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The Effect of Race/Ethnicity on the Relation between Substance Use Disorder Diagnosis and Substance Use Treatment Receipt among Male Serious Adolescent Offenders

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Abstract

The high rates of substance disorders in the juvenile justice system, as well as the relation between substance use and reoffending, suggest the importance of substance use treatment service and understanding the factors that influence treatment provision. The current study tested whether race/ethnicity affects the relation between substance use disorder diagnosis and the receipt of substance use treatment services among a sample of male serious juvenile offenders (N=638). Findings showed that among adolescents with a substance use disorder diagnosis, there were no race/ethnicity differences in substance use treatment receipt. However, among adolescents without a substance use disorder diagnosis, non-Hispanic Caucasians were more likely to receive substance use treatment than were Hispanics or African-Americans. Additionally, findings showed that there were race/ethnicity differences in service receipt at moderate levels of substance use problems, such that non-Hispanic Caucasians were more likely to receive substance use treatment than Hispanics or African-Americans. There were no race/ethnicity differences in treatment receipt when substance use problems were either very severe or very low. Results suggest that race/ethnicity may play a role in service provision in the juvenile justice system when levels of need are less clear.

Keywords

substance use; juvenile offending; services; race/ethnicity

1. Introduction

The juvenile justice system's mission includes protecting the youth in its custody, protecting the community, and engaging in interventions that reduce crime (Butts & Mears, 2001).

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Although increased adolescent offending in the 1960's and 1970's caused a shift in the juvenile justice systems' practices from rehabilitation based services to retributive based consequences, more recently there has been a call for increasing rehabilitative efforts for juvenile offenders (Behnken, Arredondo, & Packman, 2009; Scott & Steinberg, 2008; Steinberg, 2008). This trend back to the original juvenile justice system's mission, at least in theory, should offer adolescents in the juvenile justice system opportunities for rehabilitation over only incarceration. However, gaps between theory and practice still exist (Steinberg, 2008).

Increased rehabilitative efforts are especially important for adolescent offenders who have problems associated with substance use. Substance use and substance use disorders are common among youth in the juvenile justice system and are associated with continued offending (Farabee, Shen, Hser, Grella, & Anglin, 2001; Mason & Windle, 2002; Mulvey, Schubert, & Chassin, 2010; Schubert, Mulvey, & Glasheen, 2011). This relation between substance use and offending may occur for many reasons. First, criminal behavior is inherent for adolescents when buying, possessing, and using drugs or alcohol. Second, these behaviors often involve membership in an antisocial peer group, who may support criminal offending (Fergusson, Swain-Campbell, & Horwood, 2002). Third, the need to purchase illicit substances may require the adolescent to become involved with the drug distribution market where they may engage in, or be party to, systematic violence, and substance use may create a need for income that can be met through criminal behavior (Chassin, 2008; White, 1997). Fourth, intoxication effects from drug and alcohol use may increase delinquent behavior due to impaired judgment and decision-making (Kreek, Nielsen, Butelman, & LaForge, 2005). Fifth, substance use may interfere with normal development (e.g., through education problems and weakened social bonds, as well as through effects on the development of brain structures that regulate behavioral, emotional, and cognitive processes), resulting in a pattern of antisocial behavior (Ford, 2005; Hussong, Curran, Moffitt, Caspi, & Carrig, 2004). Finally, substance use may prevent an adolescent from "maturing out" of criminal behavior due to an inability to successfully transition into more mature, adult roles (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Chen & Kandel, 1995).

Research has shown that substance use disorder service interventions can reduce delinquency for youth with substance use disorders in the juvenile justice system (Grisso, 2008). Drug and alcohol treatment for juvenile offenders with substance use disorders has been associated with statistically significant reductions in the number of offenses committed by juveniles after completion of treatment (Behnken, Arredondo, & Packman, 2009; Cuellar, McReynolds, & Wasserman, 2006; Farabee et al., 2001; Townsend, Walker, Sargeant, Vostanis, Hawton, Stocker, & Sithole, 2009). Furthermore, substance use treatment has been shown to decrease alcohol and drug use (Chassin, Knight, Vargas-Chanes, Losoya, Naranjo, 2009; Henggeler, Halliday-Boykins, Cunningham, Randall, Shapiro, & Chapman, 2006).

However, involvement with the juvenile justice sector has been associated with a decreased likelihood of receiving specialty substance use disorder outpatient and inpatient services, despite the juvenile justice system being the most widely used publically funded mechanism for substance use treatment for adolescents (Chassin, 2008; Hazen, Hough, Landsverk, &

Wood, 2004). Furthermore, youth in the juvenile justice system tend to have a decreased likelihood of receiving substance use disorder services, relative to youth in other sectors of publically funded care (Hazen et al., 2004; Johnson, Cho, Fendrich, Graf, Kelly-Wilson, & Pickup, 2004; Walrath, Sharp, Zuber, & Leaf, 2001). Garland and colleagues (2005) note that referral rates from the juvenile justice system to formal substance use related services are much lower than expected, given the high level of substance use in this population.

Furthermore, juvenile offenders who are transferred to adult corrections are even less likely to receive substance use treatment. The availability of substance use treatment in the adult system is low (Friedmann, Taxman, & Henderson, 2007) and adult correctional facilities offer even fewer treatment and counseling services than do juvenile correctional facilities (Redding, 2003). Moreover, treatment programs meant for adults may not be efficacious for adolescent offenders.

In addition to undertreatment of adolescent substance use disorders in the general adolescent offender population, there may also be a particular failure to serve ethnic minority adolescent offenders. In other sectors of court ordered care (e.g., children involved in the foster care system) minority adolescents in need of substance use services have been shown to be referred to fewer services than are non-Hispanic Caucasian adolescents, even when exhibiting the same amount of need (Garland, Hough, Landsverk, & Brown, 2001). African-American and Hispanic adolescents in other sectors of court ordered care have been shown to be less likely to receive court ordered substance use treatment (Garland & Besinger, 1997; Garland et al., 2001; Leslie, Landsverk, Ezzet-Lofstrom, Tschann, Slymen, & Garland, 2000; Wells, Hillemeier, Bai, & Belue, 2009; Yeh, McCabe, Hurlburt, Hough, Hazen, Culver, Garland, & Landsverk, 2002). Indeed, it has been suggested that in many public sectors of care, a child's race/ethnicity may be a stronger predictor of involvement in substance use treatment services than is a substance use disorder diagnosis (Garland et al., 2001).

Racial/ethnic biases in referral for substance use disorder services may persist because of attitudes and beliefs of decision-makers in the juvenile justice system. Often there is an assumption that the delinquent behaviors observed in non-Hispanic Caucasian youth do not represent a long-term disposition, yet criminal behavior in minority adolescents is more likely attributed to innate characteristics or environments that are not amenable to treatment (Fitzgerald, 1996). If decision-makers in the juvenile justice system believe that minority youth are less amenable to services or are less likely to benefit from services than are non-Hispanic Caucasians, then it is likely that they will choose to recommend non-Hispanic Caucasians for substance use disorder services more often than African-American or Hispanic adolescents, despite the needs of the individual (Breda, 2001; Garland & Besinger, 1997; Slobogin, 1999).

The current study extends the work of Mulvey, Schubert, and Chung (2007) who predicted service receipt after court involvement within the juvenile justice system in the Pathways to Desistance Study (Mulvey, Steinberg, Fagan, Cauffman, Piquero, Chassin, et al., 2004). Mulvey et al. (2007) found that youth in the juvenile justice system received low levels of specialized services, although the amount of services varied depending on the type of

juvenile justice setting. In addition, although Mulvey et al. (2007) found that youth with higher cumulative risk received a greater number of services in most settings, service need remained an inconsistent determinant of service provision across settings.

The current study expands on the results of Mulvey and colleagues (2007) by testing whether the relation between substance use disorder diagnosis and the receipt of a substance use treatment service was moderated by race/ethnicity. We hypothesized that Hispanics and African-Americans with substance use disorders would be less likely to receive drug and alcohol treatment services compared to non-Hispanic Caucasians with substance use disorders. The current study is the first, to our knowledge, to test how race/ethnicity may moderate the relations between substance use disorder diagnosis and the receipt of the substance use treatment services in the juvenile justice system. Because substance use treatments have been shown to decrease adolescent criminal behavior, the findings have implications for reducing recurrent criminal behavior in adolescent offenders.

2. Methods

2.1. Participants

Participants were drawn from the Pathways to Desistance Study, a two-site (Philadelphia, PA & Maricopa County, AZ), longitudinal study of desistance among serious juvenile offenders (Mulvey et al., 2004). The study began in 2000, with follow-ups occurring every 6 months for 36 months and then annually until 84-months. A total of 1354 adolescents between the ages of 14- and 17-years-old participated in the study. Adolescents were selected for potential enrollment after a review of court files in Philadelphia and Maricopa County. They were included as potential participants if they were found to be adjudicated delinquent or found guilty of a serious criminal offense. Crimes eligible for the study included all felony offenses (except those of less serious property crimes), misdemeanor weapons offenses, and misdemeanor sexual assault. In order to maintain heterogeneity in the sample, the proportion of male juveniles with drug offenses was capped at 15% at each site. Additional details regarding recruitment and a description of the full sample and study methodology can be found in Schubert et al. (2004).

Participants for the current analyses were a subset of the full Pathways to Desistance Study sample. The current subsample ($N=638$) was comprised of males who (1) had complete data on self-reported service receipt at both the 6- and 12-month time-point interviews, (2) had complete data on self-reported substance use disorders at baseline, and (3) identified themselves as non-Hispanic Caucasian, African-American, or Hispanic at baseline. Participants who did not meet these criteria were excluded from the analyses. Female participants were not included in the current analyses. The current analyses focused on services received within one year from the study's beginning because this offered a reasonable time frame to expect receipt of substance use treatment services based on a baseline diagnosis of substance use disorder in the past year, while also minimizing the likelihood that a participant would have received multiple services in multiple settings.

A series of analyses were conducted to determine whether there were any significant differences between male participants included in the final subsample and male participants

who were excluded. Females were not included in the in these analyses. The included sample had a significantly larger proportion of Hispanics and had significantly higher rates of prior criminal behavior than the excluded sample, but did not differ significantly from the excluded sample on any other study variables.

2.2 Procedures

Informed assent/consent was obtained from the juveniles and their parents/guardians at the baseline interview. Youth in the juvenile justice system completed their baseline interview within 75 days of their adjudication hearing. The current study used data from the baseline interview and the 6- and 12-month follow-up interviews.

Trained interviewers read each item in the interviews aloud and respondents generally responded aloud. In situations or sections of the interview where privacy was a concern, a portable keypad was provided as an option to obtain a non-verbal response. Participants were paid between \$50 and \$150 for their participation over the data collection waves (when allowed by facility rules).

2.3 Measures

Descriptive statistics for the variables in the current subsample are presented in Table 1.

2.3.1 Adolescent demographics—Adolescents self-reported their age at baseline ($M=16.6$). Adolescent age was used as a covariate because older adolescents may be viewed as less amenable to treatment by the juvenile justice system than are younger adolescents (Fitzgerald, 1996). Adolescents also self-reported their ethnicity through the following: (1) “Do you consider yourself to be Latino or Hispanic?” (Yes or No) and (2) a choice between White, African-American/Black, Asian, Native American, or some other race. For the current study, only non-Hispanic Caucasians, Hispanics, and African-Americans were included. For this subsample, 20.7% of participants identified as non-Hispanic Caucasian, 41.1% of participants identified as Hispanic, and 38.2% identified as African-American. Two dummy coded variables were created in order to compare the three groups.

2.3.2 Adolescent substance use disorder—At baseline, adolescent alcohol abuse, alcohol dependence, drug abuse, and drug dependence were measured by the Composite International Diagnostic Interview (CIDI; World Health Organization, 1990). The CIDI is a comprehensive, fully standardized diagnostic interview that assessed mental disorders according the Diagnostic and Statistical Manual, Fourth Ed. (4th ed., DSM-IV; American Psychiatric Association, 1994).¹ The CIDI has been deemed both reliable and valid (Wittchen, 1994), and has high interrater agreement ($\kappa=0.86$; Reed, Gander, Pfister, Steiger, Sonntag, et al., 1998).

For the purpose of this study, substance use disorder was dichotomized as either “yes, suffered from any disorder in the past year” (score = 1; 36.1%) or “no, did not suffer from

¹At baseline, two slightly different versions of the CIDI were used due to changes implemented by the CIDI authors at Harvard. For this reason, 58 participants in the subsample were administered an older version of the CIDI at baseline. However, the slight differences in the versions of the CIDI produced no significant differences on the substance use disorder diagnosis variables

any disorder in the past year” (score = 0; 63.9%). The rate of substance use disorders in this subsample was higher than rates in the general adolescent population (which range from about 6.4–11.4%, see, e.g., Merikangas, He, Burstein, Swanson, Avenevoli, Cui, et al., 2010), but lower than those found in some other juvenile offender samples, where as many as 50.7% of males suffered from a substance use disorder (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). This may be explained by differences in measurement tools, diagnostic criteria, and study settings (Teplin et al., 2002; Washburn, Teplin, Voss, Simon, Abram, & McClelland, 2008). Race/ethnicity differences in rates of substance use disorder in the current study were similar to those found by Teplin and colleagues, with African-Americans being diagnosed the least and non-Hispanic Caucasians being diagnosed the most (Teplin et al., 2002).

2.3.3. Substance use problems—At baseline, adolescents also reported on 27 social consequences or dependence symptoms from alcohol and drug use over the past 6-months using a modified version of a questionnaire used in the Missouri Health and Behavior Study (Sher, 1987). Social consequences attributable to drugs or alcohol were assessed with questions such as, “Have you ever had problems or arguments with family or friends because of your alcohol or drug use?” Dependence symptoms attributable to drugs or alcohol use were assessed with questions such as, “Have you ever wanted a drink or drugs so badly that you could not think about anything else?” A substance use problems variable was created by summing the number of social consequences and dependence symptoms from drugs and alcohol endorsed by the participant ($M(SD)=3.08(4.97)$ for entire sample; $M(SD)=6.46(5.47)$ for adolescents who endorsed one or more substance use problems).

2.3.4. Drug/alcohol treatment services—At the 6- and 12-month follow-ups, adolescents self-reported services that they received using a modified version of the Child and Adolescent Services Assessment (CASA; Burns, Angold, & Costello, 1992). The CASA was developed to assess the receipt of mental health and substance use disorder services by children and adolescents ages 8 years to 18 years. The CASA has been deemed both reliable and valid. Test-retest reliability varies with the intensity or intrusiveness of the service, with the most intensive services (e.g., inpatient, out-of-home, juvenile justice detention centers) reporting very high reliability (Cohen’s Kappa = 0.91, 0.92, and 0.84 over 3 months, respectively; Ascher, Farmer, Burns, & Angold, 1996). In addition, in the Pathways to Desistance Project there was a high agreement between official records at the Philadelphia site and CASA responses (Mulvey, Schubert, & Chung, 2007).

The adolescent responded “yes” or “no” to receiving a treatment service specifically for drug and alcohol problems within the time period assessed. If the participant responded that they received a substance use disorder service in the past year they were assigned a value of “1”. If the participant did not receive a substance use disorder service in the past year they were assigned a value of “0”. Service types that constituted service receipt were those that could be considered to be “professional” services, which included (1) sessions with a psychologist, counselor, or social worker, (2) mental health treatment group for drug and alcohol problems, (3) partial hospitalization or day treatment program, (4) in home counseling, (5) sessions with a counselor or special teacher at school, and (6) special school

program outside of class. Participants only endorsing the following services were not included as having received a substance use treatment service: (1) visit to emergency room, (2) sessions with a priest, minister, clergy or healer, and (3) community support groups or self-help groups. Using this classification system 38.6% of participants received a substance use disorder service in the year after the baseline interview.

2.3.5. Prior criminal behavior—Prior criminal behavior was chosen as a covariate because it may affect referral to treatment services. Decision-makers in the juvenile justice system may use indicators of prior criminal behavior to determine amenability to substance use treatment, thus influencing court-ordered treatment (Fitzgerald, 1996).

Prior criminal behavior was a composite created from self-reported age of 1st arrest, number of prior court petitions, self-reported aggressive offending and self-reported income-related offending. This composite is a part of a group of seven risk/need domains (see, Mulvey, Schubert, & Chung, 2007) that have been widely supported as factors linked to future offending. Using this composite rather than multiple risk factors reduces multicollinearity problems (Mulvey, Steinberg, Piquero, Besana, Fagan, Schubert, & Cauffman, 2010). The number of prior court petitions in the past year at baseline (range: 0-4) was gathered from court records. Both aggressive offending and income-related offending were taken from self-reports at baseline. Eleven offending behaviors asked of participants were considered “aggressive” offenses and ten offending behaviors were considered “income:” offenses. Scores for aggressive and income-related offending were calculated as a proportion of items endorsed, and thus scores ranged from 0 to 1 with higher scores indicating a greater variety of offenses (Sample aggressive-offending items: “Shot someone (where bullet hit the victim)?”; “Purposely set fire to a house, building, car or vacant lot?” Sample income-offending items: “Used checks or credit cards illegally?”; “Stolen something from a store (shoplifted)?”; Huizinga, Esbensen, & Weiher, 1991).

The composite prior criminal behavior was comprised of the mean of the standardized scores on the four measured variables (with age of first arrest multiplied by - 1 so that younger age reflected higher criminal behavior scores). A confirmatory factor analysis (CFA) on the full sample (n=1,354) showed significant indicator loadings and good model fit (CFI=0.99 and RMSEA=0.04).

2.4. Data Analytic Plan

Logistic regression was used to estimate the main and interaction effects of the study variables on receiving a substance use disorder service. Covariates (age and prior criminal behavior), predictors (substance use disorder diagnosis and the two race/ethnicity variables), and the interaction variables representing the two-way interaction between race/ethnicity and substance use disorder diagnosis were entered in the logistic regression model to predict receipt of substance use treatment as a dichotomous outcome variable. Statistical significance of each predictor and interaction were assessed using the Wald chi-square statistic.

3. Results

3.1. Main Effects

Results from the logistic regression analysis are shown in Table 2. Results showed that age was a significant predictor of receiving substance use disorder services, such that older participants were less likely than were younger participants to receive substance use treatment services. Prior criminal behavior was marginally significant in predicting service receipt such that participants with higher levels of prior criminal behavior were somewhat less likely to receive treatment services. In addition, substance use disorder diagnosis was a marginally significant predictor of service involvement, such that those with a diagnosed substance use disorder were somewhat more likely to receive substance use treatment compared to non-diagnosed adolescents.

3.2. Interaction Effects

A Wald chi-square test showed a marginally significant interaction of substance use disorder diagnosis and race/ethnicity for the comparison of Hispanics vs. Non-Hispanic Caucasians. There was no significant interaction between substance use disorder diagnosis and race/ethnicity in predicting service receipt when comparing African-Americans to non-Hispanic Caucasians.

In order to probe the marginally significant interaction, chi-square comparisons of rates for service receipt by race/ethnicity were assessed (see Table 3). Results showed that for participants who were diagnosed with a substance use disorder, there were no significant race/ethnicity differences in the receipt of substance use treatment services. Instead, significant race/ethnicity differences in substance use treatment receipt were found for adolescents who were *not* diagnosed with a substance use disorder, such that non-Hispanic Caucasians without a substance use disorder received treatment more often than did their Hispanic and African-American counterparts.

3.3. Post-hoc analyses using substance use problems

The unexpectedly large numbers of adolescents without a diagnosed substance use disorder who also received substance use treatment services raised questions about whether substance use treatment services were being provided to adolescents who displayed subclinical substance use problems. Therefore, we tested the relation between the number of reported substance use problems and treatment receipt and tested whether this relation varied by race/ethnicity. In order to test these relations, the logistic regression described above was re-estimated substituting substance use problems for substance use disorder diagnosis (see Table 4).

Results of the logistic regression analysis showed that substance use problems did not predict substance use treatment services. In addition, there were no significant interactions between substance use problems and race/ethnicity in predicting the receipt of substance use treatment services. In order to understand why substance use problems eliminated the significant interaction effect from the original analysis, the logistic regression was further probed using the Johnson-Neyman technique (Hayes & Matthes, 2009). This technique

identified regions where the interaction effect of substance use problems and race/ethnicity was statistically significant and not significant in predicting substance use disorder service receipt (Hayes & Matthes, 2009). These analyses used the SPSS macro MODPROBE (Hayes & Matthes, 2009). However, this technique did not allow for testing the interactions between the race/ethnicity dummy coded variables and substance use problems all at once. Therefore to probe the regions of significance, two separate models were estimated, one comparing Hispanics and non-Hispanic Caucasians and another comparing African-Americans and non-Hispanic Caucasians.

Results from using the Johnson-Neyman technique when comparing Hispanics to non-Hispanic Caucasians (see Figure 1) showed that differences in service receipt due to race/ethnicity only occurred at low to moderate levels of reported substance use problems (from 1.20-5.84), but the relationship was not significant at high levels of substance use problems (≥ 6) or when no substance use problems or only 1 substance use problem were reported. When comparing African-Americans to non-Hispanic Caucasians (see Figure 2), there were also significant differences by race/ethnicity at low to moderate levels of reported substance use problems (from 1.91-3.99), but not at high levels of substance use problems (≥ 4) or when no substance use problems or 1 substance use problem were reported.

4. Discussion

The present study sought to explore the relation between substance use disorder diagnosis and the receipt of substance use disorder services in a sample of serious juvenile offenders. This study builds on previous research by Mulvey and colleagues (2007) who found that youth with higher cumulative risk received a greater number of substance use treatment services in most juvenile justice settings. The current study expanded on this literature by examining how this relationship differed by race/ethnicity. Specifically, we looked at whether the relation between substance use disorder diagnosis and the receipt of substance use treatment services differed for non-Hispanic Caucasians compared to Hispanics and for non-Hispanic Caucasians compared to African-Americans. We hypothesized that Hispanics and African-Americans diagnosed with a substance use disorder would receive fewer substance use treatment services compared to non-Hispanic Caucasians.

The first finding was that adolescents in the juvenile justice system diagnosed with a substance use disorder were undertreated. That is, only 42.2% of adolescents with a diagnosed substance use disorder received substance use treatment services in the year after the diagnostic interview. Such undertreatment of substance use disorders is concerning given the juvenile justice system's role as the major publically funded source of substance use treatment. However, substance use treatment provision was significantly higher in the juvenile justice system than in the general population of adolescents. For example, the Substance Abuse and Mental Health Services Administration (SAMHSA) reported that in 2013, only 18.6% of adolescents who met criteria for a substance use disorder received substance use treatment (SAMHSA, 2014). Thus, although a minority of adolescent offenders in need of substance use treatment actually received a substance use treatment service, these adolescents were still more likely to receive treatment inside the juvenile justice system than their peers outside of the juvenile justice system.

Second, this study found that older juveniles were less likely than younger juveniles to receive treatment services. This finding is consistent with previous literature that suggests juvenile courts are less likely to find older juveniles amenable to treatment. One reason for this finding may be that the court believes older offenders are likely not able to be rehabilitated before adulthood (Gee, 1983; Slobogin, 2013). Additionally, there was a marginally significant relation between prior criminal behavior and service receipt, such that higher scores on prior criminal behavior predicted less service involvement. This unexpected relation is likely due to the effects of partialling out correlated third variables because the zero-order relation between prior criminal behavior and service involvement was virtually zero ($r=-0.03$). Because this unexpected effect was only marginally significant and also not present in the zero-order correlations, it should not be interpreted.

Third, this study found that race/ethnicity was a moderating factor in the relation between substance use disorder diagnosis and substance use treatment service receipt. However, the nature of the moderation was unexpected. Among adolescents with a substance use disorder, there were no race/ethnicity differences in service receipt. Instead, the major driving factor in the interaction between substance use disorder and race/ethnicity were participants who were *not* diagnosed with a substance use disorder. Among non-diagnosed adolescents, non-Hispanic Caucasians were more likely than racial/ethnic minority adolescents to receive treatment. These results do not suggest undertreatment of racial/ethnic minorities, as hypothesized, but perhaps overtreatment of non-Hispanic Caucasians.

4.1. Substance Use Problems vs. Substance Use Disorder Diagnosis

Further analyses suggested that considering substance use problems, as opposed to substance use disorder diagnosis, may provide a clearer picture of why differences were observed in service receipt among the different racial/ethnic groups. When predicting substance use disorder service receipt from substance use problems, differences among racial/ethnic groups occurred only at low to moderate levels of substance use problems. That is, when substance use issues were clear (i.e., either when there were no substance use problems or only one problem, or when there were a high number of substance use problems), there was no difference in service receipt by race/ethnicity. This suggests that it is within the ambiguous margin of subclinical substance use disorders that race/ethnicity may play a role in the provision of substance use treatment services for juvenile offenders.

There are several characteristics of the juvenile justice system that may make it more likely for racial/ethnic biases to influence decision-making when substance use problems are ambiguous. First, the American Bar Association (ABA) Model Code of Judicial Conduct does not provide many guidelines for the Juvenile Court on appropriate adjudications and dispositions for adolescents in the system, in addition to acknowledging that judges in these types of courts often operate outside of their role as independent decisions-makers (American Bar Association, 2007; Bendetto Neitz, 2011). Second, judges in the juvenile justice system are able to decide dispositions and placements based on both legal and non-legal factors (Tomkins, Slain, Hallinan, & Willis, 1995). Although none of these factors may overtly take race into account, the subjectivity involved in decision-making creates the possibility for race/ethnicity to be taken into account covertly. Finally, judges in the juvenile

justice system are rarely required to articulate the basis for a decision and appellate courts seldom reverse juvenile court decisions, showing very little accountability and oversight (Bendetto Neitz, 2011; Tomkins et al., 1995).

4.2. The Effects of Treating Subclinical Substance Use Problems

There were high rates of substance use treatment provided to adolescents who did not meet clinical diagnostic criteria for a substance use disorder and baseline, and the effects of treating these cases of subclinical substance use disorders may be positive or negative. Treating subclinical substance use problems may prevent the progression of substance use problems to full-blown substance use disorders in these at-risk adolescents. Studies have also shown that subclinical levels of substance use disorder problems can lead to other problematic behaviors, such as criminal conduct and suicide (Esposito-Smythers & Spirito 2004). In addition, treatment of subclinical disorders has proven effective for other types of mental disorders, such as depression and anxiety (Fergusson, Horwood, Ridder, & Beautrais, 2005). Therefore, treatment of substance use problems in adolescents who fall short of being diagnosed with a substance use disorder may result in positive outcomes for the adolescent. Moreover, previous studies have suggested that diagnosing substance use disorders in adolescents may be more difficult than diagnosing these disorders in adults (Kaczynski & Martin, 1995). Kaczynski & Martin (1995) raised concerns about a high prevalence of adolescent “diagnostic orphans” who manifest one or two substance dependence symptoms and no substance abuse symptoms, and therefore do not qualify for either diagnosis (Kaczynski & Martin, 1995). In a study of young adults ages 14-21, diagnostic orphans were shown to be at higher risk for developing alcohol abuse or dependence disorders than young adults with no alcohol use disorder symptoms, making them a potentially important target group for treatment and intervention (Harford, Yi, & Grant, 2010). Finally, adolescents with subclinical levels of substance use problems may be more likely to benefit from treatment services than are clinically diagnosable adolescents.

On the other hand, there may be adverse consequences in treating adolescents who do not meet diagnostic criteria for a substance use disorder. Using resources to treat those who are not actually diagnosed with a disorder may further strain an already financially strapped system. In addition, treatment services might be most beneficial to adolescents with the highest severity and who may have the most to gain through recovery from a substance use disorder. Given the juvenile justice system’s goal of reducing offending, the institution may want to focus on the most at-risk adolescents to achieve the greatest likelihood of offenders not committing more crimes in the future. Finally, iatrogenic effects of substance use treatment have been known to occur (Dishion, McCord, & Poulin, 1999; Moos, 2005; Werch & Owen, 2002). Although iatrogenic effects may occur among both diagnosed and non-diagnosed adolescents, the risk may be less acceptable in the absence of a clearly diagnosable disorder. Given the possible advantages and disadvantages of treating adolescents with subclinical levels of substance use problems in the juvenile justice system, the effects of the current race/ethnicity differences in treatment provision are not entirely clear.

4.3. Limitations and Future Directions

It is important to note the limitations of the current study. First, the use of only two different study locations (Philadelphia, PA and Maricopa County, AZ), as well as the study's drug crime cap of 15%, create potential limitations on the generalizability of these findings. Second, this study relied heavily on self-report data. However, Mulvey and colleagues (2007) noted that adolescents had little motivation to be dishonest in their various self-reports and service receipt in Philadelphia was validated with official records (Mulvey, Schubert, & Chung, 2007). Third, due to the distribution of race/ethnicity by site (i.e., more African-Americans at the PA site and more Hispanic-Americans at the AZ site), site differences could not be tested. Third, drug or alcohol disorder diagnoses were only assessed at baseline. This allows the potential for diagnostic status to change by the six- or twelve-month follow up. However, some time lag between diagnosis and treatment receipt is necessary to examine the provision of services to adolescents who are in need of these services. Furthermore, we found that only 14.2% of participants who did not meet diagnostic criteria at baseline increased significantly (i.e., reported an increase of greater than one symptom) in their reports of these symptoms at the six- and twelve-month follow-up and accounted for only 12.6% of participants who received treatment. Finally, service setting may influence the disparate treatment of minorities in the juvenile justice system and a larger sample would be needed to test a more complex interaction among substance use disorder, race/ethnicity, and type of service setting.

Despite these limitations, the current study contributes to the literature on substance use treatment service provision in the juvenile justice system. The current findings suggest that the majority of adolescents with substance use disorders in the juvenile justice system failed to receive substance use treatment services and that more emphasis on assessing substance use treatment need and appropriate targeting of substance use treatment receipt is warranted. In addition, Hispanic and African-American adolescents not diagnosed with a substance use disorder were less likely to receive substance use treatment services than were their non-Hispanic Caucasian counterparts. These race/ethnicity differences occurred only when adolescents exhibit low or moderate levels of substance use problems and not when substance use problems were either absent or very low, or were clearly severe. These findings suggest the need for more research to understand the factors that drive treatment decisions, whether what appears as possible overtreatment is due to limitations of diagnostic measures and whether there are positive or negative effects of providing substance use treatment to adolescents who may not meet substance use disorder diagnostic criteria. In addition, future research could study the perceptions of decision-makers (e.g., judges, probation officers, etc.) who make treatment decisions regarding juvenile offenders. Further understanding of the factors that lead to a recommendation for substance use treatment services would shed more light on the potential causes for the racial/ethnic differences observed in this study and for the weak relation between substance use disorder diagnosis and treatment provision.

Appendix A. Social Consequences Items

In the past six months have you ever... (read below)... because of your drug or alcohol use?

1=Yes 0=No

1. Had complaints from your family?
2. Had complaints from your friends?
3. Been in trouble at school or work (e.g., missed because you were hung over)?
4. Missed school or work (e.g. missed because you were hung over)?
5. Been arrested (e.g. arrested when drunk/high or while using)?
6. Had problems or arguments with family or friends?
7. Did you ever continue to drink/use drugs when you knew you had a serious physical or emotional problem that might have been caused or made worse by drinking or using drugs?
8. Awakened after a night of partying and found that you could not remember part or all of the evening before?
9. Drank or used drugs in situations where you might get hurt?
10. Did you ever have an accident or injury because of your drinking or drug use?
11. Drinking or using drugs interfered with work or responsibility at school, at home, or on a job?
12. Had trouble with the police (but not arrested)?
13. Have you ever had sex to get money to buy drugs or had sex in exchange for drugs?
14. Have you ever sold drugs to get money to buy drugs?
15. Have you ever robbed or stolen something to get money to buy drugs?
16. Had a physical fight?
17. Destroyed any property?

Appendix B. Dependence Symptoms Items

In the past six months have you ever... (read below)... because of your drug or alcohol use?

1=Yes 0=No

1. Felt such a strong urge or desire to drink or use drugs that you could not stop yourself from doing it?
2. Have you ever wanted a drink or drugs so badly that you could not think about anything else?
3. People who cut down or stop drinking or using drugs steadily for some time may not feel well. These feelings are intense and can last longer than the usual hangover. Did you ever have times when you stopped, cut down, or went without drinking/using drugs and then experienced symptoms like fatigue, headaches, diarrhea, the shakes, or emotional problems?

4. Have you ever taken a drink or drugs to keep from having problems like these?
5. Given up or cut your usual activities or interests like sports, work, or seeing family or friends in order to drink or use drugs?
6. Was there ever a time when you started drinking/using drugs even though you promised yourself you wouldn't or when you drank/used drugs a lot more than you intended?
7. Was there ever a time when you drank/used drugs more frequently or for more days in a row that you intended?
8. Tried to cut down on alcohol/drugs but found that you couldn't?
9. Found that you needed larger amounts of alcohol/drugs to get an effect or that you could no longer get high on the same amount you used to?
10. Have you ever used alcohol or drugs enough so that you felt that you needed it or depended on it?

References

- American Bar Association. ABA Model Code of Judicial Conduct. American Bar Association; 2007.
- Ascher BH, Farmer EM, Burns BJ, Angold A. The Child and Adolescent Services Assessment (CASA) Description and Psychometrics. *Journal of Emotional and Behavioral Disorders*. 1996; 4:12–20.
- Bachman, JG.; Wadsworth, KN.; O'Malley, JM.; Johnston, LD.; Schulenberg, JE. Smoking, drinking, and substance use in young adulthood: the impact of new freedoms and new responsibilities. Lawrence Erlbaum Associates, Inc.; New Jersey: 1997.
- Behnken MP, Arredondo DE, Packman WL. Reduction in recidivism in a juvenile mental health court: A pre- and post-treatment outcome study. *Juvenile and Family Court Journal*. 2009; 60:23–44.
- Benedetto Neitz M. A unique bench, a common code: Evaluating judicial ethics in juvenile court. *Georgetown Journal of Legal Ethics*. 2011; 24:97–135.
- Breda CS. The mental health orientation of juvenile courts. *The Journal of Behavioral Health Services & Research*. 2001; 28:89–95. [PubMed: 11330002]
- Burns BJ, Angold A, Costello EJ. Measuring child, adolescent, and family service use. *New Directions for Program Evaluation*. 1992; 54:17–29.
- Butts JA, Mears DP. Reviving juvenile justice in a get-tough era. *Youth Society*. 2001; 33:169–198.
- Chassin L. Juvenile justice and substance use. *The Future of Children*. 2008; 18:165–183. [PubMed: 21338002]
- Chassin L, Knight G, Vargas-Chanes D, Losoya SH, Naranjo D. Substance use treatment outcomes in a sample of male serious juvenile offenders. *Journal of Substance Abuse Treatment*. 2009; 36:183–194. [PubMed: 18657942]
- Chen K, Kandel DB. The natural history of drug use from adolescence to the mid-thirties in a general population sample. *American Journal of Public Health*. 1995; 85:41–47. [PubMed: 7832260]
- Cuellar AE, McReynolds LS, Wasserman GA. A cure for crime: can mental health treatment diversion reduce crime among youth? *Journal of Policy Analysis and Management*. 2006; 25:197–214. [PubMed: 16465707]
- Dishion TJ, McCord J, Poulin F. When interventions harm: Peer groups and problem behavior. *American Psychologist*. 1999; 54:755–764. [PubMed: 10510665]
- Esposito-Smythers C, Spirito A. Adolescent substance use and suicidal behavior: A review with implications for treatment research. *Alcoholism: Clinical and Experimental Research*. 2004; 28:77S–88S.

- Farabee D, Shen H, Hser Y, Grella CE, Anglin MD. The effect of drug treatment on criminal behavior among adolescents in DATOS-A. *Journal of Adolescent Research*. 2001; 16:679–696.
- Fergusson DM, Horwood LJ, Ridder EM, Beaudrais AL. Subthreshold depression in adolescence and mental health outcomes in adulthood. *Archives of General Psychiatry*. 2005; 62:66–72. [PubMed: 15630074]
- Fergusson DM, Swain-Campbell NR, Horwood LJ. Deviant peer affiliations, crime and substance use: A fixed effects regression analysis. *Journal of Abnormal Child Psychology*. 2002; 30:419–430. [PubMed: 12108769]
- Fitzgerald WA. Stories of child outlaws: On child heroism and adult power in juvenile justice. *Wisconsin Law Review*. 1996; 1996:495–538.
- Friedmann PD, Taxman FS, Henderson CE. Evidence-based treatment practices for drug-involved adults in the criminal justice system. *Journal of Substance Abuse Treatment*. 2007; 32:267–277. [PubMed: 17383551]
- Ford JA. Substance Use, the social bond, and delinquency. *Sociological Inquiry*. 2005; 75:109–128.
- Garland AF, Besinger BA. Racial/ethnic differences in court referred pathways to mental health services for children in foster care. *Children and Youth Services Review*. 1997; 19:651–666.
- Garland AF, Hough RL, Landsverk JA, Brown SA. Multi-sector complexity of systems of care for youth with mental health needs. *Children's Services: Social Policy, Research, and Practice*. 2001; 4:123–140.
- Garland AF, Lau AS, Yeh M, McCabe KM, Hough RL, Landsverk JA. Racial and ethnic differences in utilization of mental health services among high-risk youths. *American Journal of Psychiatry*. 2005; 167:1336–1343. [PubMed: 15994717]
- Gee MM. Possibility of rehabilitation as affecting whether juvenile offender should be tried as adult. *American Law Reports*. 1983; 22:1162–1257.
- Grisso T. Adolescent offenders with mental disorders. *The Future of Children*. 2008; 18:143–164. [PubMed: 21338001]
- Harford TC, Yi HY, Grant BF. The five-year diagnostic utility of “diagnostic orphans” for alcohol use disorders in a national sample of young adults. *Journal of Studies on Alcohol and Drugs*. 2010; 71:410–417. [PubMed: 20409435]
- Hayes AF, Matthes J. Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*. 2009; 41:924–936. [PubMed: 19587209]
- Hazen AL, Hough RL, Landsverk JA, Wood PA. Use of mental health services by youths in public sectors of care. *Mental Health Services Research*. 2004; 6:213–226. [PubMed: 15588032]
- Henggeler SW, Halliday-Boykins CA, Cunningham PB, Randall J, Shapiro SB, Chapman JE. Juvenile drug court: Enhancing outcomes by integrating evidence-based treatments. *Journal of Consulting and Clinical Psychology*. 2006; 74:42–54. [PubMed: 16551142]
- Huizinga D, Esbensen FA, Weiher AW. Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology*. 1991; 82:83–118.
- Hussong AM, Curran PJ, Moffitt TE, Caspi A, Carrig MM. Substance abuse hinders desistance in young adults' antisocial behavior. *Development and Psychopathology*. 2004; 16:1029–1046. [PubMed: 15704826]
- Johnson PO, Neyman J. Tests of certain linear hypotheses and their application to some educational problems. *Statistical Research Memoirs*. 1936
- Johnson TP, Cho YI, Fendrich M, Graf I, Kelly-Wilson L, Pickup L. Treatment need and utilization among youth entering the juvenile corrections system. *Journal of Substance Abuse Treatment*. 2004; 26:117–128. [PubMed: 15050089]
- Kaczynski, NA.; Martin, CS. Diagnostic orphans: Adolescents with clinical alcohol symptomatology who do not qualify for DSM-IV abuse or dependence diagnosis; Paper presented at the annual meeting of the Research Society on Alcoholism; Steamboat Springs, CO. 1995; Jun. 1995
- Kreek MJ, Nielsen DA, Butelman ER, LaForge KS. Genetic influences on impulsivity, risk taking, stress responsivity and vulnerability to drug abuse and addiction. *Nature Neuroscience*. 2005; 8:1450–1457. [PubMed: 16251987]

- Leslie LK, Landsverk J, Ezzet-Lofstrom R, Tschann JM, Slymen DJ, Garland AF. Children in foster care: factors influencing outpatient mental health service use. *Child Abuse and Neglect*. 2000; 24:465–476. [PubMed: 10798837]
- Mason WA, Windle M. Reciprocal relations between adolescent substance use and delinquency: A longitudinal latent variable analysis. *Journal of Abnormal Psychology*. 2002; 111:63–76. [PubMed: 11866180]
- Merikangas KR, He JP, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K, Swendsen J. Lifetime prevalence of mental disorders in US adolescents: Results from the national comorbidity study-adolescent supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*. 2010; 49:980–989. [PubMed: 20855043]
- Moos RH. Iatrogenic effects of psychosocial interventions for substance use disorders: prevalence, predictors, prevention. *Addiction*. 2005; 100:595–604. [PubMed: 15847616]
- Mulvey E, Iselin A. Improving professional judgments of risk and amenability in juvenile justice. *The Future of Children*. 2008; 18:35–51. [PubMed: 21337997]
- Mulvey, EP.; Schubert, CA.; Chassin, L. Substance use and offending in serious adolescent offenders. US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention; Washington, DC: 2010.
- Mulvey EP, Schubert CA, Chung HL. Service use after court involvement in a sample of serious adolescent offenders. *Children and Youth Services Review*. 2007; 29:518–544. [PubMed: 19907667]
- Mulvey EP, Steinberg L, Fagan J, Cauffman E, Piquero AR, Chassin L, Knight GP, Brame R, Schubert CA, Hecker T, Losoya SH. Theory and research on desistance from antisocial activity among serious adolescent offenders. *Youth Violence and Juvenile Justice*. 2004; 2:213–236. [PubMed: 20119505]
- Mulvey EP, Steinberg L, Piquero AR, Besana M, Fagan J, Schubert C, Cauffman E. Trajectories of desistance and continuity in antisocial behavior following court adjudication among serious adolescent offenders. *Development and Psychopathology*. 2010; 22:453–475. [PubMed: 20423553]
- Redding RE. The Effects Of Adjudicating And Sentencing Juveniles As Adults Research and Policy Implications. *Youth Violence and Juvenile Justice*. 2003; 1:128–155.
- Reed V, Gander F, Pfister H, Steiger A, Sonntag H, Trenkwalder C, Sonntag A, Hundt W, Wittchen HU. To what degree does the Composite International Diagnostic Interview (CIDI) correctly identify DSM-IV disorders? Testing validity issues in a clinical sample. *International Journal of Methods in Psychiatric Research*. 1998; 7:142–155.
- Schubert CA, Mulvey EP, Glasheen C. Influence of mental health and substance use problems and criminogenic risk on outcomes in serious juvenile offenders. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2011; 50:925–937. [PubMed: 21871374]
- Schubert CA, Mulvey EP, Steinberg L, Cauffman E, Losoya SH, Hecker T, Chassin L, Knight GP. Operational lessons from the pathways to desistance project. *Youth Violence and Juvenile Justice*. 2004; 2:237–255. [PubMed: 20119515]
- Scott, E.; Steinberg, L. Adolescence and crime: Rethinking juvenile justice. Harvard University Press; Cambridge, MA: 2008.
- Sher, KJ. Questionnaire for the alcohol, health, and behavior study. University of Missouri; Columbia, MO: 1987. Unpublished manuscript
- Slobogin C. Treating kids right: Deconstructing and reconstructing the amenability to treatment concept. *Journal of Contemporary Legal Issues*. 1999; 10:1–25.
- Slobogin C. Treating juveniles like juveniles: Getting rid of transfer and expanded adult court jurisdiction. *Texas Tech Law Review*. 2013; 46:103–140.
- Steinberg L. Introducing the issue. *The Future of Children*. 2008; 18:1–14.
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2014. NSDUH Series H-48, HHS Publication No. (SMA) 14-4863

- Teplin LA, Abram KM, McClelland GM, Dulcan MK, Mericle AA. Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*. 2002; 59:1133–1143. [PubMed: 12470130]
- Tomkins AJ, Slain AJ, Hallinan MN, Willis CE. Subtle discrimination in juvenile justice decisionmaking: Social scientific perspectives and explanations. *Creighton Law Review*. 1995; 29:1619.
- Townsend E, Walker DM, Sargeant S, Vostanis P, Hawton K, Stocker O, Sithole J. Systematic review and meta-analysis of interventions relevant for young offenders with mood disorders, anxiety disorders, or self-harm. *Journal of Adolescence*. 2009; 10:1–27.
- Ullman RP. Federal juvenile waiver practices: A contextual approach to the consideration of prior delinquency records. *Fordham Law Review*. 2000; 68:1329–1382.
- Walrath CM, Sharp MJ, Zuber M, Leaf P. Serving children with SED in urban systems of care: Referral agency differences in child characteristics in Baltimore and the Bronx. *Journal of Emotional and Behavioral Disorders*. 2001; 9:94–105.
- Washburn J, Teplin L, Voss L, Simon C, Abram K, McClelland G. Psychiatric disorders among detained youths: a comparison of youths processed in juvenile court and adult criminal court. *Psychiatric services*. 2008; 59:1–16.
- Wells R, Hillemeier MM, Bai Y, Belue R. Health service access across racial/ethnic groups of children in the child welfare system. *Child Abuse and Neglect*. 2009; 33:282–292. [PubMed: 19481260]
- Werch CE, Owen DM. Iatrogenic effects of alcohol and drug prevention programs. *Journal of Studies on Alcohol and Drugs*. 2002; 63:581.
- White, HR. Longitudinal perspective on alcohol use and aggression during adolescence. In: Galanter, M., editor. *Recent developments in alcoholism*. Kluwer Academic; New York: 1997. p. 81-103.
- Wittchen HU. Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): a critical review. *Journal of Psychiatric Research*. 1994; 28:57–84.0. [PubMed: 8064641]
- World Health Organization. Composite international diagnostic interview. World Health Organization; Geneva, Switzerland: 1990.
- Yeh M, McCabe K, Hurlburt M, Hough R, Hazen A, Culver S, Garland A, Landsverk J. Referral sources, diagnoses, and service types of youth in public outpatient mental health care: A Focus on Ethnic Minorities. *Ethnic Minorities and Mental Health Services*. 2002; 29:45–54.

Highlights

- We test race/ethnicity differences in the relation between substance use disorder diagnosis and substance use treatment receipt among male serious juvenile offenders.
- There are no race/ethnicity differences in treatment receipt for adolescents diagnosed with a substance use disorder.
- There are race/ethnicity differences in treatment receipt for adolescents with moderate levels of substance use problems, such that non-Hispanic Caucasians are more likely to receive treatment than Hispanics or African-Americans.
- There are no race/ethnicity differences for adolescents when substance use problems are either very severe or very low.

Figure 1. Conditional effect of race/ethnicity (Hispanic vs. non-Hispanic Caucasians) at values of substance use problems

Table 1

Descriptive statistics for subsample participants

	Full Sample (N=638)	Non-Hispanic Caucasians (n=132)	Hispanics (n=244)	African-Americans (n=262)
	Mean (SD) or %			
Age ^a	16.6 (1.08)	16.5 (1.00)	16.5 (1.08)	16.7 (1.11)
Prior Criminal Behavior ^a	.048 (.648)	.014 (.681)	.118 (.680)	-.001 (.593)
Substance Use Disorder Diagnosis ^b	36.1%	45.5%	37.3%	30.2% ^e
Substance Use Problems ^c	3.08 (4.97)	4.41 (5.92)	3.71 (5.40)	1.81 (3.55) ^e
Substance Use Treatment Receipt ^d	38.6%	49.2%	36.5% ^e	35.1 % ^e

^a At baseline;^b Past year at baseline, scores range from 0-1 with scores closer to one indicating greater proportion of prior criminal behavior;^c Substance use disorder diagnosis=1, No substance use disorder diagnosis=0, past 6-months at baseline;^d Substance use treatment receipt=1, no substance use treatment receipt=0, one year after baseline;^e Denotes significant difference from non-Hispanic Caucasians at $p < .05$.

Logistic regression analyses predicting substance use treatment receipt from substance use disorder diagnosis

Table 2

	β	SE β	Wald's χ^2	Exp (β)
Age	-0.40***	0.08	23.6	0.67
Prior Criminal Behavior	-0.25*	0.14	3.09	0.78
SUD ^a Diagnosis	0.48*	0.27	3.23	1.61
Hispanic vs. NHC ^b	-0.03	0.34	0.01	0.97
African-American vs. NHC	-0.64	0.35	0.03	1.06
SUD by Hispanic vs. NHC	0.88*	0.45	3.74	2.41
SUD by African-American vs. NHC	0.69	0.46	2.29	2.00
Constant	6.41	1.45	19.6	609.2

p<.01;

**
p<.05;

*
p<.10;

^aSUD=Substance use disorder;

^bNHC=Non-Hispanic Caucasians.

Table 3
Percent of participants who received substance use treatment (by diagnosis)

	NHC ^b	Hispanics	χ^2 (df) (Hispanics vs. NHC)	p-value	African- Americans	χ^2 (df) (African-Americans vs. NHC)	p-value
Among those diagnosed with SUD ^a	43.3%	44.0%	0.01(1)	1.00	39.2%	0.24(1)	0.73
Among those not diagnosed with SUD	54.2%	32.0%	10.1(1)**	0.00	33.3%	9.41(1)**	0.00

p<.01;

**
p<.05;

*
p<.10;

^a SUD=Substance use disorder;

^b NHC=Non-Hispanic Caucasians.

Table 4
Logistic regression analyses predicting substance use treatment receipt from substance use problems

	β	SE β	Wald's	Exp (β)
Age	-0.38***	0.08	22.5	0.68
Prior Criminal Behavior	-0.23	0.14	2.67	0.79
SU ^a Problems	0.05	0.06	0.95	1.06
Hispanic vs. NHC ^b	-0.61**	0.28	4.76	1.83
African-American vs. NHC	-0.46*	0.27	2.90	1.58
SU problems by Hispanic vs. NHC	0.03	0.04	0.60	0.97
SU problems by African-American vs. NHC	-0.00	0.05	0.00	1.00
Constant	5.07***	1.36	13.9	158.5

 $p < .01$;

**
 $p < .05$;

*
 $p < .10$;

^a
 SU=Substance use;

^b
 NHC=Non-Hispanic Caucasians.