first block consisted of SUD occurring before age 19 and any significant demographic variables. The second block consisted of the interaction of adolescent SUD X gender. For the 9 functioning measures that had been assessed in adolescence, the third block included the T2 measure of functioning. The fourth block controlled for other psychiatric disorders occurring before age 19. To control for adult SUD, a dichotomous measure indicating the presence or absence of SUD from age 19 to 30 was entered into the models in the fifth block. Covariates from earlier blocks were retained in subsequent models. Although the effect of adolescent SUD on 14 outcomes was examined, to avoid missing potential associations, we did not adjust alpha for the multiple analyses. Alpha, therefore, was set at .05 for all analyses. With a sample size of 773 and alpha set at $p < .05$, two-tailed, there is sufficient power ($>.80$) to detect small effect sizes or larger (odd ratios > 1.60; semi-partial $r \geq .10$).

Results

Comparison of SUD Diagnostic Group on T1 Demographic Variables

The sample was first compared on whether SUD before age 19 was associated with T1 demographic variables. Adolescent SUD was significantly associated with male gender (48% of participants with SUD were male vs. 38% of participants who did not have adolescent SUD); χ^2 (1, $N = 773$) = 4.73, $p < .05$, slightly younger age (mean age of 16.4 vs. 16.6 years; t[771] = 2.47, $p < .05$), and a lower probability of living with two biological parents (48% vs. 52%); χ^2 (1, $N = 773$) = 4.75, $p < .05$. SUD was not associated with race/ethnicity (White vs. non-White); χ^2 (1, $N = 773$) = 0.82, $p > .10$) or maximum parental education (defined as having one or both parents with a bachelors education); χ^2 (1, $N = 773$) = .003, $p > .10$. Therefore, subsequent analyses controlled for gender, age, and whether participants had been living with both biological parents at T1 in the first block of the regression models.

Associations of Adolescent SUD with Functioning by Age 30

For descriptive purposes, unadjusted rates of the adult functioning measures at age 30 as a function of adolescent SUD are shown in Table 1. Measures expressed in percentages or years are self-explanatory; values on the remaining measures refer to the scale scoring. For example, values of 1 and 2 on the recent unemployment measure refer to 0 and 1-13 weeks of unemployment during the past year, respectively; values of 4 and 5 on the annual household income measure refer to $30,000-$39,999 and $40,000-$49,999, respectively.

The association of adult functioning measures with adolescent SUD, controlling for relevant adolescent demographic factors, is shown in the first column of Table 2. As can be seen, eight

adult functioning measures were associated with adolescent SUD: all three indices of academic/ occupational functioning (fewer years of completed education, recent unemployment, lower annual household income); two indices of health/psychological functioning (engagement in risky sexual behavior, suicide attempt); and three additional indices of functioning (poor coping skills, stressful life events, poorer global adjustment). Contrary to expectation, none of the measures of interpersonal adjustment at age 30 were associated with adolescent SUD.

Interactions with gender—The second block of the models consisted of the interaction of adolescent SUD X gender. None of the interactions were significant, indicating that gender did not moderate the associations. Given their nonsignificance, the interaction terms were not retained in subsequent models.

Controlling for T2 level of functioning—The nine measures of functioning assessed at T2 were entered in the third block of the models to control for functioning level in older adolescence. Three of the eight measures significantly associated with adolescent SUD in Block 1 (recent unemployment, annual household income, risky sexual behavior) had not been assessed at T2, and therefore were unchanged in this analysis. Of the five variables that had been measured in adolescence, four variables at age 30 (i.e., years of completed education, coping skills, stressful life events, global adjustment) remained significantly associated with adolescent SUD; the fifth variable – suicide attempts in adulthood (T3-T4) – was no longer associated with adolescent SUD after controlling for suicide attempts that occurred by T2.

Controlling for comorbid adolescent psychopathology—The fourth block in the models adjusted for other psychiatric disorders present before age 19. Controlling for adolescent comorbidity, five of the seven variables remained significantly associated with adolescent SUD; risky sexual behavior and stressful life events at age 30 were no longer significantly associated with adolescent SUD.

Controlling for SUD between 19-30—The fifth, and final, block in the models controlled for SUD from ages 19-30. After controlling for SUD during adulthood, three of the five remaining functioning measures associated with adolescent SUD became nonsignificant: annual household income, coping skills, and global adjustment. Fewer years of education and recent unemployment remained significantly associated after all of the controls were applied. In addition, three new T4 variables – being current married (versus never married), being a parent, and lower life satisfaction – emerged as significantly associated with adolescent SUD after controlling for SUD occurring between 19 and 30 years of age.

To better understand the three new variables that emerged as associated with adolescent SUD in the final models, we examined the association of adolescent SUD with each adult functioning measure separately for those who did or did not have SUD between 19 and 30 years of age. Among participants who had SUD between 19-30, adolescent SUD was significantly associated with being currently married (55% of those with adolescent SUD vs. 39% of those who did not have adolescents SUD were currently married); χ^2 (1, $N = 237$) = 5.82, $p > .05$. Conversely, among participants who did not have SUD between 19-30, adolescent SUD was unrelated to being currently married at age 30 (71% versus 67%, respectively); χ^2 (1, $N = 394$) = 0.13, *ns*. Among participants who had SUD between 19-30, adolescent SUD was not associated with being a parent (50% vs. 50%, respectively); χ^2 (1, $N = 297$) = 1.52, $p > .10$. Conversely, among participants who did not have SUD between 19-30, adolescent SUD significantly predicted being a parent by age 30 (78% of those with adolescent SUD versus 52% of those who did not have adolescent SUD had given birth by age 30); χ^2 (1, $N = 470$) = 9.74, $p < .01$. The opposite pattern of findings was present for life satisfaction at age 30: adolescent SUD predicted lower life satisfaction only among participants who also had SUD between 19-30; semi-partial correlation (*sr*) = -.12, $p < .05$. For participants with adolescent

SUD but no SUD episodes beginning after they turned 19 years of age, adolescent SUD was unrelated to life satisfaction at age 30, $sr = -.04$, $p > .10$.

Exploratory SUD Subgroup Analyses

Given the high degree of comorbidity within adolescent SUD diagnoses, we examined adolescent SUD as a single construct. However, given the range of legal consequences associated with different substances, we conclude with a descriptive exploration of whether different SUD diagnoses might be associated with poorer adult functioning. Of the 179 participants with adolescent SUD, 59 had an alcohol use disorder (and no other SUD), 59 had a cannabis use disorder (with no hard drug use disorder but 41% had alcohol use disorder), and the remaining 61 had a hard drug use disorder (79% of whom also had either alcohol/cannabis use disorder). These three groups were compared on five outcomes at age 30 (four of the five significant results from the final models and GAF as a general functioning indictor). Group differences were significant on three variables: (1) years of completed education; $F(2, 178) = 11.01$, $p < .001$; (2) global functioning; $F(2, 178) = 3.25$, $p < .05$; and (3) having been a parent; $\chi^2(2, n = 175) = 9.36$, $p < .01$. Mean years of completed education ranged from 14.8 years for the alcohol only group to 13.6 years for the cannabis group to 13.3 years for the hard drug use group. Mean GAF scores for the three groups were 79.2, 73.8, and 75.1, respectively. Of the three respective groups, 41%, 55%, and 70% had had a child. Group differences on two remaining key outcomes – recent unemployment and marital status – were nonsignificant.

Discussion

The primary aim of the present study was to describe the characteristic adult functioning of individuals who had experienced SUD before age 19. In the initial analyses, which only controlled for relevant demographic differences, eight of the 14 functioning measures at age 30 were associated with adolescent SUD. Although men had a higher rate of SUD, gender moderated none of the associations between adolescent SUD and later functioning. After controlling for functioning and psychopathology, including SUD, prior to age 30, two of the eight associations remained significant. Two additional variables emerged as significantly associated with adolescent SUD after accounting for recurrent SUD in adulthood. The pattern of findings and potential research and clinical implications are discussed next.

We wanted to rule out the possibilities that poor functioning in adolescence might be a third factor associated with both adolescent SUD and poor adult functioning or a causal factor through which adolescent SUD impacts later functioning. Given that data on adolescent levels of functioning were available for a subset of examined measures, our models controlled for these measures during adolescence. The association of adult suicide attempts became nonsignificant after controlling for the presence of adolescent suicide attempts. Clinically, this finding suggests that SUD patients with a history of suicidality be carefully monitored for future suicidality. Adult functioning problems as measured by four other variables – less formal education, poor coping skills, stressful events, low global functioning – were not fully accounted for by lowered functioning levels in adolescence.

We also wanted to rule out the possibility that comorbid adolescent psychopathology might be a third factor variable predictive of both adolescent SUD and poor adult functioning. Our models therefore controlled for additional psychiatric disorders occurring before age 19. Accounting for comorbid adolescent psychopathology rendered two associations nonsignificant: risky sexual activity and stressful life events. We did not examine which specific psychiatric disorder may be most strongly associated with these outcomes, although risky adolescent sexual behavior is known to be associated with both depression (e.g., Tubman, Wagner, & Langer, 2003) and conduct problems (e.g., Bachanas et al., 2002), in addition to substance abuse. Clinically, the findings suggest that STD prevention efforts be aimed at multi-

disordered adolescents and adults receiving SUD treatment. Stressful life events have generally been studied in relation to psychiatric disorders other than SUD (e.g., major depression, bipolar disorder, post-traumatic stress disorder). The present results are consistent with the supposition that stressful events are more closely associated with internalizing disorders, although it is possible that stress may trigger SUD relapse in addicted individuals.

The last issue we examined was the effect of controlling for adult SUD on the associations with adolescent SUD. Controlling for SUD episodes occurring between 19 and 30 years of age brought three of the previously significant associations to nonsignificance: annual household income, coping skills, and global functioning. The two measures that remained significantly associated with adolescent SUD (i.e., less education, recent unemployment) appeared to be associated with adolescent SUD regardless of the course of SUD in adulthood. Interestingly, three additional adult measures emerged as significant only after accounting for adult SUD: being currently married (versus never married), being a parent, and life dissatisfaction. We next provide additional detail regarding the nature of each of these associations and discuss their implications.

Academic and occupational functioning measures at age 30 had the most robust associations with adolescent SUD. Even after a number of rigorous controls were made, experiencing SUD by age 19 remained associated with both completing less education and more recent unemployment at age 30. The present findings are consistent with Giaconia, Reinherz, Paradis, Hauf, and Stashwick (2001), who found that problems unique to drug use disorders at age 18 included a lower likelihood of post-high school education and being fired at age 21. Regarding the specific type of education that was impacted, adolescent SUD in the present study was not related to high school completion (93% with adolescent SUD completed high school compared to 96% of those with no adolescent SUD history, $p > .10$), but was associated with lower rates of receiving a bachelors degree (36% vs. 47%), $\chi^2 (1, N = 754) = 7.10, p < .01$, or masters degree (5% vs. 13%), $\chi^2 (1, N = 754) = 9.75, p < .01$. Individuals with less education or with higher rates of unemployment presumably have fewer opportunities for future job advancement. Given that most individuals at age 30 have not reached the peak of their career, the consequences of a more limited education and more frequent unemployment may increase over time. As the person ages, these factors may be associated with lowered income, increased financial stress, and possibly even lowered access to health care, and poorer physical health. The clinical implications of these results are that post-high school education and job management skills be strongly encouraged as SUD treatment goals for all individuals with a history of adolescent SUD.

Two opposing processes have been proposed for the relations between adolescent SUD and functioning problems in early adulthood. The concept of "role incompatibility" (Yamaguchi & Kandel, 1984a; 1984b) postulates that drug use disrupts normative transitions to adult roles and, conversely, the successful adoption of adult roles discourages subsequent drug use. This hypothesis has been supported by research that shows that adolescent drug use disrupts or delays the conventional developmental transitions to marriage, parenthood, and employment (e.g., Brook, Richter, Whiteman, & Cohen, 1999; Kandel, Davies, Karus, & Yamaguchi, 1986), and that marriage acts as a protective factor against substance use (Bachman, Wadsworth, O'Malley, Schulenberg, & Johnston, 1997). The alternative concept of "pseudo-maturity" (Newcomb & Bentler, 1988) postulates a positive relation between substance abuse and the adoption of adult roles before the adolescent has acquired the capability to deal with the associated challenges of these roles. The pseudo-maturity hypothesis is consistent with data showing associations between substance abuse and early onset of sexual activity, teenage parenthood, and early marriage (e.g., Krohn et al., 1997).

The present academic and occupational results offer support to the role incompatibility hypothesis, with the detectable negative impact of adolescent SUD on education completion and consistent employment extending well into adulthood. The finding that being a parent by age 30 was significantly associated with adolescent SUD for only the subset who did not have additional SUD episodes after turning 19 years of age also supports the supposition of the role incompatibility hypothesis that the adoption of adult roles, such as childbirth, discourages subsequent drug use. Unlike most of the functioning measures we examined, being a parent has the potential for being both a deeply rewarding and a difficult or troubling experience. The present finding suggests that becoming a parent may be an important pathway out of SUD. Clinically, the experience of becoming a parent may represent an important window of opportunity for making changes that reduce the likelihood of SUD relapse.

The overall pattern of findings for being currently married at age 30 also support the role incompatibility hypothesis, but require some elaboration. In our control group of participants with no history of either adolescent or adult SUD, 67% were currently married at age 30. Participants who had adolescent SUD but no continuance of SUD into adulthood had a similar rate of marriage (70%). Thus, adolescent SUD by itself was not predictive of having married by age 30. The remaining participants in our sample had SUD from age 19-30. Among that group, 55% with adolescent SUD and 39% with no history of adolescent SUD were currently married at age 30. Thus, the experience of SUD in adulthood, especially when the abuse or dependence disorder is first emerging in adulthood, appeared to disrupt the person's ability to successfully complete this important interpersonal milestone.

The fifth variable associated with adolescent SUD in the final models was lower life satisfaction. The outcome emerged as significant only after controlling for SUD occurring post-adolescence. One interpretation for the finding that adolescent SUD is associated with lowered life satisfaction at age 30 among only individuals who had continued SUD is that the ongoing SUD serves to maintain this negative experience. Life satisfaction may be based on a current appraisal of one's present life circumstances, and is therefore influenced by proximal, rather than distal, factors. If individuals with adolescent SUD remain free of SUD in adulthood, their perceived quality of life is not reduced. In retrospect, it might have been unreasonable or even counter-intuitive to posit that adolescent SUD would predict lowered life satisfaction unless it persisted. Clinically, lowered life satisfaction may be a motivating factor in seeking SUD treatment.

Exploratory analyses examined the possibility that different SUD categories would be associated with greater or lesser problems in subsequent functioning. Based on descriptive statistics, it appeared that adults with a history of adolescent alcohol use disorder may have better outcomes than those with a history of adolescent cannabis or hard drug use disorder. Tempering this conclusion, however, is the fact that these subgroup analyses confounded SUD category with the number of SUD diagnoses. Participants with alcohol use disorders but no other adolescent SUD represented only half of the adolescent alcohol use group. The pattern of findings suggests that clinical interventions with adolescents who abuse illegal substances or have multi-drug addictions should focus on addressing or preventing deficits in psychosocial functioning, in addition to achieving reductions in substance use or abstinence.

Several variables in the present study were unrelated to adolescent SUD and deserve mention. Contrary to expectation, with the exception of having given birth, the measures of interpersonal functioning in adulthood were unrelated to adolescent SUD. SUD may negatively impact concurrent rather than future interpersonal functioning. One possible caveat to this conclusion is that community-residing adolescents diagnosed with SUD may tend to have disorders of mild severity. The majority of participants with adolescent SUD in the present study neither sought nor received treatment for their problematic substance use. Adolescents or adult patients

seeking drug and alcohol treatment may exhibit more pervasive and persistent interpersonal functioning difficulties related to greater SUD severity.

We acknowledge several limitations of this study. First, the sample was from a single region of the country and consisted predominantly of White adolescents. In addition, participants were recruited from both rural and urban areas in western Oregon, which may differ substantially in their access to various illegal substances. These factors may limit the generalizability of findings. Second, we focused primarily on the examination of a single summary category of SUD rather than associations with specific drug use categories. Although we believe the advantages of this design decision (e.g., high comorbidity within SUD diagnoses, disorders share a number of common features) outweigh the costs, psychoactive substances vary along important dimensions that are relevant to functioning and different categories of substances may have very different correlate profiles. Our preliminary comparison of three SUD categories support this supposition. On a related note, we did not include nicotine dependence in our classification of SUD. This decision was partially pragmatic (we did not assess nicotine dependence in all participants) and partially based on the logic that heavy smoking is not as clearly associated with direct impairments in psychosocial functioning as other substances. Third, our measures of adult psychosocial functioning relied exclusively on participant self-report. This is less of a concern given that three of our strongest association (i.e., education, unemployment, childbirth) are fairly objective in nature. Fourth, a relatively large number of statistical comparisons were computed, and some findings may have been significant by chance (4 expected by chance, 21 were found to be significant). Results need to be independently replicated.

Several additional directions for future research can be offered based on the present study. First, research needs to incorporate measures of pre-existing functioning levels and continued psychopathology into the analyses. Second, continued research on the long-term impact of adolescent SUD on academic and occupational functioning is recommended. Given the number of variables that were examined in the final models, it is striking that adolescent SUD continued to have a direct effect on adult academic and work functioning. These are important outcomes, and the fact that these effects could not be attributed to adolescent functioning, adolescent comorbidity, and continuing SUD is extremely noteworthy. Does the impact of a restricted academic career or sporadic employment have continued effects on future career opportunities or is the individual able to compensate for these apparent limitations? Third, a considerable amount of neuropsychological and cognitive science research has explored the adverse impact of adolescent substance abuse on brain development and executive functioning (e.g., Carlin & O'Malley, 1996; Dahl & Spear, 2004; Giancola & Mezzich, 2003; Shoal & Giancola, 2001; Tapert & Brown, 2000), and the degree to which these changes account for psychosocial functioning in adulthood should be examined. Last, can randomized trials be used to experimentally manipulate these factors? For example, does treating adolescent SUD lead to a course of functioning indistinguishable from those who never experienced addiction? As research continues to move beyond treatment efficacy into effectiveness, evaluating the degree to which interventions improve functioning more broadly will become even more salient.

In summary, experiencing SUD in adolescence is associated with a number of functioning difficulties extending to age 30. Significant differences can be identified. However, with the possible exception of academic and occupational functioning, it is unlikely that these differences are the direct "consequences" of adolescent SUD. Instead, the problems of functioning seen in adults with a history of SUD appear to be better accounted for by continuing drug and alcohol abuse, by other psychiatric disorders, or by pre-existing problems that are already evident in adolescence. Perhaps this is to be expected; adolescent SUD would likely impact adult functioning through mediators or third factor variables of some sort. Although we can say with confidence that adults with a history of adolescent SUD showed numerous

signs of functional impairment, we cannot determine the causal nature of these associations. With these caveats in mind, however, given that the adolescent SUD episode preceded the measurement of functioning in this study, the pattern of findings is consistent with the possibility that some or all of these effects are related to the SUD experienced during adolescence, either directly or, more often, through SUD recurrence, prior functioning, or psychiatric comorbidity.

Acknowledgements

References

Aarons GA, Brown SA, Coe MT, Myers MG, Garland AF, Ezzet-Lofstram R, et al. Adolescent Alcohol and Drug Abuse and Health. Journal of Adolescent Health 1999;24:412–421. [PubMed: 10401969]

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, III-R. Washington, DC: American Psychiatric Association; 1987.

American Psychiatric Association. Diagnostic and statistical manual of mental disorders, fourth edition. Washington, DC: American Psychiatric Association; 1994.

Andrews, FM.; Withey, SB. Social indicators of well-being: American's perceptions of life quality. New York, NY: Plenum Press; 1976.

Bachanas PJ, Morris MK, Lewis-Gess J, Sarett-Cuasay EJ, Flores AL, Sirl KS, et al. Psychological adjustment, substance use, HIV knowledge, and risky sexual behavior in at-risk minority females: Developmental differences during adolescence. Journal of Pediatric Psychology 2002;27:373–384. [PubMed: 11986360]

Bachman, JG.; Wadsworth, KN.; O'Malley, PM.; Schulenberg, J.; Johnston, LD. Marriage, divorce, and parenthood during the transition to young adulthood: Impacts on drug use and abuse. In: Schulenberg, J.; Maggs, JL.; Hurrelmann, K., editors. Health risks and developmental transitions during adolescence. Cambridge: Cambridge University Press; 1997. p. 246-279.

Blume SB. Chemical dependency in women: Important issues. American Journal of Drug and Alcohol Abuse 1990;16:297–307. [PubMed: 2288328]

Brent DA. Risk factors for adolescent suicide and suicidal behavior: Mental and substance abuse disorders, family environmental factors, and life stress. Suicide and Life-Threatening Behavior 1995;25:52–63. [PubMed: 8553429]

Brick, J., editor. Handbook of the medical consequences of alcohol and drug abuse. New York: Haworth Press; 2004.

Brook JS, Richter L, Whiteman M, Cohen P. Consequences of adolescent marijuana use: Incompatibility with the assumption of adult roles. Genetic, Social, and General Psychology Monographs 1999;125:193–207.

Campbell, A.; Converse, PE.; Rodgers, WL. The quality of American life: Perceptions, evaluations, and satisfactions. New York, NY: Russell Sage Foundation; 1976.

Carlin, AS.; O'Malley, S., editors. Neuropsychological consequences of drug abuse. New York: Oxford University Press; 1996.

Costello EJ, Erkanli A, Federman E, Angold A. Development of psychiatric comorbidity with substance abuse in adolescents: Effects of timing and sex. Journal of Clinical Child Psychology 1999;28:298–311. [PubMed: 10446679]

Dahl, RE.; Spear, LP., editors. Adolescent brain development: Vulnerabilities and opportunities. New York: New York Academy of Science; 2004.

Daley SE, Hammen C, Burge D, Davila J, Paley B, Lindberg N, et al. Predictors of the generation of episodic stress: A longitudinal study of late adolescent women. Journal of Abnormal Psychology 1997;106:251–259. [PubMed: 9131845]

Dishion TJ, Owen LD. A longitudinal analysis of friendships and substance use: Bidirectional influence from adolescence to adulthood. Developmental Psychology 2002;38:480–491. [PubMed: 12090479]

Dohrenwend, BP.; Levav, I.; Shrout, PE. Screening scales from the Psychiatric Epidemiology Research Interview (PERI). In: Weissman, MM.; Myers, JK.; Ross, C., editors. Community Surveys of Psychiatric Disorders. New Brunswick, NJ: Rutgers University Press; 1986. p. 349-375.

Duncan SC, Alpert A, Duncan TE, Hops H. Adolescent alcohol use development and young adult outcomes. Drug and Alcohol Dependence 1997;49:39–48. [PubMed: 9476698]

Fergusson DM, Horwood LJ, Swain-Campbell NR. Cannabis use and psychosocial adjustment in adolescence and young adulthood. Addiction 2002;97:1123–1135. [PubMed: 12199828]

Giaconia RM, Reinherz HZ, Paradis AD, Hauf AMC, Stashwick CK. Major depression and drug disorders in adolescence: General and specific impairments in early adulthood. Journal of the American Academy of Child and Adolescent Psychiatry 2001;40:1426–1433. [PubMed: 11765288]

Giancola PR, Mezzich AC. Executive functioning, temperament, and drug use involvement in adolescent females with a substance use disorder. Journal of Child Psychology and Psychiatry 2003;44:857–866. [PubMed: 12959494]

Hammen C. Generation of stress in the course of unipolar depression. Journal of Abnormal Psychology 1991;100:555–561. [PubMed: 1757669]

Holmes TH, Rahe RH. The social readjustment rating scale. Psychosomatic Medicine 1967;11:213–218.

Jennison KM. The short-term effects and long-term consequences of binge drinking in college: A 10-year follow-up study. American Journal of Drug and Alcohol Abuse 2004;30:659–684. [PubMed: 15540499]

Jessor, R.; Donovan, JE.; Costa, FM. Beyond adolescence: Problem behavior and young adult development. New York: Cambridge University Press; 1991.

Kandel DB, Davies M, Karus D, Yamaguchi K. The consequences in young adulthood of adolescent drug involvement: An overview. Archives of General Psychiatry 1986;43:746–754. [PubMed: 3729669]

Kandel DB, Mossel P, Kaestner R. Drug use, the transition from school to work and occupational achievement in the United States. European Journal of Psychology of Education 1987;2:337–363.

Keller MB, Lavori PW, Friedman B, Nielsen E, Endicott J, McDonald-Scott PA. The Longitudinal Interval Follow-up Evaluation: A comprehensive method for assessing outcome in prospective longitudinal studies. Archives of General Psychiatry 1987;44:540–548. [PubMed: 3579500]

Kellogg ND, Hoffman TJ, Taylor ER. Early sexual experiences among pregnant and parenting adolescents. Adolescence 1999;34:293–303. [PubMed: 10494978]

Krohn MD, Lizotte A, Perez C. The interrelationship between substance use and precocious transitions to adult statuses. Journal of Health and Social Behavior 1997;38:87–103. [PubMed: 9097510]

Lewinsohn PM, Hops H, Roberts RE, Seeley JR, Andrews JA. Adolescent psychopathology: I. Prevalence and incidence of depression and other DSM-III-R disorders in high school students. Journal of Abnormal Psychology 1993;102:133–144. [PubMed: 8436689]

Lewinsohn PM, Klein DN, Durbin CE, Seeley JR, Rohde P. Family study of subthreshold depressive symptoms: Risk factor for MDD? Journal of Affective Disorders 2003;77:149–157. [PubMed: 14607392]

Lewinsohn PM, Roberts RE, Seeley JR, Rohde P, Gotlib IH, Hops H. Adolescent psychopathology: II. Psychosocial risk factors for depression. Journal of Abnormal Psychology 1994;103:302–315. [PubMed: 8040500]

Lewinsohn PM, Rohde P, Klein DN, Seeley JR. Natural course of adolescent major depressive disorder: I. Continuity into young adulthood. Journal of the American Academy of Child and Adolescent Psychiatry 1999;38:56–63. [PubMed: 9893417]

Lewinsohn PM, Rohde P, Seeley JR, Klein DN, Gotlib I. Psychosocial functioning of young adults who have experienced and recovered from major depressive disorder during adolescence. Journal of Abnormal Psychology 2003;112:353–363. [PubMed: 12943014]

Martino SC, Collins RL, Ellickson PL. Substance use and early marriage. Journal of Marriage and the Family 2004;66:244–257.

Newcomb MD. Drug use and intimate relationships among women and men: Separating specific from general effects in prospective data using structural equation models. Journal of Consulting and Clinical Psychology 1994;62:463–476. [PubMed: 8063973]

Newcomb, MD.; Bentler, TM. Consequences of adolescent drug abuse. Newbury Park, CA: Sage; 1988.

Newcomb MD, Galaif ER, Carmona JV. The drug-crime nexus in a community sample of adults. Psychology of Addictive Behaviors 2001;15:185–193. [PubMed: 11563795]

Newcomb MD, Jack L. Drug use, agency, and communality: Causes and consequences among adults. Psychology of Addictive Behavior 1995;9:67–82.

Newcomb MD, Vargas-Carmona J, Galaif ER. Drug problems and psychological distress among a community sample of adults: Predictors, consequences, or confound? Journal of Community Psychology 1999;27:405–429.

O'Hara P, Parris D, Fichtner RR, Oster R. Influence of alcohol and drug use on AIDS risk behavior among youth in dropout prevention. Journal of Drug Education 1998;28:159–168. [PubMed: 9673075]

Orvaschel H, Puig-Antich J, Chambers WJ, Tabrizi MA, Johnson R. Retrospective assessment of prepubertal major depression with the Kiddie-SADS-E. Journal of the American Academy of Child Psychiatry 1982;21:392–397. [PubMed: 7119313]

Procidano ME, Heller K. Measures of perceived social support from friends and from family. American Journal of Community Psychology 1983;11:1–24. [PubMed: 6837532]

Rahdert, ER. The adolescent assessment/referral system manual, Volume DHHS Publication no. ADM91-1735. Rockville, MD: NIDA; 1991.

Robbins C. Sex differences in psychosocial consequences of alcohol and drug abuse. Journal of Health and Social Behavior 1989;30:117–130. [PubMed: 2723378]

Rohde P, Lewinsohn PM, Tilson M, Seeley JR. Dimensionality of coping and its relation to depression. Journal of Personality and Social Psychology 1990;58:499–511. [PubMed: 2324939]

Shedler J, Block J. Adolescent drug use and psychological health: A longitudinal inquiry. American Psychologist 1990;45:612–630. [PubMed: 2350080]

Shoal GD, Giancola PR. Executive cognitive functioning, negative affectivity, and drug use in adolescent boys with and without a family history of a substance use disorder. Journal of Child and Adolescent Substance Abuse 2001;10:111–121.

Spitzer, RL.; Williams, JBW.; Gibbon, M.; First, MB. User's guide for the structured clinical interview for DSM-III-R; SCID. Washington, DC: American Psychiatric Association; 1990.

Spooner C. Causes and correlates of adolescent drug abuse and implications for treatment. Drug and Alcohol Review 1999;18:453–475.

Tapert SF, Brown SA. Substance dependence, family history of alcohol dependence and neuropsychological functioning in adolescence. Addiction 2000;95:1043–1053. [PubMed: 10962769]

Tubman JG, Wagner EF, Langer LM. Patterns of depressive symptoms, drinking motives, and sexual behavior among substance abusing adolescents: Implications for health risk. Journal of Child and Adolescent Substance Abuse 2003;13:37–57.

Weber JE, Maio RF, Blow FC, Hill EM, Barry KL, Waller PF. Alcohol and/or other drug use among adult non-occupant motor vehicle crash victims. Alcohol and Alcoholism 2002;37:468–471. [PubMed: 12217940]

Weissman MM, Bothwell S. Assessment of social adjustment by patient self-report. Archives of General Psychiatry 1976;33:1111–1115. [PubMed: 962494]

Wills TA, Vaccaro D, McNamara G. The role of life events, family support, and competence in adolescent substance use: A test of vulnerability and protective factors. American Journal of Community Psychology 1992;20:349–374. [PubMed: 1415032]

Wu P, Hoven CW, Liu X, Cohen P, Fuller CJ, Shaffer D. Substance use, suicidal ideation and attempts in children and adolescents. Suicide and Life-Threatening Behavior 2004;34:408–420. [PubMed: 15585462]

Yamaguchi K, Kandel DB. Patterns of drug use from adolescence to young adulthood: II. Sequences of progression. American Journal of Public Health 1984a;74:668–672. [PubMed: 6742252]

Yamaguchi K, Kandel DB. Patterns of drug use from adolescence to young adulthood: III. Predictors of progression. American Journal of Public Health 1984b;74:673–681. [PubMed: 6742253]

Zullig KJ, Valois RT, Huebner ES, Oeltmann JE, Drane W. Relationship between perceived life satisfaction and adolescents' substance abuse. Journal of Adolescent Health 2001;29:279–288. [PubMed: 11587912]

Table 1

Descriptive Statistics for Functioning Measures at Age 30 as a Function of SUD before Age 19

	SUD before Age 19	
	Yes (*n* = 179)	No (*n* = 594)
Academic/Occupational		
Years of school completed *M(SD)*	13.9 (2.0)	14.6 (1.9)
Recent unemployment *M(SD)*	2.0 (1.5)	1.7 (1.4)
Annual household income *M(SD)*	3.9 (1.8)	4.4 (1.6)
Interpersonal		
Marital status (%)		
never	34	33
currently married	46	50
ever divorced/separated	20	18
Ever been a parent (%)	55	49
Social support *M(SD)*	17.1 (4.3)	17.3 (4.0)
Social adjustment *M(SD)*	1.7 (0.4)	1.7 (0.4)
Health/Psychological		
Poor physical health *M(SD)*	2.5 (1.8)	2.2 (1.7)
Risky sexual behavior *M(SD)*	0.8 (1.5)	0.5 (1.3)
Suicide attempt (%)	25	12
Additional Outcomes		
Life satisfaction *M(SD)*	29.8 (8.6)	29.5 (8.5)
Coping skills *M(SD)*	48.0 (7.1)	50.9 (7.0)
Stressful life events *M(SD)*	3.7 (3.2)	3.0 (2.7)
Global functioning *M(SD)*	75.8 (12.1)	80.0 (11.0)

Note. SUD = substance use disorder; *M* = mean, *SD* = standard deviation.

Table 2
Associations between Functioning Measures at Age 30 and SUD before Age 19

Functioning Measure	Block 1[a]	Block 3[a,b]	Block 4[a,b,c]	Block 5[a,b,c,d]
Academic/Occupational				
Years of school	-.14***	-.14***	-.14***	-.09**
Recent unemployment	.09*	--	.09*	.07*
Annual income	-.12**	--	-.10**	-.04
Interpersonal				
Marital status				
Never vs. current	0.9 (0.6-1.3)	0.9 (0.6-1.3)	0.9 (0.6-1.4)	1.7 (1.1-2.8)*
married vs. div/sep	0.8 (0.5-1.2)	0.8 (0.5-1.2)	0.9 (0.5-1.4)	1.3 (0.8-2.2)
Ever been parent	1.3 (0.9-1.8)	1.2 (0.8-1.8)	1.3 (0.9-1.8)	1.7 (1.1-2.6)**
Social support	-.01	-.03	-.01	.04
Social adjustment	.01	--	-.01	-.06
Health/Psychological				
Poor physical health	.04	.03	.02	-.02
Risky sex behavior	.09**	--	.08	-.02
Suicide attempt	2.7 (1.8-4.2)***	1.8 (0.8-3.9)	1.6 (0.7-3.5)	0.9 (0.4-2.0)
Additional Outcomes				
Life satisfaction	.00	--	-.02	-.07*
Coping skills	-.12**	-.08*	-.07*	-.01
Stressful life events	.10**	.08*	.06	-.02
Global adjustment	-.16***	-.14***	-.12***	-.03

[a] Adjusted for gender, age, and living with both biological parents at T1.

[b] Adjusted for same measure of functioning at T2.

[c] Adjusted for other diagnosed disorders occurring before age 19.

[d] Adjusted for period prevalence of SUD during 19-30.

Note. Psych aggression = psychological aggression in the marriage; phys assault = physical assault in the marriage. Odds ratios (and 95% confidence intervals) are provided for dichotomous functioning measures; semi-partial correlations are provided for continuous functioning measures. The second block consisted of the interaction of adolescent SUD X gender; none of the interactions were statistically significant.

*
$p < .05$.

**
$p < .01$.

***
$p < .001$.