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High-risk drug use and sexual behaviors among out-of-treatment drug users: An aging and life course perspective

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ABSTRACT

High-risk injection drug use and its accompanying sexual behaviors have large social and financial costs. However, little is known about how age and age at first drug use are related to high-risk injection or sex behaviors. The current study draws on life course perspectives and data from the NIDA Cooperative Agreement to examine the relationship between eight high-risk behavior variables and age and age at first drug use. Random effects negative binomial regression models reveal that the frequency of high-risk sexual behaviors in the past month decreases up to 28% with each decade of age, although the frequency of high-risk injection behaviors in the past month *increases* by up to 62% with each decade of age. Both high-risk injection and high-risk sex behaviors are lower among those who initiated first drug use at later ages. Previous research has indicated the importance of interventions to reduce the high-risk sexual behaviors of older drug users. The current study suggests a refocusing of public health efforts on their high-risk injection habits.

1. Background

High-risk drug injection habits and the sexual practices that accompany them are estimated to be responsible for more than one-third of AIDS cases in the United States (Centers for Disease Control (CDC), 2002). These behaviors also facilitate the rapid spread of Hepatitis B and C, and can have devastating effects on the skin, veins, muscles, and joints (Burt et al., 2007; Ebright & Pieper, 2002; Estrada, 2002; Pieper, Kirsner, Templin, & Birk, 2007). Drug treatment, and outreach interventions to those not in treatment, are successful at reducing rates of high-risk behaviors among injection drug users (Hoffman, Klein, Clark, & Boyd, 1998; Metzger, Navaline, & Woody, 1998), especially when tailored to specific racial, ethnic, sex, or cultural groups (Battjes, Pickens, Haverkos, & Sloboda, 1994; Coyle, Needle, & Normand, 1998; Des Jarlais & Friedman, 1998; Holtgrave et al., 1995). However, despite the well established benefits of tailoring interventions to particular groups, there is limited knowledge about how age is associated with high-risk injection and sexual behaviors among out-of-treatment drug users.

Two aims guide our analyses. Our first aim is to examine the relationship between age and high-risk drug injection habits and patterns of sexual engagement among out-of-treatment drug users. Schoeneberger, Logan and Leukefeld (2001) find that compared to younger drug users (aged 30–39; $N = 643$), older users (aged 40–49; $N = 395$) were significantly more likely to have ever used any of the 10 drugs considered in the study and to have a higher lifetime prevalence of injecting drugs and giving money for sex. Kwiatkowski and Booth (2003) find that 76.2% of drug users younger than age 50 had sex in the past month compared to 59% of drug users over 50. However, they find no significant differences in the proportion of drug users reporting multiple partners, exchanging sex for money or drugs, having sex with an injection drug user, or using condoms. Thus, although a smaller percentage of older drug users are having sex, their sex practices are as risky as those of younger participants. In fact, Hartel, Schoenbaum, Lo, and Klein (2006) find that many substance abusers continue to use illicit drugs into their sixties. We extend prior research by using a larger, more geographically diverse sample, and individuals aged 18 to 81, to examine age patterns in risky drug use and sexual behaviors.

Our second aim is to examine the relationship between age at first drug use and high-risk drug injection habits and patterns of sexual engagement. Life course perspectives suggest that adverse events

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early in life can have a detrimental impact on health later in life (Hayward & Gorman, 2004; Ross & Wu, 1996). Thus, an earlier onset of drug use might be associated with increased levels of drug dependence and abuse, and risky injection practices and sex behaviors in later life. Indeed, an earlier onset of drug use is associated with increases in high-risk sexual behaviors among youth as they transition into adulthood (Shrier, Emans, Woods, & Durant, 1996; Tapert, Aarons, Sedlar, & Brown, 2001), and delaying the onset of drug use is associated with a 4% reduction in lifetime drug abuse and a 5% reduction in lifetime drug dependence (Grant and Dawson, 1998). Compared to those who begin injecting drugs later in life, those who begin injecting earlier in life have higher HIV prevalence rates and are more likely to engage in risky behaviors such as sharing needles and injecting in shooting galleries (Battjes, Leukefeld, & Pickens, 1992; Carneiro, Fuller, Doherty, & Vlahov, 1998). However, the research that investigates the relationship between age of onset of drug use and later high-risk behaviors is sparse, and we are aware of no studies that examine out-of-treatment drug users, a population that is at particular risk of contracting and spreading infectious diseases. Both prior research and life course theory suggest that an earlier onset of drug use should be associated with increased levels of risky injection practices and sex behaviors in later life.

2. Data and methods

The National Institute on Drug Abuse's (NIDA) Cooperative Agreement (CA) for AIDS Community-Based Outreach/Intervention Research Program collected data from 1992 to 1998 to evaluate interventions designed to reduce HIV risk behaviors (U.S. Department of Health and Human Services, 2001). Because of the illegal nature of their behavior, out-of-treatment drug users are difficult to recruit into research studies (Anglin, Caulkins, & Hser, 1993). The current dataset, with 31 088 respondents, is the largest publicly available dataset of its kind, and provides rich detail about participants' high-risk drug use and sex habits. Despite dating from 1992 to 1998, we are aware of no comparable data.

The data come from 23 Cooperative Agreement sites; 21 sites are in the United States, with one additional site each in Puerto Rico and Brazil. Respondents were recruited using targeted ethnographic and epidemiological sampling of areas with high drug use and HIV infection rates. Each month, sites attempted to recruit 35 multi-ethnic/racial drug injectors and crack users at risk for HIV, aiming for a sample that was at least 30% female. Table 1 summarizes the characteristics of the sample. Community outreach workers who were familiar with the local drug using community and who were typically recovering drug users themselves recruited participants from the areas around each CA site. The study required that participants were at least 18 years of age, had self-reported crack, cocaine, or injection drug use in the past 30 days, were not enrolled in treatment at intake, and were not interviewed by the National AIDS Demonstration Research Program or the CA in the past year. Interviewers collected information using an established NIDA questionnaire, the Risk Behavior Assessment (RBA). The RBA reliably ascertains self-reported data on drug use habits, patterns of sexual activity, health/medical history, drug treatment history, and demographic information among out-of-treatment drug users (Weatherby et al., 1994). Compensation varied by site, with participants generally receiving between $10 and $20 for completing the RBA.

Table 1
Demographic characteristics of the sample.

Demographic variables	Percent
Sex (%)	
Male	69.1
Race (%)	
Black	57.0
White	16.7
Hispanic	21.0
Other	5.3
Spanish spoken at interview (yes, %)	8.2
Homeless (yes, %)	28.3
Live with dependent child (yes, %)	25.6
Education (%)	
Less than HS graduation	44.7
HS graduation or GED	32.9
Trade/tech school, some college, or college grad	22.4
Spent time in jail or prison (yes, %)	78.8

2.1. Variables and measurement

For the present analyses, we used two categories of dependent variables: high-risk sex practice variables and high-risk injection drug use variables. Four dependent variables were used to examine respondents' high-risk sex behaviors in the past 30 days: the number of days respondents had sex (vaginal, oral, or anal), the number of different sex partners, the number of times respondents traded sex for drugs, and the number of unprotected sex acts (Schoeneberger et al., 2001). Four dependent variables were used to characterize high-risk injection drug use in the past 30 days: the number of times respondents injected drugs, the number of times respondents injected with used injection equipment, the number of times respondents loaned used injection equipment to another user, and the number of sex partners that were likely to be injectors. All of the dependent variables were count variables. For descriptive purposes, we also created a dichotomous variable that coded for those that had injected any drug in the past 30 days (henceforth, injectors) and those that had not injected in the past 30 days (non-injectors).

Our key independent variables were age and age at first drug use. Age was measured in single years (range 18 to 81) and divided by ten, so that we can interpret our results in terms of decades of life. Some analyses examine younger (less than 35 years of age) and older (aged 35 or older) adults separately by splitting the sample at approximately the median age. Participants reported their age at first use of ten drugs: alcohol, marijuana/hashish, smokable cocaine (crack), cocaine, heroin, speedball, nonprescription methadone, other opiates, amphetamines, and other drugs. Age at first drug use excluding alcohol and marijuana (henceforth referred to only as “age at first use”) divided by 10 indicated when participants initiated “hard” drug use.

We compared models that included age as linear, quadratic, and categorical (i.e., quintiles) variables. Table 2 shows that the Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) (Akaike, 1974; Raftery, 1986) generally preferred models where age is measured with linear and quadratic terms, or linear, quadratic and cubic terms. However, graphs (not shown) indicated relatively minor differences in the predicted values across model specifications. Thus, we relied on a linear specification of age to avoid over-fitting our models to the data, but we also present age-stratified analyses that allow the linear relationship between age, age at first use, and the risk behaviors to differ for older and younger adults.

We adjusted for key variables that were determined prior to the onset of drug use. Sex was coded as 0 for males or 1 for females. Race was coded categorically as non-Hispanic white (the referent), non-Hispanic black, Hispanic, and other. Language of interview was coded as 0 for English or 1 for Spanish. We also adjusted for several variables that may occur simultaneously with or after the age of first drug use and that might be associated with current drug use. Homeless status was coded as 0 for not homeless or 1 for homeless. A dichotomous variable indicated those who lived with a dependent child. Education was coded categorically as less than high school graduation (the referent), high school degree or GED, and some trade/technical school