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## The influence of childhood welfare participation on adulthood substance use: evidence from the National Longitudinal Study of Adolescent to Adult Health

Shiyou Wu, MSW, PhD candidate<sup>a</sup>, Lisa de Saxe Zerden, MSW, PhD<sup>a</sup>, and Qi Wu, PhD<sup>b</sup><sup>a</sup>School of Social Work, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA<sup>b</sup>Department of Social Work, University of Mississippi, Oxford, MS, USA

### Abstract

**Background**—The associations between early life-socioeconomic status and health, specifically substance use, is well substantiated. The vulnerabilities associated with adversity in childhood, particularly poverty, can have a cumulative effect on an individual's risk and resilience throughout the life course. While several studies substantiate the relationship between substance use and welfare participation, less known is the impact of and prevalence of behavioral health problems later in life among young adults who were welfare recipients before age 18.

**Objective**—This paper explores whether childhood welfare participation before the age of 18 years influences substance use until young adulthood (24–34 years).

**Methods**—This study used Add Health data with sample sizes ranging from 12,042 to 12,324 respondents, and propensity score matching methods to balance the samples and account for selection bias. Matched data were then used to run a series of regression models.

**Results**—Those who participated in welfare before age 18 years had a significant lower probability of remaining substance-free until young adulthood (marijuana-free by 30%,  $p < 0.001$ ; and other illicit substances-free by 16%,  $p < 0.05$ ). However, no significant between-group differences were found on any of the alcohol-related variables.

**Conclusions**—Findings highlight long-term behavioral health risks, especially substance use, faced by young adults who participated in welfare before the age of 18 years old. Acknowledging the vulnerabilities associated with welfare participation and living in poverty could help increase the effectiveness of program and treatment efforts. The prevention of long-term behavioral health disorders hinges on early diagnosis and intervention.

### Keywords

Welfare participation; substance use; drug use; alcohol use; propensity score matching; Add Health

## INTRODUCTION

Childhood adversities such as poverty and socio-economic stress have been cited as important predictors of health outcomes into adulthood (1–4) and can have a cumulative effect on ones' risk and resilience (4). The associations between early life-socioeconomic status and health, specifically substance use, throughout the life course is well documented (4, 6–8). Several studies substantiate the relationship between substance use and welfare participation (9–12). However, less known is the impact of and prevalence of behavioral health problems later in life among children who were welfare recipients before age 18. Using longitudinal data from the nationally representative Add Health dataset, this study contributes to the literature by exploring whether welfare participation before the age of 18 predicts substance use rates, and prevalence until young adulthood, a period categorized broadly between 24–34 years of age (13–14).

In terms of substance use rates, youth and young adults constitute the groups most likely to use alcohol or illicit substances (15–17). Current estimates suggest 23 million individuals in the United States, or 9% of the population 12 years and older, meet diagnostic criteria for a substance use disorder (18–19). As 1996 welfare reform was debated, estimates ranged dramatically from 6–37% of welfare recipients who had a substance use problem (20). However, this data is for adult welfare recipients only and to date, there are no comparable data of substance use rates later in the life course for children and adolescents who received Aid to Families with Dependent Children (AFDC), or Temporary Assistance for Needy Families (TANF) benefits before age 18. Additionally, the discrepancy in the wide range is due to different data sources, definitions, methodology, and thresholds for substance use over different increments of time. In order to understand the influence of childhood welfare participation on adulthood substance use, the social safety net of welfare assistance warrants further attention.

Welfare, formerly AFDC and renamed TANF under the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, (also commonly referred to as “welfare reform”) was signed by President Clinton and is considered to be a main safety-net welfare program for children and families delivered through federal block grants for states to administer (21). Under TANF, substantial changes to welfare include a maximum 5-year lifetime limit of benefits, work (or in some states, school) requirements, and more state discretion on how benefits can be administered or sanctioned (1, 22–23). As a result of welfare reform, caseloads have been reduced from 5 million families in 1993 to 3.94 million in 1997, and to 1.95 million in 2011 (23–25). While these numbers reflect lower rates of participation in welfare overall, a more nuanced understanding recognizes that declining caseloads resulted from stricter eligibility requirements and not due to poverty alleviation (1, 22). Further, stigma associated with welfare participation has been documented and connected to welfare participation rates historically (26–27).

Precisely because studies have shown that those who experience chronic childhood adversity, such as socioeconomic disadvantage, have a greater likelihood of substance use disorder and an increased risk for chronic adversity (6, 28–30), the impact of childhood welfare participation on substance use later in life warrants further attention. Specifically,

childhood poverty has been linked to a host of physical and psychological disorders during childhood and later in life (4, 28) including; social adjustment (31); disadvantaged neighborhood conditions (32); educational achievement (33–34); housing mobility, economic capital and self-sufficiency (34–35); and obesity rates (36–37). However, given the heightened vulnerabilities of children experiencing poverty and participation in means-tested welfare programs, the literature remains surprisingly nascent on the impact of receiving welfare in the early part of the life course (<18 years old) and rates of substance use in adulthood. To fill this gap, this study attempts to connect adversities in childhood, such as poverty and as indicated by welfare participation before the age of 18 with adult substance use.

## Methods

### Data

This study used survey data from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a longitudinal study of nationally representative cohort survey of grades 7–12 students of 1994–95 academic year conducted by the Carolina Population Center at University of North Carolina at Chapel Hill. Participants were followed into young adulthood (ages 24–34 at Wave IV; 13) with 4 waves of in-home interviews (Wave I, 1995,  $N = 20,745$  to Wave IV, 2008–09,  $N = 15,701$ ), yielding rich data that tracked participants' social, economic, psychological and physical well-being dimensions from childhood to adulthood (see (38) for detailed information on the Add Health survey design). In addition, this survey collected parents' information at Wave I ( $N = 17,670$ ). For this paper, we used the subpopulation of respondents who finished both the Wave I and IV survey. We also included participants' family background and their parent's information to explore the potential effects of welfare participation on substance use. Our sample size started at 15,701 and reduced to final analytic ranges of 12,042 to 12,324 for several reasons including: roughly 15% of adolescents had parents who did not finish the interview at Wave IV, and Wave IV sampling weights had 901 missing values, including the dependent variables.

### Measures

**Dependent variables**—For this study, the substance use dependent variables included six dimensions of alcohol use, and five categories of drug use of adults in Wave IV.

**Alcohol use:** The Add Health survey defined “a drink” as “a glass of wine, a can or bottle of beer, a wine cooler, a shot glass of liquor, or a mixed drink, not just sips or tastes from someone else’s drink.” To yield a better understanding and more precise measure of alcohol use, participants were asked to recall six dimensions of their alcohol use for both long-term (during the past 12 months) and short-term periods (past 30 days). *For longer-term alcohol use*, participants were asked: a) “how many days they drank alcohol”. Seven response categories were provided: 0 = None, 1 = 1 or 2 days a year, 2 = once a month or less (3–12 days) a year, 3 = 2 or 3 days a month, 4 = 1 or 2 days a week, 5 = 3–5 days a week, and 6 = (almost) every day; b) participants were asked “Think of all the times you have had a drink. How many drinks did you usually have each time?” Responses ranged from 0 to 18 drinks;

c) participants were asked “how many days did you drink (5 or more/4 or more) drinks in a row?” Response options were the same as the first dimension range from 0 to 6; and d) participants were asked to report how many days did they get drunk or very high on alcohol, also using the same seven responses as the first dimension. *Short term use was categorized as drinking during the past 30 days*: e) participants were asked how many days they drank, using the same responses from 0 to 6 as the first dimension; and f) participants were asked “Think of all the times you have had a drink during the past 30 days. How many drinks did you usually have each time?” Responses range from 0 to 18 drinks.

**Substance use:** At the Wave IV data collection, the Add Health survey asked participants whether they had ever used the following drugs before the Wave IV survey time point: a) steroids, including anabolic steroids or body-building drugs; b) *marijuana*, including *hashish*, *bang*, and *ganja*; c) *cocaine*, including crack and coca leaves; d) crystal meth, also known as ice, crank, or tweak; and e) *other types of illicit drugs*, such as lysergic acid diethylamide (LSD), phencyclidine (PCP), ecstasy, heroin, psilocybin mushrooms, or intoxicative inhalants. These questions used dichotomous responses, with *yes* coded as 1 and *no* coded as 0. Notably, the Wave IV Add Health survey did not ask young adult respondents about their current use of all these five types of substances. Given this limitation of the data, our analysis could not include an explicit measure of substance use during adult years only. However, a responses of *no* indicated the respondent had never used illicit substances at least until young adulthood. Therefore, we created the five variables indicating no use of a particular substance before the Wave IV survey time point: *steroid-free*, *marijuana-free*, *cocaine-free*, *crystal meth-free*, and *free of other types of illicit drug use* (1= never used; 0= previously used).

Table 1 presents the distributions of each dependent variable. For participants’ alcohol use, in past 12 months, the average number of days when alcohol was consumed was 2.29 ( $SD = 1.8$ ), with 2.72 ( $SD = 2.99$ ) being the average number of alcoholic drinks consumed at each episode. Table 1 also offers alcohol use variables presented in the past 30 days. As for rates of drug use, more than half of the respondents (55%) reported previous use of marijuana, followed by: other illicit substances (22%), cocaine (19%), crystal meth (9%), and steroids (2%). Although just over half of the sample had used marijuana before adulthood, 45% had not used marijuana, and the vast majority of respondents reported no previous use of other illicit substances (78%), cocaine (81%), crystal meth (91%), and steroids (98%).

**Key independent variable**—Our aim was to explore whether a household’s receipt of public welfare assistance before a child was 18 years old had an impact on substance use once the respondent reached young adulthood. To answer this question, we divided participants into two groups based on responses to the question: “*Before you were 18 years old, did anyone in your household ever receive public assistance, welfare payments, or Food Stamps?*” Responses to the questions were based on data from Wave III (aged from 18–26); for participants missing Wave III data, responses were based on Wave IV data. Overall, about 18% of participants were from a welfare recipient family.

**Covariates**—We controlled for demographic and socioeconomic variables at individual, parental, household and community levels on all the analytic models identified in the

literature. At the individual level from Wave I, we controlled for adults' *gender* (1=female; 0=male), *age* (as a continuous variable), and *race*. Race was recoded as 5 dummy variables: White; Black; Hispanic; Asian; Native American and others. *Self-perceived intelligence* was assessed by asking adults "compared to other people in your age, how intelligent are you?" Responses ranged from 1 to 6, denoting "moderately below average" to "extremely above average". We also controlled for adults' personal income level from Wave IV, which was recoded as 3 dummy variables: low income (< \$10,000), moderate income (\$10,000 – \$ 99,999), high income (>\$99,999). *Educational level* from Wave IV was recoded as 4 dummy variables: high school graduate or less, some colleges, college graduate, and some graduate school and above. *Marriage status* from Wave IV was coded as a dummy variable (1= married or cohabitating; 0 = other).

We controlled for adults' parental education, employment status and health status from Wave I. Parental *education* ranges were scored from 0 (less than 8 the grade) to 7 (professional training after college). *Employment status* was coded as 4 dummy variables: unemployed and not looking for a job; unemployed and is looking for a job; part-time employed, and full-time employed. Parental *health status* was recoded as 3 dummy variables: good, fair and poor. In addition, we controlled whether respondent's family had enough money to pay their bills (1=yes; 0=no). *Family structure* was measured as four dummy variables: two biological parents; two parents' one biological; single parent and other), and *household size* (number of persons living in the household) from Wave I.

For all of the five drug use outcomes, we additionally controlled for whether participants' assessed drug use as a problem within their neighborhood to gauge their normative beliefs regarding drug use. This was recoded as 3 dummy variables that substance use was perceived as: not a problem, a small problem, and big problem; we also controlled for whether participants had learned about drug use in a class at school (1=yes; 0=no). For all the six alcohol use outcomes, we controlled for parental alcohol use (recoded as 3 dummy variables: never, sometimes, and more than 3 days a week), and whether participants had learned about issues of drinking in a class at school (1=yes; 0=no).

### Analytical strategies

First, we conducted descriptive analysis to capture the overall distributions for all of the variables. Then, to investigate whether young adults whose family had ever received welfare benefits before 18 years had impact on their adulthood substance use, given the non-randomization design of this study, we conducted propensity score matching so that the two groups (received welfare vs. not received welfare) were comparable. By conducting these analytic steps, the sample selection bias could be reduced (39–40).

To conduct propensity score full matching, first, we used logistic regression to predict each participant's probability (i.e., propensity score) of living in a family that received welfare benefits before 18 years based on all the covariates that were introduced previously. Second, we matched each adult who grew up in a welfare recipient family with someone who did not grow up in a welfare recipient family but had the closest propensity scores. We used 0.01 as the caliper for the matching (39). We limited our matching in a common support region with overlapped propensity scores, and did balance checks on all the control variables before and

after matching to ensure the matching process was conducted appropriately. Table 2 and Table 3 show that most of the covariates did not balance before matching, whereas those imbalanced variables were all balanced after matching. The adequate balance after matching indicates that the adults who grew up in a welfare recipient family are very similar to their counterparts who did not grow up in a welfare recipient family.

Finally, we conducted regression models (logistic regression for the five drug use models, whereas OLS regression for the six alcohol use models) to examine the association between the key independent variable and each of the outcome variables, while controlling for the demographic and socioeconomic factors at the individual, parental, household and community levels. All of the analysis was conducted by using Stata 13.1 for Windows. Based on Chen and Chantala's suggestion (41), we used survey command with sampling weights for the analyses, which can adjust the complexity survey design (unequal probability and clustering selection) of Add Health, and yield national population estimates for selection bias.

## Results

The results of our analysis on the effects of welfare participation before 18 years on six dimensions of the alcohol use are shown in Table 4. Overall, young adults (24–34 years old) raised in a household that ever received welfare had lower levels of alcohol use as adults when compared with adults who did not participate in welfare during childhood. Although between-group differences were found among the six dimensions of alcohol use, none reached statistical significance at the 0.05 level.

### Effect of Childhood Welfare Participation on Drug Use

As shown in Table 5, we found that, as compared with counterparts whose families had never received welfare, young adults whose families received welfare before age 18 years old had a 30% lower probability of remaining marijuana-free until young adulthood ( $OR = 0.702$ ,  $p < 0.001$ ) Similarly, young adults with childhood welfare experience before the age of 18 had a 16% lower probability of remaining free of use of other illicit substances ( $OR = 0.844$ ,  $p < 0.05$ ) until young adulthood. However, childhood welfare participation had no statistically significant effect on the probability of remaining cocaine-free, steroid-free and crystal meth-free until young adulthood.

The column (b) of Table 5 shows that in comparison with counterparts with no welfare experience, the probability of a person with welfare experience in childhood remaining marijuana-free until young adulthood was affected by other factors, including having parents with higher education ( $OR = 0.901$ ,  $p < 0.001$ ), parents with full-time jobs ( $OR = 0.731$ ,  $p < 0.01$ ), and parents with good health status ( $OR = 0.667$ ,  $p < 0.001$ ). A statistically significant lower probability of remaining marijuana-free was also associated with household-level covariates, including young adults from a single-parent family ( $OR = 0.812$ ,  $p < 0.05$ ), and adults living in neighborhoods recognized as having a low level of drug use ( $OR = 0.786$ ,  $p < 0.01$ ). For the covariates at the young adult level, higher probability of remaining marijuana-free until young adulthood was found for females ( $OR = 1.513$ ,  $p < 0.001$ ), Hispanics ( $OR = 1.466$ ,  $p < 0.01$ ), blacks ( $OR = 2.082$ ,  $p < 0.001$ ), and young adults with

education at the graduate school level or above (OR = 1.402,  $p < 0.001$ ). In addition, for every one year increase in age, the probability of remaining marijuana-free until young adulthood increased by 15% ( $p < 0.001$ ).

The column (b) of Table 5 shows that in comparison with counterparts with no welfare experience, the probability of a person with welfare experience in childhood remaining free of use of other illicit substances until young adulthood was affected by other factors, including having parents with higher education (OR = 0.915,  $p < 0.01$ ), parents with full-time jobs (OR = 0.518,  $p < 0.001$ ), and parents with part time job (OR = 0.606,  $p < 0.01$ ). A statistically significant lower probability of remaining free of use of other illicit substances was also associated with household-level covariates, including young adults from a single-parent family (OR = 0.745,  $p < 0.05$ ), young adults from two parents with only one biological parent (OR = 0.684,  $p < 0.01$ ), and adults living in neighborhoods recognized as having a low level of drug use (OR = 0.802,  $p < 0.05$ ). For the covariates at the young adult level, higher probability of remaining free of use of other illicit substances until young adulthood was found for females (OR = 1.105,  $p < 0.001$ ), Hispanics (OR = 1.466,  $p < 0.05$ ), blacks (OR = 5.667,  $p < 0.001$ ), young adults with a high income level (OR = 1.848,  $p < 0.05$ ), with education at the graduate school level or above (OR = 1.818,  $p < 0.01$ ), and for those who were married or cohabitating (OR = 1.413,  $p < 0.01$ ). In addition, for every one year increase in age, the probability of remaining marijuana-free until young adulthood increased by 11% ( $p < 0.001$ ).

## Discussion

Behavioral health problems among welfare recipients have become important themes in the broader public discourse about welfare reform and new policies to drug-test welfare participants (11). Establishing the rates of substance use problems among welfare recipients has been important for prevention and targeted treatment among this population (9, 12). Findings of this study highlight long-term behavioral health risks of young adults whose families participate in welfare programs before the age of 18. This population focus is important given the developmental tasks associated with emerging and young adulthood that can impact physical health, behavioral health, and social development, as well as participation in community and employment contexts (42).

The web of factors impacting substance use are multi-faceted and complex and have include environmental, interpersonal, social and individual level risks (43). This study draws attention to various risk and protective factors that impact substance use into adulthood among adults who before the age of 18 participated in welfare. Participation in welfare is one casual mechanism that impacts rates of illicit drug use as one ages. However, equally important are the protective factors that reduce the likelihood of engaging in substance use, despite the known risks of poverty on human development and subsequent health outcomes. Across the continuum from policy makers developing programs to assist families living in poverty to those on the ground implementing programs and services, families impacted by poverty are at increased risk for adverse circumstances (44). These adversities last beyond childhood and have impact on human development throughout the life course. Family structure, neighborhood safety, educational attainment, and gender differences warrant

additional focus especially as the impact of welfare participation before age 18 is further understood.

Interestingly, there were no significant differences between any of the alcohol use variables and welfare participation before the age of 18. While Keyes et al.'s (45) work underscores the importance of social context and social norms in how alcohol use impacts population level determinants of the population's alcohol use, it is possible these factors were not sufficiently controlled for within this study. Ample research exists to confirm that alcohol outlets are concentrated in minority and low-wealth communities (46–49), and may impact community level norms and attitude concerning alcohol. Cultural norms and values have a powerful influence on alcohol-related behaviors, as well as on belief systems about use (50) indicating that more research is warranted around these norms and later alcohol use among welfare recipients specifically.

The prevention of long-term negative outcomes, including the development of behavioral health disorders, hinges on early diagnosis and intervention. In order to reach more children, adults and families impacted by poverty and potential substance use, additional focus on the prevention of behavioral health problems is crucial. This includes “effective programs to scale at the school, neighborhood and community level” (43, p. 245) in addition to a clear understanding of the intersection between adverse social conditions and the social policies in place to remedy them. With the passage of the Affordable Care Act and a move towards integrated systems of care, there is a renewed emphasis on the screening, prevention, and early intervention for behavioral health problems; this new approach can have great benefit, particularly for those experiencing poverty early on in the life-course and among recipients of welfare programs.

This study has several strengths: first, this study used a nationally representative large sample size data from Add Health, which allowed us to more broadly generalize study conclusions. Second, this study used several measures of substance use (i.e., five dimensions for drug use and six dimensions for alcohol use), to yield a better understanding of the type and severity of substance use and also to show the impacts of household welfare participation on participants' substance use later on in the life course. Third, this study used propensity score matching method to reduce the sample selection bias, and could yield more precisely results, as compared with running regressions on unmatched samples. This study can significantly enhance the current literature and fill the research gap of exploring the relationship between childhood welfare participation and adulthood substance use.

Despite these strengths, several limitations need to be acknowledged: first, Add Health survey used a school-based sampling approach, which excluded adolescents who were not in school for a variety of reasons. Second, given the consideration of the complicated survey design (i.e., needs to use survey commend with weights), we lost a large amount of the original sample size due to missing data. For future studies, using multiple imputation could be a robust method for dealing with missing data, rather than just deleting the cases as was done in this analysis (51). Third, given the limitation of the Wave IV Add Health data, our analysis could not include an explicit measure of drug use during adult years only. Therefore, instead of looking at the adulthood drug use, we examined the impacts of



childhood welfare participation on probability of remaining drug-free until young adulthood. Lastly, although this study used propensity score analysis to control the selection bias for the effects of household welfare participant and several other influential variables on adulthood substance use, this statistical methodology cannot conclusively rule out the unmeasured or unobserved variables that may be crucial to the “treatment” effects. A randomized experiment in which both observed and unobserved predictors are balanced would be an ideal approach.

Further research is needed to capture a more nuanced analysis that includes variables to assess the depth and context of childhood adversity and poverty and the impact on later life behavioral health issues. This includes the length and duration of welfare participation in childhood given the adversities of poverty can differ based on pervasiveness and when in child development they occur (1). Precisely because “personal responsibility” and “work” were the key focus of 1996 welfare reform, and employability continues to be an important barometer for contributing to society (11), the impact of welfare participation warrants close consideration for the long term behavioral health and well-being of program participants.

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**Table 1**

## Unweighted Distributions of Dependent Variables

Dependent Variables	N	Mean/%	SD
<b>Alcohol Use</b>			
Number of days drinking in past 12 months	12,324	2.29	1.80
Number of drinks each time in past 12 months	12,240	2.72	2.99
Number of days drink > 5 drinks in past 12 months	12,295	1.16	1.53
Number of days been drunk in past 12 months	12,305	1.00	1.32
Number of days drinking in past 30 days	12,313	1.70	1.78
Number of drinks each time in past 30 days	12,146	2.17	2.79
<b>Drug-Free (1 = yes; 0 = no)</b>			
Steroids-free	12,057	98%	
Marijuana-free	12,042	45%	
Cocaine-free	12,058	81%	
Crystal meth-free	12,065	92%	
Free of other illicit drugs	12,060	78%	

*Note:* Drug-free means the respondent had never used drugs at least until young adulthood.

**Table 2**  
Unweighted Description Results and Balance Check of Independent Variables of Drug Use

Independent Variables	(a) Before Matching (n = 12,108)				(b) After Full Matching (n = 11,549)				
	Yes (n = 2,166)	SD	Mean	P	Yes (n = 2,147)	SD	Mean	P	
<i>Welfare participation before 18</i>									
	Yes (n = 2,166)	SD	Mean	P	Yes (n = 2,147)	SD	Mean	P	
<b>Parental Level</b>									
Education	4.66	2.31	5.69	2.34	***	4.68	2.30	4.66	2.35
<b>Employment status</b>									
Unemployed & not looking for a job	0.28	0.45	0.19	0.39	***	0.28	0.45	0.27	0.44
Unemployed & looking for a job	0.12	0.32	0.05	0.21	***	0.11	0.32	0.11	0.31
Employed part time	0.14	0.35	0.15	0.36		0.14	0.35	0.14	0.34
Employed full time	0.47	0.50	0.61	0.49	***	0.47	0.50	0.49	0.50
<b>Health Status</b>									
Good	0.75	0.43	0.88	0.32	***	0.75	0.43	0.75	0.43
Fair	0.18	0.39	0.10	0.29	***	0.18	0.38	0.18	0.39
Poor	0.07	0.25	0.02	0.15	***	0.07	0.25	0.06	0.25
<b>Household Level</b>									
Hardship pay for bills	0.68	0.47	0.85	0.36	***	0.68	0.46	0.68	0.47
<b>Family Structure</b>									
Others	0.10	0.30	0.06	0.24	***	0.10	0.31	0.11	0.31
Single parent	0.50	0.50	0.24	0.43	***	0.50	0.50	0.50	0.50
Two parents one biological	0.13	0.34	0.10	0.31	***	0.14	0.34	0.14	0.35
Two biological parents	0.26	0.44	0.59	0.49	***	0.26	0.44	0.25	0.44
Household size	3.81	1.94	3.55	1.47	***	3.77	1.89	3.77	1.88
<b>Community Level</b>									
<i>Neighborhood drug use problem</i>									
Not a problem	0.48	0.50	0.63	0.48	***	0.48	0.50	0.48	0.50
Small problem	0.36	0.48	0.30	0.46	***	0.36	0.48	0.37	0.48
Big problem	0.16	0.37	0.07	0.25	***	0.16	0.37	0.15	0.36
<b>Young Adults Level</b>									

Independent Variables	(a) Before Matching (n = 12,108)				(b) After Full Matching (n = 11,549)			
	Mean	SD	Mean	P	Yes (n = 2,166)	No (n = 9,942)	Yes (n = 2,147)	No (n = 9,402)
<i>Welfare participation before 18</i>								
Female	0.56	0.50	0.53	0.50	**	0.56	0.50	0.55
Age	16.03	1.70	15.98	1.68		16.03	1.70	16.05
Had class on drug use	0.97	0.18	0.97	0.18		0.97	0.18	0.97
Self-perceived Intelligent	3.74	1.07	3.93	1.08	***	3.75	1.07	3.74
<i>Race</i>								
Hispanic	0.18	0.38	0.15	0.35	**	0.17	0.38	0.18
Black	0.31	0.46	0.19	0.39	***	0.31	0.46	0.30
American Indian and others	0.03	0.16	0.05	0.23	***	0.03	0.16	0.03
Asian	0.04	0.19	0.03	0.16	**	0.04	0.19	0.04
White	0.45	0.50	0.58	0.49	***	0.45	0.50	0.45
<i>Income level</i>								
Low	0.27	0.44	0.18	0.38	***	0.27	0.44	0.26
Moderate	0.69	0.46	0.77	0.42	***	0.70	0.46	0.70
High	0.04	0.19	0.05	0.21	*	0.04	0.19	0.04
<i>Educational level</i>								
High school and less	0.36	0.48	0.21	0.41	***	0.35	0.48	0.36
Some colleges	0.48	0.50	0.43	0.50	***	0.49	0.50	0.49
College graduate	0.10	0.30	0.22	0.41	***	0.10	0.30	0.09
Some graduate school and above	0.06	0.24	0.14	0.34	***	0.06	0.24	0.06
Married/cohabitating	0.65	0.48	0.63	0.48		0.65	0.48	0.65

Notes: Chi-square (for categorical variables) and t tests (for continuous variables) were used to test significant group differences.

\*\*\* p < 0.001,

\*\* p < 0.01,

\* p < 0.05, p value with blank means variable has no statistically significant difference between the two groups.

**Table 3**  
Unweighted Description Results and Balance Check of Independent Variables of Alcohol Use

Independent Variables	(a) Before Matching (n = 12,343)				(b) After Full Matching (n = 11,791)						
	Yes (n = 2,219)	SD	Mean	SD	No (n = 10,124)	P	Yes (n = 2,204)	SD	Mean	SD	P
<b>Welfare participation before 18</b>											
<b>Parental Level</b>											
Education	4.68	2.31	5.69	2.33	***	4.69	2.31	4.66	2.36		
<b>Employment status</b>											
Unemployed & not looking for a job	0.28	0.45	0.19	0.39	***	0.28	0.45	0.28	0.45		
Unemployed & looking for a job	0.11	0.32	0.05	0.21	***	0.11	0.32	0.10	0.30		
Employed part time	0.14	0.34	0.15	0.36		0.14	0.34	0.14	0.34		
Employed full time	0.47	0.50	0.61	0.49	***	0.47	0.50	0.49	0.50		
<b>Health Status</b>											
Good	0.75	0.43	0.88	0.32	***	0.75	0.43	0.75	0.43		
Fair	0.18	0.39	0.10	0.30	***	0.18	0.39	0.18	0.39		
Poor	0.07	0.25	0.02	0.15	***	0.07	0.25	0.06	0.24		
<b>Parental alcohol use</b>											
Never	0.49	0.50	0.44	0.50	***	0.49	0.50	0.50	0.50		
Sometimes	0.48	0.50	0.52	0.50	**	0.48	0.50	0.47	0.50		
>3 days per week	0.03	0.17	0.04	0.21	**	0.03	0.17	0.03	0.16		
<b>Household Level</b>											
Hardship pay for bills	0.68	0.47	0.85	0.36	***	0.68	0.46	0.68	0.46		
<b>Family Structure</b>											
Others	0.10	0.30	0.06	0.25	***	0.10	0.30	0.11	0.31		
Single parent	0.51	0.50	0.24	0.43	***	0.50	0.50	0.50	0.50		
Two parents one biological	0.13	0.34	0.10	0.31	***	0.14	0.34	0.14	0.35		
Two biological parents	0.25	0.44	0.59	0.49	***	0.26	0.44	0.25	0.43		
Household size	3.80	1.94	3.54	1.47	***	3.77	1.90	3.78	1.82		
<b>Young Adults Level</b>											
Female	0.57	0.50	0.53	0.50	**	0.57	0.50	0.56	0.50		

Independent Variables	(a) Before Matching (n = 12,343)				(b) After Full Matching (n = 11,791)			
	Mean	SD	Yes (n = 2,219)	No (n = 10,124)	Mean	SD	Yes (n = 2,204)	No (n = 9,587)
<i>Welfare participation before 18</i>								
Age	16.03	1.70	15.99	1.68	16.04	1.70	16.07	1.69
Had class on drinking	0.95	0.23	0.95	0.22	0.95	0.23	0.94	0.23
Self-perceived Intelligent	3.74	1.07	3.93	1.08	3.74	1.07	3.74	1.09
<b>Race</b>								
Hispanic	0.18	0.38	0.15	0.35	0.18	0.38	0.18	0.39
Black	0.31	0.46	0.19	0.39	0.31	0.46	0.31	0.46
American Indian and others	0.03	0.16	0.06	0.23	0.03	0.16	0.03	0.16
Asian	0.04	0.19	0.03	0.16	0.04	0.19	0.04	0.19
White	0.45	0.50	0.58	0.49	0.45	0.50	0.45	0.50
<b>Income level</b>								
Low	0.27	0.44	0.18	0.38	0.27	0.44	0.26	0.44
Moderate	0.70	0.46	0.77	0.42	0.70	0.46	0.70	0.46
High	0.04	0.19	0.05	0.21	0.04	0.18	0.03	0.18
<b>Educational level</b>								
High school and less	0.36	0.48	0.21	0.41	0.35	0.48	0.35	0.48
Some colleges	0.48	0.50	0.43	0.50	0.48	0.50	0.49	0.50
College graduate	0.10	0.30	0.22	0.41	0.10	0.30	0.09	0.29
Some graduate school and above	0.06	0.24	0.14	0.34	0.06	0.24	0.06	0.24
Married/cohabitating	0.64	0.48	0.63	0.48	0.64	0.48	0.64	0.48

Notes: Chi-square (for categorical variables) and t tests (for continuous variables) were used to test significant group differences.

\*\*\* p<0.001,

\*\* p<0.01,

\* p<0.05. p value with blank means variable has no statistically significant difference between the two groups.



**Table 4**

**Weighted Results of Effects on Welfare Participation on Alcohol Use**

Independent Variables	# of days drinking in past 12 months	# of drinks each time in past 12 months	# of days drink > 5 drinks in past 12 months	# of days been drunk in past 12 months	# of days drinking in past 30 days	# of drinks each time in past 30 days
Welfare participation before 18	-0.037 [-0.153 - 0.079]	-0.033 [-0.277 - 0.212]	-0.072 [-0.177 - 0.034]	-0.019 [-0.107 - 0.070]	-0.039 [-0.167 - 0.089]	-0.024 [-0.222 - 0.175]
<b>Parental Level</b>						
Education	0.050 *** [0.024 - 0.076]	-0.008 [-0.067 - 0.051]	0.020 [-0.005 - 0.045]	0.029* [0.006 - 0.052]	0.049 *** [0.022 - 0.076]	0.048 [-0.004 - 0.100]
<i>Employment status (ref. = unemployed &amp; not looking for a job)</i>						
Unemployed & looking for a job	0.091 [-0.151 - 0.334]	0.647* [0.121 - 1.172]	0.204 [-0.013 - 0.422]	0.265** [0.073 - 0.457]	0.079 [-0.181 - 0.339]	0.502* [0.029 - 0.974]
Employed part time	0.129 [-0.082 - 0.339]	0.164 [-0.174 - 0.502]	0.160 [-0.013 - 0.333]	0.174* [0.027 - 0.322]	0.126 [-0.079 - 0.331]	0.374* [0.035 - 0.712]
Employed full time	0.128 [-0.038 - 0.294]	0.216 [-0.091 - 0.524]	0.096 [-0.032 - 0.224]	0.116* [0.004 - 0.228]	0.144 [-0.024 - 0.312]	0.302* [0.029 - 0.575]
<i>Health Status (ref. = fair)</i>						
Good	0.168 [-0.016 - 0.352]	0.137 [-0.193 - 0.466]	0.091 [-0.051 - 0.234]	0.067 [-0.049 - 0.184]	0.175* [0.007 - 0.342]	0.222 [-0.054 - 0.498]
Poor	0.143 [-0.196 - 0.483]	0.169 [-0.446 - 0.785]	0.255 [-0.193 - 0.703]	0.144 [-0.089 - 0.377]	0.264 [-0.150 - 0.679]	0.315 [-0.181 - 0.811]
<i>Parental alcohol use (ref. = never use)</i>						
Sometimes	0.320 *** [0.186 - 0.454]	0.351** [0.106 - 0.596]	0.285 *** [0.175 - 0.394]	0.186 *** [0.099 - 0.274]	0.287 *** [0.145 - 0.430]	0.259* [0.025 - 0.492]
>3 days per week	0.582 *** [0.185 - 0.978]	0.605 [-0.070 - 1.281]	0.476** [0.171 - 0.782]	0.485 *** [0.211 - 0.758]	0.545 *** [0.148 - 0.942]	0.726* [0.055 - 1.397]
<b>Household Level</b>						
Hardship pay for bills	-0.011 [-0.162 - 0.140]	0.112 [-0.175 - 0.398]	0.048 [-0.075 - 0.171]	0.063 [-0.048 - 0.173]	-0.042 [-0.183 - 0.099]	0.017 [-0.262 - 0.297]
<i>Family Structure (ref. = two biological parents)</i>						
Others	0.152 [-0.143 - 0.446]	0.368 [-0.046 - 0.782]	0.091 [-0.143 - 0.324]	0.050 [-0.084 - 0.183]	0.148 [-0.142 - 0.438]	0.417 [-0.057 - 0.891]
Single parent	0.085 [-0.069 - 0.239]	0.198 [-0.088 - 0.485]	-0.005 [-0.133 - 0.124]	0.081 [-0.034 - 0.197]	0.048 [-0.098 - 0.195]	0.191 [-0.064 - 0.446]
Two parents one biological	0.023 [-0.190 - 0.237]	0.012 [-0.367 - 0.390]	-0.011 [-0.176 - 0.153]	0.041 [-0.106 - 0.189]	0.112 [-0.098 - 0.322]	0.253 [-0.100 - 0.606]
Household size	-0.041* [-0.081 - 0.000]	-0.021 [-0.086 - 0.044]	-0.034* [-0.064 - 0.003]	-0.024 [-0.052 - 0.004]	-0.042* [-0.076 - 0.007]	-0.044 [-0.106 - 0.019]
<b>Young Adults Level</b>						

Independent Variables	# of days drinking in past 12 months	# of drinks each time in past 12 months	# of days drink > 5 drinks in past 12 months	# of days been drunk in past 12 months	# of days drinking in past 30 days	# of drinks each time in past 30 days
Female	-0.661 <sup>***</sup> [-0.792 – 0.529]	-1.039 <sup>***</sup> [-1.330 – 0.748]	-0.454 <sup>***</sup> [-0.575 – 0.333]	-0.450 <sup>***</sup> [-0.550 – 0.349]	-0.745 <sup>***</sup> [-0.867 – 0.622]	-1.047 <sup>***</sup> [-1.283 – 0.810]
Age	-0.055 <sup>**</sup> [-0.091 – 0.019]	-0.108 <sup>***</sup> [-0.170 – 0.047]	-0.037 <sup>*</sup> [-0.065 – 0.009]	-0.054 <sup>***</sup> [-0.079 – 0.029]	-0.038 <sup>*</sup> [-0.072 – 0.003]	-0.113 <sup>**</sup> [-0.180 – 0.045]
Had class on alcohol	0.132 [-0.103 – 0.367]	0.040 [-0.621 – 0.701]	-0.035 [-0.352 – 0.283]	-0.043 [-0.214 – 0.129]	-0.025 [-0.331 – 0.280]	0.203 [-0.198 – 0.605]
Self-perceived Intelligent	0.053 [-0.014 – 0.120]	0.058 [-0.048 – 0.165]	0.019 [-0.045 – 0.083]	0.008 [-0.044 – 0.059]	0.063 [-0.010 – 0.135]	0.051 [-0.048 – 0.150]
<b>Race (ref. = white)</b>						
Hispanic	-0.234 <sup>*</sup> [-0.464 – 0.004]	-0.494 <sup>*</sup> [-0.899 – 0.090]	-0.166 [-0.353 – 0.022]	-0.269 <sup>**</sup> [-0.443 – 0.095]	-0.119 [-0.312 – 0.074]	-0.277 [-0.613 – 0.059]
Black	-0.483 <sup>***</sup> [-0.653 – 0.314]	-1.271 <sup>***</sup> [-1.555 – 0.986]	-0.414 <sup>***</sup> [-0.562 – 0.267]	-0.405 <sup>***</sup> [-0.539 – 0.272]	-0.259 <sup>**</sup> [-0.429 – 0.089]	-0.968 <sup>***</sup> [-1.215 – 0.722]
American Indian and others	0.085 [-0.307 – 0.478]	-0.324 [-1.072 – 0.424]	0.048 [-0.269 – 0.364]	-0.146 [-0.352 – 0.061]	0.174 [-0.173 – 0.520]	0.265 [-0.494 – 1.024]
Asian	0.219 [-0.181 – 0.619]	0.406 [-0.405 – 1.217]	0.295 [-0.107 – 0.698]	0.068 [-0.215 – 0.352]	0.319 [-0.095 – 0.734]	0.621 [-0.281 – 1.523]
<b>Income level (ref. = low)</b>						
Moderate	0.440 <sup>***</sup> [0.290 – 0.590]	0.506 <sup>***</sup> [0.232 – 0.780]	0.221 <sup>**</sup> [0.082 – 0.361]	0.215 <sup>***</sup> [0.106 – 0.324]	0.283 <sup>***</sup> [0.140 – 0.427]	0.470 <sup>***</sup> [0.222 – 0.717]
High	-0.080 [-0.435 – 0.276]	-0.559 <sup>*</sup> [-1.083 – 0.035]	-0.176 [-0.452 – 0.101]	-0.182 <sup>*</sup> [-0.363 – 0.002]	-0.057 [-0.409 – 0.296]	-0.466 <sup>*</sup> [-0.901 – 0.032]
<b>Educational level (ref. = High school and less)</b>						
Some colleges	0.203 <sup>**</sup> [0.054 – 0.352]	-0.016 [-0.274 – 0.243]	-0.025 [-0.157 – 0.107]	0.011 [-0.106 – 0.127]	0.070 [-0.074 – 0.214]	-0.123 [-0.403 – 0.157]
College graduate	0.535 <sup>***</sup> [0.291 – 0.778]	-0.512 <sup>**</sup> [-0.820 – 0.204]	-0.082 [-0.307 – 0.143]	0.048 [-0.130 – 0.225]	0.458 <sup>***</sup> [0.216 – 0.700]	-0.606 <sup>***</sup> [-0.913 – 0.300]
Some graduate school and above	0.437 <sup>**</sup> [0.162 – 0.713]	-0.582 <sup>*</sup> [-1.028 – 0.136]	-0.250 <sup>**</sup> [-0.437 – 0.063]	-0.078 [-0.242 – 0.087]	0.252 <sup>*</sup> [0.042 – 0.462]	-0.599 <sup>***</sup> [-0.947 – 0.252]
Married/cohabitating	-0.138 [-0.292 – 0.015]	-0.121 [-0.404 – 0.163]	-0.211 <sup>***</sup> [-0.334 – 0.089]	-0.271 <sup>***</sup> [-0.380 – 0.161]	-0.153 <sup>*</sup> [-0.300 – 0.006]	-0.187 [-0.414 – 0.041]
Constant	2.189 <sup>***</sup> [1.434 – 2.944]	4.394 <sup>***</sup> [2.915 – 5.873]	1.693 <sup>***</sup> [1.035 – 2.351]	1.787 <sup>***</sup> [1.221 – 2.353]	1.676 <sup>***</sup> [0.921 – 2.430]	3.510 <sup>***</sup> [2.250 – 4.770]
Observations	11,073	10,993	11,048	11,057	11,064	10,910
R-squared	0.128	0.085	0.081	0.106	0.111	0.094

Notes: OLS regression results based on propensity score radius matching within .01 caliper are reported. 95% confident intervals were in brackets

\*\*\* p<.001,

50.0>d  
\*  
'10<0.01  
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**Table 5**

**Weighted Results of Effects on Welfare Participation on Drug-Free**

<b>Independent Variables</b>	<b>(a) Steroids-free OR [95%CI]</b>	<b>(b) Marijuana-free OR [95%CI]</b>	<b>(c) Cocaine-free OR [95%CI]</b>	<b>(d) Crystal Meth-free OR [95%CI]</b>	<b>(e) Other Drugs-free OR [95%CI]</b>
Welfare participation before 18	1.073 [0.658 – 1.748]	0.702 *** [0.603 – 0.817]	0.828 [0.684 – 1.001]	0.996 [0.748 – 1.326]	0.844 * [0.720 – 0.989]
<b>Parental Level</b>					
Education	1.028 [0.930 – 1.137]	0.901 *** [0.865 – 0.939]	0.950 [0.901 – 1.002]	0.917 * [0.851 – 0.988]	0.915 *** [0.866 – 0.967]
<b>Employment status(ref. = unemployed &amp; not looking for a job )</b>					
Unemployed & looking for a job	0.687 [0.179 – 2.636]	0.799 [0.599 – 1.066]	0.589 * [0.394 – 0.879]	0.817 [0.468 – 1.427]	0.714 [0.470 – 1.085]
Employed part time	0.477 [0.207 – 1.099]	0.781 [0.604 – 1.008]	0.723 * [0.528 – 0.992]	0.753 [0.488 – 1.164]	0.606 ** [0.436 – 0.843]
Employed full time	0.841 [0.386 – 1.833]	0.731 ** [0.596 – 0.898]	0.628 *** [0.493 – 0.801]	0.650 * [0.468 – 0.904]	0.518 *** [0.389 – 0.692]
<b>Health Status (ref. = fair)</b>					
Good	0.888 [0.385 – 2.049]	0.667 *** [0.550 – 0.809]	0.781 [0.581 – 1.048]	0.963 [0.656 – 1.415]	0.794 [0.606 – 1.041]
Poor	0.615 [0.158 – 2.403]	0.988 [0.647 – 1.507]	0.722 [0.429 – 1.214]	0.957 [0.523 – 1.751]	0.610 [0.354 – 1.051]
<b>Household Level</b>					
Hardship pay for bills	0.728 [0.398 – 1.330]	1.041 [0.878 – 1.234]	0.942 [0.789 – 1.126]	0.840 [0.595 – 1.186]	0.858 [0.693 – 1.061]
<b>Family Structure (ref. = two biological parents)</b>					
Others	0.509 [0.179 – 1.447]	0.761 [0.570 – 1.015]	0.473 *** [0.318 – 0.702]	0.501 ** [0.307 – 0.818]	0.697 [0.450 – 1.079]
Single parent	1.176 [0.653 – 2.116]	0.812 * [0.675 – 0.977]	0.628 *** [0.502 – 0.785]	0.601 ** [0.434 – 0.832]	0.745 * [0.564 – 0.985]
Two parents one biological	0.485 * [0.256 – 0.921]	0.922 [0.734 – 1.160]	0.648 ** [0.491 – 0.855]	0.538 *** [0.384 – 0.755]	0.684 ** [0.524 – 0.894]
Household size	1.020 [0.883 – 1.176]	1.025 [0.979 – 1.073]	1.050 [0.994 – 1.109]	1.007 [0.934 – 1.086]	1.015 [0.937 – 1.099]
<b>Community drug problems (ref. = not a problem)</b>					
Small problem	0.900 [0.535 – 1.513]	0.786 ** [0.672 – 0.919]	0.828 [0.667 – 1.029]	0.909 [0.708 – 1.166]	0.802 * [0.651 – 0.988]
Big problem	0.936 [0.376 – 2.330]	1.051 [0.823 – 1.342]	0.933 [0.708 – 1.230]	0.991 [0.661 – 1.486]	1.148 [0.812 – 1.621]
<b>Young Adults Level</b>					
Female	5.810 *** [3.294 – 10.247]	1.513 *** [1.314 – 1.742]	1.905 *** [1.578 – 2.301]	1.438 ** [1.105 – 1.872]	1.903 *** [1.534 – 2.360]
Age	0.999 [0.878 – 1.137]	1.149 *** [1.090 – 1.210]	1.127 *** [1.061 – 1.196]	1.062 [0.985 – 1.145]	1.105 *** [1.042 – 1.171]
Had class on drug	0.253 [0.050 – 1.283]	0.714 [0.485 – 1.052]	1.010 [0.545 – 1.872]	1.265 [0.684 – 2.339]	0.986 [0.477 – 2.040]
Self-perceived Intelligent	0.968 [0.747 – 1.255]	0.980 [0.895 – 1.073]	1.024 [0.920 – 1.141]	1.119 [0.973 – 1.286]	0.970 [0.872 – 1.079]

Independent Variables	(a) Steroids-free OR [95%CI]	(b) Marijuana-free OR [95%CI]	(c) Cocaine-free OR [95%CI]	(d) Crystal Meth-free OR [95%CI]	(e) Other Drugs-free OR [95%CI]
<b>Race (ref. = white)</b>					
Hispanic	1.547 [0.823 – 2.910]	1.466 ** [1.130 – 1.901]	1.141 [0.821 – 1.585]	1.201 [0.699 – 2.064]	1.466 * [1.036 – 2.073]
Black	3.233 *** [1.701 – 6.144]	2.082 *** [1.598 – 2.712]	6.238 *** [4.309 – 9.031]	8.945 *** [4.994 – 16.021]	5.667 *** [3.362 – 9.554]
American Indian and others	19.651 ** [2.784 – 138.696]	1.332 [0.854 – 2.079]	0.925 [0.476 – 1.796]	0.477 * [0.262 – 0.869]	1.068 [0.426 – 2.676]
Asian	0.892 [0.297 – 2.679]	1.175 [0.690 – 2.002]	1.035 [0.596 – 1.795]	1.166 [0.696 – 1.954]	1.415 [0.835 – 2.397]
<b>Income level (ref. = low)</b>					
Moderate	0.580 [0.270 – 1.244]	0.899 [0.733 – 1.104]	1.006 [0.793 – 1.276]	0.926 [0.678 – 1.266]	1.112 [0.824 – 1.499]
High	0.791 [0.281 – 2.227]	1.490 [0.984 – 2.255]	1.159 [0.613 – 2.191]	1.141 [0.504 – 2.581]	1.848 * [1.063 – 3.213]
<b>Educational level (ref. = High school and less )</b>					
Some colleges	0.624 [0.352 – 1.106]	0.968 [0.805 – 1.164]	1.138 [0.929 – 1.395]	1.878 *** [1.470 – 2.400]	1.009 [0.826 – 1.233]
College graduate	1.915 [0.750 – 4.888]	1.256 [0.958 – 1.647]	2.087 *** [1.361 – 3.203]	6.193 *** [3.467 – 11.062]	1.193 [0.843 – 1.690]
Some graduate school and above	1.117 [0.363 – 3.434]	1.402 * [1.036 – 1.896]	3.018 *** [1.872 – 4.866]	14.252 *** [7.870 – 25.807]	1.819 ** [1.186 – 2.791]
Married/cohabitating	1.203 [0.749 – 1.933]	1.065 [0.903 – 1.256]	1.233 [0.983 – 1.547]	1.222 [0.969 – 1.541]	1.413 ** [1.115 – 1.791]
Constant	226.580 ** [7.968 – 6,443.093]	0.289 * [0.106 – 0.784]	0.650 [0.188 – 2.253]	2.183 [0.529 – 9.013]	1.323 [0.247 – 7.086]
Observations	9,665	9,659	9,670	9,675	9,668

Notes: Logistic regression results based on propensity score radius matching within .01 caliper are reported. 95% confident intervals were in brackets

\*\*\* p<0.001,

\*\* p<0.01,

\* p<0.05