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## Gender Differences in Circumstances Surrounding First Injection Experience of Rural Injection Drug Users in the United States

April M. Young<sup>a,b,\*</sup>, Nika Larian<sup>c</sup>, and Jennifer R. Havens<sup>b</sup>

April M. Young: amyoun2@emory.edu; Nika Larian: nika.larian@gmail.com; Jennifer R. Havens: Jennifer.havens@uky.edu

<sup>a</sup>Emory University Rollins School of Public Health, Department of Behavioral Sciences and Health Education, 1518 Clifton Road, Atlanta, Georgia USA 30322

<sup>b</sup>Center on Drug and Alcohol Research, Department of Behavioral Science, University of Kentucky College of Medicine, 333 Waller Avenue, Lexington, Kentucky USA 40504

<sup>c</sup>Transylvania University, Lexington, KY, 300 North Broadway, Lexington, Kentucky USA 40508

### Abstract

**Background**—Research has demonstrated that there can be substantial gender differences in circumstances surrounding initiation of injection drug use; however, little is known about the gendered dynamics of first injection in rural areas where syringe exchange is inaccessible or among those who predominantly inject prescription medications. The present study examines gender differences in first injection experience among rural residents who predominantly inject prescription opioids.

**Methods**—Interview-administered questionnaires collected data from a sample of injection drug users (n=394) recruited from Appalachian Kentucky using respondent-driven sampling.

**Results**—Women were more likely to have initiated injection due to social-pressure (p=0.001), received the drugs as a gift (p=0.011), initiated in their partner's home (p=0.004) and in their partner's presence (p<0.001), been injected by their partner (p<0.001), used an unclean syringe (p=0.026), and received the syringe from their partner (p<0.001). Women were also more likely to report having engaged in sexual intercourse before or after initiation (p<0.001). Men were more likely to have personally purchased the drugs (p=0.002), to have acquired the syringe from a pharmacy/clinic (p=0.004), and to have injected with a friend (p=0.001) or family member (p=0.020). Men were also more likely to have a friend administer the first injection (p=0.007).

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\*Corresponding Author: April M. Young, Center on Drug and Alcohol Research, University of Kentucky Department of Behavioral Science, 333 Waller Avenue, Lexington, Kentucky USA 40504, april.young@uky.edu, Phone: 859-323-6553; Fax: 859-323-5350.

#### Contributors

Jennifer Havens designed the study and wrote the protocol. Nika Larian conducted literature searches, provided summaries of previous research studies, and assisted with drafting the Introduction. April Young conducted the statistical analysis and drafted the complete manuscript. All authors contributed to and have approved the final manuscript.

#### Conflict of Interest

All authors have no conflict of interest in relation to this research.

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**Conclusions**—In this population of rural drug users, notable gender differences in injection initiation were observed. Social pressure played a more substantial role in women’s first injection experience, and male partners had an integral role in women’s initiation.

### Keywords

gender; injection drug use; nonmedical use of prescription drugs; risk behavior; rural

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## 1. INTRODUCTION

Injection drug use is a well-established risk factor for blood-borne infections such as HIV and hepatitis C (HCV; Alter, 2002; Centers for Disease Control and Prevention, 2009), as well as drug dependence (Gossop et al., 1994; Strang et al., 1999) and overdose (Gossop and Griffiths, 1996). Numerous contextual factors influence drug users’ likelihood of initiating injection, and the circumstances surrounding the first injection experience are often laden with complex sociocultural norms, particularly those associated with gender. While both sexes commonly report curiosity as the motivation for initiating, women are more likely to cite social network influences (e.g., desire to emulate network members’ behavior, experience pressure from network members, be encouraged by sexual partner) as a reason to start injecting (Frajzyngier et al., 2007). At first injection, women are less likely than men to administer the injection (Draus and Carlson, 2006; Evans et al., 2003; Frajzyngier et al., 2007; Goldsamt et al., 2010), more likely to share equipment (Barnard, 1993; Evans et al., 2003; Frajzyngier et al., 2007; Macrae and Aalto, 2000; Neaigus et al., 2007; Tortu et al., 2003), and more likely to be injected by men, particularly their sexual partners (Crofts et al., 1996; Diaz et al., 2002; Frajzyngier et al., 2007). Male partners also often facilitate women’s initiation by purchasing or obtaining the drugs (Bryant and Treloar, 2007; Simmons et al., 2012). These phenomena can be driven by gender norms (Davies et al., 1996; Simmons et al., 2012) and feelings of trust and intimacy (Davies et al., 1996; Macrae and Aalto, 2000; Martin, 2010; Neaigus et al., 1995; Simmons et al., 2012). The drug-using and sexual networks of female injection drug users often have greater overlap than do men’s, thus potentially exacerbating women’s risk of blood-borne infection (Latkin et al., 1998).

While these studies have provided insight into gender differences in injection practices in urban settings and among users of heroin, cocaine, and crack (e.g., (Bryant and Treloar, 2007; Frajzyngier et al., 2007; Simmons et al., 2012), little is known about gender differences in injection among rural drug users or among users who primarily inject prescription medications. Some research suggests that injection of prescription medications is more prevalent among drug users in rural areas compared to those from urban settings (Young et al., 2010), and that use of prescription opioids, particularly oxycodone, may hasten the transition from non-injection to injection (Young and Havens, 2011). Furthermore, most of the studies conducted to date on initiation of injection have been based in urban areas where syringe exchange programs are available and/or where possession of drug paraphernalia is not criminalized (Bryant and Treloar, 2007; Frajzyngier et al., 2007; Novelli et al., 2005; Sherman et al., 2005; Simmons et al., 2012). This may present a significant gap in understanding given evidence suggesting that syringe availability and policing practices can have a major influence on drug users’ ability to practice risk reduction (Cooper et al., 2005).

The present study was conducted in rural Appalachian Kentucky, where drug paraphernalia laws prohibit the possession of syringes and syringe exchange is unavailable (Kentucky Legislative Research Commission, 2005, 2010). Illicit prescription drug use is prevalent in this population (Kentucky State Epidemiological Outcomes Workgroup, 2011; Young et al., 2012; Zhang et al., 2008) and, unlike many urban populations examined in previous

research, the most common drug used at initiation of injection is oxycodone (Young and Havens, 2011). Furthermore, previous research has identified differences in use of illicit drugs such as heroin and marijuana in this population, speculatively attributed to complex gender norms, roles, and stereotypes (Shannon et al., 2011). No study to the authors' knowledge has examined gender differences in injection initiation in this population; therefore, the purpose of the present study was to describe and compare the first injection experience of male and female nonmedical users of prescription drugs recruited from rural Appalachia.

## 2. METHODS

Data were collected from drug users (n=503) enrolled in the ongoing Social Networks among Appalachian People (SNAP) study (sample and methods described elsewhere (Young and Havens, 2011)). Eligibility criteria included being at least 18 years of age, residing in Appalachian Kentucky, and having used at least one of the following to get high in the past 30 days: prescription opioids, heroin, crack/cocaine or methamphetamine. Respondent-driven sampling (Heckathorn, 1997, 2002) was used for recruitment and interviewer-administered questionnaires were used to collect self-reported data between November 2008 and August 2010. For the present analysis, only data from injection drug users (n=394; 231 men [59%]; 163 women [41%]) were included. The Institutional Review Board at the University of Kentucky approved the protocol.

Questions about first injection experience assessed the following: major reason for first injection (coding described in Table 1), location, drugs used, source of drugs used, source of syringe, cleanliness of the syringe, individuals present, sexual behavior before/after injection, who administered the injection, intoxication of self and/or the person administering the injection, and awareness of HIV risk posed by injection. Data on age at first injection, age of person who administered first injection (if applicable), and amount of time elapsed between the first injection and becoming a 'regular injector' were also collected. Finally, respondents were asked if they had ever initiated someone else to injection, and if so, whom. Gender-stratified analyses of continuous dependent variables were conducted using Mann-Whitney U-tests performed with SPSS 20.0 (Chicago, IL). Rao Scott chi-square analyses were conducted in SAS version 9.3 (Cary, NC) and weighted for RDS recruitment using individualized weights produced by RDS Analytical Tool (RDSAT) version 7.1 (Volz et al., 2012).

## 3. RESULTS

Contextual factors surrounding first injection are described in Tables 1 and 2. The median age for initiation of injection was 24 years. Approximately 36% reported that they never became a regular injector. The majority of men and women reported curiosity as the primary reason for first injection (71% and 58%, respectively), that their personal residence was the location for first injection (75% and 74%, respectively), that a friend was present (75% and 57%, respectively), and that they personally purchased the injected drugs (73% and 52%, respectively). The first injection was most commonly administered by a friend for both men (56%) and women (44%), though 30% of women reported that a partner had administered the injection and 26% of men reported they had administered their own. Among those who did not administer their own injection (n=311), 80% reported that the person injecting them was intoxicated at the time. For men and women, the most common source of the syringe used at first injection was a friend/acquaintance (42% and 37%, respectively), followed by a diabetic (22% and 18%, respectively). Overall, 10% reported that the syringe had previously been used.

As displayed in Table 1, women were significantly more likely to have initiated injection due to social-pressure (e.g., “felt pressured into it” or “wanted to be cool”;  $p=0.011$ ). Women were more likely to report having received the drugs for first injection as a gift ( $p=0.005$ ), and men were more likely to have purchased the drugs ( $p=0.002$ ). Women were also more likely to have initiated injection in their partner(s)’ home ( $p=0.004$ ) and in their partner(s)’ presence ( $p<0.001$ ), and were more likely to have engaged in sexual intercourse before or after first injection ( $p=0.045$  and  $p<0.001$ , respectively). In contrast, men were more likely to have initiated injection with a friend ( $p=0.001$ ), or with an immediate family member ( $p=0.020$ ).

Gender differences in administration of the first injection are described in Table 2. Women were more likely to report that their partner administered the first injection ( $p<0.001$ ), while men were more likely to report that it was administered by a friend ( $p=0.007$ ). The median age of the person administering the first injection was significantly older among women ( $p=0.007$ ). Women were more likely to report that the syringe had been previously used ( $p=0.026$ ). Women were more likely to report that the syringe was provided by a partner ( $p<0.001$ ), while men were more likely to have acquired theirs from a pharmacy/clinic ( $p=0.004$ ).

There were no gender differences in age at initiation, condition at injection, drugs used, or time elapsed from initiating to becoming a regular injector. Of note, 25% of participants reported having initiated someone else to injection, a behavior that was more common among men (31%) than women (18%,  $p=0.009$ ). Among those who had initiated someone to injection ( $n=100$ ), significantly more men (20%) reported having initiated a partner than did women (6%,  $p=0.015$ ). However, significantly more women (88%) than men (66%) reported having initiated a friend ( $p=0.019$ ).

#### 4. DISCUSSION

Few studies to date have examined the circumstances surrounding men and women’s injection initiation in settings where syringe exchange is unavailable, possession of drug paraphernalia is criminalized, and the predominant drugs of abuse are prescription opioids. In this rural sample of nonmedical users of prescription drugs, social factors played a larger role in women’s first injection experience than in men’s. Women were more likely to report social pressure as the primary reason for their first injection, were more likely to report that they received the drugs and syringes from someone else, and were less likely to have used a clean syringe. These findings are consistent with previous studies (e.g., Crofts et al., 1996; Diaz et al., 2002; Draus and Carlson, 2006; Evans et al., 2003; Frajzyngier et al., 2007; Goldsamt et al., 2010). Similarly consistent with previous research (Bryant and Treloar, 2006; Robertson et al., 2010; Simmons et al., 2012), the present study found that partners played an important role in women’s first injection experience. Women were more likely to report being with their partner and in their partner’s home during their first injection, that their partner administered the injection and provided the syringe, and that they had sexual intercourse before or after injecting.

The majority of men and women injected in their personal residences and acquired their needles from sources aside from pharmacies. These findings should be interpreted in light of contextual circumstances, as criminalization of syringe possession and strict regulation of needle provision (Kentucky Legislative Research Commission, 2005, 2010) may have prompted individuals to inject in more “private” spaces and to seek non-medical sources of syringes. The ubiquity of the syringe possession policy may underlie the absence of a gender-difference in injection location in this population. However, the finding that men were more likely to acquire the needle for their first injection from a pharmacy is notable,

and suggests that current policies may not have a uniform impact. Future qualitative research would be especially helpful in determining if there are gender differences in how drug users in this region are impacted by current drug policies and enforcement.

No gender differences in the types of drugs used at first injection, intoxication at first injection, length of time between first injection and “becoming a regular injector”, or age at first injection were observed. The latter finding is consistent with that of similar studies (Bryant and Treloar, 2007; Frajzyngier et al., 2007). Previous research in this population suggests that there was a spike in injection initiation around the year 1995. While causality cannot be determined, it is notable that this is when oxycodone entered the market and oxycodone has been associated with rapid transition from first use to injection in this population (Young and Havens, 2011). Thus, the absence of a gender-difference in age at first injection in this population may be a product of the pervasiveness of nonmedical use of oxycodone at the time of the interviews (2008–2010).

The findings from this study should be interpreted in the context of the study’s cross-sectional design and reliance on self-reported behavior. Despite limitations, however, the study is one of the first to provide insight into the gender dynamics of injection drug use in a rural setting. The data provide strong evidence that interventions aimed at preventing the initiation of injection in this setting should take into account social dynamics and gender norms. Interpersonal relationships, particularly women’s agency within relationships, are shaped by complex economic realities and sociopolitical forces; additional qualitative research would be especially valuable to exploring these dynamics and providing insight into the role that empowerment and structural-level intervention could play in curbing injection in this population. Findings from this study clearly suggest that programs targeting male partners should be considered and designed with the aim of reducing their personal risk for initiating injection, as well as their likelihood of facilitating the initiation of female partners. An ideal intervention in this setting would involve the establishment of a syringe exchange program; however, current policies prohibit this approach. In the short-term, interventions that align with or circumvent current policy, such as the promotion and distribution of bleach for needle cleaning and improved access to mental health and substance abuse treatment, will be necessary. To appropriately design such programs, more research is needed to fully capture the lived experience of these rural injection drug users and the circumstances surrounding their first injection.

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**Table 1**

Characteristics of first injection experience by gender (n=394)

	Total – n(%)	Male – n(%)	Female – n(%)	p-value
Age at first injection – median (IQR)	24.0 (20.0 – 30.0)	24.0 (20.0 – 28.0)	24.0 (20.0 – 30.0)	0.237
Reason for first injection				
Curiosity <sup>a</sup>	243 (65.5)	155 (71.1)	88 (57.5)	0.053
Social pressure <sup>b</sup>	59 (15.0)	23 (10.0)	36 (22.1)	0.011*
Emotional distress <sup>c</sup>	17 (4.3)	7 (3.0)	10 (6.1)	0.201
Transitioned from oral/nasal	30 (7.6)	23 (10.0)	7 (4.3)	0.130
Injection was normative <sup>d</sup>	18 (4.6)	7 (3.0)	11 (6.7)	0.196
Other	16 (4.1)	8 (3.5)	8 (3.5)	0.176
Condition at first injection				
Sober	194 (49.2)	114 (49.4)	80 (49.1)	0.813
Intoxicated (drugs or alcohol)	174 (44.2)	106 (45.9)	68 (41.7)	0.541
Ill from withdrawal	26 (6.6)	11 (4.8)	15 (9.2)	0.055
Source of drugs for first injection				
Received as a gift	134 (34.0)	61 (26.4)	73 (44.8)	0.005**
Purchased	253 (64.2)	168 (72.7)	85 (52.1)	0.002**
Other	7 (1.8)	2 (0.9)	5 (3.1)	--
Location of first injection				
Personal residence	294 (74.6)	173 (74.9)	121 (74.2)	0.936
Partner's home	21 (5.3)	3 (1.3)	18 (11.0)	0.004**
Dealer's home	5 (1.3)	4 (1.7)	1 (0.6)	--
Car	24 (6.1)	14 (6.1)	10 (6.1)	0.984
Party	15 (3.8)	12 (5.2)	3 (1.8)	0.023*
Public space	15 (3.8)	12 (5.2)	3 (1.8)	0.224
Hotel	5 (1.0)	2 (0.7)	3 (1.4)	--
Other	6 (1.5)	3 (1.3)	3 (1.3)	0.815
Who was present at first injection				
Alone	62 (15.7)	44 (19.0)	18 (11.0)	0.518
Friend	223 (67.2)	141 (75.4)	82 (56.6)	0.001**
Partner	66 (19.9)	13 (7.0)	53 (36.6)	<0.001**
Immediate family	20 (6.0)	16 (8.6)	4 (2.8)	0.020*
Extended family and/or in-laws	28 (8.4)	17 (9.1)	11 (7.6)	0.590
Other	8 (2.4)	6 (3.2)	2 (1.4)	--
Sexual behavior at first injection				
Before injecting	20 (5.1)	6 (2.6)	14 (8.6)	0.045*
After injecting	57 (14.5)	19 (8.2)	38 (23.3)	<0.001**
Aware of HIV risk posed by IDU	283 (71.8)	174 (75.3)	109 (66.9)	0.411
Time passed between becoming a regular injector				



	<b>Total – n(%)</b>	<b>Male – n(%)</b>	<b>Female – n(%)</b>	<b>p-value</b>
Never became a regular injector	142 (36.0)	82 (35.5)	60 (36.8)	0.462
Less than one week	114 (28.9)	61 (26.4)	53 (32.5)	0.475
Less than six months	85 (21.6)	52 (22.5)	33 (20.2)	0.534
Less than one year	17 (4.3)	13 (5.6)	4 (2.5)	0.188
Less than 5 years	29 (7.4)	18 (7.8)	11 (6.7)	0.652
More than 5 years	7 (1.8)	5 (2.2)	2 (1.2)	0.470

IQR: Interquartile range; IDU: injection drug use

\*  
p<0.05,

\*\*  
p<0.01

<sup>a</sup>Includes: “curious to know”, “didn’t know what to expect”, “felt adventuresome”

<sup>b</sup>Includes: “felt pressured into it”, “wanted to be cool”, “Sister talked [me] into it”

<sup>c</sup>Includes: “depressed/having problems”, “marital problems”

<sup>d</sup>Includes: “best friend/partner was [injecting] and [I] ... gave it a try”, “everyone was doing it”

**Table 2**

Characteristics of administration of first injection by gender (n=394)

	Total – n(%)	Male – n(%)	Female – n(%)	p-value
Person administering injection				
Self	83 (21.1)	59 (25.5)	24 (14.7)	0.291
Partner	57 (14.5)	8 (3.5)	49 (30.1)	<0.001**
Siblings	15 (3.8)	11 (4.8)	4 (2.5)	0.104
Extended family	25 (6.3)	15 (6.5)	10 (6.1)	0.591
Friend	201 (51.0)	129 (55.8)	72 (44.2)	0.007**
Other	13 (3.3)	9 (3.9)	4 (2.5)	0.942
Age of person administering injection (n=311) – median (IQR)	26.0 (22.0 – 32.0)	25.0 (22.0 – 30.0)	28.0 (24.0 – 35.0)	0.007**
Condition of person administering injection (n=311)				
Sober	56 (18.0)	37 (21.5)	19 (13.7)	0.295
Intoxicated (drugs or alcohol)	250 (80.4)	132 (76.7)	118 (84.9)	0.251
Ill from withdrawal	5 (1.6)	3 (1.7)	2 (1.4)	--
Source of syringe for first injection				
Partner	32 (8.1)	4 (1.7)	28 (17.2)	<0.001**
Family	50 (12.7)	30 (13.0)	20 (12.3)	0.107
Friend/acquaintance	158 (40.1)	97 (42.0)	61 (37.4)	0.480
Pharmacy/clinic	24 (6.1)	21 (9.1)	3 (1.8)	0.004**
Diabetic	81 (20.6)	51 (22.1)	30 (18.4)	0.288
Drug/syringe dealer	33 (8.4)	18 (7.8)	15 (9.2)	0.085
Other	16 (4.1)	10 (4.3)	6 (3.7)	0.993
Syringe had previously been used	38 (9.6)	16 (6.9)	22 (13.5)	0.026*

IQR: Interquartile range

\* p&lt;0.05,

\*\* p&lt;0.01