



# Longitudinal pathways from unconventional personal attributes in the late 20s to cannabis use prior to sexual intercourse in the late 30s



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## HIGHLIGHTS

- Unconventional personal attributes were associated with substance use.
- Substance use was associated with cannabis use prior to sexual intercourse.
- Unconventional personal attributes were associated with cannabis use prior to sex.

## ARTICLE INFO

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## ABSTRACT

A quarter of people living with human immunodeficiency virus (HIV) infection in the United States are women. Furthermore, African American and Hispanic/Latina women continue to be disproportionately affected by HIV, compared with women of other races/ethnicities. Cannabis use prior to intercourse may be associated with increased risky sexual behaviors which are highly related to HIV. The ultimate goal of this research is to better understand the relationships between unconventional personal attributes (e.g., risk-taking behaviors) in the late 20s, substance use (e.g., alcohol) in the mid 30s, and cannabis use prior to intercourse in the late 30s using a community sample; such an understanding may inform interventions. This study employing data from the Harlem Longitudinal Development Study includes 343 female participants (50% African Americans, 50% Puerto Ricans). Structural equation modeling indicated that unconventional personal attributes in the late 20s were associated with substance use in the mid 30s ( $\beta = 0.32, p < 0.001$ ), which in turn, was associated with cannabis use prior to sexual intercourse in the late 30s ( $\beta = 0.64, p < 0.001$ ). Unconventional personal attributes in the late 20s were also directly related to cannabis use prior to sexual intercourse in the late 30s ( $\beta = 0.39, p < 0.01$ ). The findings of this study suggest that interventions focused on decreasing unconventional personal attributes as well as substance use may reduce sexual risk behaviors among urban African American and Puerto Rican women. Also, the implications of this study for health care providers and researchers working in HIV prevention are that these precursors may be useful as patient screening tools.

## 1. Introduction

According to a report from the Centers for Disease Control and Prevention (CDC, 2015a), a quarter of people living with the human immunodeficiency virus (HIV) infection in the United States are women. African American and Hispanic/Latina women continue to be disproportionately infected by HIV, compared with women of other races/ethnicities. Of the total estimated number of women living with diagnosed HIV at the end of 2015, 26% were African Americans, and 5% were Hispanics/Latinas (CDC, 2015b). Heterosexual intercourse is the primary mode of HIV acquisition among women (CDC, 2015a). Risk factors for HIV infection among women of color include, but are not

limited to, lower education and income, marital status, drug use, history of sexually transmitted infections (STI), multiple sex partners, inconsistent condom use, and violent victimization (Adimora et al., 2006; Amaro & Raj, 2000; Javanbakht et al., 2010; McNair & Prather, 2004; Moreno, El-Bassel, & Morrill, 2007; Patrick, O'Malley, Johnston, Terry-McElrath, & Schulenberg, 2012; Royce, Krauss, & Silverman, 2010).

Most of the HIV epidemiologic and behavioral studies of women of color have focused on women who are at increased risk (e.g., STI clinic attendees), pregnant women (Rosenthal et al., 2014), and HIV-infected women (Hutton et al., 2013). Findings from those studies may not reflect the experiences of risks of heterosexually active women of color residing in an urban area who do not meet high-risk inclusion criteria.

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The current longitudinal study examines the pathways from unconventional personal attributes (e.g., risk-taking behaviors) in the late 20s to cannabis use prior to intercourse in the late 30s via substance use (e.g., alcohol) in the mid 30s using a community sample of African American and Puerto Rican women. The ultimate goal is to better understand the relationships between unconventional personal attributes, substance use, and cannabis use prior to intercourse among African American and Puerto Rican women; such an understanding may inform interventions.

Cannabis use potentially increases sexual desire (Gorzalka, Hill, & Chang, 2010) and has effects on cognitive ability such as decreased memory performance (Harvey et al., 2007; Thoma et al., 2011) and increased disinhibition (Skosnik, Spatz-Glenn, & Park, 2001). Limited laboratory research on cannabis administration demonstrates that acute cannabis use is associated with increased risky decision making (Lane, Cherek, Tcheremissine, Lieving, & Pietras, 2005). Therefore, it follows that cannabis use may be associated with increased risky sexual behaviors which are highly related to HIV/STI.

From a theoretical perspective, expectancy theory (Hays, 1985) may explain the mechanism underlying the use of cannabis before having sexual intercourse. Expectancy theory posits that positive outcome expectancies may originate from exposure to the conditioning stimuli associated with previous expectancies about the drug, physical dependence, personal and cultural beliefs about the drug effects and situational/environmental factors. Studies have also shown that young people hold sex-related cannabis expectancies such as sexual facilitation (Hendershot, Magnan, & Bryan, 2010; Schafer & Brown, 1991).

Investigators should be aware of the importance of research involving the administration of cannabis to women of color residing in an urban area who are sexually active. Also, treatment professionals and educators should be aware that cannabis use may be associated with HIV-related risk behaviors, and tailor interventions in accord with the findings of research. As a first step towards such research and interventions, the current study seeks to find the possible precursors of cannabis use prior to sexual intercourse.

Among the possible precursors of sexual risk behaviors are personal factors. More specifically, unconventional personal attributes such as rebelliousness and sensation seeking behaviors were associated with sexual risk behaviors. A research paper using a sample of undergraduate students showed that proactive rebelliousness was a particularly influential predictor of risky sexual activities (Lafreniere, Menna, & Cramer, 2013). In addition to rebelliousness, sensation seeking behaviors have been found to be related to risky sexual behaviors. A study with 2386 adult participants showed that sensation seeking was positively associated with drug use before or during sex (Charnigo et al., 2013).

A variety of adverse health behaviors has been found to be more common among rebellious compared with non-rebellious individuals, including: the use of alcohol (Lee, Brook, Nezia, & Brook, 2016; Scholes-Balog, Hemphill, Reid, Patton, & Toumbourou, 2013; Stautz & Cooper, 2013); smoking tobacco (Hwang & Park, 2015); smoking marijuana (McCabe, Louie, & King, 2015); and cocaine use (Hamil-Luker, Land, & Blau, 2004). Also, sensation seeking (defined as the tendency to enjoy and pursue exciting, risky activities) is associated with drinking alcohol (De Haan, Egberts, & Heerdink, 2015), cigarette smoking (Perkins et al., 2008; Spillane, Smith, & Kahler, 2010; Spillane et al., 2012), marijuana use (Meil et al., 2016), and other illicit drug use (Ballon, Brunault, & Cortese, 2015). The use of legal and/or illegal substances is then related to sexual risk behaviors (Benotsch, Snipes, Martin, & Bull, 2013).

Our study is unique since it is a longitudinal study beginning when the participants were about 19 years of age, and now extending to about 39 years old. This extensive period of time makes it possible to observe the participants over the span of three critical developmental stages (i.e., late teens, late 20s, and late 30s). Also, the current study used a community sample which is able to reflect the experiences of

risks of heterosexually active women of color residing in an urban area who do not meet high-risk inclusion criteria.

We hypothesized that: 1) Unconventional personal attributes in the late 20s will be associated with substance use in the mid 30s which in turn, will be related to cannabis use in the late 30s. 2) Unconventional personal attributes in the late 20s will be also directly related to cannabis use in the late 30s. 3) The pathways will be maintained after control on a number of HIV risk factors (e.g., condom use in late adolescence).

## 2. Methods

### 2.1. Participants

This study, a part of the Harlem Longitudinal Development Study (Lee, Brook, Finch, & Brook, 2016), includes 343 female participants (50% African Americans, 50% Puerto Ricans) who completed questionnaires at time 6 (T6). Data on the participants were first collected in 1990 (time 1; T1,  $N = 712$ ) when the participants were students attending schools in the East Harlem area of New York City. At T1, the questionnaires were administered in classrooms under the supervision of the study research staff with no teachers present. The mean age of the participants at T1 was 14.1 years (standard deviation;  $SD = 1.3$  years). At time 2 (T2; 1994–1996;  $N = 649$ ), the National Opinion Research Center interviewed the participants in person or by phone. The mean age of the participants at this wave was 19.2 years ( $SD = 1.5$  years). At time 3 (T3; 2000–2001;  $N = 335$  – due to budgetary limitations, we took a subsample of T2 participants), the Survey Research Center of the University of Michigan collected the data. The mean age of the participants at T3 was 24.4 years ( $SD = 1.3$  years). At time 4 (T4) and time 5 (T5), the data were collected by our research group. At T4 (2004–2006;  $N = 498$ ), the mean age was 29.2 years ( $SD = 1.4$  years). At T5 (2011–2013;  $N = 405$ ), the average age of the participants was 35.9 years ( $SD = 1.4$  years). At T6 (2014–2016;  $N = 343$ ), the mean age of the participants was 39.1 years ( $SD = 1.4$  years). The current study included data from the T2, T4, T5, and T6 waves.

The Institutional Review Board (IRB) of the New York University School of Medicine approved the study for T4, T5 and T6, and the IRBs of the Mount Sinai School of Medicine and New York Medical College approved the study for the earlier waves. A Certificate of Confidentiality was obtained from the National Institute on Drug Abuse for T1–T6. At each time wave, we obtained informed consent or consent from all of the participants. Additional information regarding the study methodology is available from a previous report (Lee, Brook, Finch, & Brook, 2015).

At T6, we attempted to follow up all those who participated at T2. We compared the demographic variables for the 343 female adults who participated at both T2 and T6 with the 306 who participated at T2 but not at T6. There was a difference between the T6 non-participants (60% African Americans, 40% Puerto Ricans) and the T6 participants (50% African Americans, 50% Puerto Ricans) in the proportion of African Americans and Puerto Ricans ( $\chi^2(1) = 4.88, p < 0.05$ ). However, the mean scores of condom use ( $t = -0.93, p = 0.35$ ) and sexual assault ( $t = -0.72, p = 0.47$ ) at age 19 among T6 non-participants was not significantly different from the mean score for the women who participated at T6.

### 2.2. Measures

#### 2.2.1. Control variables

- Condom use at age 19 was a single item: “How often were condoms used when you had sex?” using a 5-point Likert scale that ranged from “never” to “always.”
- Sexual assault at age 19 was a single item: “Have you been pushed by someone to have sex?” using a yes or a no answer option.

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