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Potential Risk Factors for Injecting Among Mexican American Non-Injecting Heroin Users

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SUMMARY

This study examines potential risk factors for resuming and transitioning to injecting among a prospective cohort of 300 Mexican American non-injecting heroin users (NIUs) with distinct injecting histories (i.e., never vs. former injectors). Overall, findings revealed NIUs with an injecting history are more likely to be at greater risk for resuming injecting practices. Of interest, scoring high on acculturation decreased the risk of being a former injector. The present analysis supports previous research, and more importantly further identifies potential risk factors for injecting that are unique to the cultural and social context of the Mexican American community.

Keywords

Non-injecting heroin; transitioning; injecting; Mexican Americans; acculturation

INTRODUCTION

Existing research has documented the numerous social and health consequences associated with injection drug use (IDU). For instance, injecting drug use has been associated with such health and social consequences as depression, suicidal ideation, incarceration, homelessness, Hepatitis C and of most consequential risk, HIV infection (Campbell et al., 2006; Chitwood et al., 2000; Des Jarlais et al., 1999; Havens, Sherman, Sapun, & Strathdee, 2006; Ochoa et al., 2005; Waldrop-Valverde, Ownby, & Kumar, 2005; Wood et al., 2005). Of the 33, 132 cases of HIV infection reported in 2004, 12 percent of adults and adolescents were IDU associated (Centers for Disease Control and Prevention, 2004). Specifically, those most widely affected by IDU associated HIV infection are racial and ethnic minority populations in the United States. In 2004, injection drug use HIV infection accounted for 23 percent of cases among Hispanics and 11 percent among African Americans compared to 6 percent among white adults and adolescents. One of the important new precursors of injecting use is sniffing or smoking heroin, a popular route among young Hispanic polydrug users. This paper explains the potential risk

factors associated with Mexican American non-injectors embedded in a community with a long history of injecting heroin use.

Rapid growth in non-injecting heroin use (NIU) has been reported in highly diverse cultural populations and social settings (Griffiths, Gossop, Powis, & Strang, 1992). This route of heroin administration has included different forms of non-injecting use, such as “sniffing,” smoking in cigarettes mixed with tobacco/cannabis and *shabanging* (“spraying” a mix of heroin and water into nasal cavities using a syringe). Among IDUs the increase in this new route of administration (NIU) may represent a decline in the spread of HIV among this population. Conversely, NIU may be a precursor to initiating injecting drug use among those who have never injected or through resuming the practice among those who are former injectors. Thus, the increase in transitioning to injecting has serious consequences for the epidemic spread of HIV and other blood borne pathogens into a cohort of heroin users at risk of initiating or resuming injecting practices.

Recently, a growing body of research has focused on the risks associated with making a transition to injecting among NIUs (Chitwood et al., 2000; De La Fuente, Barrio, Royuela, & Bravo, 1997; Des Jarlais et al., 1999; Neaigus et al., 2006; Neaigus et al., 2001). Many of these studies have found that former injectors are at greater risk of making a transition to injecting compared to those who have never injected. Factors associated with these former injectors resuming and transitioning to injecting include such characteristics as being older male users, younger age of first heroin use, longer duration of use, and greater heroin dependence (Des Jarlais, Casriel, Friedman, & Rosenblum, 1992; Griffiths, Gossop, Powis, & Strang, 1994; Neaigus et al., 2001; van Ameijden, van den Hoek, & Coutinho, 1994). This same research has also identified having drug and sexual networks that include injectors as factors associated with transitioning. Furthermore, individual susceptibility such as personal traumatic events, fear of HIV/AIDS, not being afraid of needles and attitudes about injectors have been identified as important risks for making a transition (Bravo, Barrio, & de la Fuente, 2003; Casriel, Des Jarlais, Rodriguez, Friedman, & Khurl, 1990; Neaigus, Atillasoy, & Friedman, 1998; Sotharan, Goldsmith, Blasco, & Friedman, 1999).

Among Hispanics who comprise a heterogeneous population by ethnicity, generation, and region of residence only limited research has been done on non-injecting heroin users. Two existing studies have included sub-samples of Hispanic NIUs including Puerto Ricans in New York City (37%) and Puerto Ricans and Dominicans in Miami (26%) (Chitwood et al., 2000; Neaigus et al., 2001). These studies have begun to provide evidence of the association of ethnicity and injection history. For instance, in New York City, Puerto Rican NIUs were found to be overrepresented among frequent former injectors (Neaigus et al., 2001).

More recently, Mexican Americans in San Antonio have experienced an increase in non-injecting heroin use among a drug-using population that has consistently been characterized by high rates of drug injecting (ADAM, 1998; Desmond & Maddux, 1984; DUF, 1995, 1996). Before the 1990’s, heroin use in this city as in others was almost exclusively by injection (Bullington, 1977; Casavantes, 1976; Desmond & Maddux, 1984; Moore, 1978). Much of this was associated with a distinct heroin subculture developed over the last fifty years in Southwestern cities and towns, including San Antonio among Mexican American users or *tecatos*. The term *tecatos* tends to denote a chronic or career injecting heroin user with a criminal orientation and repeated involvement with the criminal justice system. As a result, in these communities *tecatos* have developed a distinct street identity that revolves around a “pachuco” lifestyle characterized by heroin use, criminality, incarceration, and distinct style of dress, tattoos, and street-based social networks.

In the early 90's there was evidence of changes in heroin and other drug markets that led to increases in the supply, accessibility, and purity of powdered "brown" heroin that could be used non-intravenously (Valdez & Sifaneck, 2004). Previously, Mexican black tar was the heroin most available in this market, however, it requires an extensive process in preparing it for non-intravenous use. This new form of administration has increased the relatively young Mexican American heroin using population that tended to reject the traditional tecato lifestyle or were adverse to injecting. This young NIU population is at risk for potentially transitioning or resume injecting especially within the context of a poly-drug using low-income Mexican American barrio. These behaviors increase the number of Mexican American and other Hispanic IDUs at risk of acquiring or transmitting HIV and other blood-borne diseases.

Among NIUs, those with a history of injecting, Hispanics have the highest risk of transitioning to injecting. Given this and the health consequences, there is a considerable need to assess the extent to which Hispanic NIUs with a history of being former injectors are at risk of resuming injecting practices. In this analyses, we examine potential risk factors for transitioning to injecting including heroin use patterns, drug and sex IDU partners, personal susceptibility, perceived susceptibility and attitudinal factors by injecting history differences (i.e., never vs. former). As importantly, we will examine how acculturation may be a distinct risk factor among Mexican Americans. These risk factors may be different from other populations of NIUs, given the long history and cultural context of heroin use among Mexican-Americans. Furthermore, of significance, is that by conducting the present research among Mexican Americans in San Antonio this analysis will enhance the generalizability of the study to a larger and more diverse population of Hispanic NIUs and newly transitioned injectors in the U.S.¹

METHODS

Study Design

Data for this analysis are from baseline structured interviews with 300 Mexican American non-injecting heroin users in San Antonio. The purpose of the study is to investigate the incidence and risk factors for making a transition to injecting and the prevalence and incidence for infection with blood borne and sexually transmitted infections (HIV, HBV and HCV). The prospective cohort study design consists of a baseline interview with two follow up interviews at six-month intervals. The present analysis focuses on injecting history at baseline defined as either never injectors (those who have never injected) or former injectors (those who were former IDU, have not injected in prior 6 months and are currently non-injectors).

Study Setting

San Antonio, Texas is located 140 miles from the U.S.-Mexico border. The population in 2000 was estimated at 1.2 million, with approximately 60 percent of Mexican descent (U.S. Bureau of the Census, 2000). The city's economic base is centered on service and tourism, and is sustained by one of the lowest wage structures in the United States. Compared to other cities, San Antonio has one of the largest populations of "working poor." Poverty is largely a Mexican-American phenomenon with 28% of that group below the poverty line compared to 19% of the total general population (U.S. Bureau of the Census, 2001). Among cities with large U.S. Mexican populations, San Antonio is one of three cities with a relatively low percentage of foreign-born Hispanics.

¹This research is a replication of a study entitled "HIV Risk and Transitions from Non-Injecting Heroin Use" conducted in New York City that included a subsample of Puerto Ricans.

Sampling

The study used an adaptive sampling methodology that included a combination of several techniques that the authors have employed in prior studies of non-treatment populations. It combines elements of a field-intensive outreach methodology with a targeted respondent-driven sampling design (Booth, Watters, & Chitwood, 1993; Broadhead, Heckathorn, Grund, Stern, & Anthony, 1995; Carlson, Wang, Siegal, Falck, & Guo, 1994; Clatts, Davis, & Atillasoy, 1995; Heckathorn, 1997; Kaplan & Korf, 1987; Sifaneck & Neaigus, 2001; TenHouten, 1992; Watters & Biernacki, 1989; Yin, Valdez, Mata, & Kaplan, 1996).

Respondents were recruited from the South and West sides of San Antonio. The study was delimited to these two areas of the city, which are the centers of commerce and residency for San Antonio's Mexican American population. The areas also have the highest concentration of poverty and delinquent behavior including street gang activity (Kasarda, 1993). During the summer of 2001, outreach specialist began social mapping of these two areas by identifying potential recruitment locations including heroin acquisition and using sites. During different times of the day and week, outreach specialist conducted regular sweeps of the neighborhoods identifying potential respondents, key informants and contacts. In conducting this initial fieldwork, outreach specialists were able to establish "an ethnographic presence" (Sifaneck & Neaigus, 2001) and maintain a high visibility within the targeted neighborhoods to help legitimize the project in the community. After this was accomplished, the outreach specialists began to make contacts with the non-injecting heroin users, gain their trust, and obtain access to their social networks. The primary goals of the field workers were to establish rapport with the NIUs, maintain non-judgmental attitudes, and to promote candid and accurate reporting by respondents during data collection and the interview process. During the course of recruiting respondents, outreach specialists documented observations in weekly fieldnotes that were discussed with the research team.

In addition to the field intensive outreach methodology, the study also recruited respondents using respondent-driven sampling. Incentives Sothers. Potential respondents were identified in the network section of the questionnaire in which respondents were asked to nominate individuals who are members of their heroin-using networks. Within this network, respondents were asked whether the network member is a current (last 30 days) non-injecting heroin user. First names or "street" names of these nominated individuals were collected. Respondents were then given a numbered coupon for each potentially eligible network member and asked to help recruit one or more identified members to take part in the study. In order to prevent biasing the sample with respondents who are referred by index subjects with large networks, the number of referrals per index subject was limited to two. Finally, the respondent-recruiter was rewarded if the potential respondent came to the research field office to be screened and was eligible for the study.

Inclusion criteria for entry into the baseline cohort were 16 years of age through 40 years for females and 35 years for males, self-report Mexican American ethnic background, no participation in formal drug treatment in 30 days prior, used noninjected heroin 30 days prior, and either never injected drugs or if a former injector, had not done so in the prior 6 months. Biological confirmation was conducted using the Varian On-Trak Test Stik (Mor) or hair toxicology tests to detect opiate use in the past 30 days. Trained paraprofessional outreach specialists conducted informal field screening of potential subjects in the field. For instance, since most IDUs inject in their arms, respondents were asked to show arms to staff for signs of fresh venipunctures or scarring. If staff observed evidence of recent injecting, subjects were rendered ineligible.

Study Variables

The face-to-face interviews were administered in private by trained interviewers using a modified version of the New York structured questionnaire. The interview was between 2-3 hours in duration and collected self-report data on demographic characteristics, drug use and injecting behavior history, medical history, drug markets, social and risk networks and other personal susceptibility measures. Participants were compensated \$35 for their time and effort at the completion of the baseline interview.

For the purposes of this analysis, the injection drug use history variable was obtained by asking subjects to report how many times they had injected drugs in their lifetime. As a preface to this question, subjects were informed that injecting included intravenous (injecting into the veins), intramuscular (injecting into muscles) and subcutaneous (skin popping) injecting by themselves or by someone else. The injection of legally prescribed drugs was excluded from the definition. Given that it would be highly unlikely that subjects could provide the precise number of times they had injected, six fixed categorical choices were provided ranging from never to 1000 times or more. From these, two groups representing the drug injecting history were developed and coded as 0 = never injector and 1 = former injector (former IDU who reported injecting one or more times during their lifetime).

The two injecting experience groups were compared on selected variables associated with possible risk factors for transitioning to injecting. Duration of heroin use variable was constructed by subtracting the age at which heroin was first used from current age. The mean age of initiation of heroin use was also used as a measure for prior history. Heroin use, drug market experiences and characteristics of heroin use and sexual partners were measured for the 30 days prior to the baseline interview. Perceived severity of heroin dependence was measured in the month prior to the baseline using the Severity of Dependence Scale (SDS) (Gossop, Griffiths, Powis, & Strang, 1992). A cutoff of 6 or above was used to indicate heroin dependence. The alpha coefficient for the scale among this population was .84.

Several personal susceptibility indicators were included in the analysis. Depression in the 30 days prior to the baseline interview was measured using a shortened eight-item version of the Center for Epidemiological Studies Depression Scale (CES-D) (Melchior, Huba, Brown, & Reback, 1993; Radloff, 1977). Individuals scoring 7 or higher were considered to have clinically significant levels of depressive symptoms. Among this population the alpha coefficient for the scale was .94. Lifetime reports of physical abuse, sexual abuse and attempted suicide were also utilized as personal susceptibility indicators. Perceived susceptibility for HIV, HBV and HCV and engaging in injecting drug use were measured using a five-point scale ranging from 1 to 5.

Finally, the Short Acculturation Scale was administered to the sample (Marin, Sabogal, VanOss Marin, Otero-Sabogal, & Perez-Stable, 1987). The measure is a five point Likert type scale that assesses acculturation among Hispanics as measured by modifications in their values, norms, attitudes and behaviors as a result of exposure to the mainstream cultural patterns of United States. More specifically, the items address English language proficiency, preference for speaking English versus Spanish, preference for English versus Spanish media, and preferred ethnicity of individuals with whom the respondent interacts. A cut-off score of 2.99 or less is considered to indicate a less acculturated individual while those above 2.99 are considered highly acculturated. The alpha coefficient in previous research has been reported to be .92. In this population the alpha coefficient was .84. While much existing research has provided evidence of the relationship between acculturation as measured by immigration status and illicit drug use, few have focused on differences among U.S. born Hispanics (De La Rosa, Vega, & Radisch, 2000; Vega, Scribney, & Achara-Abrahams, 2003). This research will begin

to understand the effect of acculturation as a potential risk factor for transitioning to injecting among U.S. Mexican Americans.

Analysis

Comparisons on the dependent variables were analyzed controlling for age, since this variable was associated with the level of prior injecting experience and thus may be associated with differences between the injecting history groups. For these purposes, a continuous age variable was used as a control. Since women who are former injectors may be more likely to have IDU sex partners and have a history of sexual abuse, depression, and other traumatic events, respective analyses were stratified by gender (Anglin, Hser, & McGlothlin, 1987; Miller, 1999; Nichols, 1985; Prather & Fidell, 1978; Rosenbaum, 1981). Univariate analysis of differences between the injection history groups on dichotomous categorical variables were conducted using chi-square test and multivariate analysis using logistic regression controlling for age. T-tests were used to examine differences between the means of continuous variables. In the multivariate analysis, adjusted odds ratios (AOR) with 95% confidence intervals (95% CI) were estimated. Statistical significance is $p < .05$ and all analyses were conducted using SPSS 13.0.

RESULTS

Sample Characteristics

The sample consisted of 300 non-injecting Mexican American heroin users in San Antonio, Texas. Of these, 79 percent ($n = 238$) were never injectors and 21 percent ($n = 62$) were identified as former injectors. As seen in Table 1, the sample was predominantly male with a larger proportion of them reporting former injecting histories (77%; $p < .033$). Mean age of the sample was 22 years ($SD = 4.9$) with females significantly older (23 years) than males (21 years) ($t = 3.4$, $p < .001$). The mean age of the never injectors (21 years, $SD = 4.4$) was significantly lower than that of the former injectors (24 years, $SD = 6.2$, $t = -4.1$, $p < .000$). The mean number of years for education was 9.7 with 11 percent of the sample currently enrolled in school. Of those not in school ($n = 266$), 14 percent had graduated from high school while the remaining 86 percent had not. The majority of the sample indicated being single (56%) with approximately 31% reporting being in a common law relationship. Over 60 percent of the sample reported having children of their own but there were no differences by injecting history.

Additional demographic characteristics reveal that an overwhelming majority (76%) of the sample are unemployed. Income in the last 30 days ranged from 0 to \$999 for 63 percent of the sample. While only 39 percent of their income came from a job, the remaining reported their sources of income from family, illegal activities, i.e., drug selling and public assistance. A unique characteristic of this NIU sample is the percentage of respondents who did not identify as current gang members (85%). Compared with former injectors, a larger proportion of never injectors did not self-identify as gang members. Furthermore, 60 percent reported having been on parole or probation at least once during their lifetime with 26 percent currently in this status. A significantly larger proportion of former injectors reported lifetime parole/probation status (71%; $p < .052$).

Heroin Use and Related Variables

Selected heroin and other related variables are presented in Table 2. Prior history of heroin use was examined using two measures. The first, mean number of years since starting to use heroin, was positively associated with injecting experience with former injectors using heroin for a significantly longer period of time (6.9 years vs. 3.3) $p < .000$. Having used heroin for 4 or more years increased the risk of being a former injector (AOR = 3.7, 95% CI = 1.6, 8.7). A

second measure although not significant indicated that former injectors initiated heroin use at a slightly younger age (17.5 years) than never injectors (18.2 years, $p < .228$). Furthermore, approximately 54 percent of the respondents reported daily use of heroin during the past month. However, no significant differences were observed by injecting experience categories for frequency and volume of current (prior 30 days) heroin use. Similarly, no differences were found by injecting experience with route of heroin administration, with over 80 percent in each group reporting using heroin always through sniffing during the 30 days prior to the interview.

Over 30 percent of the respondents reported a score of 6 or higher on the SDS scale, indicating perceived dependence on heroin. No significant differences by injecting experience were observed, however. Overall, the mean SDS score for this population of Mexican American non-injecting heroin users was 4.2 ($SD = 3.7$, range = 0 to 14, median = 3).

In regards to heroin market experience, seventy-five percent of the sample reported the quality of heroin as being “good” or “very good.” Of interest, the never injectors (78%) were slightly more likely to provide a more positive assessment of the quality of heroin compared to the former (66%) injectors. The quantity of heroin available on the street was apparently not an issue for almost all respondents. Overall, 96 percent reported that it was “enough” or “more than enough” with no differences found by injecting experience. Findings associated with the Short Acculturation Scale revealed significant differences by injecting history. The mean score of the never injectors (3.4) was significantly higher, indicating high acculturation in comparison to that of the former injectors (2.9, $SD = .7$, $t = 4.8$, $p < .000$). Furthermore, analyses revealed that being highly acculturated decreased the risk of being a former injector ($AOR = 0.3$, 95% $CI = 0.2, 0.7$).

Heroin Use Networks and Sex Networks with IDUs

Table 3 shows the extent to which the NIU sample reported using heroin or having sex with IDUs in the prior 30 days. Former injectors were more likely to have used non-injecting heroin with an ever IDU ($\chi^2 = 18.3$, $p < .000$). Those who reported using noninjected heroin with an ever IDU were almost three times more likely to be former injectors ($AOR = 2.7$, 95% $CI = .09, 8.1$; $p < .05$). Further analysis revealed that twenty-one percent indicated using non-injecting heroin with current IDUs, but this did not differ by injecting history.

Stratified analysis by gender for the relationship between injection experience and having IDU sex partner were conducted. Women were more likely than men to report having a sex partner who had ever injected (18% vs. 3%, $\chi^2 = 18.1$, $p < .000$) and who was a current IDU sex partner (9% vs. 1%, $\chi^2 = 8.6$, $p < .003$). In the stratified analysis for women, those who reported having a sex partner who was an “ever” IDU were significantly more likely to be former injectors compared to those who did not report this type of partner ($AOR = 10.5$, 95% $CI = 2.0, 54.6$; $p < .00$).

Personal Susceptibility

Indicators of personal susceptibility, stratified by gender are presented in Table 4. Women were much more likely to report having been sexually abused, with 33 percent reporting such abuse compared to 8 percent of men ($\chi^2 = 31.2$, $p < .000$). A similar trend was observed for physical abuse with 20 and 11 percent for women and men, respectively ($\chi^2 = 3.9$, $p < .046$). The prevalence for attempted suicide was substantially high for both female and male samples. However, although not statistically significant, the men were more likely to report that they had tried to commit suicide compared to females (39% vs. 36%). Based on the short version of the CES-D scale, a substantial percentage scored 7 or above for the prior 30 days, indicating that they were clinically depressed. Women were more likely than men to report being depressed with 53 percent scoring at or above the cut-off point compared to 24 percent of men

($\chi^2 = 24.8$, $p < .000$). Among the male sample, having been exposed to sexual abuse and attempted suicide increased the risk of being a former injector. For the female sample, with the exception of physical abuse, the presence of the identified personal susceptibility factors increased their risk for being a former injector.

Perceived Susceptibility for Acquiring HIV, HBV and HCV

As shown in Table 5, perceived susceptibility for acquiring HIV, HBV and HCV were more prevalent among former injectors than among those NIUs who have never injected. For instance, former injectors were almost twice as likely to report that they thought they had a “medium” or “very high” chance of getting infected with HIV. Significant differences by injecting history were only observed for getting infected with HCV or HBV. That is those that reported they thought they had a “medium” or “very high” chance of getting infected with HBV or HCV were more than four times as likely to be former injectors (AOR = 4.3, 95% CI = 1.9, 10.1; $p < .001$).

Attitudes About Needle Use and Injecting Drugs

Table 6 presents a strong, positive association between injection history and not being afraid of injecting one self with needles (AOR = 13.9, 95% CI = 6.2, 31.4; $p < .000$). Among former injectors 51 percent were not at all afraid of injecting themselves compared to six percent of never injectors. Thirteen percent of former injectors reported that their friends think that injecting drugs is acceptable. Thirteen percent of the former injectors also reported perceiving their chances of injecting drugs in the next 6 months as “medium” or “very high.” Those that reported they felt “quite worried” or “extremely worried” about injecting drugs in the next 6 months were more likely to be former injectors (AOR = 18.3, 95% CI = 4.3, 77.9; $p < .000$).

DISCUSSION

The present analysis supports previous findings on risk to injecting, and further identifies potential risk factors that are unique to the cultural and social context of the Mexican American community. Early studies have found that acculturation has been widely associated with higher rates of drug use among Hispanics (Vega, Zimmerman, Warheit, & Andres, 2002). In this analysis, however, acculturation was a protective factor for engaging in injecting heroin use practices. That is, being highly acculturated was found to decrease the risk of being a former injector among this population of Mexican American NIUs.

Within this context, the association between acculturation and injecting history may be influenced by the distinct *tecato* subculture that is deeply embedded in traditional styles of dress, language and a street orientation. Never injectors may be less acculturated because of their exposure to the tecatos subculture’s adaptation and use of Spanish “slang” language and highly identifiable religious/cultural symbols (i.e., *Virgen de Guadalupe*, Mexican flag, etc.). Contributing to this process is that former injectors were older and have a longer history of injecting heroin use and may be insulated within this subculture. By contrast, the more acculturated never injectors may be less committed to these cultural values associated with the *tecato* lifestyle.

Another factor contributing to this acculturation phenomena is the relatively young age of this Mexican American NIU population. Older former injectors have been found to be more likely to have initiated use earlier, longer history of use and early adoption of injecting practices as route of administration (Neaigus et al., 2001). In contrast, the present analysis reveals a relatively young (early twenties) Mexican American NIU population. These relatively younger NIUs may view sniffing as opposed to injecting, as a way in which to use heroin and avoid the adverse negative association with this lifestyle (i.e., addiction, criminal involvement,

incarceration, HIV infection, etc.) and to a lesser extent their ethnicity. This young age is reflective of the distinct socio-historical experiences with heroin in this community that has resulted to some extent in the generational transmission of heroin use. This study's findings reveal that the risk of being a former injector increases if the individual used heroin for four or more years. Thus, the longer history of continued use confounded by the relatively young age makes this former injector NIU population highly susceptible for resuming injecting practices.

Another cultural characteristic of the Mexican Americans that may potentially contribute to increase the risk of former injectors resuming injecting heroin is the traditional value of fatalism. This refers to the belief among more traditional Hispanics that one's destiny is determined by fate and is therefore inevitable (Medina, 1987). Former injectors in this study were more likely to not be afraid of injecting themselves with needles, concerned for becoming infected with HCV, and expressed a strong belief they will resume injecting practices in the near future. These attitudes were in contrast to the younger, less acculturated NIUs who were not former injectors. The former injectors' perceived susceptibility and attitudes about injecting have created a sense of fatalism that points to the resumption of injecting practices.

Prior research has indicated, former injectors are more likely to have IDUs in their networks and are thus subject to the influence of resuming injection practices (Des Jarlais, Casriel, Friedman, & Rosenblum, 1992; Strang, Grif, Powis, & Gossop, 1999; van Ameijden, van den Hoek, Hartgers, & Coutinho, 1994). A similar pattern was observed in this Mexican American population. Because of the greater likelihood of having former IDUs in their heroin use network, former injectors are more likely to resume injecting practices. Within a community with a relatively high density of injecting drug users, these NIU drug networks are more likely to have IDUs.

For females, there was a greater likelihood for former injectors to have former IDUs as sex partners thus potentially increasing the risk for resuming injecting. This is particularly important in light of the fact that the introduction and initiation of heroin use through male sex partners has been well documented in existing studies of Hispanic female addicts (Moore, 1990; Valdez, Kaplan, & Cepeda, 2000). Mexican American women NIUs thus, may be more prone to the influence of IDU sex partners in transitioning or resuming injecting practices than other non-Hispanic women. This may be reinforced by the importance Hispanic women place on the cultural norm of "connectedness" or maintaining relationships with men (Amaro, 1995). This research has found that women's need for connection with men prevents them from negotiating safer sex practices that are characteristic of non-traditional female gender roles that put them at increased risk for sexually transmitted infections (i.e., HIV, gonorrhea, etc.).

Lastly, these NIUs are embedded within a socio-economic environment that is an exposure risk, independent from the risks stemming from their injecting history. The scarcity of meaningful employment and social opportunities within the community shapes the behaviors of these drug users. Within this context, economic realities necessitate that these non-injectors create and maintain bonds and share resources among the existing drug networks that oftentimes include former injectors. Thus, the potential risk factors that may help to explain former injectors' susceptibility of resuming and making a transition to injecting needs to be taken into account given the social, economic and cultural context of these San Antonio neighborhoods.

The findings in this paper are subject to some key limitations. Respondents were street-recruited and cannot be generalized to other non-injecting heroin populations. While injecting history was based on self-report and observational methods, there remains the possibility that some prior injectors may have reported to be never injectors. Self-reports, however, have been

found to have good reliability and validity in reporting HIV risk behaviors in previous research (McElrath, Chitwood, Griffin, & Comerford, 1994; Neaigus et al., 2001).

This research contributes to existing studies on NIUs in that it begins to identify cultural and community norms that may potentially promote or prevent a transition to injecting that are unique to this Hispanic population. Future research on NIUs needs to take into consideration the cultural context in which the risk for transitioning is occurring in order to develop intervention strategies culturally appropriate for the Mexican American population.

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TABLE 1
Mexican American Non-injecting Heroin Users by Injecting History

Variable	Total %		Never (n = 238)		Former (n = 62)		P-value
	N	%	N	%	N	%	
Sex							
Male	150	(66)	48	(63)	48	(77)	.033
Female	88	(34)	14	(37)	14	(23)	
Age							
≤ 20	127	(50)	22	(53)	22	(36)	.012
≥ 21	111	(50)	40	(47)	40	(64)	
Graduated high school							
Yes	31	(14)	10	(13)	10	(16)	.511
No	205	(86)	51	(87)	51	(84)	
Marital status							1.00
Single	133	(56)	35	(56)	35	(57)	
Married	12	(5)	3	(5)	3	(4)	
Separated/Divorced	19	(8)	5	(8)	5	(8)	
Common Law	74	(31)	19	(31)	19	(31)	
Have Children							.200
Yes	142	(62)	42	(60)	42	(69)	
No	95	(38)	19	(40)	19	(31)	
Employment status							.326
Employed	61	(24)	12	(26)	12	(20)	
Not employed	176	(76)	49	(74)	49	(80)	
Current member of gang							.007
Yes	29	(15)	16	(12)	16	(26)	
No	209	(85)	46	(88)	46	(74)	
Current parole/Probation							.071
Yes	32	(26)	16	(23)	16	(36)	
No	109	(74)	28	(77)	28	(64)	
Lifetime parole/Probation							.052
Yes	136	(60)	44	(57)	44	(71)	
No	101	(40)	18	(43)	18	(29)	
Income past month							.926
\$0 - \$999	150	(63)	39	(63)	39	(64)	
\$1000 or more	87	(37)	22	(37)	22	(36)	

TABLE 2
Selected Variables for Mexican American Non-Injecting Heroin Users by Injecting History

	Total % N = 300	Never Injectors % AOR ^a N = 238	Former Injectors % AOR N = 62
Prior history of heroin use			
Four or more years since started to use heroin**	44		
Mean age at first heroin use 18 or older	45	1.0	3.7 (1.6, 8.7)
Heroin use (prior 30 days)			0.6 (0.2, 1.6)
Daily user	54	1.0	
≥ 2 bags per day	32	1.0	1.3 (0.6, 2.7)
Sniffing (intranasal) always	83	1.0	0.7 (0.3, 1.5)
Severity of heroin dependence (prior 30 days)			1.6 (0.6, 4.5)
Severity of heroin dependence score ≥ 6 on SDS scale	34	1.0	
Heroin market experience (prior 30 days)			1.6 (0.7, 3.3)
Quality is good or very good	75	1.0	
Quantity available on the street is enough or more than enough	96	1.0	0.5 (0.2, 1.0)
Drug Use			0.8 (0.2, 4.4)
Marijuana	83	1.0	1.5 (0.6, 4.1)
Acculturation			
Score 3 and Above on Short Acculturation Scale***	71	1.0	0.3 (0.2, 0.7)

**
p < . 01.

^a AOR are adjusted for age.

Heroin Use with IDUs by Injecting History, and Sex Partners with IDUs by Injecting History Among Mexican American Non-Injecting Heroin Using Women

TABLE 3

	Total % N = 300	Never Injectors % AOR ^a N = 238	Former Injectors % AOR N = 62
Heroin use with IDUs			
Use non-injected heroin with ever IDUs [*]	25	20	47
Use non-injected heroin with current IDUs	21	16	39
Sex partners with IDUs (women)	N = 102	N = 88	N = 14
Sex partner is an ever IDU ^{**}	18	13	46
Sex partner is a current IDU	9	8	15

**
p < .01

*
p < .05

^a AOR are adjusted for age.

Personal Susceptibility Indicators by Injecting History and Stratified by Gender Among Mexican American Non-Injecting Heroin Users

TABLE 4

	Total %	Never Injectors % AOR ^a	Former Injectors % AOR
Women	N= 102	N = 88	N= 14
Ever abused sexually	33	30	54
Ever abused physically	20	18	29
Ever try suicide	36	29	64
Depression score is ≥ 7 on CES-D scale (prior 30 days)	53	47	86
Men	N = 198	N = 150	N = 48
Ever abused sexually	8	6	13
Ever abused physically	11	10	17
Ever try suicide	39	35	48
Depression score is ≥ 7 on CES-D scale (prior 30 days)	24	23	27

^a AOR are adjusted for age.

TABLE 5
Perceived Susceptibility for HIV Among Mexican American Non-Injecting Heroin Users Who Are Not HIV Positive, by Injecting History

	Total % N = 300	Never Injectors % AOR ^a N = 238		Former Injectors % AOR N = 62	
Subject believes that his/her chances of getting infected with HIV are "medium" or "very high"	22	16	1.0	45	1.9 (0.8, 4.4)
Subject is "quite worried" or "extremely worried" about getting infected with HIV	23	20	1.0	32	0.7 (0.2, 2.0)
Subject believes that his/her chances of getting infected with HCV or HBV are "medium" or "very high"	29	21	1.0	65	4.3 (1.9, 10.1)
Subject is "quite worried" or "extremely worried" about getting infected with HCV or HBV	23	19	1.0	38	1.5 (0.5, 4.3)

**
p < .01.

^a AOR are adjusted for age.

Attitudes About Needle Use and Injecting Drugs by Injecting History Among Mexican American Non-Injecting Heroin Users

TABLE 6

	Total %	Never Injectors % AOR ^a		Former Injectors % AOR	
		N = 300	N = 238	N = 62	
Subject is "not at all afraid" of injecting self with needles ^{***}	15	6	51	3.9 (6.2, 31.4)	
Subject perceives friends as thinking that it is "OK" to inject drug	6	4	13	1.3 (0.3, 4.8)	
Subject perceives his/her chances of injecting drugs in the next 6 months as "medium" or "very high"	3	1	13	2.3 (0.3, 15.7)	
Subject is "quite worried" or "extremely worried" about injecting drugs in the next 6 months ^{***}	5	1	21	18.3 (4.3, 77.9)	

p < .001.

^a AOR are adjusted for age.