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The relationship between parental alcohol use, early and late adolescent alcohol use, and young adult psychological symptoms: A longitudinal study

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Abstract

We tested the hypothesis that there is a mediational pathway from parental alcohol use during the participants' adolescence to the participants' psychological symptoms in young adulthood. This pathway includes the participants' alcohol use and their psychological symptoms, both during adolescence. The participants are inner city African American and Puerto Rican early adolescents followed until young adulthood. They reported their own and their parents' behavior. Structural equation modeling showed that parental alcohol use was related to early adolescent alcohol use, which was associated with late adolescent alcohol use. Late adolescent alcohol use was related to psychological symptoms in late adolescence, which predicted young adult psychological symptoms. Males reported more alcohol use and more psychological symptoms than females in late adolescence and more psychological symptoms in young adulthood. Findings suggest that parents' and adolescents' alcohol use should be a focus in interventions designed to prevent or treat psychological symptoms in late adolescence and young adulthood.

Keywords

Parent and adolescent alcohol use; adolescent and young adult psychological symptoms

Introduction

In this study, we followed individuals from early adolescence through young adulthood. Our formulation suggests a developmental model relating parental alcohol use to their offspring's alcohol use in adolescence, and their offspring's psychological symptoms in late adolescence and young adulthood. We have used structural equation modeling to assess the adequacy of our developmental model, which incorporates these interrelationships. Furthermore, in contrast to some studies that focus on children of alcoholics (COA), the current study is based on a community sample of children.

Pathway from Parent Alcohol Use to Youth Alcohol Use

Parental alcohol use is a well-established risk factor for alcohol use and dependence in their children. This relationship may be due in part to biological or genetic factors,¹ as there is a 40-60% genetic variance that contributes to the heritability of alcohol dependence.^{2, 3} The

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remaining risk factors include social, familial, and/or psychological dimensions. For example, social learning theory emphasizes the importance of the child's modeling parental use of alcohol or a more general identification with the parent.⁴

Pathway from Parental Alcohol Use to Youth Psychological Symptoms

The relationship between parental alcohol use and their children's internalizing and externalizing symptoms has been established in studies using clinical diagnoses as well as psychological constructs as measures. For example, some investigators found that maternal substance use was significantly related to their adolescent children having a major depressive disorder.⁵ Others found that COA were more aggressive than children of non-alcohol using parents even after controlling for the children's substance use.⁶ Schuckit and his colleagues⁷ found that parental alcohol use was related to externalizing symptoms in children via home stability. In contrast to the above cross-sectional research, the present study fills an important gap insofar as it examines the effects of parental alcohol use on their offspring over several developmental periods, early and late adolescence, and young adulthood. Thus, we can shed light on adolescent alcohol use as related to the occurrence of psychological symptoms over time, as well as examine parental alcohol use as a precursor of psychological symptoms in their offspring.

Pathway from Youth Alcohol Use to Youth Psychological Symptoms

There is a relationship between alcohol use and psychological symptoms of depression and anxiety in individuals. The National Comorbidity Study^{8, 9} found that between 1990-1992, approximately 50% of the adolescents and adults with a lifetime substance use disorder also had a lifetime psychiatric disorder. In a general college sample, there was more psychological distress in students who reported greater alcohol consumption, and this relationship was stronger in men.¹⁰ In studies of community samples of adolescents and adults, as well as in clinical studies, the relationship between substance use, including alcohol, and internalizing disorders (e.g., mood and anxiety disorders), and externalizing disorders (e.g., conduct disorder) has been established.^{11, 12} However, to our knowledge there are no studies which examine these relationships in African American or Puerto Rican adolescents and young adults.

A few longitudinal studies have: a) examined the longitudinal relationship between substance use and psychological symptoms in order to establish their temporal order^{13, 14}; b) explored the factors linking earlier alcohol use and later psychological symptoms^{11, 15}; and c) identified potential areas for prevention and intervention activities.¹⁶ In a one-year longitudinal study, Aneshensel and Huba¹⁷ found that while alcohol use may lead to an initial decrease in depressive symptoms, over time, alcohol use worsened depressive symptoms. Brook and her colleagues¹⁸ found that controlling for earlier psychiatric disorders, early adolescent and young adult alcohol use significantly predicted later major depressive disorder, alcohol dependence, and other substance use disorders in participants in their late 20s.

Pathway from Early to Late Adolescent Alcohol Use

Several investigators have demonstrated that over the course of adolescence, not only does alcohol use increase, but also alcohol users in varying patterns or trajectories of alcohol use generally show increases during this developmental period.¹⁹⁻²³ Hence, light, moderate, and heavy-drinking adolescents show varying rates of increase over the course of adolescence, but tend to remain light, moderate, and heavy drinkers in late adolescence.²⁰ One review of adolescent alcohol use research has concluded that some biological and psychosocial factors related to use show similar associations for males and females.²⁴ However, these investigators found evidence that physiological differences (low response to alcohol) and social changes (higher estimate of perceived peer alcohol use) show differential relationships to gender as youths enter young adulthood. These gender differences place boys at greater risk for problem

drinking. Others have found that males are more likely to drink more than females.²⁰ Furthermore, males are more likely than females to be diagnosed with substance use disorders.²⁰

Earlier Psychological and Later Psychological Symptoms

An important question for mental health is whether the stability of psychological symptoms over time is traceable to earlier and contemporaneous use of alcohol. Based on the literature, we hypothesize that there is some stability in psychological symptoms between late adolescence and young adulthood.^{25, 26} To our knowledge, there are no studies that examine whether this stability is related to earlier and contemporaneous alcohol use in male and female adolescents and young adults. Research has shown that there are gender differences in various types of psychological symptoms. Males have more externalizing problems than females²⁷⁻²⁹ and females are more likely than males to have internalizing problems.^{26, 30, 31}

In order to understand better the developmental sequence in which parental and children's alcohol use may affect their young adult's later psychological functioning, we applied structural equation modeling techniques to data from an urban, minority, community-based sample. Minority adolescents constitute an understudied population. By assessing psychological symptoms rather than psychiatric diagnoses, interrelationships can be evaluated involving psychological symptomatology which may not have reached a clinical threshold. The significance of studying psychological symptomatology lies in the fact that it is a predictor of psychiatric diagnoses including alcohol dependence.¹⁴ We hypothesize that parental alcohol use and psychological symptoms in their young adult children are linked by: a) early adolescent alcohol use; b) by late adolescent alcohol use; and c) late adolescent psychological symptoms. Since gender is related to alcohol use and to psychological symptoms, gender is included in the model.

Methods

Sample

Participants for the present study were drawn from three waves of a longitudinal study of African American (AA) and Puerto Rican (PR) adolescents and young adults. The Time 1 (T1) data were collected in 1990 (N=1330); Time 2 (T2) data were collected in 1995 (N=1190); and the Time 3 (T3) data were collected in 2000-2001 (N=660). The T3 participants represented a subsample of those interviewed at T2 (See below). The Institutional Review Boards of the Mount Sinai School of Medicine and New York Medical College approved the study's procedures for all data collections.

Participants at T1 came from Grades 7-10 in a school district serving the East Harlem area of New York City. The school district was specifically selected in order to obtain a large sample of African American (N=694) and Puerto Rican (N=636) youths living in an urban area. At T1, the participants took self-administered questionnaires while listening via personal tape players to the questionnaire being read to them. This occurred in school classrooms from which teachers were absent. At T2 and T3, interviewers used structured questionnaires to conduct individual interviews with the participants. Participants were given copies of the questionnaire with which to follow the interview. Given the sensitive nature of many of the questions, we matched the T2 and T3 interviewers' gender and ethnicity with those of the participants as often as possible, but males never interviewed females.

The T2 response rate was 89.5% of those who participated at T1. Due to budgetary constraints, the T3 sample was limited to 660 participants. Given the overall study's focus on drug use and our interest in subsequently following participants who had children, at T3 we oversampled

participants who had reported using marijuana and/or having a child at T2. Since we had no hypotheses regarding attrition effects, we considered differences between the T3 participants and nonparticipants to be significant only if they were at least at the $p \leq .01$ level. There were no significant differences between the T3 participants and nonparticipants on T2 beer and wine use, nor on T2 depression ($p > 0.05$ and $p \leq 0.05$, respectively). However, the T3 sample reported more T2 hard liquor use and more T2 externalizing problems ($t = 3.02$, $p \leq 0.01$ and $t = 3.39$, $p \leq 0.01$, respectively) than the T3 nonparticipants. More details concerning the T1-T3 sample are available.³²

Of this study's 660 T1-T3 participants, 50.2% ($N = 331$) were African American, 49.8% ($N = 329$) were Puerto Rican, and 51% ($N = 335$) were female. Participants used options defined by the investigator to report their race/ethnicity. Their mean ages were 14.6 ($SD = 1.3$) at T1, 19.1 ($SD = 1.5$) at T2, and 24.5 ($SD = 1.3$) at T3. To analyze attrition effects in the sample from T1 to T3, several t -tests were conducted. The results showed that people who participated at both T1 and T3 were similar to those who participated only at T1 on mother and father alcohol use ($p > 0.1$ and $p > 0.5$, respectively), on youth beer and wine and youth hard liquor use ($p < 0.05$, and $p > 0.1$, respectively) and on mother and father education ($p > 0.1$ and $p > 0.1$, respectively). In addition, there was no significant difference between the proportion of the sample that was female at T1, 53.5% and at T3, 51% ($p \leq 0.05$), nor between the proportion that self-identified as African American at T1, 52.3% and at T3, 50.2% ($p > 0.1$).

Measures

The measures included in this study have been related to psychological symptoms in studies using other samples³³ and have predictive validity.³⁴ Apart from gender and ethnicity, the scales each had two to thirteen items. This study's multi-item scales are based on item intercorrelations and reliabilities and are grouped into manifest variables and latent constructs. The manifest variables, T1 Parental Alcohol Use, T1 Youth Alcohol Use, and T2 Youth Alcohol Use, each included two variables. The latent construct, T2 Youth Psychological Symptoms, included four manifest variables: a) Rebellion ($\alpha = .63$); b) Psychological Depression; c) Violent Experiences; and d) Deviant Behavior. The latent construct, T3 Youth Psychological Symptoms, also included four manifest variables: a) Intrapersonal Distress (a combination of three scales, physical depression, anxiety, and interpersonal difficulty); b) Rebellion; c) Violent Experiences; and d) Deviant Behavior. Please see Table I for information regarding the measures.

Data Analysis

A structural equation model (SEM) was conducted using LISREL VIII programs to assess the hypothesized pathways from parental alcohol use at T1 to youth psychological symptoms at T3.⁴⁰ We do not have any hypotheses regarding ethnic and socioeconomic differences in the pathways from parent to adolescent alcohol use to young adult psychological symptoms. Hence, when testing the SEM, we controlled for the youth's self-reported ethnicity and their education and income as young adults. In Appendix Tables 1 and 2, we present correlations within and among the latent and manifest variables. Following the recommendation of Hu, Bentler, and Kano,⁴¹ the Satorra-Bentler⁴² scaled statistic ($S-B \chi^2$) was used as the test statistic for model evaluation. We used the LISREL goodness of fit model (GFI) to assess the fit of the model. GFI values between 0.90 and 1.0 indicate a good fit.⁴³ We expected that the measurement errors of the following T2 and T3 parallel manifest variables, i.e., Rebellion, Violent Experiences and Deviant Behavior, would be highly correlated. Therefore, in the measurement model we estimated these correlation coefficients. Finally, a total effects analysis was performed to examine both the direct and indirect effects.

Results

The modification indices computed by LISREL indicated the adequacy of the estimated structural equation model depicted in Figure 2. The S-B χ^2 was 289.68 with 78 degrees of freedom. The GFI of the empirical model was 0.94. Therefore, the empirical model obtained adequately represented the relationships among the parental and youth latent constructs and manifest variables.

The significant pathways ($p \leq 0.05$, one tail) manifested in the empirical structural equation model and depicted in Figure 2 were as follows:

1. Parental alcohol use at T1 was positively associated with the frequency of youth alcohol use at T1 ($\beta=0.72$, $t=5.19$);
2. There was considerable stability across time (T1-T2) in youth alcohol use ($\beta=0.20$, $t=3.85$);
3. Youth alcohol use at T1 showed a trend ($p \leq 0.06$) toward a positive path to youth psychological symptoms at T2 ($\beta=0.02$, $t=1.58$);
4. Youth alcohol use at T2 had a positive path to youth psychological symptoms at T2 ($\beta=0.12$, $t=4.04$);
5. Adolescent psychological symptoms at T2 had a positive path to young adult psychological symptoms at T3 ($\beta=0.91$, $t=3.49$);
6. Males drank significantly more alcohol than females at T2 ($\beta=0.14$, $t=3.96$); and males manifested more psychological symptoms than females at T2 ($\beta=0.03$, $t=3.33$) and at T3 ($\beta=0.05$, $t=3.96$); and

The hypothesized direct effect between parent alcohol use at T1 and psychological symptoms at T2 was not supported ($\beta=0.01$, $t=0.27$). The hypothesized direct effect between T2 alcohol use and psychological symptoms at T3 was also not supported ($\beta=0.01$, $t=0.33$).

The results of the total effects analysis are presented in Table 2. This analysis showed that the hypothesized manifest and latent variables had statistically significant relationships with young adult psychological symptoms at T3. The greatest total effect was for late adolescent psychological symptoms on young adult psychological symptoms. Both T2 adolescent alcohol use and gender had greater effects than did T1 adolescent and parent alcohol use on young adult psychological symptoms.

Discussion

Parental Alcohol Use (T1) to Young Adult Psychological Symptoms (T3)

There was significant support for our structural equation model hypothesizing a pathway from parental alcohol use at T1 to young adult psychological symptoms at T3, covering a period of ten years. The model of the relationship between parental alcohol use and young adult psychological symptoms is mediational. Our findings suggest that parental alcohol use during the participants' early adolescence is associated with the participants' use during early adolescence, which is associated with their late adolescent drinking. Early adolescent drinking shows a trend in its relationship to late adolescent psychological symptoms. Late adolescent drinking at T2 is related to more psychological symptoms at T2 which, in turn, directly predict T3 psychological symptoms. However, parent drinking at T1 did not have a direct relationship with youth psychological symptoms at T2, nor did youth alcohol use at T2 have a direct relationship with youth psychological symptoms at T3. The effects of both of these manifest variables were mediated by contemporaneous psychological symptoms. This study highlights

the importance of both parent and early and late adolescent alcohol use in the development of psychological symptoms at two developmental periods (T2 and T3). This is one of the first studies to examine these developmental paths to young adult psychological symptoms in inner city African American and Puerto Rican adolescents and young adults. The results also suggest that males as compared to females are more likely to develop late adolescent and young adult psychological symptoms (note the direct pathway between gender and T2 and T3 psychological symptoms). This study's T2 and T3 latent constructs of psychological symptoms included more externalizing than internalizing variables (i.e., more variables on which males are likely to score higher). This pattern may have contributed to the association of gender with psychological symptoms. At the same time males use more alcohol during late adolescence (the direct path between gender and T2 alcohol use). Future research should focus on factors, in addition to alcohol, that mediate between gender and late adolescent and young adult psychological symptoms.

Alcohol (T1) to Alcohol (T2)

There is a significant relationship between early and late adolescent alcohol use. Moreover, the cross-sectional relationship between parental and early adolescent alcohol use at T1 was stronger than the longitudinal one between early and late adolescent alcohol use. In accord with past findings, there was considerable continuity between earlier and later alcohol use.²⁰ Nevertheless, the association was not perfect; hence, there was some discontinuity. It would be important to more closely investigate what contributes to both continuity and discontinuity during this time period. A major aspect of early adolescent alcohol use is parental alcohol use at that time. Those adolescents who continue to use more than experimentally also may be influenced by associating with deviant peer groups and social reinforcement from the broader environment.¹¹ Early adolescence may be an important time period for interventions designed to limit continued problematic alcohol use and the associated development of psychological symptoms. Treatment for early adolescent alcohol use and more than moderate parent use may also be indicated.

T1 Alcohol to T2 Psychological Symptoms

There was also a weak longitudinal pathway ($p \leq 0.06$) from early adolescent alcohol use (T1) to later adolescent psychological symptoms (T2), but the contemporaneous relationship between alcohol use and psychological symptoms at T2 was significant. This stronger relationship can probably be attributed to the two variables being assessed at the same time. The results of our developmental model suggest that early and late adolescent alcohol use have an indirect association with later internalizing and/or externalizing symptoms.^{11, 12} There may also be other factors underlying both the alcohol use and psychological symptoms, such as affiliation with a deviant peer group, new environmental stresses, modeling in a family environment, or common genetic risks for both alcohol use and psychological symptoms.^{20, 44, 45}

T2 Psychological Symptoms to T3 Psychological Symptoms

Late adolescent psychological symptoms are related to the presence of symptoms during young adulthood. This stability has been noted by previous investigators.^{25, 26} Again other factors, such as a similar family environment at T2 and T3 as well as genetic predispositions, might be contributing to the stability of psychological symptoms over time.⁴⁶

The study has some limitations. Parental alcohol use is reported by the youth, which implies that the parent's use of alcohol is observable or has come to the child's attention. Thus, parental alcohol use is likely to be under-reported in those instances where children are unaware of their parents' drinking. If parents were directly screened, it is possible that covert alcohol use might contribute to even more robust findings. In addition, the results would be more enlightening if

we knew from whom adolescents obtained alcohol (e.g., family members, peers, and/or commercial establishments). In addition, incorporating drug use, as well as other factors related to alcohol use, might strengthen future research regarding the predictors of psychological symptoms. Lastly, future studies should include measures of psychiatric disorders, including depression and substance use disorders, as well measures of psychological symptoms to assess whether there are differences in the pathways.

Despite the above limitations, the results of this study suggest that: a) late adolescent psychological symptoms and alcohol use, as well as gender, may have the greatest impact on young adult psychological symptoms; b) the impact of parental and early adolescent alcohol use on psychological symptoms, while statistically significant, is of lesser magnitude. These conclusions are supported by the Total Effects Analysis. The model is robust in so far as it was supported in both African American and Puerto Rican samples. While many cross-sectional studies have found comorbidities between alcohol use and psychological symptomatology,^{1, 12, 47} the present study has been better able to establish the temporal ordering of these dimensions. Also, by using measures of psychological symptoms rather than psychiatric diagnoses, this study extends the literature by assessing the relationship of alcohol use to symptoms (e.g., depressive mood, anxiety) that may be undetected, unheeded, or do not contribute to a diagnosed DSM disorder, but are present nonetheless. These symptoms are important because in this age group they may foreshadow the later development of clinical psychiatric illness. Early interventions directed at this at-risk group might prevent the progression of symptoms. Further research is needed to more closely examine the interactions between alcohol use and psychological symptoms, as well as the variety of risk or protective factors that might mediate the onset and progression of these problems.

In sum, the study highlights the importance of alcohol use by parents and early and late adolescents to the presence of psychological symptoms in late adolescence and young adulthood. This suggests that parental and adolescent alcohol use should be a focus for intervention programs designed to prevent or treat psychological symptoms in youth.

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Appendix

Appendix Table 1

Correlations between the variables within the manifest variables and latent constructs.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. T1 Maternal alcohol use													
2. T1 Paternal alcohol use	.29***												
3. T1 Youth beer & wine use	.21***	.20***											

	1	2	3	4	5	6	7	8	9	10	11	12	13
4. T1 Youth hard liquor use	.20***	.21***	.57***										
5. Gender	.00	-.03	-.01	.04									
6. T2 Youth beer & wine use	.03	.12**	.12**	.06	.14***								
7. T2 Youth hard liquor use	.07	.07	.16***	.12**	.13***	.60***							
8. T2 Youth depression	.06	.05	.06	.09*	-.19***	.12**	.08*						
9. T2 Youth rebellion	.10*	.10*	.07	.07	.00	.25***	.28***	.29***					
10. T2 Youth violence	.05	.02	.16***	.09*	.26***	.31***	.36***	.11**	.28***				
11. T2 Youth deviancy	.09*	.05	.16***	.10*	.27***	.45***	.41***	.20***	.36***	.72***			
12. T3 Youth intrapersonal distress	.08*	.06	.09*	-.00	-.13**	.10*	.11**	.29***	.19***	.12**	.15***		
13. T2 Youth rebellion	.11**	.04	.07	.09*	.13**	.16***	.18***	.14***	.29***	.18***	.26***	.30***	
14. T3 Youth violence	.01	-.06	.12**	.09*	.31***	.20***	.21***	.03	.14***	.52***	.47***	.17***	.32***
15. T3 Youth deviancy	.05	-.01	.14***	.12**	.32***	.31***	.30***	.05	.21***	.48***	.53***	.26***	.47***

Note: For gender male is scored high.

*

p ≤ .05;

**

p ≤ .01;

p ≤ .001.

Appendix Table 2

Correlations between latent constructs and manifest variables.

	1	2	3	4	5	6
1. T1 Parental alcohol use	–					
2. T1 Youth alcohol use	.50***	–				
3. Youth's gender	-.03	.01	–			
4. T2 Youth alcohol use	.10	.21**	.18***	–		
5. T2 Youth psychological symptoms	.11	.22**	.29***	.60***	–	
6. T3 Youth psychological symptoms	.06	.14**	.36***	.42***	.66***	–

Note:

*

p ≤ .05;

**

p ≤ .01;

p ≤ .001.

References

1. Lieberman DZ. Children of alcoholics: An update. *Curr Opin Pediatr* 2000;12:336–340. [PubMed: 10943813]
2. Prescott CA, Kendler KS. Genetic and environmental contributions to alcohol abuse and dependence in a population-based sample of male twins. *Am J Psychiatry* 1999;156:34–40. [PubMed: 9892295]
3. Schuckit MA, Smith TL, Kalmijn JA, Raimo EB. The relationship of a low response to alcohol to ERP and personality measures (abstract). *Alcohol Clin Exp Res* 2000;24(Supplement No 5):27A.
4. Bandura, A. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.
5. Ohannessian CM, Hesselbrock VM, Kramer J, et al. Parental substance use consequences and adolescent psychopathology. *J Stud Alcohol Drugs* 2004;65:725–730.
6. Elkins IJ, McGue M, Malone S, Iacono WG. The effect of parental alcohol and drug disorders on adolescent personality. *Am J Psychiatry* 2004;161:670–676. [PubMed: 15056513]
7. Schuckit MA, Smith TL, Barnow S, Preuss U, Luczak S, Radzinski S. Correlates of externalizing symptoms in children from families of alcoholics and controls. *Alcohol Alcohol* 2003;38:559–567. [PubMed: 14633643]
8. Kessler RC, Anthony JC, Blazer DG, et al. The US National Comorbidity Survey: Overview and future directions. *Epidemiol Psychiatr Soc* 1997;6:4–16. [PubMed: 9151646]
9. Kessler RC, Crum RM, Warner LA, Nelson CB, Schulenberg J, Anthony JC. Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Arch Gen Psychiatry* 1997;54:313–321. [PubMed: 9107147]
10. Geisner IM, Larimer ME, Neighbors C. The relationship between alcohol use, related problems, and psychological distress: Gender as a moderator in a college sample. *Addict Behav* 2004;29:843–848. [PubMed: 15219328]
11. Brook JS, Richter L, Rubenstein E. Consequences of adolescent drug use on psychiatric disorders in early adulthood. *Ann Med* 2000;32:401–407. [PubMed: 11028688]
12. Johnson JL, Leff M. Children of substance abusers: Overview of research findings. *Pediatrics* 1999;103(5 Pt 2):1085–1099. [PubMed: 10224196]
13. Brook JS, Cohen P, Brook DW. Longitudinal study of co-occurring psychiatric disorders and substance use. *J Am Acad Child Adolesc Psychiatry* 1998;37:322–330. [PubMed: 9519638]
14. Cohen P, Chen H, Crawford TN, Brook JS, Gordon K. Personality disorders in early adolescence and the development of later substance use disorders in the general population. *Drug Alcohol Depend* 2007;88S:S71–S84. [PubMed: 17227697]
15. Kushner MG. The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clin Psychol Rev* 2000;20:149–171. [PubMed: 10721495]
16. Tucker JS, Orlando M, Ellickson PL. Patterns and correlates of binge drinking trajectories from early adolescence to young adulthood. *Health Psychol* 2003;22:79–87. [PubMed: 12558205]
17. Aneshensel CS, Huba GJ. Depression, alcohol use, and smoking over one year: a four-wave longitudinal causal model. *J Abnorm Psychol* 1983;92:134–150. [PubMed: 6863729]
18. Brook DW, Brook JS, Zhang C, Cohen P, Whiteman M. Drug use and the risk of major depressive disorder, alcohol dependence, and substance use disorders. *Arch Gen Psychiatry* 2002;30:65–76.
19. Capaldi DM, Stoolmiller M, Kim HK, Yoerger K. Growth in alcohol use in at-risk adolescent boys: Two-part random effects prediction models. *Drug Alcohol Depend*. 2009 Jul 20; In Press. Epub ahead of print.
20. Chassin L, Flora DB, King KM. Trajectories of alcohol and drug use and dependence from adolescence to adulthood: The effects of familial alcoholism and personality. *J Abnorm Psychol* 2004;113:483–498. [PubMed: 15535782]
21. Flory K, Brown TL, Lynam DR, Miller JD, Leukefeld C, Clayton RR. Developmental patterns of African American and Caucasian adolescents' alcohol use. *Cultur Divers Ethnic Minor Psychol* 2006;12:740–746. [PubMed: 17087533]
22. Mauricio AM, Little M, Chassin L, et al. Juvenile offenders' alcohol and marijuana trajectories: risk and protective factor effects in the context of time in a supervised facility. *Journal of Youth and Adolescence* 2008;38:440–453. [PubMed: 19636756]

23. Orlando M, Tucker JS, Ellickson PL, Klein DJ. Concurrent use of alcohol and cigarettes from adolescence to young adulthood: An examination of developmental trajectories and outcomes. *Subst Use Misuse* 2005;40:1051–1069. [PubMed: 16040368]
24. Schulte MT, Ramo D, Brown SA. Gender differences in factors influencing alcohol use and drinking progression among adolescents. *Clin Psychol Rev* 2009;29:535–547. [PubMed: 19592147]
25. Weissman MM, Wolk S, Goldstein RB, et al. Depressed adolescents grown up. *JAMA* 1999;281:1707–1713. [PubMed: 10328070]
26. Woodward LJ, Fergusson DM. Life course outcomes of young people with anxiety disorders in adolescence. *J Am Acad Child Adolesc Psychiatry* 2001;40:1086–1093. [PubMed: 11556633]
27. Bongers IL, Koot HM, van der Ende J, Verhulst FC. Developmental trajectories of externalizing behaviors in childhood and adolescence. *Child Dev* 2004;75(5):1523–1537. [PubMed: 15369529]
28. Harris MB. Aggressive experiences and aggressiveness: Relationship to ethnicity, gender, and age. *Journal of Applied Social Psychology* 2006;26:843–870.
29. Hicks BM, Blonigen DM, Kramer MD, et al. Gender differences and developmental change in externalizing disorders from late adolescence to early adulthood: A longitudinal twin study. *J Abnorm Psychol* 2007;116(3):433–447. [PubMed: 17696699]
30. Crawford TN, Cohen P, Midlarsky E, Brook JS. Internalizing symptoms in adolescents: Gender differences in vulnerability to parental distress and discord. *Journal of Research on Adolescence* 2001;11(1):95–118.
31. Bell AC, D'Zurilla TJ. The influence of social problem-solving ability on the relationship between daily stress and adjustment. *Cognitive Therapy & Research* 2009;33:439–448.
32. Brook JS, Balka EB, Rosen Z, Brook DW, Adams R. Tobacco use in adolescence: Longitudinal links to later problem behavior among African American and Puerto Rican urban young adults. *J Genet Psychol* 2005;166:133–151. [PubMed: 15906928]
33. Brook DW, Brook JS, Rubenstein E, Zhang C, Singer M, Duke MR. Alcohol use in adolescents whose fathers abuse drugs. *J Addict Dis* 2003;22:11–34. [PubMed: 12661977]
34. Brook JS, Brook DW, Gordon AS, Whiteman M, Cohen P. The psychosocial etiology of adolescent drug use: A family interactional approach. *Genet Soc Gen Psychol Monogr* 1990;116(2):111–267. entire monograph. [PubMed: 2376323]
35. Derogatis LR, Lipman RS, Rickels K, Uhlenhuth EH, Covi L. The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. *Behavioral Science* 1974;19:1–15. [PubMed: 4808738]
36. Chavez EL, Oetting ER, Swaim RC. Dropout and delinquency: Mexican-American and Caucasian non-Hispanic Youth. *J Clin Child Adolesc Psychol* 1994;23:47–55.
37. Gold M. Undetected delinquent behavior. *Journal of Research in Crime and Delinquency* 1966;3:27–46.
38. Smith, GM.; Fogg, CP. Psychological antecedents of teenage drug use. In: Simmons, R., editor. *Research in community and mental health: An annual compilation of research*. JAI; Greenwich, CT: 1979. p. 87-102.
39. Costello, AJ.; Edelbrock, CS.; Kalas, R.; Kessler, MK.; Klaric, SA. *Diagnostic Interview Schedule for Children (DISC)*. Rockville, MD: National Institutes of Health; 1982.
40. Jöreskog, KG.; Sörbon, D. *LISREL 8: User's reference guide*. Chicago: Scientific Software International; 1996.
41. Hu L, Bentler PM, Kano Y. Can test statistics in covariance structure analysis be trusted? *Psychol Bull* 1992;112:351–362. [PubMed: 1454899]
42. Satorra, A.; Bentler, PM. Scaling corrections for chi-square statistics in covariance structure analysis. Alexandria, VA: American Statistical Association; 1988. p. 308-313.
43. Kelloway, KE. *Using LISREL for structural equation modeling: A researcher's guide*. Thousand Oaks, CA: Sage Publications; 1998.
44. Chassin L, Curran PJ, Hussong AM, Colder CR. The relation of parent alcoholism to adolescent substance use: A longitudinal follow-up study. *J Abnorm Psychol* 1996;105:70–80. [PubMed: 8666713]
45. Colder CR, Chassin L. The psychosocial characteristics of alcohol users versus problem users: Data from a study of adolescents at risk. *Dev Psychopathol* 1999;11:321–348. [PubMed: 16506537]

46. Kendler K, Prescott CA, Myers J, Neale MC. The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Arch Gen Psychiatry* 2003;60:929–937. [PubMed: 12963675]
47. Sher KJ, Walitzer KS, Wood PK, Brent EE. Characteristics of children of alcoholics: Putative risk factors, substance use and abuse, and psychopathology. *J Abnorm Psychol* 1991;100:427–448. [PubMed: 1757657]

Figure 1.
The Hypothesized Pathways from Parental Alcohol Use at Time 1 to the Offspring's Psychological Symptoms at Time 3.
1. Time 1 (T1); Time 2 (T2); Time 3 (T3).

Figure 2.

The Empirical Model of the Pathways from Parental Alcohol Use at Time 1 to the Offspring's Psychological Symptoms at Time 3. (GFI=0.94) (N=660).

1. Time 1 (T1); Time 2 (T2); Time 3 (T3).
2. For gender male is scored high.
3. Ethnicity and T3 education and income were statistically controlled.
4. We report the 95% Confidence Interval for each β .

Table 1

Measures Included in the Latent Constructs, Manifest Variables, and the Dependent Variable.

Measure	Sample Item and Range of Answer Options	Source ¹	Alpha
Time 1 (T1)			
Mother and father alcohol use (2) ²	How often does your mother drink alcohol (beer, wine or hard liquor)? (1=Never to 5=3 or more drinks every day)		
T1 and Time 2 (T2)			
Youth alcohol use (2)	How often do you drink beer or wine? How often do you drink alcohol, that is hard liquor? (1=Never to 5=3 or more drinks every day)		
T2 Psychological Symptoms			
Psychological depression (2)	You sometimes feel unhappy, sad, or depressed. (1=Completely false to 4=Completely true)	35	.70
Violent experiences (5)	How often have you hit someone with a weapon or shot someone? (1=Never to 5=5 or more times)	36	.80
Deviant Behavior (10)	How often have you taken something worth more than \$5? (1=Never to 5=5 or more times)	37	.84
Rebellion (3)	Sometimes you enjoy seeing how much you can get away with. (1=Completely false to 4=Completely true)	38	.63
T2 and Time 3 (T3) Gender	1=Female; 2=Male		
T3 Psychological Symptoms			
Internalizing behavior (13) ³ :			.87
Physical Depression (6)	How much have you been bothered by trouble sleeping? (1=Not at all to 5=Extremely)	39	
Anxiety (3)	How much have you been bothered by feeling nervous or shaky inside? (1=Not at all to 5=Extremely)	35	
Interpersonal difficulty (4)	How much have you been bothered by feeling that others do not understand you or are unsympathetic? (1=Not at all to 5=Extremely)	35	
Violent experiences (5)	How often have you held a weapon to someone? (1=Never to 5=5 or more times)	36	.77
Deviant Behavior (13)	How often have you gotten into trouble with the police for something you did? (1=Never to 5=5 or more times)	37	.80
Rebellion (3)	You enjoy doing things you shouldn't just for the fun of it. (1=Completely false to 5=Completely true)	38	.70

¹ Scales without sources originate with the first author.² The number in the parenthesis is the number of items in the scale.³ We present the Chronbach alpha for the combined scale and the source for each of the individual scales.

Table 2

Standardized Total Effect and Their t-Test Statistics

	Youth Psychological Symptoms (T3)
Youth Psychological Symptoms (T2)	0.91 *** (t=3.49)
Youth Alcohol Use (T2)	0.12 *** (t=4.89)
Youth Alcohol Use (T1)	0.04 ** (t=3.05)
Parent Alcohol Use (T1)	0.03 * (t=2.08)
Youth's Gender	0.09 *** (t=5.33)

Note:

*
p<0.05;**
p<0.01;***
p<0.001.