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## Association between Childhood Residential Mobility and Non-Medical Use of Prescription Drugs among American Youth

Meagan E. Stabler<sup>1</sup>, Kelly K. Gurka<sup>2</sup>, Laura R. Lander<sup>3</sup>

<sup>1</sup>Department of Epidemiology, West Virginia University School of Public Health; Robert C. Byrd Health Sciences Center, P.O. Box 9190, Morgantown WV 26506-9190.

<sup>2</sup>Department of Epidemiology, West Virginia University School of Public Health; Injury Control Research Center, Research Ridge, 3606 Collins Ferry Road, Suite 201, Morgantown, WV 26505.

<sup>3</sup>Department of Behavioral Medicine and Psychiatry, West Virginia University School of Medicine; Chestnut Ridge Center, 930 Chestnut Ridge Road, Morgantown, WV 26505.

### Abstract

**Introduction**—Prescription drug abuse is a public health epidemic, resulting in 15,000 deaths annually. Disruption of childhood residence has been shown to increase drug-seeking behavior among adolescents; however, little research has explored its association specifically with non-medical use of prescription drugs (NMUPD). The objective of the study was to measure the association between residential mobility and NMUPD.

**Methods**—The 2010 National Survey on Drug Use and Health data were analyzed for 15,745 participants aged 12 to 17 years. NMUPD was defined as self-report of any non-medical use (i.e., taking a prescription drug that was not prescribed to them or consumption for recreational purposes) of tranquilizers, pain relievers, sedatives, or stimulants. Logistic regression for survey data was used to estimate the association between residential mobility and NMUPD, adjusting for potential confounders.

**Results**—After controlling for demographic, intrapersonal, interpersonal, and community factors, adolescents with low mobility (1–2 moves in the past five years) and residential instability (≥ 3 moves) were 16% [OR = 1.16, 95% CI: 1.01, 1.33] and 25% [OR = 1.25, 95% CI: 1.00, 1.56] more likely to report NMUPD compared to non-mobile adolescents (0 moves). Low-mobile adolescents were 18% [OR = 1.18, 95% CI: 1.01, 1.38] more likely to abuse pain relievers, specifically. No relationship was found between moving and tranquilizer, stimulant, or sedative use.

**Discussion**—Increasing childhood residential mobility is associated with NMUPD; therefore, efforts to prevent NMUPD should target mobile adolescents. Further examination of the psychological effects of moving and its association with pain reliever abuse is indicated.

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Correspondence should be directed to: Meagan E. Stabler, Department of Epidemiology, West Virginia University School of Public Health, Robert C. Byrd Health Sciences Center, P.O. Box 9190, Morgantown WV 26506-9190. Tel: (740)525-5759; Fax: (304)293-0265; mstabler@hsc.wvu.edu.

Conflict of Interest

The authors declare no conflict of interest.

## Keywords

Residential mobility; Adolescents; Health behavior; Prescription drug misuse; Opioids

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## Introduction

Prescription drug abuse is a public health epidemic (Office of National Drug Control Policy [ONDCP], 2013). One in every 20 Americans take prescription drugs for non-medical use, resulting in 15,000 deaths annually (Centers for Disease Control and Prevention, 2012). American youth have also felt the impact of this epidemic. One in every three people aged 12 years or older who initiated drug use in 2009 did so with non-medical use of prescription drugs (NMUPD) (ONDCP, 2013). Prescription medications are second to cannabis as the most commonly abused illicit drugs among youth aged 12 to 17, with an estimated 759,000 individuals who reported current NMUPD (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011; Forum on Child and Family Statistics, 2013).

In addition to high rates of NMUPD, the US has consistently high residential mobility rates. In 2012, about 36.5 million Americans, one year of age or older, moved (U.S. Census Bureau, 2012). Adverse developmental-, behavioral-, social-, emotional-, and health-related outcomes are attributed to childhood residential mobility. Long-term effects that continue into adulthood include depression, lack of continuity of health care, poorer well-being, psychosocial stress, exhaustion, and lack of consistency in personality characteristics (Buu et al., 2009; Jelleman & Spencer, 2008; K.-C. Lin, Twisk, & Huang, 2012; K. C. Lin, Twisk, & Rong, 2011; Oishi, Lun, & Sherman, 2007). Childhood residential mobility is a risk factor for late-adolescent substance use disorders, particularly alcohol, marijuana, and nicotine-dependence. (Buu et al., 2009; Hoffmann, 2002; Trim & Chassin, 2008). An increased number of residential moves in childhood and adolescence is also associated with early initiation of illicit drugs (DeWit, 1998). However, it is not known specifically how residential mobility influences adolescent NMUPD. Thus, the purpose of this study was to explore the association between childhood residential mobility and NMUPD among American adolescents.

## Methods

### Data Source

The National Survey on Drug Use and Health (NSDUH) is a nationally-representative survey that provides country and state-level information on the distribution and determinants of tobacco, alcohol, and illicit drug use (including NMUPD) among non-active-duty Americans aged 12 years and older. NSDUH utilizes a complex, multi-level sampling strategy described in detail elsewhere (SAMHSA, 2011; Morton, 2009; U.S. Department of Health and Human Services, 2013). The survey includes a one-hour interview that is conducted in each participant's home using a laptop computer into which most responses are entered by the participant. Audio, computer-assisted, self-interviewing is utilized for sensitive questions. Participants are provided \$30 for completing the interview.

For the current study, publicly-available, de-identified data from the 2010 survey were analyzed. Thus, ethics approval was not required as this research was not considered human subjects research. A total of 68,487 participants completed interviews. Of those, 18,614, were aged 12 to 17 years and completed the youth experiences questionnaire. Topics in this questionnaire include participant physical and social environments; legal and illegal activities and behaviors; accessibility of substances and substance prevention programs; and personal attitudes, perceived norms, and risk related to drug use.

### Independent Variable

Residential mobility was assessed during the interview by asking the question “How many times have you moved in the past 5 years?”. In the NSDUH dataset, this categorical variable has eight response options ranging from “none” to “six or more times”, including “I don’t know”. From this question, the independent variable was created where respondents were classified as ‘residentially immobile’ if they reported zero moves, ‘low mobility’ if they reported one or two moves, and ‘residentially unstable’ if they reported three or more moves. This coding is consistent with other research (Brown et al., 2012; Ersing, Sutphen, & Loeffler, 2009; Simpson & Fowler, 1994) in which residential instability is defined as three or more childhood or adolescent moves (Brown et al., 2012; Bures, 2003; Gilman, Kawachi, Fitzmaurice, & Buka, 2003; Jelleyman & Spencer, 2008; Wood, Halfon, Scarlata, Newacheck, & Nessim, 1993).

### Dependent Variables

The primary outcome of interest for this study was non-medical use of prescription drugs (NMUPD). During the NSDUH interview, participants were asked if they had ever used tranquilizers, pain relievers, sedatives, and/or stimulants non-medically. Participants were instructed to only report NMUPD if the drug was not prescribed to them or if they “took the drug for the experience or feeling it caused” (U.S. Department of Health and Human Services., 2013). They were asked to only report on drugs that require a doctor’s prescription, not over-the-counter drugs. A picture and name of each pill/brand was shown to the participant to improve participant recall. For example, non-medical use of prescription pain relievers is ascertained from the following question: “[Have you] ever used pain reliever non-medically?”. The outcome variable was created from responses to questions regarding NMUPD that were asked throughout the survey. Participants were classified as ‘yes’ for NMUPD if they endorsed ever using a prescription drug non-medically at least once during the interview or ‘no’ for NMUPD if they never endorsed using a prescription drug non-medically.

In addition to the overall NMUPD variable (any prescription drug, regardless of class), individual variables were created for each of the four NSDUH categories of prescription drugs, i.e. tranquilizers, pain relievers, sedatives, and stimulants. Participants were classified as ‘yes’ for drug-specific NMUPD if they endorsed ever using any of the drugs in the specific category non-medically at least once during the interview and ‘no’ for drug-specific NMUPD if they never endorsed using any drugs in that category non-medically during the interview.

## Covariates

To calculate the least-biased estimate of the effect of NMUPD on childhood residential mobility, confounding by a number of factors was explored. Socio-demographic, intrapersonal, interpersonal, and community factors likely to influence adolescent prescription drug misuse were identified utilizing the social-ecological model as a theoretical framework. This model conceptualizes the interplay between intrapersonal-, interpersonal-, and community-level factors and their effect on health outcomes (McLaren & Hawe, 2005). The current study utilized a three-level, modified social-ecological framework to select potential confounders *a priori*.

Socio-demographic factors used in the analysis included race/ethnicity, sex, age, and financial assistance. Race/ethnicity was categorized as ‘non-Hispanic white’; ‘non-Hispanic black’; ‘Native American, Alaskan, Hawaiian, or other Pacific Islander’; ‘non-Hispanic Asian’; ‘non-Hispanic, mixed race’; or ‘Hispanic, any race’. Participants were classified ‘yes’ for financial assistance if they endorsed participating in one or more government assistance programs, including supplemental security income, food stamps, cash assistance, and/or non-cash assistance.

Intrapersonal-level factors included in the analysis were perception of health, perceived risk of drug use, sensation seeking behavior, bonding to school, average grades, delinquent behavior, and other drug use. Using a 5-point scale ranging from “excellent” to “poor”, participants were asked to rate their current health. Responses of “excellent”, “very good”, and “good” were classified as positive perceived health. Responses of “fair” and “poor” were classified as negative perceived health. Perceived risk of drug use was classified as ‘present’ if respondents answered “great risk” to eleven drug related activities (e.g., “smoke 1+ packs of cigarettes per day”). Sensation-seeking behavior was classified as ‘present’ if the participant endorsed that they agree with the following statements “sometimes” or “always”: “I get a real kick out of doing dangerous things” and “I like to test myself by doing risky things”. School bonding was classified as ‘high’ if respondents reported participating in more than one school/community-based youth activity within the previous school year or if they positively responded to questions regarding attitudes and feelings towards school. Participants were also classified based on their average grades as passing (C or above) or failing (below a C). Delinquent behavior was considered ‘present’ if the participant reported activity in six antisocial scenarios (e.g., “had a serious fight at school/work”). Use of other substances was classified as ‘present’ if the participant reported “yes” to smoking part or all of a cigarette in the past 30 days, having ever had a drink of alcohol (excluding sips or a couple of drinks from someone else’s alcoholic drink), and having ever used crack, heroin, LSD, PCP, mescaline, psilocybin (i.e., mushrooms), ecstasy, or any other hallucinogens.

Interpersonal-level covariates include parental monitoring, parental disapproval of drug use, perceived peer drug use, and peer disapproval of drug use. Parental monitoring was classified as ‘present’ if the participant responded “always” or “sometimes” for six example scenarios reflecting parental monitoring in the previous year (e.g., “my parents check if homework is done”). Parental disapproval of drug use was classified as ‘present’ when participants perceived their parents to “strongly disapprove” of four drug-related activities

(e.g., “smoking a pack of cigarettes per day”). Peer disapproval of drug use was classified as ‘present’ if participants reported one of their close friends “strongly” or “somewhat” disapproving of four drug-related activities (e.g., “have one to two alcoholic drinks per day”). Peer drug use was classified as ‘yes’ if the participant reported that “most” or “all” students in their grade smoke cigarettes, use marijuana, drink alcoholic drinks, or get drunk at least once a week.

Community-level factors were availability of drugs, school norms against drug use, and community norms against drug use. Availability of drugs was classified as ‘yes’ if participants reported being approached by someone selling drugs or if they perceived their ability to obtain marijuana, cocaine, crack, heroin, or LSD as “fairly easy” or “very easy”. School and community norms against drug use were classified as ‘yes’ if participants reported “yes” to having had any drug education in school or if they saw drug prevention messages outside of school.

### Statistical Analysis

Descriptive statistics and chi-square tests were utilized to describe the sample and compute population estimates of predetermined variables by drug use. To measure the association between residential mobility and NMUPD, multivariable logistic regression models were fit, accounting for the complex survey design. Due to oversampling in the survey design, weights were utilized during the analysis. A sensitivity analysis was conducted to explore missing data among the covariates for participants with complete data and participants with incomplete data; there were no significant differences in the exposure variable, outcome variable, or exposure-outcome association between the complete and incomplete cases. Then a complete-case, multivariable analysis was performed, during which only participants without missing data ( $n = 15,745$ ) for all of the factors under study were included in all of the descriptive and multivariable analyses. When assessing for confounding, conducting a complete-case analysis enables attributing changes in the effect estimates to confounding rather than differences in the participants included in the analysis.

Four models were fit to estimate the association between residential mobility and NMUPD for all prescription drug types, while adjusting for the different groups of social-ecological covariates. The first model included the exposure and outcome variables of interest, adjusting for only demographic variables. In the second model, the intrapersonal-level variables were added to the model with the demographic variables. In the third model, the interpersonal-level variables were added to the model with the demographic and intrapersonal-level variables. In the final model, all of the variables, including the community-level variables were incorporated. All analyses were conducted using SAS® 9.3.

### Results

Of the 15,745 participants aged 12 – 17 years included in this study, 54% ( $n = 8,594$ ) were non-mobile, 33% ( $n = 5,081$ ) were low-mobile, and 13% ( $n = 2,070$ ) were residentially instable (Table 1). Among the 10% ( $n = 1,642$ ) of adolescents who reported using drugs for non-medical purposes, most moved, were female, older, relied on financial assistance, and were Native American, Alaskan, Hawaiian or other Pacific Islander or non-Hispanic white,

compared to adolescents who did not report NMUPD. Adolescents who reported NMUPD were significantly more likely to perceive their health to be fair or poor, engage in sensation seeking behaviors, report low school bonding, have lower grades on average, exhibit delinquent behavior, use other drugs, lack parental monitoring, perceive parents and peers to not disapprove of drug use, have friends who use drugs, have access to drugs, and do not perceive school norms to be against drug use, compared to adolescents who did not report NMUPD.

Adolescents with low mobility were 26% [unadjusted OR = 1.26; 95% CI: 1.20, 1.41] and adolescents with residential instability were 81% [unadjusted OR = 1.81; 95% CI: 1.49, 2.21] more likely to use prescription drugs for non-medical purposes than their non-mobile counterparts (Table 2). This association persists after controlling for socio-demographic and social-ecological factors. When controlling for socio-demographic factors only, the odds of NMUPD among low-mobile and residentially unstable adolescents were 32% and 94% greater, respectively, than the odds of NMUPD among non-mobile adolescents. When controlling for social-ecological factors via a four step modeling process, the association again persists but is attenuated with odds ratios ranging from 1.32 (controlling for socio-demographic and intrapersonal-level factors) to 1.16 (controlling for socio-demographic, intrapersonal-, interpersonal-, and community-level factors) for adolescents with low mobility; in contrast, residentially unstable adolescents had attenuated odds ratios ranging from 1.94 to 1.25. After controlling for all social-ecological factors, low-mobile adolescents were 16% [OR = 1.16; 95% CI: 1.01, 1.33] and residentially unstable adolescents were 25% [OR = 1.25; 95% CI: 1.00, 1.56] more likely to use prescription drugs for non-medical purposes than their non-mobile counterparts.

With regard to specific categories of prescription drugs, low-mobile adolescents were 18% [OR = 1.18; 95% CI: 1.01, 1.38] more likely to abuse pain relievers than their non-mobile counterparts; this association was not significant for residentially unstable adolescents. The association between moving and NMUPD was not significant for tranquilizers, stimulants, or sedatives alone (Table 3).

## Discussion

In a nationally-representative sample of US adolescents, low-mobile and residentially unstable adolescents were more likely to use prescription drugs for non-medical purposes than non-mobile adolescents. The magnitude of the association increased with more moves and persisted even after controlling for traditional confounders (Collins, Abadi, Johnson, Shamblen, & Thompson, 2011; Viana et al., 2012), which were selected and organized using the social-ecological model. Pain relievers were the only specific category of prescription drugs that low mobility adolescents were significantly more likely to abuse than non-mobile adolescents.

These results are congruent with existing literature. The current study, along with previous studies (Dong et al., 2005; Gasper, DeLuca, & Estacion, 2010), found adolescents who are female, white, have depressed socioeconomic status, poor perceived health, poor academic performance, delinquent behavior, use other drugs, lack peer and parental disapproval of

drug use, and have drugs available to them are more likely to use prescription drugs non-medically. Also, the increasing magnitude of the association between residential mobility and NMUPD with increased instability is similar to those observed of other illicit drug use (DeWit, 1998).

Short- and long-term effects of childhood residential mobility have been linked to adolescent alcohol, marijuana, and nicotine use (Buu et al., 2009; DeWit, 1998; Hoffmann, 2002; Trim & Chassin, 2008). Additionally, increased numbers of moves before 16 years of age have been shown to be associated with early initiation of illicit drugs, including marijuana, hallucinogens, crack/cocaine, and illicit use of prescribed drugs (DeWit, 1998). Yet in previous research, prescription drug misuse was not broken down into drug types and illicit use of prescription drugs was only significantly associated with moving four or more times before the age of 16 years. The current study, however, showed an association between different levels of residential mobility and NMUPD via drug-specific categories; i.e., low-mobile adolescents were at increased odds of prescription pain reliever abuse compared to their non-mobile counterparts. After controlling for potential confounders, this relationship was not significant for other drug-specific categories nor for residentially unstable adolescents. This study may have been underpowered to detect small differences in the other drug types due to the lower prevalence of abuse of these classes of drugs, compared to pain relievers, and the lower prevalence of frequent residential moves within our sample.

The influence of moving on adolescent drug use could have numerous explanations. Usually children have little control over the decision to move. This lack of control over a major life event could result in adolescents feeling powerless, frustrated, and lonely (Newcomb & Harlow, 1986). Loneliness resulting from moving is common and can have serious implications for adolescents who need supportive social and normative structures (Stack, 1994). Close social structures aid in adolescent self-esteem and social competence (Cornille, 1993; Hendershott, 1989). Absence of support to deal with stress and anxiety could make these adolescents more vulnerable to deviant behavior, such as drug use initiation (DeWit, 1998). Many changes at once (e.g., schools, friends, neighborhood, neighborhood surroundings) could be stressful. These adolescents are forced to adjust quickly. Many studies have shown that youth who transfer to a new school are more likely to exhibit academic and behavioral problems (Felner, Ginter, & Primavera, 1982; Seidman, Allen, Aber, Mitchell, & Feinman, 1994; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Another reason relocating is associated with adolescent drug use could be the time and energy demands placed on the parents associated with moving. DeWit (1998) purport that parental distraction, resulting from moving, could result in less parental supervision, which could prompt children to seek acceptance from peers. Peer delinquency and best-friend delinquency are strong risk factors for adolescent substance abuse (Fite, Vitulano, Elkins, Grassetti, & Wimsatt, 2012).

These findings suggest that social-ecological factors confound the association between residential mobility and NMUPD. There was a substantial increase in the odds ratio between models 1 and 2, which is evidence of confounding by intra-personal factors. Future studies, therefore, should further establish the association between intra-personal factors and NMUPD.

This study has several strengths and limitations. This analysis utilizes a large, nationally-representative sample of US adolescents. The interviewing methodology has been tested and utilized over several years. Because participants are asked to report their own historic drug use, their responses are dependent upon accurate recall and honest answers. Though these data were obtained through self-report, which has the above-mentioned limitations, these data are not available from an alternative source. Furthermore, the manner in which sensitive data are collected, by way of direct entry into a study computer and the different, repeated ways in which questions are asked about the same topic, ensure that the data are as accurate as possible. This study is the first to examine the association between residential mobility and different categories of prescription drugs. In addition, the participants were only asked to recall residential mobility that took place within the past 5 years, thus potentially reducing errors in reporting of residential mobility. A limitation of using secondary data to answer this research question, however, is that the definition of residential mobility employed was dependent on the questions asked during the survey, preventing the consideration of the effect of the distance between moves on the outcome. Furthermore, because the data are cross-sectional in nature, the temporal relationship between moving in the last five year and lifetime use of NMUPD is unclear. Given the age range of the participants, however, the likelihood of initiation of drug use prior to any moving in the previous five years is less likely than in an older population.

In addition, we were unable to control for adverse childhood experiences (ACE), which could confound the association between frequency of moves and NMUPD. Potentially important ACE factors (e.g., parental divorce, abuse, and family dysfunction) were not included in the NSDUH interview. ACE have been studied with regard to their influence on child health, their continued impact on adult health, alcohol initiation, drug addiction, and lifetime drug use (Dong et al., 2005; Dube et al., 2003). Though the influence of ACE on the relationship between frequent childhood and adolescent moves and NMUPD has not been studied, the current study did explore numerous variables under the application of the social-ecological model. Variables exploring financial stability, perceived health and risk of drug use, parent monitoring, delinquent behaviors, and parental/peer use and disapproval of drugs may serve as proxy measures for certain ACE factors, for which the current study was unable to control.

## Conclusion

Based on these findings, childhood residential mobility is associated with adolescent NMUPD, with the magnitude of the association increasing with more moving. Future research should further examine the association between moving and NMUPD, particularly with regard to the direction of the association and the types of drugs involved. In addition, interventions to prevent prescription drug misuse and abuse among adolescents should be developed for and targeted towards mobile adolescents and the particular challenges faced by this group. Given that prescription drugs are most commonly obtained from family and friends, and the influence that parents have on adolescent initiation of drug use, future interventions should also target parents of residentially mobile adolescents.



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### Significance

**What is already known on this subject?**

Among adolescents, childhood residential instability is linked to developmental and social-emotional issues, including substance use. However, the relationship between residential mobility and non-medical use of prescription drugs (NMUPD) in particular is unknown.

**What this study adds?**

Residentially mobile adolescents are more likely to use prescription drugs non-medically than non-mobile adolescents. Drug-specific associations indicate a relationship between low-mobile adolescents and pain reliever abuse. This suggests that increasing childhood residential mobility is associated with increased NMUPD.

**Table 1.**

Individual-, intrapersonal-, interpersonal-, and school-level characteristics of study sample, NSDUH, 2010 (n = 15,745).

	<b>Total N (%)</b>	<b>Drug Use N (%)</b>	<b>No Drug Use N (%)</b>
<b>Number of moves*</b>			
0	8594 (54)	747 (46)	7847 (55)
1 – 2	5081 (33)	582 (35)	4499 (33)
3	2070 (13)	313 (19)	1757 (13)
<b>Individual Characteristics</b>			
<b>Race/ethnicity*</b>			
Non-Hispanic, white	9767 (60)	1007 (61)	8760 (60)
Non-Hispanic, black	1964 (14)	182 (12)	1782 (14)
Native American, Alaskan, Hawaiian, other	271 (1)	43 (1)	228 (1)
Pacific Islander	487 (4)	23 (2)	464 (4)
Non-Hispanic, Asian	653 (2)	90 (3)	563 (2)
Non-Hispanic, mixed race	2603 (19)	297 (21)	2306 (19)
Hispanic, any race			
<b>Sex*</b>			
Male	7949 (51)	744 (47)	7205 (52)
Female	7796 (49)	898 (53)	6898 (48)
<b>Age*</b>			
12	2133 (14)	78 (5)	2055 (15)
13	2439 (16)	114 (7)	2325 (17)
14	2558 (16)	204 (12)	2354 (17)
15	2772 (18)	345 (21)	2427 (17)
16	2901 (18)	411 (23)	2490 (18)
17	2942 (19)	490 (32)	2452 (17)
<b>Financial assistance*</b>			
Yes	3550 (23)	492 (29)	3058 (22)
No	12195 (77)	1150 (71)	11045 (78)
<b>Intrapersonal Characteristics</b>			
<b>Perception of overall health*</b>			
Fair/poor	547 (3)	101 (6)	446 (3)
Good/excellent	15198 (97)	1541 (94)	13657 (97)
<b>Perceived risk of drug use</b>			
Present	15202 (97)	1586 (97)	13616 (97)
Absent	516 (3)	55 (3)	461 (3)
<b>Sensation seeking behavior*</b>			
Present	4121 (26)	790 (47)	3331 (23)
Absent	11624 (75)	852 (53)	10772 (77)

	<b>Total</b>	<b>Drug Use</b>	<b>No Drug Use</b>
	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
<b>Bonding to school*</b>			
High	15645 (100)	1608 (99)	14037 (100)
Low	100 (1)	34 (1)	66 (0)
<b>Average grades*</b>			
A, B or C	14915 (95)	1445 (89)	13470 (96)
D or F	830 (5)	197 (11)	633 (4)
<b>Delinquent behavior*</b>			
Present	4806 (30)	967 (58)	3839 (27)
Absent	10939 (70)	675 (42)	10264 (73)
<b>Other drug use*</b>			
Yes	6440 (40)	1377 (84)	5063 (35)
No	9305 (60)	265 (16)	9040 (65)
<b>Interpersonal Characteristics</b>			
<b>Parental monitoring*</b>			
Present	14499 (92)	1447 (88)	13052 (92)
Absent	1246 (8)	195 (12)	1051 (8)
<b>Parental disapproval of drug use*</b>			
Present	15271 (97)	1468 (91)	13803 (98)
Absent	474 (3)	174 (9)	300 (2)
<b>Perceived peer drug use*</b>			
Yes	7705 (49)	1277 (78)	6428 (46)
No	8040 (51)	365 (22)	7675 (54)
<b>Peer disapproval of drug use*</b>			
Present	14503 (92)	1290 (79)	13213 (94)
Absent	1242 (8)	352 (21)	890 (6)
<b>School-level Characteristics</b>			
<b>Availability of drugs*</b>			
Yes	8779 (56)	1387 (84)	7392 (52)
No	6966 (44)	255 (16)	6711 (48)
<b>School norms against drug use*</b>			
Yes	11902 (76)	1135 (68)	10767 (76)
No	3843 (24)	507 (32)	3336 (24)
<b>Community norm against drug use</b>			
Yes	12193 (77)	1232 (76)	10961 (77)
No	3497 (23)	408 (24)	3089 (23)

n, Number of participants; %, weighted percent (takes into account NSDUH's complex survey design and does not include missing values).

\* Indicates a significant ( $p < 0.05$ ) Rao-Scott Chi-Square value.

**Table 2.**

Association between childhood residential mobility and non-medical use of prescription drugs, NSDUH 2010, (n=15,745).

	OR (95% CI)	Model 2 <sup>b</sup> aOR (95% CI)	Model 2 <sup>c</sup> aOR (95% CI)	Model 3 <sup>d</sup> aOR (95% CI)	Model 4 <sup>e</sup> aOR (95% CI)
Moves in Previous Five Years					
1 – 2 versus 0	1.26 (1.20, 1.41)	1.32 (1.17, 1.50)	1.18 (1.04, 1.35)	1.16 (1.01, 1.34)	1.16 (1.01, 1.33)
3 versus 0	1.81 (1.49, 2.21)	1.94 (1.57, 2.39)	1.35 (1.09, 1.68)	1.27 (1.02, 1.60)	1.25 (1.00, 1.56)

NSDUH: National Study on Drug Use and Health; n: Number of participants; OR: unadjusted odds ratio; aOR: adjusted odds ratio; CI: confidence interval

<sup>a</sup> Respondents were classified based on 0 moves (non-mobile), 1–2 moves (low mobility), and 3 moves (residential instability).

<sup>b</sup> Model 1 adjusts for race, sex, age, and financial assistance.

<sup>c</sup> Model 2 adjusts for Model 1 covariates + perceived overall health, bonding to school, sensation seeking behavior, average grades, delinquent behavior, and other drug use.

<sup>d</sup> Model 3 adjusts for Model 2 covariates + parental monitoring, parental disapproval of drug use, peer drug use, and peer disapproval of drug use.

<sup>e</sup> Model 4 adjusts for Model 3 covariates + availability of drugs and school norms against drug use.

**Table 3.**

Association between childhood residential mobility and NMUPD by drug class, NSDUH, 2010 (n=15,745).

	<b>NMUPD</b>	<b>Pain Relievers</b>	<b>Tranquilizers</b>	<b>Stimulants</b>	<b>Sedatives</b>
	<b>OR (95% CI)</b>	<b>aOR (95% CI)</b>	<b>aOR (95% CI)</b>	<b>aOR (95% CI)</b>	<b>aOR (95% CI)</b>
Moves in Previous Five Years <sup>a</sup>					
1 – 2 versus 0	1.16 (1.01, 1.33)	1.18 (1.01, 1.38)	1.07 (0.79, 1.45)	1.08 (0.75, 1.55)	1.33 (0.71, 2.50)
3 versus 0	1.25 (1.00, 1.56)	1.12 (0.89, 1.42)	1.28 (0.92, 1.79)	1.35 (0.85, 2.13)	1.03 (0.54, 1.96)

NMUPD: non-medical use of prescription drugs; NSDUH: National Study on Drug Use and Health; n: number of participants; aOR: adjusted odds ratio; CI: confidence interval

<sup>a</sup> Respondents were classified based on 0 moves (non-mobile), 1–2 moves (low mobility), and 3 moves (residential instability).

<sup>b</sup> Model is adjusted for race, sex, age, financial assistance, perceived overall health, bonding to school, sensation seeking behavior, average grades, delinquent behavior, other drug use, parental monitoring, parental disapproval of drug use, peer drug use, peer disapproval of drug use, availability of drugs, and school norms against drug use.

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