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A Prospective Study of Marijuana Use Change and Cessation Among Adolescents

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Abstract

Background—With marijuana use increasing among American adolescents, better understanding the factors associated with decreasing use and quitting can help inform cessation efforts. This study evaluates a range of neighborhood, family, peer network, and individual factors as predictors of marijuana use change and non-use over one year, and cessation over six years.

Methods—Data come from adolescents in Waves I and II of the National Longitudinal Study of Adolescent Health (N=458, one-year sample), or Waves I and III (N=358, six-year sample), and reported using marijuana at least four times in the past month at Wave I.

Results—Eighteen percent of adolescents stopped using marijuana after six years. Results suggest neighborhood context affects overall use level, whereas neighborhood context and friends were critical to cessation vs. continuation of use. Decreases in use were more likely among adolescents in disadvantaged or less cohesive neighborhoods, or who moved between waves. Non-use after one year was more likely among adolescents who did not move, had fewer marijuana-using friends, and did not exclusively have outside-of-school friends. Cessation at six years was more likely among adolescents in less disadvantaged and more cohesive neighborhoods, and for those with within-school friends.

Conclusions—Results highlight the importance of both objective and subjective neighborhood characteristics, as well as peer networks, on adolescent marijuana use. Factors associated with decreases in use appear distinct from those that predict quitting, suggesting that continuation versus cessation is linked to peers as well as neighborhood context. Relocated and isolated individuals may face challenges with cessation.

1. Introduction

Marijuana use is rising, with past year use reaching 36% among high school seniors (Johnston et al., 2014). Adolescent marijuana users tend to fare worse than abstainers in terms of academic achievement, earnings in young adulthood, involvement in delinquency,

and engagement in sexual risk behavior (see Bryan et al., 2012; Ellickson et al., 2004; Lynskey and Hall, 2000; Tucker et al., 2006). However, there is evidence that adolescents who decrease their use show short-term gains in psychosocial maturity (Chassin et al., 2010) and have better behavioral outcomes in adulthood (Brook et al., 2011; Juon et al., 2011). Effective programs are needed to facilitate quitting among adolescents who have begun using marijuana. Better understanding of the barriers and facilitators of quitting can help inform these efforts.

Social disorganization theory (Shaw and McKay, 1942) emphasizes that adolescent delinquent behavior is not equally distributed across communities, but is clustered in more disadvantaged areas (e.g., Cubbin et al., 2010; Hayne, Silver and Teasdale, 2006; Zimmerman and Messner, 2010). The theory posits that neighborhood features such as low socioeconomic status and residential instability influence individual behavior through their impact on neighborhood-level social processes, including exposure to deviant individuals and activities, environmentally induced stress, and fewer forms of social control or monitoring. However, there are only a handful of studies that consider the role of neighborhood disadvantage in adolescent substance use. The strength and direction of the relationship is unclear and varies by substance. For alcohol and tobacco, neighborhood disadvantage has been positively, negatively, and nonsignificantly linked to use. There is similar disagreement regarding marijuana initiation. Only two studies have considered the role of neighborhood characteristics in the quantity of marijuana use. Fagan, Wright and Pinchevsky (2013) found no association in a sample of Chicago adolescents. Snedker, Herting and Walton (2009) found a negative association between neighborhood disadvantage and quantity of use in a sample of Seattle adolescents. No studies have examined disadvantage and adolescent marijuana cessation.

Significantly more is known about factors associated with marijuana initiation than change in level of use, let alone cessation. Research generally finds that family and peer factors are associated with marijuana initiation (e.g. Buu et al., 2009; de la Haye et al., 2013; Dishion and Loeber, 1985; Furr-Holden et al. 2011; Hoffman, 1995; Tucker et al., 2013) and levels of use (Juon et al., 2011; Snedker, Herting and Walton, 2009; Tucker et al., 2014; Washburn and Capaldi, 2014; Windle and Wiesner, 2004), but their roles in quantity change and cessation are less clear and may operate differently given that these processes involve a different population (i.e., current drug users). Further, other than peer use, factors that predict marijuana initiation are generally not significant predictors of level of use (Washburn and Capaldi, 2014), and it is important to not conflate initiation with level of use or cessation. Longitudinal studies of adult marijuana users find that cessation is associated with being female, older, married, employed, more highly educated, and less exposed to social contexts encouraging use (see Agosti and Levin, 2007; Aitken et al., 2000; Chen and Kandel, 1998; Hammer and Vaglum, 1990; Kandel and Raveis, 1989; Sussman and Dent, 2004; Yamaguchi and Kandel, 1985). These studies suggest that transitioning to conventional adult roles has a deterring effect on marijuana use. Only one study has identified predictors of cessation during adolescence (Sussman and Dent, 1999), finding it more likely among older individuals, males, and those with less peer approval for using drugs, more unfavorable attitudes about drug use, and less violent victimization. However, results are based on youth with functional or delinquency problems enrolled in special

continuation high schools and may not be generalizable to adolescent marijuana users more generally.

The present study is the first to simultaneously examine the importance of neighborhood, family, peer, and individual factors as short-term (one year) and longer-term (six year) predictors of change in levels of use and stopping use in a large national sample. Informed by social disorganization theory, we hypothesized that adolescents would be less likely to reduce or quit marijuana use if they resided in neighborhoods that were more disadvantaged (based on census data) or perceived to be less safe and cohesive (based on adolescent perceptions). Although no previous study has examined the influence of neighborhood characteristics on marijuana cessation, several have looked at initiation. Studies using objective characteristics have generated mixed results: disadvantaged and deteriorating neighborhoods have been positively associated with alcohol and marijuana initiation and use (Furr-Holden et al., 2011; Smart et al., 1994; Tucker et al., 2012), negatively associated (Snedker et al., 2000), and unassociated (Allison et al., 1999; Fagan, Wright and Pinchevsky, 2013). Subjective neighborhood measures provide more consistent findings that accord with social disorganization theory; adolescents report greater initiation and substance use if they report feeling less safe in their neighborhoods (Burlew et al., 2009; Choi et al., 2006; Theall et al., 2009; Tucker et al., 2013). Because of these mixed findings, we examine both objective and subjective neighborhood characteristics as predictors of change and cessation in adolescent marijuana use.

Social disorganization theory suggests that disadvantaged neighborhood effects on substance use are partly attributable to lower parental control and greater exposure to deviant or substance using peers in these neighborhoods, as proximate determinants. Thus, we hypothesized that adolescents would be more likely to decrease or stop using marijuana if: a) they reported greater parental control and closeness; and lived in households where more parents and grandparents were present; b) they had less exposure to substance using or deviant peers; c) they reported less involvement in other problem behaviors; and d) they had less easy access to substances in the home.

2. Methods

2.1. Participants and data collection

Data come from Waves I-III of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative longitudinal study of U.S. adolescents in grades 7–12 in 1995. The sampling frame included all high schools in the U.S. Initially, participants from 145 schools were given a basic interview at school. Data from this in-school interview were then used to generate a baseline sample of 20,745 adolescents aged 12–19 to complete interviews at home in 1995 (Wave I), 1996 (Wave II), and between 2001–2002 (Wave III). 14,738 respondents were re-interviewed at Wave II (87.6% response rate among eligible Wave I respondents; adolescents in grade 12 at Wave I were not interviewed at Wave II by design). 15,170 Wave I respondents were re-interviewed for Wave III (76% response rate). In addition, parents of respondents were interviewed at Wave I. See Harris et al. (2009) for more details on the study design and longitudinal data. Regression analyses are corrected for

attrition and complex sample design effects using strata, cluster, and weight variables (Chantala and Tabor, 1999).

Adolescents were excluded from the one-year analyses if they: a) had not completed the in-school interview, the Wave II interview, or did not have a parent interview or neighborhood information (excluding $n=11,348$); b) did not use marijuana at least four times in the 30 days preceding the Wave I interview (excluding $n=2,246$ nonusers and 568 users [51% of users]); or c) were missing information on marijuana use at Wave II ($n=32$), or perceived safety, selected neighborhood, race/ethnicity, or availability of drugs or alcohol in the home at Wave I (excluding $n=88$). These exclusions resulted in a final analytic sample of $N=458$. Analogous exclusions were made for the six-year cessation analysis (final analytic sample $N=358$). We focus on youth who used marijuana at least four times in the past month in order to reflect those that had been somewhat regularly using marijuana; it is important to keep in mind that the analyses thus reflect change and cessation among these users. Table 1 provides unweighted descriptive statistics for the study variables for the two analytic samples.

2.2. Key measures

Marijuana use—Adolescents were asked how many times they had used marijuana in the past 30 days and whether they had used marijuana since the last interview. The analytic sample consists of those who reported using marijuana 4 or more times in the past 30 days at Wave I, which roughly corresponds to weekly use and is the median number of times reported by Wave I users. The majority of excluded users reported a single use in the past month, and “change” or “non-use/cessation” for this low level of use may be less meaningful. *Change* at Wave II was calculated as (Wave II use minus Wave I use). *Non-Use* at Wave II was defined as no reported use of marijuana since the last interview (binary response item). *Cessation* at Wave III was defined as no reported marijuana use since Wave I. Information on substance use was obtained via computer-aided self-interview, shown to improve the validity of self-reported sensitive data among adolescents (Supple, Aquilino and Wright, 1999; Turner et al., 1998).

Residential neighborhood characteristics at Wave I—Objective characteristics were assessed using 1990 U.S. Census data: proportion with income below the poverty line; proportion of family households that are female-headed with children under age 18; unemployment rate; and proportion of individuals aged 5 or older who lived in a different household 5 years earlier (an indicator of residential instability). These characteristics were assessed at the level of block group, and were derived by Add Health. Each item is typical of neighborhood characteristics considered in related literature (e.g. Haynie et al., 2006; Nowlin and Colder, 2007; Snedker, Herting and Walton, 2009; Tucker et al., 2013). These characteristics were converted to a neighborhood disadvantage scale (range -1.15 to 4.5 , $\alpha=0.88$; higher value=greater disadvantage) using exploratory factor analysis through SAS PROC FACTOR (Pasta and Suhr, 2004). We also examined two dichotomous subjective neighborhood characteristics based on adolescent report: neighborhood cohesion (“People in this neighborhood look out for each other”); and perceived safety (“Do you usually feel safe in your neighborhood?”). Following Haynie et al. (2006), we addressed possible selection

effects by controlling for the most important reason parents provided for living in their neighborhood (out of 10 options, this variable is dummy coded as 1 if due to better schools, to be near family/friends, or because of low neighborhood crime). Analyses also control for whether the family moved to a different block group during the follow-up period, reducing exposure to the neighborhood factors measured at Wave I.

Personal demographics—Gender, age, race/ethnicity, total household income, mother's education, whether the adolescent lived with both parents, and whether the adolescent's grandmother lived in the household were assessed. Literature on multigenerational households, particularly including grandmothers, suggests that they may reflect an additional avenue of adolescent supervision (Song et al., 2009; Tomlin, 1998).

Friend characteristics—The proportions of school friends who were marijuana users and binge drinkers come from the in-school survey in which respondents were asked to nominate up to five male and five female friends. Nominated friends from Add Health schools are linked to their own Wave I in-home survey responses to assess each friend's self-reported substance use – a considerable strength of this study. From this information we calculated the proportion of nominated school friends who reported: a) any past month marijuana use; and b) any past year binge drinking, defined as “five or more drinks in a row” (past month binge drinking was not assessed). The in-school survey also specifies whether nominated friends did not go to the respondents' school; individuals who only nominated outside-of-school friends were coded as 1. Additionally, parents reported whether the adolescent's best friend was a good influence, bad influence, or neither good nor bad. We derived a dichotomous indicator of whether the best friend was perceived as a good influence.

Behavioral and family risk factors—We controlled for initial frequency of marijuana use and binge drinking during the past 30 days (total past-year binge drink episodes were converted to a monthly average measure for comparability with marijuana use). Three variables assessed adolescent behavioral problems: trouble at school (4 items; range 0–16, $\alpha=.86$); delinquency (14 items; range 0–39, $\alpha=.83$); and low school participation (dichotomous, 1 item). Four variables assessed family risk factors: low parental control (7 items; range 0–7, $\alpha=.59$. Higher value means lower control); closeness to mother (1 item; range 0–5. Higher value means closer); and whether alcohol and illegal drugs were “easily available” to them in their home (1 item each).

2.3. Analytic approach

We first examine short-term change in level of past 30-day use using OLS regression, including objective and subjective neighborhood characteristics, personal demographics, friend information, and behavioral and family risk factors. Next, we estimate logistic regression models predicting nonuse after one year, and cessation after six years.

3. Results

3.1. Change in level of use

Table 2 presents the results of OLS regression of the change in past 30-day marijuana use from Wave I to Wave II among adolescents using marijuana four or more times per month at Wave I. Change in marijuana use was roughly normally distributed with a mean of -4.3 and standard deviation of 0.97 . Results indicate that greater neighborhood disadvantage is associated with decreased marijuana use, while greater neighborhood cohesiveness is significantly associated with increased use. Moving between waves is significantly associated with declines in use, as is increased age. Males report greater increase than females. Mother's greater educational attainment is associated with increased use. Higher levels of respondent's own use at Wave I predict decline in Wave II use, suggesting regression to the mean. Declines in marijuana use are marginally ($p < .10$) associated with lack of marijuana availability, and greater availability of alcohol, in the home. In sum, neighborhood context emerged as a more salient factor in predicting changes in level of marijuana use, albeit in a complex way, compared to family, peer, and most individual factors.

3.2 Non-Use and Cessation of Marijuana Use

Non-use of marijuana after one year occurred for 19% of adolescents in the analytic sample, and cessation after six years occurred for 18% of adolescents, suggesting regular marijuana users who stop using for one year will successfully abstain for a substantially longer period. As shown in the "Non-Use Model" in Table 3, none of the behavioral or family risk factors are significantly associated with non-use, nor are the objective or subjective neighborhood characteristics. Only four variables are significantly associated with non-use: adolescents are more likely to stop using marijuana over a one-year period if they are African American (vs. White), do not move between waves, have a social network with a lower proportion of marijuana-using friends, and do not exclusively nominate outside-of-school friends.

In contrast, results for the six-year cessation of use shown in Table 3 identify both neighborhood disadvantage (negatively associated with cessation) and neighborhood cohesiveness (positively associated with cessation) as significant predictors. The proportion of school friends using marijuana becomes nonsignificant for prediction of cessation, while reporting only outside-of-school friends remains a substantial and significant predictor of continuing. Greater trouble at school in Wave I is associated with increased cessation; low parental control and availability of alcohol in the home are negatively associated with quitting.

Thus, for non-use of marijuana over a one-year period, certain friend influences were more important in predicting this transition than neighborhood characteristics or a wide range of behavioral, family, and personal factors. However, for long-term cessation, neighborhood factors appear salient in that cessation is less likely in more disadvantaged and less cohesive neighborhoods. Having only outside-of-school friends was also associated with reduced likelihood of cessation six years later.

4. Discussion

These results suggest that the factors critical to change in marijuana use, and especially to cessation, are different and more limited than those relevant to initiation for adolescents. Motivations or nudges to start using marijuana (e.g., attaining social status, opportunities for use via friends, lack of supervision, neighborhood access, coping with stress) may differ substantially from processes of decreasing or ceasing use, and are not simply the inverse of initiation factors. However, results from this study identified several relevant factors that, to the best of our knowledge, have not been previously reported. Contrary to expectation, adolescents who lived in more disadvantaged and less cohesive neighborhoods tended to report decreases in their level of use over time. It may be that adolescents from more disadvantaged neighborhoods perceive greater risk and consequences to use (e.g., greater police and school enforcement), as Snedker et al. (2009) suggest. More advantaged neighborhoods may also provide adolescents with a safer space to experiment and use marijuana, which is reflected in the initiation literature linking perceived safety to marijuana initiation (Tucker et al., 2013).

Moving was associated with significant declines in level of use. Substance use by friends did not predict changes in adolescents' level of use. Further, neighborhood characteristics, personal demographics and behavioral and family risk factors were generally not significant predictors of non-use. Adolescents were more likely to stop using in the short-term if they were African American, but were less likely to stop use if their family moved recently, if they had a higher proportion of school-based friends who used marijuana, or if they had only outside-of-school friends. Long-term cessation was a product of neighborhood aspects as well as friendships; more advantaged and cohesive neighborhoods were positively associated with cessation, while friends from only outside-of-school was associated with reduced likelihood of cessation.

Together, these results suggest that overall patterns of marijuana use are affected by neighborhood context, but that non-use in the short-term is more related to peer factors than neighborhood or family characteristics, and that ultimately cessation is a combination of neighborhood and peer factors in the anticipated fashion. Exposure to marijuana-using peers is a deterrent to non-use, as expected from social learning theory (Akers, 1985) and congruent with its role in initiation. Further, having only outside-of-school friends deters non-use, congruent with their role in facilitating initiation (Tucker et al., 2013). One limitation of this study is that we do not have information about these outside-of-school individuals (e.g., their marijuana use, age) to inform conclusions about the specific mechanisms involved. However, it may reflect the focal adolescent being isolated at school, which may promote continued use, or lacking school-based friends who are modeling nonuse behavior. Moreover, although marijuana use among non-school peers is not known, it is possible that their substance use is relatively higher than that of school-based friends (see Haynie et al., 2006). Long-term cessation is hampered by disadvantaged and less cohesive neighborhood context, as well as by having only outside-of-school friends, lower parental control, and easy access to alcohol in the home.

Of particular note, adolescents who moved were likely to significantly reduce their level of use, but were also significantly less likely to stop use in the short-term. Originally this measure was included to account for reduced exposure to neighborhood characteristics measured at baseline. However, it may be that adolescent problem behavior prompted the move, that moving generates stress and anxiety for which marijuana use is a coping mechanism (Dewitt, 1998), or that moving disrupts ties to friends and socialization agents in the sending community. Indeed, Hoffman (2002) found that ZIP Code-level neighborhood environment did not predict adolescent drug use, but moving did. Thus, programs specifically targeting relocated and isolated adolescents may be useful; while moves may be associated with significant declines in level of use (perhaps linked to disruptions in access) they are also associated with persistent use (possibly as a coping mechanism for the stress of relocation).

Contrasting the significant predictors of changes in level of marijuana use with the literature on initiation of use indicates that they differ substantially (Washburn and Capaldi, 2014). This is especially the case with neighborhood disadvantage: while previous analyses of Add Health data indicated that neighborhood disadvantage is positively associated with marijuana initiation (Tucker et al., 2013), here it is a significant predictor of declining use among regular users, and is unrelated to short-term non-use. Similarly, peer influences are significant predictors of initiating marijuana use (Tucker et al, 2013), but here are not associated with changes in pattern of use. Further, here neighborhood cohesiveness is associated with significant increases in level of use as well as long-term cessation, but was unrelated to initiation in earlier analyses (Tucker et al., 2013). There is a similar disconnect in terms of predictors of short-term non-use compared to predictors of initiation. Neighborhood characteristics are not associated with non-use, nor are behavioral or family risk factors, while other studies do link them to initiation of marijuana (e.g., Tucker et al., 2013). With regard to peer influences, having a greater proportion of friends who use marijuana makes it less likely that an adolescent will stop using in the short-term, but exposure to friends' drinking appears more relevant than their marijuana use in predicting adolescents' initiation of marijuana use (Tucker et al., 2013).

Finally, the broad lack of significant predictors of one-year non-use and long-term cessation in adolescence may reflect that most users make multiple short-lived attempts to quit, and many initially successful abstentions do not persist in the long run (Budney et al., 2008; Hughes et al., 2008). We also estimated models of cessation based on no past-month use at Wave II (rather than no past-year use) for a smaller subsample where this information was available; results were qualitatively consistent but items had lower significance (African American, marijuana-using friends) or lost significance (moved, only outside-of-school friends). In many respects, substance use during adolescence is a normative behavior and it may be that the role of neighborhood disadvantage and other factors change once the transition to adulthood is begun. Yamaguchi and Kandel (1985) argued that marijuana use is incompatible with the acquisition of normative adult roles, and it may be that successful cessation is driven by role conflicts that are typically not observed in adolescence. Employment, establishing a family, and becoming a parent are all factors that have been linked to marijuana cessation among adults (Agosti and Levin, 2007; Aitken et al., 2000; Hammer and Vaglum, 1990; Sussman and Dent, 2004; Yamaguchi and Kanel, 1985), and it

may be that acquisition and prolonged exposure to these adult roles contributes more to eventually quitting than broader contextual features of the neighborhood or family background. This is consistent with developmental research on motivations for quitting alcohol use that highlights the relative importance of interpersonal reasons (related to friends and family) for quitting during adolescence, compared to personal reasons (personal health, self-control, and personal consequences) during emerging adulthood (Smith, Cleeland and Dennis, 2010). A limitation of this study is that unobserved factors associated with marijuana use may be declining, contributing to declining marijuana use.

While factors related to marijuana use reduction and cessation in adolescence may be limited, there are several important directions for cessation programs to highlight regarding social connections. Although neighborhood context is linked to overall level of use in a counter-intuitive way, it is ultimately linked to cessation as anticipated. Continuation versus cessation of use is also linked to friends: their marijuana use in the short-term, and where the friends are from in both the short- and long-term. Additionally, recently relocated or isolated individuals may face particular challenges in the process, perhaps due to stress or lack of supportive ties. Research on tobacco cessation has identified the positive roles of social integration (e.g. Cobb, Graham and Abrams, 2010) and social support (e.g. Lawhon et al., 2009; Mermelstein et al., 1986). The current study is suggestive of similar results and it may be fruitful for future work to directly examine the role of social integration and social support on marijuana cessation. A related finding to consider is that individuals with school-based social networks containing other marijuana users are also confronted with challenges to cessation. Peer-based intervention programs during adolescence, where programs target collective change among socially connected youth, may have a role to play in promoting marijuana cessation and abstinence. However, the specific mechanisms are not entirely clear. The association between peer network marijuana use and personal use reflects both selection processes (whereby personal use leads to friendship with other users) and, to a lesser extent, influence processes (whereby peer use leads to personal use) (de la Haye et al. 2013). Thus, the findings of this study combined with prior work (de la Haye et al., 2013; Sussman and Dent, 1999) suggest that school-based programs targeting the social norms of marijuana use may be a particularly important avenue of intervention, especially in light of the current rise in adolescent marijuana use.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Description of Study Variables (Unweighted)

	One-Year	Six-Year
Variable	Mean (SD) or Proportion	Mean (SD) or Proportion
Neighborhood Characteristics		
Neighborhood Disadvantage Scale	0.00 (0.96)	−0.01 (0.94)
Neighborhood Cohesiveness	0.66 (0.47)	0.66 (0.47)
Perceived Safety	0.86(0.34)	0.86(0.35)
Selected Neighborhood	0.78(0.41)	0.79(0.41)
Moved Between Waves	0.07 (0.25)	0.06(0.25)
Personal Demographics		
Male	0.58 (0.49)	0.55(0.50)
Age	15.89(1.30)	15.87(1.29)
Black	0.16(0.37)	0.16(0.37)
Hispanic	0.20 (0.40)	0.18(0.39)
Other Race (reference category = white)	0.10(0.30)	0.11 (0.32)
Household Income	46.35 (59.37)	47.50(61.29)
Mother's Education	3.98(1.55)	3.98(1.59)
Both Parents In Home	0.57(0.50)	0.61 (0.49)
Grandmother in Household	0.06 (0.24)	0.06(0.25)
Friends		
Proportion School Friends Using Marijuana	0.22 (0.35)	0.22(0.35)
Proportion School Friends Binge Drinking	0.30(0.39)	0.28(0.38)
Only Outside-of-School Friends	0.20 (0.40)	0.20 (0.40)
Best Friend a "Good Influence"	0.47 (0.50)	0.48(0.50)
Behavioral and Family Risk Factors		
Respondent Monthly Marijuana Use at Wave 1	20.76 (43.52)	20.81 (45.83)
Respondent Monthly Binge Drinking at Wave 1	3.68(6.41)	3.63 (6.52)
Trouble at School	6.11(3.11)	6.10(3.03)
Delinquency	10.07(7.53)	10.14(7.52)
Low School Participation	0.26 (0.44)	0.25 (0.43)
Low Parental Control	5.35(1.70)	5.34(1.71)
Closeness to Mother	4.03 (1.38)	4.01 (1.36)
Drugs Available In Home	0.12(0.32)	0.12(0.33)
Alcohol Available In Home	0.34 (0.47)	0.36(0.48)
N	458	358

Table 2

OLS Model Predicting One-Year Change in Marijuana Use

	Coefficient (with standard error)
Neighborhood Characteristics	
Neighborhood Disadvantage Scale	-2.14 (-3.81, -0.46) *
Neighborhood Cohesiveness	4.84(1.73,7.96) ***
Perceived Safety	1.46 (-3.66, 6.58)
Selected Neighborhood	-0.77 (-6.22, 4.69)
Moved Between Waves	-8.56 (-14.72, -2.40) **
Personal Demographics	
Male	6.93 (2.74, 11.13) ***
Age	-1.83 (-3.43, -0.24) *
Black	-3.33 (-8.89, 2.24)
Hispanic	4.97 (-2.86, 12.80)
Other Race (reference category = white)	-5.51 (-13.71,2.68)
Household Income	-0.01 (-0.42, 0.03)
Mother's Education	1.37(0.09,2.65) *
Both Parents In Home	-0.11 (-3.83, 3.61)
Grandmother in Household	1.47 (-4.09, 7.04)
Friends	
Proportion School Friends Using Marijuana	2.61 (-3.20, 8.43)
Proportion School Friends Binge Drinking	-0.06 (-6.13, 6.01)
Only Outside-of-School Friends	-2.83 (-7.04, 1.38)
Best Friend a "Good Influence"	3.53 (-8.16, 1.09)
Behavioral and Family Risk Factors	
Respondent Marijuana Use at Wave 1	-0.53 (0.66, -0.41) ***
Respondent Binge Drinking at Wave 1	0.40 (-0.83, 1.63)
Trouble at School	-0.30 (-1.02, 0.41)
Delinquency	-0.18 (-0.77, 0.41)
Low School Participation	2.22 (-1.83, 6.27)
Low Parental Control	0.68 (-0.56, 1.93)
Closeness to Mother	0.56 (-1.54, 2.67)
Drugs Available In Home	5.96 (-0.47, 12.39) †
Alcohol Available In Home	-3.73 (-7.48, 0.03) †

†
p<. 10*
p<. 05,**
p<01,

 $p < .001$

Table 3

Odds Ratios and 95% Confidence Intervals from Logit Models Predicting Marijuana Non-Use and Cessation

	Non-Use (One Year Sample)	Cessation (Six Year Sample)
Neighborhood Characteristics		
Neighborhood Disadvantage Scale	0.886 (0.620, 1.266)	0.279 (0.090, 0.869) *
Neighborhood Cohesiveness	1.163 (0.570, 2.374)	6.746 (1.190, 38.244) *
Perceived Safety	0.798 (0.256, 2.481)	0.322 (0.016, 6.436)
Selected Neighborhood	0.748 (0.327, 1.708)	0.345 (0.054, 2.213)
Moved Between Waves	0.151 (0.027, 0.828) *	1.104(0.0523, 23.332)
Personal Demographics		
Male	1.365 (0.606, 3.076)	0.983 (0.108, 8.934)
Age	1.133 (0.879, 1.460)	1.491 (0.627, 3.546)
Black	2.563 (1.041, 6.311) *	1.716 (0.086, 34.103)
Hispanic	0.496 (0.134, 1.824)	0.383 (0.012, 12.495)
Other Race (reference category = white)	1.142 (0.382, 3.416)	0.394 (0.006, 25.338)
Household Income	0.992(0.979, 1.004)	0.963 (0.903, 1.028)
Mother's Education	0.858(0.693, 1.063)	0.845 (0.327, 2.186)
Both Parents In Home	1.177 (0.572, 2.421)	0.355 (0.051, 2.480)
Grandmother in Household	2.153 (0.703, 6.591)	0.337 (0.02, 53.459)
Friends		
Proportion School Friends Using Marijuana	0.345 (0.126, 0.947) *	0.131 (0.002, 9.965)
Proportion School Friends Binge Drinking	1.322 (0.516, 3.388)	0.221 (0.006, 7.877)
Only Outside-of-School Friends	0.315 (0.130, 0.759) *	0.006 (0.000, 0.152) **
Best Friend a "Good Influence"	0.877 (0.388, 1.981)	1.715 (0.237, 12.428)
Behavioral and Family Risk Factors		
Respondent Marijuana Use at Wave 1	1.005 (0.997, 1.012)	0.930 (0.843, 1.026)
Respondent Binge Drinking at Wave 1	0.981 (0.925, 1.040)	1.002(0.892, 1.126)
Trouble at School	0.994 (0.873, 1.132)	1.580 (1.104, 2.262) *
Delinquency	1.033 (0.969, 1.102)	0.941 (0.713, 1.241)
Low School Participation	0.936 (0.300, 2.918)	1.164(0.273, 4.964)
Low Parental Control	0.924 (0.739, 1.156)	0.574 (0.355, 0.928) *
Closeness to Mother	0.976(0.734, 1.298)	0.965 (0.636, 1.463)
Drugs Available In Home	0.408(0.086, 1.941)	0.177(0.021, 1.477)
Alcohol Available In Home	1.144 (0.609, 2.150)	0.237 (0.045, 1.258) †

†
 $p < .10$ *
 $p < .05$,**
 $p < .01$,

 $p < .001$