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Testing three pathways to substance use and delinquency among low-income African American adolescents☆

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Abstract

Objective—Mounting literature suggests that parental monitoring, risky peer norms, and future orientation correlate with illicit drug use and delinquency. However, few studies have investigated these constructs simultaneously in a single statistical model with low income African American youth. This study examined parental monitoring, peer norms and future orientation as primary pathways to drug use and delinquent behaviors in a large sample of African American urban adolescents.

Methods—A path model tested direct paths from peer norms, parental monitoring, and future orientation to drug use and delinquency outcomes after adjusting for potential confounders such as age, socioeconomic, and sexual orientation in a sample of 541 African American youth.

Results—Greater scores on measures of risky peer norms were associated with heightened risk of delinquency with an effect size that was twice in magnitude compared to the protective effects of future orientation. Regarding substance use, greater perceived risky peer norms correlated with the increased likelihood of substance use with a standardized effect size 3.33 times in magnitude compared to the protective effects of parental monitoring.

Conclusions—Findings from this study suggest that interventions targeting risky peer norms among adolescent African American youth may correlate with a greater impact on reductions in substance use and delinquency than exclusively targeting parental monitoring or future orientation.

Keywords

Peer norms; Parental monitoring; Future orientation; African American youth; Substance use; Delinquency

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1. Introduction

In the United States (U.S.), African American adolescents relative to their other ethnic counterparts experience a disproportionate burden of juvenile justice involvement (United States Department of Justice: Office of Justice Programs. Office of Juvenile Justice Delinquency and Prevention, OJJDP, 2015). During 2013, while accounting for <13% of the U.S. population, African American adolescents represented >35% of persons ages 13 to 18 years who had juvenile justice contact (Hockenberry & Puzzanchera, 2015). A high proportion of juvenile justice contacts come from stiffer surveillance, prosecutorial discretion in charging decisions, and inequities in sentencing for delinquency and substance use incidents (Armour & Hammond, 2009; Henning, 2013; Kahn & Martin, 2016). Official statistics suggest that disproportionate minority contact with African American adolescents occurs most severely in juvenile arrests compared to detention or placement. Compared to whites, African American adolescents have higher rates of juvenile arrest (63.6 vs. 26.0 per 100,000), and detention (24.9 vs. 20.9 per 100,000) (United States Department of Justice: Office of Justice Programs. Office of Juvenile Justice Delinquency and Prevention, OJJDP, 2015). A better understanding of pathways leading to substance use and delinquency can not only ameliorate such incidences but might also inform programmatic and policy efforts to curtail these risks and the heavy personal costs which come to bear upon African American youth. Consequently, the major aim of this study is to explore direct pathways correlated with substance use and delinquency in a sample of African American adolescents.

1.1. Pathways to substance use and delinquency

There is a high correlation between youth substance use and delinquent behaviors (Elliott, Huizinga, & Menard, 2012). However, knowledge of common antecedents of these behaviors are sometimes limited by studies that often assess substance use (Abram et al., 2015; McClelland, Elkington, Teplin, & Abram, 2004; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Tobler & Komro, 2010) or delinquency (Farrington, Ttofi, & Piquero, 2016) with fewer studies exploring both (Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Monahan, Rhew, Hawkins, & Brown, 2014). Parental monitoring, negative peer norms and future orientation are social cognitive constructs with strong empirical support as pathways to youth substance use and delinquency.

A large body of evidence supports an empirical relationship between inadequate parental monitoring styles and heightened risk for the development of adolescent substance use (Dishion, Nelson, & Kavanagh, 2003; Kelly, Comello, & Hunn, 2002; Tobler & Komro, 2010) and delinquency (Fosco, Stormshak, Dishion, & Winter, 2012, Keijsers, Branje, VanderValk, & Meeus, 2010). Griffin et al. (2000) conducted research with urban African American youth and found more parental monitoring was associated with lower rates of delinquency and substance use among a sample that was 87% African American in New York City. African American youth in households with parents that engaged in more monitoring behaviors were less likely to engage in delinquency, smoke cigarettes and use alcohol. Additionally, Tobler and Komro (2010) found that inconsistent parenting techniques were associated with substance use in a sample of predominantly African American and Hispanic urban youth. Social control theory would support these findings. According to

social control theory, positive bonds to and monitoring from parents can have significant implications for restraining risk behaviors and promoting healthy behaviors on the part of youth (Hirschi, 1969; Voisin, Jenkins, & Takahashi, 2011).

In addition to parental monitoring, studies suggest that youth who perceive their peers as engaging in substance use are more likely to engage in similar behaviors (Andrews, Tildesley, Hops, & Li, 2002; Brooks-Russell, Simons-Morton, Haynie, Farhat, & Wang, 2014, D'amico & McCarthy, 2006; Urberg, Luo, Pilgrim, & Degirmencioglu, 2003) and delinquency (Haynie, 2002; Reynolds & Crea, 2015). More specifically, a longitudinal study with 2248 students in the United States and Australia, documented that youth who perceived drug use as common among their peer groups were more likely to use tobacco and marijuana than their counterparts (Eisenberg, Toumbourou, Catalano, & Hemphill, 2014). Moreover, studies have found that youth are more likely to overestimate the number of peers engaged in substance use and other problem behaviors (Eisenberg et al., 2014; Wambeam, Canen, Linkenbach, & Otto, 2014). Social learning theory would suggest that peer group affiliation would reinforce dominant peer norms and that youth are more likely to adopt such behaviors in order to gain and maintain group membership (Petraitis, Flay, & Miller, 1995).

Some developmental perspectives of adolescent behavior suggest that the effect of peer norms increases with the onset of adolescence in a normative social psychological process (Carrington, 2009; Duan, Chou, Andreeva, & Pentz, 2009). Moreover, as personality and identity develops into early to mid adolescence, future orientation emerges as a robust predictor of the development of problem behaviors (Nurmi, 1991). Alongside peer influences, the risk of initiating delinquency and substance use culminates in mid to late adolescence (Duan et al., 2009) coinciding with the developmental period where influences of peer norms and future orientation are greatest. Barnow, Schuckit, Lucht, John, and Freyberger (2002) used structural equation modeling to examine the influence of peer norms and parental monitoring and found that youth with alcohol problems were more likely to have more perceived parental rejection, less parental warmth and associate with peers who used substances than youth without alcohol problems.

Finally, adolescents who report a pessimistic outlook, who do not plan for or who are not oriented positively to the future (i.e., having low future orientation) are at a greater risk of engaging in substance use (Peters Jr Dr et al., 2005; Allwood, Baetz, DeMarco, & Bell, 2012, delinquency (Clinkinbeard, 2014; Van Gelder, Hershfield, & Nordgren, 2013) and multiple problem behaviors (Jackman & MacPhee, 2015; Chen & Vazsonyi, 2013) than youth who are more oriented to the future. For instance, recent analyses of African American youth provided evidence that participants reporting high versus low future orientation were three times less likely to report substance use and 65% less likely to report delinquent behaviors even after controlling for significant factors such as socioeconomic status, gender and sexual orientation (Burnside & Gaylord-Harden, 2016). Asset theory can illuminate these findings (Sherraden, 1990). This theory posits that individuals who view themselves as having human capital or valuable are more inclined to engage in protective behaviors that protect themselves and their futures.

1.2. Study contributions

A significant expansion in literature have examined parental monitoring, peer norms, and future orientation as correlates of substance use and delinquency. However, few studies have focused exclusively on African American Adolescents, and evaluated the relative magnitude of these constructs as they may correlate to substance use and delinquency a single model. Given disproportionate contacts African American youth have with the juvenile justice systems for substance use and delinquency, additional research examining theoretical mechanisms that correlate with these behaviors is critical to advancing public health prevention interventions for African American adolescents. Guided by social control, social learning and asset theories and considerations and gaps in extant literature, this study puts forth the following aims and hypotheses.

1.3. Study aim and hypotheses

The overarching aim of this study is to identify common primary pathways that are correlated with youth delinquency and substance use. Specifically, this study sought to test the following hypotheses:

1. Increased parental monitoring, higher future orientation and lower exposure to negative peer norms will be associated with lower risk of youth delinquency and substance use.
2. Negative peer norms will be correlated more strongly than parental monitoring with regards to youth substance use and delinquent behavior.
3. The protective effects of future orientation on reducing risk of delinquency and drug use will be greater than the protective effects of parental monitoring and peer norms.

The stronger predicted effects for peer norms and future orientation over parental monitoring is based on the premise that as youth try to individuate from parents and conform to peer culture, peer and individual traits might generate stronger effects over behavioral health, especially when parental monitoring is lacking (Wood, Read, Mitchell, & Brand, 2004).

Potential confounders such as age, gender, sexual orientation, community violence and socioeconomic status were controlled for in all of the path analyses when testing these hypotheses. Compared to males, females are less likely to engage in delinquency and drug (Griffin et al., 2000; Herrera & McCloskey, 2001). Regarding sexual orientation, there is mounting empirical evidence suggesting an increased risk of substance use (Corliss et al., 2010) and non-violent delinquency among non-heterosexual identifying youth (Beaver et al., 2016). In addition to sexual orientation and gender, studies have found exposure to community violence significantly heightens risk of poor outcomes including drug use, delinquency, and sexual risk behaviors (Voisin, Tan, Tack, Wade, & DiClemente, 2012). Exposure to community violence is defined as acts of violence (e.g., witnessing or being a victim of robberies, muggings, gang-related deaths, or homicides) occurring outside the home between unrelated individuals who may or may not know each other (Krug, Mercy, Dahlberg, & Zwi, 2002). Finally, youth from communities with extreme constraints on resources may be more likely to engage in drug use and delinquency (Sirin, 2005).

2. Methods

2.1. Procedure

Data from this study comes from the Resilience Project, a study examining risk and protective factors related to sexual risk behaviors of African American youth living in urban neighborhoods of concentrated poverty. Youth were recruited in three high schools, one youth church group, two community youth programs, and four public venues frequented by youth. These schools and venues were targeted because they were in the low income communities that were the focus of this study. An overall response rate of 87% was achieved. Participants were recruited from low-income communities consisting predominantly of African American residents, where the average annual median income ranged from $24,049 to $35,946, below the city average of $43,628. Residents in the communities were predominantly socioeconomically homogenous African Americans. The percentage of single-mother households in these areas ranged from 28.9% to 32.3%, with the city average being 13.9% (City of Chicago Open Data Portal, 2015).

Active parental consent and youth assent were obtained for all study participants. Permission was obtained from principals as well as leaders of church groups and youth programs to recruit participants for the study. Flyers describing the study were posted at each of the locations, and trained research assistants introduced the study to all potential participants. Youth recruited from schools, community programs, and churches were provided with a detailed letter describing the study along with parental consent forms. Youth who returned consent forms signed by their parent were enrolled in the study. Youth recruited in public venues were only asked to participate if a parent was present to provide consent.

Participants recruited from schools, community programs, and churches were administrated the questionnaire in those respective locations. The few individuals who were recruited in public venues (e.g., parks and fast food venues) were administered the questionnaires in quiet spaces at or near those venues. In such instances, questionnaires were only administered to youth if a parent was present to provide consent and the questionnaire could be immediately administered. The questionnaire took up to 45 min to complete; youth were compensated $10. The study was approved by the university Institutional Review Board.

2.2. Measures

2.2.1. Exogenous control variables—Participants were assessed on age, gender, community violence and free school lunch as a proxy of socioeconomic status. Age was assessed by asking participants “what is your age?” using a continuous response format [number of years]. Gender was assessed by asking participants “what is your gender?” [1 = male, 2 = female]. Socioeconomic status was measured through a dichotomous variable that asked participants, “Are you currently receiving free or reduced lunch and/or SNAP benefits?” [0 = no, 1 = yes]. Free school lunch programs are means-tested and thus a relatively reliable proxy for socioeconomic status (Sirin, 2005). Lifetime exposure to community violence was assessed using items from the Exposure to Violence Probe (Stein, Walker, Hazen, & Forde, 1997). Sexual orientation was measured by asking participants “how do you identify yourself?” Participants could select heterosexual (sexually attracted to

the opposite sex), homosexual (sexually attracted to the same sex), Bisexual, (sexually attracted to both sexes), Transgender (identify as another gender than the gender you grew up as), Pan-sexual (sexually attracted to people of all gender identities and biological sexes), and other (specify). Participants who indicated heterosexual identification were coded as 1 (yes) and all other participants coded as a 0 (no).

Six items inquired about witnessing violent acts (close relative or friend died violently, close relative or friend seriously injured, close relative or friend robbed or attacked, seen someone being beaten, seen a dead body in the community, and witnessed gun-related incident) and one item inquired about being a victim of violence. Items were rated on a seven-point scale ("0 times" to ">6 times"), and a composite score for exposure to community violence was calculated by summing up the seven items. The Cronbach's alpha was 0.86.

2.2.2. Peer norms—Twelve question items measured risky peer norms using a scale developed and validated by (DiClemente et al., 2001) that assessed the perceived risky behaviors of participants' ten closest friends. The question format asked participants to rate how many of their ten closest friends engaged in risky behaviors (i.e., "drink alcohol" "get into fights?" and "carry guns"). Possible responses included a range in frequency from none (0 friends) to most (9–10 friends) (Chronbach $\alpha = 0.90$). Question items were summed for each participant to produce a scale of different types of peer norms.

2.2.3. Future orientation—*Future orientation* was assessed using a modified version of a scale (Whitaker, Miller, & Clark, 2000) with items derived from Coopersmith's (1967) validated Self-Esteem Inventory (Coopersmith, 1967). Items from the modified scale have been adapted and used in prior research ($\alpha = 0.74$) (Robbins & Bryan, 2004). In the current study, ten items were used, which inquired about perceptions of perceived control (e.g., I have little control over the things that happen to me), positive future outlook (e.g., What happens to my future mostly depends on me), and hopelessness (e.g., Sometime I feel there is nothing to look forward to in the future) within the last six months on a three-point scale (1 = not true, 2 = somewhat or sometimes true, 3 = very true or often true). Some items were reverse-coded so that higher scores indicate greater positive future orientation. The Cronbach's alpha for the current sample was 0.74. A summative score was computed for each participant that represented a continuous measure of future orientation.

2.2.4. Parental monitoring—*Parental monitoring* was assessed by the Parental Monitoring Scale validated in a number of prior studies (i.e., Steinberg, Lamborn, Dornbusch, & Darling, 1992). This 10 item scale assessed the degree to which both parents monitor their youth. A sample item includes, "How well do your parents know who your friends are?"). Reponses were recorded using a five-point scale (not at all, very little, somewhat, quite a bit, very much). A composite score was calculated by summing the responses for the 10 items, with higher scores indicating higher levels of parental monitoring. The reliability coefficient using Cronbach's alpha was 0.87. Questions were summed to form a scale measuring parental monitoring for each participant.

2.2.5. Substance use—Five question items assessed lifetime drug use behaviors and included questions (yes/no) measuring use of ecstasy, Lean or Krokodil, marijuana and crack

or cocaine. A dichotomous variable was created indicating a positive response to any of the five questions measuring substance use. For the purposes of this study, we assessed substance use which refers to consuming alcohol or drugs and not the clinical diagnosis of substance use disorders used by mental health and substance abuse treatment practitioners.

2.2.6. Delinquency—Ten questions assessed the frequency of delinquent behaviors in the past 12 months (e.g., "taken something not belonging to you under $50, "taken something from a store without paying for it," "set fire to someone else's property on purpose,", "gotten something by telling a person something bad would happen to him/her if you did not get what you wanted," "hurt someone badly enough for them to need bandages or a doctor. Used a knife or gun or some other thing (such as a bat, pipe, razor, taser, mace) to get something from a person" (Chronbach $\alpha = 0.90$). The 10-item scale was summed and then dichotomized to reflect having engaged in any delinquency in the past 12 months.

2.2.7. Statistical analysis—The primary aim of this analysis was to compare three competing theories of adolescent drug use and delinquency by examining direct pathways from future orientation, peer norms and parental monitoring to drug use and delinquency. Descriptive analyses examined the characteristics of the sample through one-way frequency tables that presented cell sizes, percentages or means, and measures of central tendency. Following descriptive analyses, Spearman rank correlation coefficients and measures of statistical significance were performed to assess bivariate relationships between all study variables. Given its ability to model simultaneously occurring mechanisms while controlling for potential confounders, the path analysis model is well equipped to provide a deeper understanding of the mechanisms leading to substance use and delinquency among adolescents (Kline, 2015). Finally, we fit a path model to the data testing direct paths from peer norms, parental monitoring, and future orientation to drug risk and delinquency outcome variables after controlling for potential confounders (gender, age, socioeconomic status, exposure to community violence and sexual orientation.

Path analysis was conducted using Mplus v1.4 for Macintosh (Muthén & Muthén, 2007). Diagonally weighted least squares estimation with a mean and variance adjustment to accommodate the dichotomous structure of the endogenous outcome variables (Mplus estimator WLSMV) (Finney & DiStefano, 2006; Wang & Wang, 2012). Variables in the path analyses were treated as observed rather than latent because all of the constructs were either based upon scales validated in prior research (parental monitoring, peer norms, future orientation and community violence) or measured by single indicators (age, gender, sexual orientation, socioeconomic status) (Kline, 2015). To elucidate approximate goodness of fit measures for the overall model, statistical analysis included the mean square error of approximation (RMSEA), the Comparative Fit Index (CFI), and the Weighted Root Mean Square Residual (WRMR). The acceptable statistical parameters for judging model fit consists of meeting 2 or more of the following criteria: $CFI > 0.95$, $WRMR \leq 1.0$, $RMSEA < 0.06$ (Schermelleh-Engel, Moosbrugger, & Müller, 2003; Yu, 2002). For each of the direct pathways, statistical analyses obtained unstandardized regression coefficients, 95% confidence intervals around the parameter estimates for unstandardized regression coefficients and standardized coefficients. Standardized regression coefficients are presented

in the results section to facilitate comparisons between parameter estimates of direct effects within path model.

Fig. 1 provides the fully specified structural equation model used to estimate paths between exogenous control variables, parental monitoring, peer norms, future orientation with delinquency and drug use. This model was used to calculate model fit statistics that evaluated the goodness of fit between this model and the study data.

3. Results

3.1. Sample description

The final analytic sample for this study included 541 adolescents who had completed data on primary measures. Overall, more than half of the sample was female (54.27%), 81.13% identified as heterosexual, and 75.68% received free school lunch. Average age of the adolescents was 15.84 (SD 1.41) and the average score on exposure to community violence was 10.01 (SD, 9.19) (Fig. 2).

The overall mean parental monitoring score was 38.58 with a range of 1 to 50. On average, the mean score on the measure of peer norms was 12.98 (SD, 9.95) with a range of 0 to 48 and 2.44 (0.35) on the measure of future orientation with a range of 1.4 to 3.0.

A large majority of participants reported using at least one drug (58.61%) in their lifetime and 43.68% reported engaging in at least one delinquent behavior within the past 12 months (Table 1).

3.1.1. Bivariate analysis—Bivariate analysis found a significant negative relationship between future orientation and delinquency (−0.19, $p < 0.01$). Higher parental monitoring was negatively associated with delinquency (−0.15, $p < 0.01$) and drug use (−0.19, $p < 0.001$). Finally, a strong correlation was identified between negative peer norms and delinquency (0.40, $p < 0.001$) and drug use (0.38, $p < 0.001$) (Table 2).

3.1.2. Direct effects—peer norms, future orientation parental monitoring and delinquency—After adjusting for age, gender, socioeconomic status, sexual orientation and exposure to community violence, path analysis identified a direct relationship in which greater scores on future orientation correlated with a lower likelihood of delinquency ($\beta = -0.20$, $p < 0.001$). Parental monitoring was significantly associated with delinquency ($\beta = -0.10$, $p < 0.05$). Out of the three paths, risky peer norms exerted the strongest direct effects in which greater scores significantly correlated with the increased likelihood of delinquency ($\beta = 0.38$, $p < 0.001$). Specifically, the magnitude of the standardized coefficient for peer norms was nearly twice as large as the effect size for future orientation and three times as large as parental monitoring. A conceptual diagram of the path analysis model with statistically significant standardized parameter estimates are provided in Fig. 1.

3.1.3. Direct effects—peer norms, future orientation parental monitoring and substance use—Similar to the direct path leading to delinquency, greater scores on parental monitoring significantly correlated with the decreased likelihood of drug use ($\beta =$

−0.12, $p < 0.05$) after controlling for potential confounders. Compared to parental monitoring and future orientation, peer norms was the most influential correlate of drug use in which greater scores significantly associated with higher drug use ($\beta = 0.40$, $p < 0.001$). Moreover, the magnitude of the standardized coefficient for peer norms was 3.33 times greater than the effects of parental monitoring. This study did not find a statistically significant relationship between future orientation and drug use ($\beta = -0.02$).

4. Discussion

This study expands upon prior literature by elucidating and exploring the magnitude of three theoretically driven direct pathways correlated with adolescent substance use and delinquency across a single sample of low income African American youth. Prior findings have documented that parental monitoring (i.e., Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Griffin et al., 2000; Keijsers et al., 2010; Kelly et al., 2002; Tobler & Komro, 2010) future orientation (Peters Jr Dr et al., 2005; Clinkinbeard, 2014; Van Gelder et al., 2013; Chen & Vazsonyi, 2013) and peer norms (Andrews et al., 2002; Brooks-Russell et al., 2014; Urberg et al., 2003; Reynolds & Crea, 2015; Eisenberg et al., 2014) are significant correlates of adolescent substance use and delinquency. However, these mechanisms are usually tested in isolated models rather than evaluating their effects holistically (Monahan et al., 2014; Barnow et al., 2002). This study addressed a significant gap in prior literature by modeling the effects of parental monitoring, peer norms and future orientation in a single model. Notably, parental monitoring significantly associated with diminished risk for both delinquency and substance use. Additionally, the magnitude of the effect size of peer norms on delinquency was >3.33 times greater than the effect size of parental monitoring. It is worth noting that the levels of parental monitoring identified in this analysis were lower than the estimates provided by prior studies (Griffin et al., 2000; Bogenschneider et al., 1998). Youth in this sample were predominantly from low-income families, which could thereby inhibit the resources necessary for parental figures and other caretakers to carry out monitoring and other activities to the same extent as parents of youth in more economically well-off samples. In low-resourced communities increasing parental monitoring might be a challenge, although it might be more critical in such communities given that the environmental risks are greater (Table 3).

Another potential explanation for diminished effects of parental monitoring observed in this study pertains to the older age of the sample (Mean = 15.84, years; SD = 1.41). Studies suggest that the effect of parental monitoring diminishes as youth progress in adolescence (Hoeve et al., 2009). Youth in this study were at a developmental stage when decision-making is most sensitive to perceptions of peers (Carrington, 2009; Duan et al., 2009 Elliott & Menard, 1996). This developmental stage coincides with an important period in adolescence characterized by the accumulation of cognitive skills to adequately plan for future consequences of behaviors (Nurmi, 1991; Robbins & Bryan, 2004; Steinberg et al., 2009). Consistent with expectations, the data suggest that youth with poor future orientation are at a heightened risk of delinquency. These findings make sense when viewed in light of the age of the sample and contextualized within well-defined theories of developmental psychology. This finding does not undermine the large body of scientific literature underpinning the importance of increasing resources for parents to supervise and monitor

youth who are under their care. Rather, additional research is necessary that examines the dynamic interplay of multiple mechanisms across mid to late adolescence.

Notwithstanding the significant findings presented in this study, there are several limitations that warrant explication and provide fruitful avenues for future research. All data in this study were cross-sectional thus precluding causal inference. It is possible that many of the relationships observed in this study were bi-directional or that the causal ordering may be different. Future empirical inquiry into this topic should pursue study designs that utilize longitudinal sampling methodologies to parse out directionality and enable causal inference. Specifically, longitudinal research would illustrate if parental monitoring, future orientation, and peer norms exert varying effects on substance use and delinquency depending on their timing within different stages of adolescent development. In addition, the present study drew on a convenience sample of low income African American youth and findings may not be generalizable to wider populations of similar youth from different economic backgrounds. Future studies would benefit from assessing major constructs using measures from youth and caregivers when possible. This study measured substance use rather than abuse thus precluding differentiation of severe from mild patterns of substance use. As a result, the measurement of substance use had a higher sensitivity and lower specificity to identify substance abuse. In additional alcohol use though common among adolescents should be assessed in future studies. Conceptualizing the outcome variable as substance use rather than abuse enables implications for prevention and treatment for a broader population of African American adolescents. Similarly, for the sake of simplicity, this study combined all types of substances into a single substance use outcome measure. Future research with larger sample sizes might investigate more complex formulations of substance use that include polysubstance use, the quantity of substances used and other factors on continuous and categorical outcome variables.

Additionally, future research would benefit from exploring alternative structural equation models that build upon the insight generated by findings from this study. Structural equation modeling provides a useful means to conduct theory-driven research that compares multiple perspectives in a single model. Testing effect modification and meditational relationships between the mechanisms tested in this study and control variables is a fruitful avenue of future research. For instance, future orientation as a mediator of the impact of peer norms and parental monitoring on substance use and delinquency among African American adolescents would provide additional insight into prevention interventions with this population. Findings from this study calls for research to understand the role of age, race, gender and sexual orientation in modifying or mediating the impact of underlying mechanisms on outcomes of delinquency and substance use in this population. Future research with more diverse samples might focus on how race interacts and modifies the relationships between constructs such as parental monitoring, future orientation and peer norms and outcomes including drug use and delinquency.

Nonetheless, this study provides cogent clinical and policy implications for interventions to attenuate youth delinquency and substance use. A review by Cuijpers (2002) identified focusing on norms, building intentions not to use substances, and peer leaders as evidence-based principles of high quality youth prevention programs. The current study supports

interventions that focus on changing perceptions of the prevalence and attitudes towards the acceptability of drug use and delinquency. In order to increase future orientation, interventions must foster the development of a healthy self-image and identity. An innovative study by Van Gelder et al. (2013) incorporated technology, the internet and visual graphics to enhance sense of vividness of the future self. Youth who formed bonds with their future selves through increasing vividness of the self were less likely to engage in delinquency than controls. Therefore targeting future orientation is a promising cognitive intervention that may enhance the ability of at-risk youth to make informed cost-benefit decisions when faced with opportunities to engage in delinquency.

In addition to cognitive interventions, this research supports implementation of mentorship programs that are traditionally situated within juvenile justice settings. Juvenile justice mentoring programs typically match detained youth with culturally appropriate mentors and successful ethnic reflectors who provide several hours of weekly contact (Bruce & Bridgeland, 2014; Catalano, Loeber, & McKinney, 1999; Mertinko, Lange, & Baker, 2000; Sar & Sterrett, 2014). Work focuses on changing norms, professional development and linkage to potential additional services (Catalano et al., 1999; Mertinko et al., 2000). This study suggests that enhancing future orientation and peer norms could improve the effectiveness peer mentorship programs for youth who are at risk of delinquency and substance use. A policy implication of this study involves expanding and improving accessibility of peer mentorship and group-based services to a broader base of at-risk youth. It is unfortunate that these services are typically restricted to justice settings.

Additionally, findings from this study call for an increase in assessments of protective and risk factors such as parental monitoring, future orientation and risky peer norms. Assessment must include information from primary caretakers, teachers and school administrators in the assessment of youth within schools and juvenile justice settings to obtain a complete picture of peer norms, networks and other characteristics of the immediate social environment. Communication of information with practitioners and peer mentors working directly with youth facilitates the customization of evidence-based interventions to the unique circumstances presented by youth within substance use and delinquency prevention programs.

5. Conclusion

Youth who engage in substance use and delinquency are disproportionately impacted by socioeconomic inequities and endure extreme constraints on important resources necessary for healthy adolescent development. This study explored three mechanisms that are connected to substance use and delinquent behaviors. Researchers and practitioners are recommended to incorporate future orientation and peer norms into delinquency prevention interventions. Changing peer norms and enhancing resources available to parents to effectively monitor may improve the effectiveness of existing substance use prevention programs. Findings from this study underscore the importance of increasing resources and expanding programs to address problems of substance use and delinquency among a population of youth that face extreme socioeconomic disadvantage.

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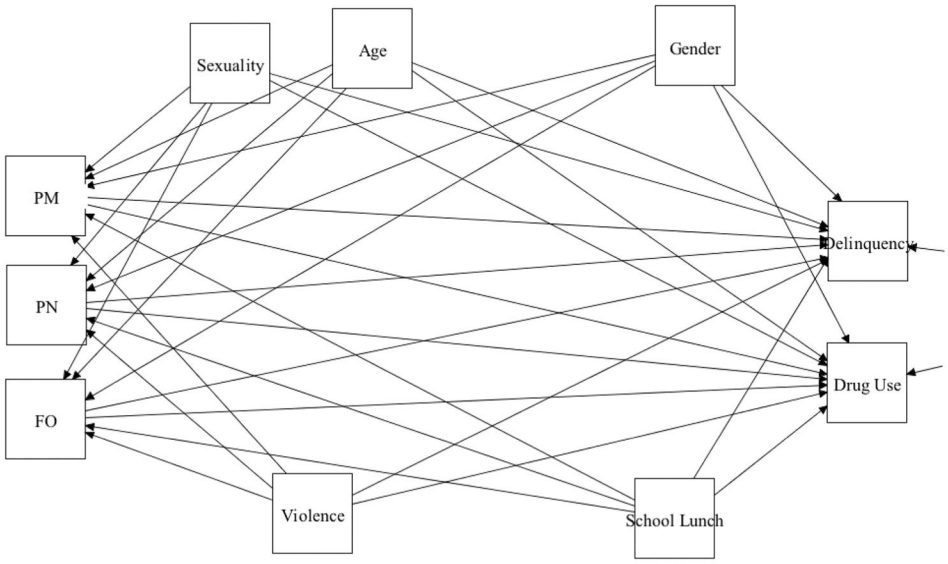

Fig. 1.

Fully specified structural equation model used estimating paths between exogenous control variables, parental monitoring (PM), peer norms (PN), and future orientation (FO).

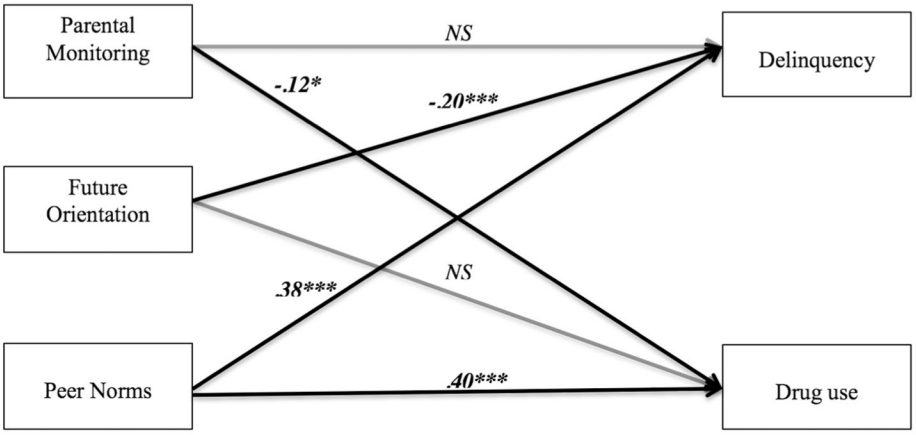

Fig. 2.

Direct pathways correlated with delinquency and substance use among African American youth.

Table 1

Characteristics of African American study participants.

Endogenous dependent variables	
Delinquency %(n)	43.68%(266)
Drug use %(n)	58.61%(371)
Endogenous independent variables	
Parental monitoring mean(SD)	38.58(8.81)
Future orientation mean(SD)	2.44(0.35)
Peer norms mean (SD)	12.98(9.95)
Exogenous control variables	
Community violence mean(SD)	10.01(9.19)
Gender %(n)	54.27%(289)
School lunch %(n)	75.68%(473)
Age years(SD)	15.84(1.41)
Sexual orientation %(n)	81.13%(473)

Table 2

Spearman rank correlation coefficients for association between study variables.

	1	2	3	4	5	6	7	8	9	10
1 Delinquency	1.00									
2 Drug use	0.33***	1.00								
3 Parental monitoring	−0.15**	−0.19***	1.00							
4 Future orientation	−0.19**	−0.06	0.23***	1.00						
5 Peer norms	0.40***	0.38***	−0.23***	−0.15***	1.00					
6 Community violence	0.28***	0.30***	−0.13*	−0.14**	0.53***	1.00				
7 Gender	−0.15***	−0.05	0.02	−0.06	−0.21***	−0.11*	1.00			
8 School lunch	−0.06	0.07	−0.01	−0.04	0.03	0.09*	0.05	1.00		
9 Age	0.02	0.18***	−0.18***	−0.08	0.28***	0.19***	−0.09**	0.14**	1.00	
10 Sexual orientation	−0.06	−0.14**	0.14***	0.08	−0.04	−0.07	−0.25***	0.02	−0.02	1.00

Note correlations are based on non-missing observations.

*$p < 0.05$.

**$p < 0.01$.

***$p < 0.001$.

Table 3

Path analysis estimating effects of parental monitoring future orientation and peer norms on drug use and delinquency ($n = 541$).

Outcome variable	Independent variable	Unstandardized regression coefficient (B)	Standardized error	Std. regression coefficient (β)
Delinquency	Parental monitoring	**−0.01**	**0,06**	**−0.10** *
	Future orientation	**−0.65**	**0.05**	**−0.21** ***
	Peer norms	**0.04**	**0.06**	**0.38** ***
	Gender	**−0.29**	**0.11**	**−0.27** **
	School lunches	−0.16	0.12	−0.14
	Sexuality	−0.25	0.13	−0.23
	Age	**−0.12**	**0.04**	**−0.11** ***
Drug use	Community V.	0.01	0.007	0.01
	Parental monitoring	**−0.02**	**0.06**	**−0.12** *
	Future orientation	−0.06	0.06	−0.02
	Peer norms	**0.04**	**0.07**	**0.40** ***
	Gender	−0.05	0.11	−0.05
	School lunches	0.13	0.12	0.12
	Sexuality	**0.40**	**0.15**	**−0.36** **
	Age	0.06	0.04	0.06
	Community V.	0.01	0.007	0.009
Mediators				
Parental monitoring	Gender	0.14	0.09	0.02
	School lunches	0.87	0.10	0.10
	Sexuality	**2.21**	**0.11**	**0.26** *
	Age	**−1.01**	**0.03**	**−0.12** ***
	Comminity V.	**−0.10**	**0.005**	**−0.01** *
Future orientation	Gender	**−0.06**	**0.09**	**−0.16** *
	School lunch	−0.02	0.10	−0.07
	Sexuality	0.03	0.12	0.09
	Age	**−0.02**	**0.03**	**−0.06** *

Outcome variable	Independent variable	Unstandardized regression coefficient (B)	Standardized error	Std. regression coefficient (β)
	Community V.	**−0.005**	**0.005**	**0.01** ***
Peer norms	Gender	**2.57**	**0.08**	**0.26** ***
	School lunch	−0.007	0.09	−0.007
	Sexuality	−1.06	0.10	−0.11
	Age	**1.14**	0.03	**0.12** ***
	Community V.	**0.51**	**0.004**	**0.05** ***

Goodness of fit statistics

CFI	WRMR	RMSEA
0.94	0.85	0.001

Model controlled for gender school lunch, community violence age and sexual orientation. Note: analysis is on non-missing observations.

Bold indicates statistical significance at

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$.