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# Peer Substance Use and Homelessness Predicting Substance Abuse from Adolescence Through Early Adulthood

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## Abstract

Adolescents who experience homelessness are at higher risk for abusing substances, and for being exposed to substance-using peers. The current study used a longitudinal design to track substance abuse, affiliation with substance-using peers, and episodes of homelessness among a sample of 223 adolescents who were homeless at thebaseline data collection and 148 adolescents who were housed at baseline. Participants were interviewed at six waves over 6.5 years, covering an age range from 13 to 25. Many participants experienced a recurrence of homelessness during follow-up, with 64.6 % of the baseline homeless group and 22.6 % of the baseline housed group reporting an additional episode of homelessness. Both alcohol abuse and other drug abuse symptoms showed an increase in adolescence followed by slowing in early adulthood. Recent homelessness and friend alcohol use predicted alcohol abuse symptoms, and the strength of the influence of friend use decreased over time. Recent homelessness and friend drug use predicted other drug abuse symptoms. Duration of the initial episode of adolescent homelessness showed no influence on substance abuse over time, or the effects of other predictors, highlighting the importance of conceptualizing the experience of homelessness as a recent stressor rather than an enduring personal characteristic.

### Keywords

Homelessness; Adolescence; Substance abuse; Peers; Hierarchical linear modeling; Alcohol abuse

## Introduction

Approximately 1.7 million youth experience homelessness each year in the United States (Hammer et al. 2002; Toro et al. 2007). Whether as a result of running away from family conflict, or dire family financial circumstances, these youth experience numerous stressors both precipitating homelessness, and during their day-to-day lives on the streets or in precarious housing (e.g., shelters, friends' homes, etc.). Substantial evidence suggests that homeless youth are at a higher risk for engaging in a number of risky behaviors, including substance abuse (Baer et al. 2003; Greene et al. 1997; Kipke et al. 1997; Van Leeuwen et al. 2004), likely as a result of some of the stressors they encounter before and during episodes


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of homelessness. Many homeless youth will experience recurrent episodes of homelessness, repeatedly exposing them to the stressors associated with being homeless (Milburn et al. 2009), which may impact their involvement in substance abuse over time. As substance abuse is itself a risk factor for a variety of other problems in the transition to adulthood, it is important to try to understand the ways in which experiences of homelessness can interact with more common risks for substance abuse.

Numerous studies indicate that across different types of substances, rates of use among homeless youth exceed rates of their housed peers (e.g., Baer et al. 2004; Kipke et al. 1993; McCaskill et al. 1998; Nyamathi et al. 2010). In addition to higher prevalence rates of use compared to their housed peers, homeless adolescents are also at greater risk for developing substance abuse and dependence. Baer et al. (2003) examined the prevalence of DSM-IV diagnoses of substance abuse and dependence in a sample of homeless youths between the ages of 13 and 19 years in Seattle, finding that 69.0 % of the sample met criteria for dependence on at least one substance (with 9.6 % meeting criteria for substance abuse only). Further, 30.1 % of Baer et al.'s sample met criteria for dependence on a second substance. Another study with homeless youth aged 14–24 found similarly high rates of substance use, including higher rates of both alcohol and marijuana, as well as a variety of harder drugs such as cocaine and methamphetamines (Salomonsen-Sautel et al. 2008). By contrast, similar research with community samples of adolescents (i.e., housed adolescents), suggests that about 4 % or fewer of adolescents meet criteria for dependence on alcohol or illegal substances, with an additional 8.6 % or fewer meeting criteria for abuse only (Chen et al. 2004; Palmer et al. 2009), although young adults in the community tend to have rates of substance dependence in the 10–12 % range (Palmer et al. 2009).

The ways in which homeless youth become more likely to abuse substances are outlined by the Risk Amplification Model (RAM), as well as the recently proposed modification, the Risk Amplification and Abatement Model (RAAM; Milburn et al. 2009; Whitbeck and Hoyt 1999). Risk factors existing prior to homelessness, such as having a substance-abusing parent, are amplified during an episode of homelessness due to stress and/or exposure to new negative social influences. During an episode of homelessness an adolescent's existing peer relationships may be disrupted, and the youth is more likely to come into contact with a variety of negative social influences, including other homeless adolescents (Falci et al. 2011; Whitbeck et al. 1999). These new social contacts may already be abusing substances, due to the risk associated with their own prior experiences of homelessness. Across many studies using community samples, peer substance use emerges as the most proximal predictor of substance use, often mediating the effects of other predictors (Creemers et al. 2010; Haller et al. 2010; Tarter et al. 2011). According to the RAM, increased contact with substance-abusing peers would contribute to risk for substance abuse among homeless adolescents, and in fact, several studies indicate that affiliation with substance-using peers is a strong predictor of homeless adolescents' substance use severity (Kipke et al. 1997; Rice et al. 2011, 2005; Tyler 2008; Wenzel et al. 2010). Conversely, the RAAM extends this model to suggest that contacts with positive social influences including prosocial peers and supportive family members can alleviate some of the risk associated with homelessness and contribute to exiting homelessness (Milburn et al. 2009).

Normative trends indicate that alcohol and other substance use tends to peak in late adolescence and early adulthood, then decline in the late 20s (Maggs and Schulenberg 2004; Masten et al. 2008). Individuals who persist in alcohol use beyond this normative decline, or who engage in more problematic drinking during adolescence and early adulthood, are more likely to suffer long-term consequences (Haller et al. 2010; Oesterle et al. 2004). Although the effects of homelessness, and the possible role of peer substance abuse, have begun to be explored within adolescence, much less is known about how the risks associated with

homelessness might change during the transition into adulthood. Identifying risk factors that predispose some individuals to problematic, or long-term, substance abuse, can be important in redirecting their trajectories.

Rather than regarding homelessness as a unitary stressor, researchers recognize that the particular experiences of homeless youth during an episode of homelessness can be singled out as contributing to later negative consequences. The current study seeks to contribute to this literature by examining the strength of the influence of peer substance use over time, while accounting for the effects of recent episodes of homelessness. Many youth who experience homelessness do not remain chronically homeless; while some may experience a single episode of homelessness, others will experience a few repeated episodes interspersed with periods of stable housing. The relative strength of influence of substance abusing peers during a period when the youth has recently experienced homelessness may be expected, per the RAM, to be higher due to the more intense exposure to deviant peers. At the same time, by following homeless and low-income housed youth across adolescence and into early adulthood, the current study takes into account the expected normative increase and subsequent decrease in substance abuse. The degree to which early experiences of homelessness, as well as the recurrence of later episodes of homelessness, could alter this normative trajectory, or interact with the effects of deviant peers in altering this trajectory, is an important question for those who work with homeless adolescents. By contributing to our understanding of predictors of substance abuse within a high risk group, the current study also seeks to inform the general field of substance abuse prevention.

## Method

### Participants

Two hundred fifty homeless adolescents aged 13–17 were recruited from homeless shelters, soup kitchens, and other service organizations targeting homeless youth in the Detroit metropolitan area. Homeless adolescents nominated peers who were not homeless, and were not close friends, to be included in the housed comparison group. Contact information for nominated housed youth was separated from surveys of homeless youth, protecting confidentiality but limiting our ability to compare results with the specific nominating homeless participants. Participants who were housed at baseline reported slightly lower rates of marijuana use when compared to results from Centers for Disease Control and Prevention Youth Risk Behavior Surveillance System (YRBSS) conducted during the same time period in the same metropolitan area (“CDC-Youth Online-High School YRBS Detroit, MI 1997 and United States 1997 Results,” n.d.), with 40.8 % reporting having ever smoked marijuana compared with 48.2 % in the YRBSS sample. Housed study participants appeared to consume alcohol at slightly higher rates than found in the YRBSS sample, with 75.5 % reporting having ever consumed alcohol compared with 71.2 % in the YRBSS sample. Due to the use of nominations by homeless participants in the sampling of housed participants, it is possible that our housed sample may differ in some unmeasured ways from other residents of the same neighborhoods; however, their rates of substance abuse do appear comparable to population estimates. The housed youth ($N$ = 148) were matched to the homeless youth on age, gender, race and neighborhood income. By matching on neighborhood income, the comparison group was expected to share many of the same risks attributable to lower-income or urban neighborhoods. Youth were then followed up at approximately 6 months, 1 year, 2 years, 5 years, 6 years, and 7 years following baseline, for a possible total of 7 waves of data. Due to difficulty locating the often transient participants, actual dates of data collection ranged within each of the set data points, and missing data points were common.

The current analyses include all participants who completed at least three waves of data, for a total $N = 370$. Two hundred and twenty-three participants had been homeless at the initial contact, and 147 were housed. The sample is 66 % female, and almost equally divided between African American and Caucasian participants (47 % African American, 48 % Caucasian, 5 % Hispanic or "Other"). The sample includes a large number of participants in each age group at baseline (*N* at 13 = 61, *N at* 14 = 83, *N* at 15 = 86, *N* at 16 = 90, *N* at 17 = 50). The total age range covered over the course of the study is 13–25, with a mean age of 18.26. When compared with the 28 participants who were in the original sample, but who had less than three interviews (baseline plus at least 2 follow-ups), the included 370 participants were more likely to have been housed at baseline ($\chi^2 = 11.64$, $p < .001$). Included participants did not differ from attrited participants on other variables of interest in this study, including gender, age, friend alcohol or drug measures at baseline, or self-reported alcohol or drug symptoms at baseline.

## Measures

**Demographics—**Participants' date of birth, gender and race were reported by participants at baseline. Participants also reported their home addresses (for homeless participants, their most recent home), which was used to calculate home neighborhood income.

**Housing Status—**The Housing, Education and Income Timeline (HEIT) is based on earlier measures developed for use with homeless and poor adults (Toro et al. 1995), informed by the Life History Calendar techniques in which respondents are asked to recall specific aspects of their recent history (Freedman et al. 1988). At the first data collection, respondents provided information on their housing status for the previous year, and for each subsequent wave of data collection, respondents provided information on where they were living for every day since the last date of data collection. By using this approach, even if a respondent missed one of the scheduled follow-up interviews, their housing status is known for the entire course of their participation in the study. Homeless status was determined using a coding system applied to each living site. Participants clarified whether they had been literally homeless at a given site (e.g., living in a shelter, sleeping on the street), precariously housed (e.g., staying with friends because they had nowhere else to go), or housed (e.g., living in their own apartment or living with family members in a stable living situation). For the purposes of the current analyses, literally homeless and precariously housed sites were combined into a single "homeless" category.

**Friend Substance Use—**Friend substance use was assessed with the Social Network Interview (SNI; Bates and Toro 1999). The SNI was administered at each time point of the study. Participants are asked to list their close friends, then are asked a number of questions about each friend. Likert scales were used to asses friend frequency of alcohol and frequency of other drug use (0 = never, through 4 = daily) and quantity of alcohol intake (1 = 1–2 drinks per occasion, through 5 = more than 8 drinks per occasion), for each friend. A friend alcohol index was created by multiplying frequency by quantity for each friend, then the mean across all friends was calculated for each time point assessed. Friend drug use was aggregated by taking the proportion of friends who used drugs at least monthly at each time point, calculated by dividing friends who use drugs monthly by total number of friends reported.

**Participant Substance Abuse Symptoms—**The substance abuse section of the Diagnostic Interview Schedule for Children (Costello et al. 1982) was used to create separate counts of alcohol abuse symptoms, and abuse symptoms associated with other substances. Alcohol symptom counts could range from 0 to 16, while the "other drug"

symptom count could range from 0 to 24 due to the inclusion of different types of substances.

## Procedure

Interviews were administered by trained full-time interviewers and by some similarly trained undergraduate and graduate students. Parental consent as well as adolescent assent was obtained at baseline. Interviews took place in private areas in shelters or homes, and every effort was made to assure participants that their responses were confidential. Participants were tracked over time by maintaining frequent contacts when possible, offering small monetary incentives for providing updated contact information, and through collateral contacts.

## Data Analysis Plan

We used hierarchical linear modeling (HLM) to predict both initial levels and change in alcohol and drug abuse symptoms over time. All HLM analyses used HLM 6.02 software (Raudenbush et al. 2004). Models examined prediction on two levels: Level 1, or intra-individual, predictors, are time-varying variables that may be associated with the outcome variable. Level 2, or inter-individual predictors, are predictors measured at one time point that may be associated with mean differences between individuals on the intercept and slope of change of the outcome variable.

When a participant missed a wave of data collection, the housing timeline measure recorded the number of days homeless since the last actual data collection, effectively eliminating missing data on days homeless. In order to preserve the measure of time-varying homelessness as an index of recent homelessness, we imputed the date that the participant should have been interviewed by calculating the mean number of days between observations across participants, then inserted a placeholder date into the housing timeline representing that number of days from the participant's last actual interview. As a result, the window of observation for days homeless is similar for all participants regardless of missing observations, and "recent" homelessness is defined as number of days residing at any site defined as "homeless" occurring between the current date of data collection and the most recent actual or, if missing, imputed, date of data collection. Due to significant skew in the recent days homeless variable, recent homelessness was dichotomized into 0 = no days homeless since the last date of data collection and 1 = any days homeless since the last date of data collection. A logarithmic transformation was used to correct skew in the outcome variables of alcohol abuse symptoms and other drug abuse symptoms.

As a first step, unconditional growth models were estimated to determine if significant change occurred in the outcome variables over time, and to determine if this change was linear. Time was operationalized as age, not days since baseline, for a number of reasons. The research questions focus on prediction of substance abuse across this developmental period, not in reference to a single episode of homelessness. Because homelessness was a recurring event for many study participants, it is less interesting to structure the analyses in reference to a single (albeit initial to the study) episode. The current sample has five cohorts with a significant degree of overlap and a large number of participants in each cohort, providing optimal circumstances for a cohort-sequential design to approximate a longitudinal design (Duncan et al. 2006, pp. 82–83). To determine whether substance abuse changed across the ages assessed (13–26), separate growth models were run for alcohol abuse symptoms and other drug abuse symptoms. Age was centered at the mean (18.26), and entered as a Level-1 predictor. A quadratic term for age was then added to the equation, as research suggests that the increase in alcohol abuse may decelerate in early adulthood (Masten et al. 2008).

Following the determination of change in alcohol and other drug abuse symptoms, a series of hierarchical linear models were tested to examine predictors of alcohol and other drug abuse symptoms over time. The initial model included only age, quadratic age term, and the dichotomous recent homelessness variable. Subsequent models sequentially added friend alcohol (or drug) use, the interaction between age and friend alcohol (or drug) use, and the interaction between recent homelessness and friend alcohol (or drug) use. Finally, days homelessness at baseline was added as a Level 2 predictor for each Level-1 effect, to determine if any of the effects of Level 1 variables were moderated by previous experience of chronic homelessness.

To facilitate the comparison of alternative models, a Deviance statistic is reported for each model. This statistic represents the − 2ln(log likelihood) value for a model, and indexes the degree to which the model deviates from the observed data. The difference between the Deviances for two models follows an approximate $\chi^2$ distribution, where the degrees of freedom is the difference in number of parameters estimated between the two models (Raudenbush and Bryk 2002). As each model tested adds a single new variable to the preceding model, pairwise comparisons were made between the each model and the immediately preceding model.

## Results

### Descriptive Analyses

Youth who were homeless versus housed at baseline did not significantly differ by gender ($\chi^2 = 1.44$, $p = .26$), race ($\chi^2 = 3.50$, $p = .32$), age ($t(368) = 1.09$, $p = .28$) or neighborhood income ($t(368) = 1.21$, $p = .23$). Of the youth who had been homeless at baseline, 65.5 % reported experiencing at least one additional episode of homeless-ness during the follow-up period after having exited the baseline episode. Of the youth who had been housed at baseline, 22.6 % reported at least one subsequent episode of homelessness during the follow-up period, indicating that youth in the homeless baseline group were significantly more likely to experience a recurrence of homelessness. The frequency of participants reporting any homelessness at each wave of data collection is depicted in Table 1. None of the participants were continuously homeless throughout the entire study, and over the course of follow-up the mean proportion of days housed reported by participants was 96 % for participants who had been homeless at baseline, and 99 % across participants who had been housed at baseline.

In the unconditional model determining the presence of change in alcohol abuse symptoms, the coefficient for age was significant ($t(1,987) = 10.26$, $p < .001$), indicating that alcohol abuse symptoms showed a linear increase between ages 13 to 26. When a quadratic term for age was added, the linear term remained positive and significant ($t(1,986) = 10.63$, $p < .001$), and the quadratic term was negative and significant ($t(1,986) = -2.56$, $p < .05$), confirming that the increase in alcohol abuse symptoms slows in the later ages covered in this study. Similar findings were obtained for other drug abuse symptoms, with both the linear term ($t(1,986) = 4.03$, $p < .001$) and quadratic term ($t(1,986) = -4.29$, $p < .001$) showing a significantly increasing then decreasing trend.

An additional exploratory analysis was run to determine if levels of friend substance abuse varied as a function of recent homelessness. Separate hierarchical linear models were run with mean friend alcohol use and proportion of friends using drugs monthly as the outcomes. Both age ($t(1,806) = 14.40$,$p < .001$) and the quadratic term for age ($t(1,806) = -2.56$, $p < .05$) predicted mean friend alcohol use, but mean friend alcohol use was not predicted by recent homelessness ($t(1,806) = .50$, $p = .62$). However, individuals who had recently experienced homelessness did report having a significantly higher proportion of

friends who used other drugs regularly ($t(1,814) = 3.06$, $p < .01$), which was also predicted by linear age ($t(1,814) = 4.90$, $p < .001$) and quadratic age ($t(1,814) = -3.23$, $p < .01$).

**Predictors of Alcohol Abuse Symptoms—**Results of hierarchical linear models predicting alcohol abuse symptoms are presented in Table 2. Recent homelessness significantly predicted alcohol abuse, indicating that participants who had had at least 1 day of homelessness since the immediately previous wave of data collection were more likely to abuse alcohol. Friend alcohol use predicted alcohol abuse symptoms beyond the effects of homelessness, with participants who reported higher rates of friend use also being likely to report alcohol abuse symptoms. The interaction between friend alcohol use and age was significant and negative, indicating that the association between friend use and alcohol abuse weakens over time. Finally, the interaction between recent homelessness and friend alcohol use was also negative and significant, indicating that the association between friend alcohol use and respondent alcohol abuse is weaker for individuals who have recently experienced homelessness.

An additional model was run adding days homeless at baseline as a Level-2 predictor, which ranged from 0 to 363 ($M = 32.61$, $SD = 70.50$). The difference between model deviance statistics with the preceding model (Model 4 in Table 2) was non-sig nificant ($\chi^2(7) = 11.69$, $p = .11$), indicating that the time-varying predictors were more predictive of current alcohol abuse. Exploratory analyses testing for the interaction between age at baseline and homeless status at baseline indicated no significant effects for this interaction on alcohol abuse, and when compared with the previous significant model (Model 4 in Table 2), the additional Level-2 predictors did not improve the variance accounted for by the model ($\chi^2(21) = 2.88$, $p > .50$).

**Predictors of Other Drug Abuse Symptoms—**A parallel series of models were tested to determine whether a similar pattern of predictors emerged for other drug abuse symptoms. Recent homelessness significantly predicted drug abuse symptoms, as did the proportion of friends who used drugs at least monthly (Table 3). Unlike with alcohol use, there was no significant interaction between age and friend drug use. These results suggest that the strength of the influence of friends on drug use was relatively stable over the age range surveyed. In addition, there was no significant interaction between recent homelessness and friend drug use, indicating that recent episodes of homelessness did not affect the strength of the association between friend drug use and drug abuse symptoms.

To test for early chronic homelessness, days homeless at baseline was added as a Level-2 predictor to a model with the significant Level-1 predictors of recent homelessness and friend drug use. Baseline days homeless did not predict drug abuse symptoms, nor did it moderate the effects of Level-1 predictors, and change in model deviance from the preceding model (Model 4 in Table 3) was non-significant ($\chi^2(7) = 4.66$, $p > .50$). However, adding age at baseline and the interaction between age at baseline and days homeless at baseline did increase the variance accounted for when compared with the previous significant model (Model 4 in Table 3; $\chi^2(21) = 46.90$, $p < .01$). While the interaction between age at baseline and days homeless at baseline was not found to moderate any of the Level-1 effects, the age at baseline was found to moderate both the linear age ($t(1,785) = -3.88$, $p < .001$) and quadratic age effects ($t(1,785) = 2.56$, $p < .011$), as well as the Level-1 interaction term (which is itself non-significant) between age and friend drug use ($t(1,785) = -2.23$, $p < .05$).These results suggest that being homeless at a particular age is not a significant moderator of later time-varying predictors. Rather, because the quadratic age curve for drug symptoms is quite marked, participants whose baseline interviews occurred at different ages (stages in that curve) demonstrated significantly different follow-up slopes.

## Discussion

The importance of peer influence in predicting substance abuse among adolescents is well-established, particularly among community samples (Creemers et al. 2010; Haller et al. 2010; Tarter et al. 2011). Among homeless youth, peer influence has also been widely cited as an important predictor of substance abuse, although the relative importance of peers in comparison with other risks associated with homelessness has been less clear (Kipke et al. 1997; Rice et al. 2011; Wenzel et al. 2010). The results of the current study support existing evidence that both recent homelessness and peer influence significantly predict alcohol and other drug abuse. Even when accounting for the number of days respondents were homeless at the baseline measurement, occurring during adolescence for all participants, the occurrence of more recent homelessness remained the more significant predictor of current substance abuse. The age at which the initial homeless episode was measured was not predictive, nor did duration of an early episode of homelessness moderate the importance of recent homelessness. These results are consistent with an understanding of homelessness as a proximal stressor, rather than reflecting some kind of stable personal characteristic. With regard to substance abuse, it is important to note that even youth who have experienced early homelessness demonstrate the same normative decrease in substance abuse over time, but the recurrence of homelessness across the transition to adulthood increases the risk of continued substance abuse.

We were a bit surprised to find that our results are not entirely consistent with the predictions of the RAM (Milburn et al. 2009; Whitbeck and Hoyt 1999). No interactions were found between the number of days homeless at the initial contact, and the more proximal risk factors; we had expected that early experiences of homelessness would have exacerbated the effects of later additional stressors (recurrence of homelessness, peer substance use). It is possible that additional, unmeasured, early experiences would have demonstrated such an interaction effect. While peer substance use continues to be an independent risk factor, even in the presence of homelessness, the one small interaction found between recent homelessness and peer alcohol use suggested that the strength of influence of peer alcohol use is lowered in the presence of homelessness. This was surprising to us, as we expected that any interaction between peer substance abuse and homelessness would have found an amplifying effect of homelessness on the influence of deviant peers. It appears more that youth who recently experienced homelessness may have been exposed to other stressors, or have been given relatively greater access to alcohol through reduced adult monitoring, thereby weakening the relative importance of the frequency or intensity of peer use in predicting their alcohol abuse symptoms. At the same time, we did find that youth who had recently been homeless reported having a higher proportion of drug-using peers, with no moderation by homelessness on the influence of drug-using peers. These results are more consistent with the RAM, indicating that although homelessness did not change the importance of peers in predicting drug abuse relative to other stressors, the experience of homelessness was associated with greater exposure to drug abusing peers.

Although we did not find evidence of early homeless-ness interacting with later risk factors, our findings that homelessness can be best conceptualized as a recent stressor is consistent with the RAM. Whatever personal risk factors might have been present before the onset of homelessness, the experience of homelessness itself appears to contribute to elevated risk for negative outcomes, including substance abuse. As researchers continue to try to better understand the psychological sequelae of homelessness, a continued emphasis on understanding the risks that occur during recent episodes of homelessness should yield a better model for preventing negative outcomes. At the same time, we recognize that the nature of our analyses do not rule out the possibility that substance abuse is itself the risk

factor of interest, contributing to both risk for recurrent episodes of homelessness and increasing affiliation with substance-using peers. While some evidence does suggest that homeless youth and adults who abuse substances later demonstrate greater housing instability that homeless individuals with other types of risk factors (Aubry et al. 2012), future longitudinal research with homeless youth may help tease out causal relationships by using more frequent follow-up interviews to determine whether increases in substance abuse immediately precede episodes of homelessness or vice versa.

In addition to examining the intersection of homeless-ness and peer influence, we found that the role of peers is not necessarily consistent across alcohol and other drug abuse over time. We found that, even in our high-risk sample, alcohol abuse symptoms followed a normative trend of increasing, then decreasing over the course of the age range studied. However, the influence of peer alcohol use weakened over time, suggesting that in early adulthood, overall frequency or quantity of peer alcohol use becomes less important as a predictor of alcohol abuse symptoms. These results highlight an important consideration of the study of alcohol use in the transition to adulthood: It seems that the settings in which an individual can consume alcohol, and therefore the associated influences on alcohol consumption, change around age 21. While an adolescent's use of alcohol may be largely determined by the circumstances in which he/she obtains and consumes alcohol together with friends, such as at parties in a friend's home, in early adulthood alcohol becomes easily obtainable regardless of peer use. By contrast, substances included in this study as 'other drugs' remain consistently illegal across the age range studied. While a decrease in drug abuse symptoms was observed in early adulthood, the role of having a higher number of drug-using peers remained stable across the period observed. These results should not be interpreted as suggesting that a stable cohort of peers exerts steady influence on drug abuse; but, rather, that the relative importance of peers in influencing drug abuse should not be expected to change during the transition to adulthood. Peers facilitate access to illegal substances, and can provide a setting for their use, which would not be expected to change for substances that remain illegal across the lifespan.

While several longitudinal studies of substance use in adolescence exist, few exist of homeless and low-income urban adolescents. A major strength of this study is the coverage of a large age range, and the high rates of follow-up among youth in a very high risk group. By providing information about the substance abuse rates and the role of peer influence in this difficult to study sample, the current study contributes significantly to our understanding of the experiences of homeless adolescents as they mature into young adulthood. In addition, the measures used were detailed and comprehensive, providing a more reliable assessment of substance abuse and peer use than is often yielded in studies with comparably large sample sizes.

A few limitations of this study are important to note. First, all measures, while comprehensive, were self-reported. Repeatedly contacting peers of such a transient population is unrealistic; however, with only self-report data it is impossible to know the true rates of substance abuse among respondent peers. Likewise, by asking respondents to retrospectively report on their housing history over long periods of time, it is likely that some errors in dates of homelessness arose. This measurement error likely decreased the power of our analyses to find associations between other predictors and homelessness, but it seems likely that individuals with multiple episodes of homelessness and/or higher levels of substance abuse may have been more vulnerable to errors in reporting; without confirmation from external sources of information it is impossible to verify the accuracy of respondent reports or determine the effects of measurement error on associations between measured variables. Also, the initially housed sample was recruited by asking homeless participants to provide contact information for housed acquaintances. While participants were instructed to

not provide names of close friends, it is possible that some overlap in social networks between the initially housed and homeless groups might exist. We feel that any initial overlap is not likely to have obscured differences between homeless and housed participants over time, as participants moved in and out of homelessness and composition of peer networks tends to be fluid at this age; however, future studies may test these assumptions by using more strictly separated homeless and housed groups. At the same time, studies that eliminate the possibility of participants being included in each others' social networks might provide a cleaner estimate of the associations between peer substance use and substance abuse symptoms. Finally, while the data were collected longitudinally, the analyses are primarily cross-sectional in nature. Predictors reflect the participants' report of the time period immediately preceding each point of data collection, but due to the wide variance across respondents in spacing of dates of data collection, we were unable to conduct a true lagged analysis. As a result, we cannot rule out the possibility that our outcome of interest, substance abuse, is in fact predicting the other time-varying variables. We must also limit our conclusions to the discussion of immediate predictors when compared with the single, initially measured episode, rather than discussing the possible delayed effect of repeated episodes of homelessness.

Despite these limitations, the current study is able to offer important insights into patterns of substance abuse over the transition to adulthood, in a very high-risk sample. The experience of homelessness is a topic of interest to many community researchers interested in examining the psychological impact of social stressors, and we hope that by providing a glimpse at the processes influencing substance use in this population, we can further a better understanding of this population. Service providers have long been aware of the prevalence of substance abuse among homeless adolescents, but our findings offer hope that many if not most homeless teens will eventually attain housing, and that the significance of early homelessness could be outweighed by the presence of later stable housing. Many homeless, substance-abusing teens will reduce or eliminate their substance abuse over the transition to adulthood, and those who are able to avoid recurrent episodes of homelessness will be even more likely to reduce their substance abuse. While homeless adolescents can be a challenging population to serve, we hope that providers will continue to focus efforts on preventing future episodes of homelessness. At the same time, policymakers who desire to reduce the impact of substance abuse on their communities may view efforts to provide affordable housing and other services for young people at risk for homelessness as investments in their fight against substance abuse.

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**Table 1**

Frequency of any days homeless since last date of data collection

| | Baseline (past year) | 6 month | 1 year | 2 year | 4 year | 5 year | 6 year |
|---|---|---|---|---|---|---|---|
| Homeless group | 100 % (N = 223) | 83.9 % (N = 187) | 27.8 % (N = 62) | 34.1 % (N = 76) | 35 % (N = 78) | 14.8 % (N = 33) | 16.6 % (N = 37) |
| Housed group | 0 % (N = 147) | 1.4 % (N = 2) | 2.0 % (N = 3) | 6.1 % (N = 9) | 8.2 % (N = 12) | 4.8 % (N = 7) | 2.7 % (N = 4) |

**Table 2**

Level-1 predictors of alcohol abuse

| Predictor | b(SE) | 95 % CI | T-ratio |
|---|---|---|---|
| *Model 1: Deviance = 844.42, parameters = 6* | | | |
| Intercept | .378 (.015) | .349–.407 | 25.272 (369)*** |
| Age | .037 (.003) | .031–. 043 | 14.464 (1,985)*** |
| Age squared | −.0028 (.0008) | −.0044 to −.0012 | −3.575 (1,985)** |
| Recent homelessness (0 = none, 1 = any) | .064 (.017) | .031–. 097 | 3.817 (1,985)*** |
| *Model 2: Deviance = 505.97, parameters = 7; compared to model 1: $\chi^2$ (1) = 338.45, p < .001* | | | |
| Intercept | .388 (.013) | .363–.413 | 29.455 (369)*** |
| Age | .018 (.003) | .012–.023 | 6.748 (1,800)*** |
| Age squared | −.0015 (.0008) | −.0031 to .0001 | −1.910 (1,800)† |
| Recent homelessness | .057 (.016) | .026–.088 | 3.48 (1,800)** |
| Friend alcohol mean | .035 (.002) | .031–. 039 | 17.545 (1,800)*** |
| *Model 3: Deviance = 470.48, parameters = 8; compared to model 2: $\chi^2$(1) = 35.49, p < .001* | | | |
| Intercept | .389 (.014) | .362–.416 | 28.562 (369)*** |
| Age | .015 (.003) | .009–.021 | 4.460 (1,799)*** |
| Age squared | .0003 (.001) | −.0017 to .0023 | 0.339 (1,799) |
| Recent homelessness | .057 (.018) | .022–.092 | 3.102 (1,799)** |
| Friend alcohol mean | .040 (.003) | .034–.046 | 15.262 (1,799)*** |
| Friend alcohol by age | −.004 (.001) | −.006 to −.002 | −5.297 (1,799)*** |
| *Model 4: Deviance = 464.24, parameters = 9; compared to model 3: $\chi^2$(1) = 6.23, p < .05* | | | |
| Intercept | .390 (.014) | .362–.417 | 28.794 (369)*** |
| Recent homelessness | .056 (.018) | .021–.091 | 3.062 (1,798)** |
| Age | .015 (.003) | .009–.021 | 4.481 (1,798)*** |
| Age squared | .0003 (.001) | −.0017 to .0023 | .345 (1,798) |
| Friend alcohol mean | .044 (.003) | .038–.050 | 15.869 (1,798)*** |
| Friend alcohol by age | −.005 (.001) | −.007 to −.003 | −5.839 (1,798)*** |
| Friend alcohol by recent homelessness | −.010 (.001) | −.012 to −.008 | −2.185 (1,798)* |

† $p < .10$;

* $p < .05$;

** $p < .01$;

*** $p < .001$

## Table 3

Level-1 predictors of drug abuse

| Predictor | b(SE) | 95 % CI | T-ratio |
|---|---|---|---|
| *Model 1: Deviance = 860.89, parameters = 6* | | | |
| Intercept | .253 (.016) | .222–.284 | 16.236 (369)*** |
| Age | .019 (.003) | .013–.025 | 7.376 (1,985)*** |
| Age squared | −.005 (.001) | −.007 to −.003 | −6.260 (1,985)*** |
| Recent homelessness (0 = none, 1 = any) | .091 (.017) | .058–. 124 | 5.427 (1,985)*** |
| *Model 2: Deviance = 546.39, parameters = 7; compared to model 1: $\chi^2(1) = 314.50$, $p < .001$* | | | |
| Intercept | .258 (.014) | .231–.285 | 19.060 (369)*** |
| Age | .011 (.002) | .007–.015 | 4.372 (1,808)*** |
| Age squared | −.003 (.001) | −.005 to −.001 | −4.019 (1,808)*** |
| Recent homelessness | .064 (.017) | .031–. 097 | 3.871 (1,808)*** |
| Friend drug use | .377 (.021) | .336–.418 | 18.071 (1,808)*** |
| *Model 3: Deviance = 546.29, parameters = 8; compared to model 2: $\chi^2(1) = .10$, ns* | | | |
| Intercept | .159 (.015) | .129–. 189 | 10.49 (369)*** |
| Age | .011 (.003) | .005–.017 | 3.73 (1,807)** |
| Age squared | −.003 (.001) | −.005 to −.001 | −2.980 (1,807)** |
| Recent homelessness | .064 (.019) | .027–. 101 | 3.44 (1,807)** |
| Friend drug use | .378 (.029) | .321–.435 | 13.253 (1,807)*** |
| Friend drug use by age | −.003 (.010) | −.023 to .017 | −.227 (1,807) |
| *Model 4: Deviance = 545.31, parameters = 9; compared to model 3: $\chi^2(1) = .98$, ns* | | | |
| Intercept | .156 (.015) | .127–. 185 | 10.57 (369)*** |
| Recent homelessness | .011 (.003) | .005–.017 | 3.409 (1,806)** |
| Age | −.003 (.001) | −.005 to −.001 | −2.992 (1,806)** |
| Age squared | .067 (.019) | .030–. 104 | 3.628 (1,806)** |
| Friend drug use | .392 (.035) | .323–.461 | 11.367 (1,806)*** |
| Friend drug use by age | −.004 (.010) | −.024 to .016 | −.420 (1,806) |
| Friend drug use by recent homelessness | −.042 (.052) | −.144 to .060 | −.816 (1,806) |

** $p < .01$;

*** $p < .001$