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A SOCIOLOGICAL INVESTIGATION OF FACTORS RELATED TO HIV RISK BEHAVIORS AMONG PUERTO RICAN INJECTION DRUG USERS IN NEW YORK AND PUERTO RICO

By

JONNY F. ANDÍA

A dissertation submitted to the Graduate Faculty in Sociology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2000

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This manuscript has been read and accepted for the Graduate Faculty in Sociology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK

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Abstract

A SOCIOLOGICAL INVESTIGATION OF THE FACTORS RELATED TO HIV RISK BEHAVIORS AMONG PUERTO RICAN DRUG USERS IN NEW YORK AND PUERTO RICO

by

Jonny Freddy Andía

Adviser: Professor Charles Winick

Objectives: This study assesses whether HIV risk behaviors can be understood using a model (Winick, 1980) that highlights 1) access to drugs, 2) drug related peer norms and 3) role strain (the felt difficulty in meeting the obligations of a role) as predictors of HIV risk behaviors.

Methods: Data were collected on 561 current Puerto Rican injection drug users in NY and 313 in PR. Dependent variables included: Syringe sharing (any direction), and any sharing of other paraphernalia (cotton, cooker and rinse water). Hierarchical multiple logistic regression was conducted to assess the influence of peer norms (regarding injection risk behaviors), and role strain indicators (e.g., drug cravings, pooling money to buy drugs [an indicator of economic strain], and illness condition). Sociodemographic and other addiction severity indicators (site, gender, income, education, years of injection, frequency of injection, ever in drug treatment and HIV status) were used as covariates.

Results: Peer norms and role strain were significant predictors for all dependent variables, after controlling for other covariates. For example, norms and pooling money were related to syringe sharing (odds =1.07; 95% C.I:1.02-1.12 and

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odds=3.53;95%C.I:2.17-5.75 respectively) and norms, pooling money and illness condition were related to sharing other paraphernalia (odds= 1.06; 95% C.I:1.02-1.11; odds=7.96; 95% C.I:5.43-11.67 and odds=1.60; 95% C.I:1.04-2.46). All were significant at $p<.05$ or better. Further analysis by site, shows that for New York norms and role strain are significant predictors for HIV risk behaviors, however, for Puerto Rico only role strain indicators are significant predictors for risk behaviors. Site was also significantly related to risk behaviors for both dependent variables.

Conclusions: This study shows the importance of the proposed HIV role strain model in understanding HIV risk behaviors among injection drug users. It also shows the importance of site as an influencing factor for risk behaviors. This model does not intend to be the only causal or explanatory condition available. Further research should focus on the utility of other role strain indicators, as well as contextual variables in addition to peer norms as predictors of HIV risk behaviors. This study shows the importance of social oriented paradigms to understand the HIV epidemic.

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Dedication

A mis padres por su amor
A Esther, mi recordada hermana
A Gloria y mis hijos
Por ser la fuente de mi inspiración!

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CHAPTER I

Introduction

Research problem

Recent epidemiological studies have shown that the demographics of HIV infection and AIDS in the United States have been increasingly associated with injection drug users (IDUs) and other drug related categories (Holmberg, 1996). Among several race/ethnic groups in the United States, Puerto Rican drug users in the mainland and in Puerto Rico, have shown one of the highest rates of HIV infection among other ethnic groups in the nation (Melendez, 1992; Robles, et al 1993; Colón, et al 1994). Understanding the implications of this phenomenon requires not only basic scientific and behavioral research but a broad theoretical understanding of the socio-cultural conditions on which this epidemic is associated.

One goal of science is to organize knowledge systematically in a manner that will optimize prediction of complex phenomena, rather than to develop separate interpretations for each set of variables. A focus of intensive discussion by social scientists concerned with HIV risk behavior (National Institutes of Health, 1997) is how to (1) integrate different macro-micro HIV risk behavior influencing factors (e.g., availability of needle exchange programs and psychological stressors), and (2) develop a robust theoretical framework to put some order into our ability to predict HIV risk behavior across different groups and situations.

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A sociological theory that will integrate different levels of influences for HIV risk behaviors and improve our ability to understand and optimize prediction could be very important. The present study used the role theory (Winick, 1980) as a heuristic tool to understand and predict HIV risk behaviors among injection drug users and to contribute to a broad theoretical understanding of the social phenomena of the HIV/AIDS epidemic.

The HIV role theory to be developed from this study is an adaptation of Winick's role theory which has been successfully used in different countries and cultures to explain the genesis of drug dependency as well to clarify the initiation of use and its continuation and expansion into dependence. He postulates that drug use and dependence is high in those groups in which there is: (1) Access to dependence-producing substances; (2) disengagement from proscriptions against their use; and (3) role strain and/or role deprivation. Winick defines role as a set of expectations and behaviors for a specific position in a social system. A role strain is a felt difficulty in meeting the obligations of a role, and role deprivation is the reaction to the termination of a significant role relationship.

This study examines two related prongs of Winick's role theory and their relationship to HIV risk behaviors. These are: (1) peer norms, and (2) role strain/deprivation among a population of Puerto Rican injection drug users (IDUs) residing in East Harlem, New York, and Bayamón, Puerto Rico. The proposed HIV role theory employs the "small world approach" on peer norms related to injection drug use (Des Jarlais, et al., 1988; Donoghoe, et al., 1989;

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Koester, et al., 1990; Celentano, et al., 1991). This approach is somewhat different from the original role theory in which the individual is 'disengaged' from the general norms against drug use proposed by Winick.

This model provides an opportunity to study the same ethnic group, at high risk for HIV/AIDS, in two different geographical and socio-cultural contexts, so that the relative contribution of the proposed HIV role theory and the two factors (peer norms and role strain/deprivation) can be ascertained.

The primary aims of this study are:

1. To examine the contributions of role theory in the form of peer norms, and role strain indicators, as influences on HIV risk behaviors among Puerto IDUs in East Harlem, New York and Bayamon, Puerto Rico.

2. To assess whether and how the influences on risk behaviors are moderated by geographical location.

3. To assess whether and how the influences on risk behaviors are moderated by socio-demographic variables (e.g., gender, place of birth, income, education) and/or by addiction severity indicators (e.g., years of injection, frequency of injection), and HIV serostatus.

4. To develop policy-related recommendations to reduce HIV risk behaviors.

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Significance of the study

This dissertation employs an important concept for the sociological framework, role theory in an effort to understand HIV risk behaviors. The application of role strain factors in the study of HIV risk behaviors is a new approach and can be helpful in understanding structural factors affecting role dynamics in relation to risk behaviors.

Most HIV/AIDS related research has been medical/biological, epidemiological and psychological oriented. The influence of two sociological indicators -peer norms and role strain/deprivation factors- may provide some clarification to the complex individual phenomena and other structural influences related to HIV risk behaviors among Puerto Rican injection drug users in Puerto Rico and New York. Finally, the proposed HIV role theory can be a foundation for future research that can lead to the development of an HIV predisposition measure to assess and predict whether or not an individual or a group may be at high risk for HIV infection.

Research questions

Two working hypotheses were generated from this theory.

It can be suggested that the level of HIV risk behaviors will be high if:

1) An individual follows the norms of the peer group which support risky behaviors, and
2) An individual experiences role strain and/or deprivation relevant to the 'role' of a drug injector.

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CHAPTER II

Literature review

Injection drug use and HIV infection

According to the World Health Organization (WHO), most countries in the world have reported injecting drug use. A large majority of them report HIV transmission through such injecting drug use. In many countries, drug injecting accounts for more HIV infections than sexual transmission. Three-quarters of cases recorded in Malaysia, Vietnam, southwest China, northeast India and Myanmar are among injecting drug users. In Western Europe, drug injection accounts for 44% of AIDS cases. In countries of Eastern Europe, injection drug use is the principal cause of HIV infection. In the Russian Federation, drug injection accounts for four out of five newly diagnosed HIV infection between 1996-1997 and in Belarus it is 87%. In the southern cone countries of Latin America, (Brazil, Argentina, Uruguay, Paraguay and Chile) it accounts for nearly a third of all cases (WHO Report, 1998).

In the United States, injecting drug users are also an important mode of HIV transmission (Des Jarlais, et al., 1997; Holmberg, 1996). Of 702,748 adult cases of AIDS reported to the Centers for Disease Control (CDC) through June 1999, in the United States 36 percent were injecting drug users or persons who have sex with IDUs, the second highest exposure category after men who have sex with men (48 percent) (CDC, 1999). Seroprevalence among IDUs in the United States shows considerable geographic variability. For instance, AIDS

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cases per 100,000 population reported through June 1999 range from less than one in North Dakota to more than 143 in District of Colombia (CDC, 1999). The highest rates are reported in the northeastern parts of the United States and in Puerto Rico. According to some epidemiological studies (Jose, 1996; Holmberg, 1996) these geographic variations in AIDS prevalence may be related to (1) individual risk behaviors; (2) individual geographical variations of when the epidemic entered in that geographical location; and (3) social-contextual and economic factors (Jose, 1996). In general, areas with high HIV prevalence rates among IDUs have high levels of other social problems such as commercial sex, lack of housing, unemployment, and lack of social services (Vermund, et al., 1989; Wallace, D. 1990; Singer, 1998; Stimson, 1992).

HIV/AIDS epidemic among IDUs in New York City

New York City has been severely affected by the AIDS epidemic. New York City AIDS cases represent over 85% of AIDS cases reported in New York State and 16 percent of the national total. As of June 1999, an accumulative of 1,161,603 adult cases of AIDS have been diagnosed among New York City residents, with a cumulative case rate of 1,745 per 100,000 people over age 13 (NYCDOH, 1999). New York is one of the epicenters of the AIDS epidemic.

HIV was introduced into the IDU population in New York City sometime in the middle 1970s, and then spread rapidly within the general population during

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the late 1970s and early 1980s (Des Jarlais, Friedman, Novick, et al., 1989; Des Jarlais, Friedman, Sotheran, et al., 1994).

Since the rise of the AIDS epidemic in the United States, we have seen an evolution of the NYC epidemic from occurring in a predominately gay male population to a heterogeneous one with 47 percent of cases now occurring among injecting drug users; 32 percent among men having sex with men and 9 percent occurring as a result of heterosexual transmission. Currently, AIDS rates are disproportionately high among people of color. In New York City, African-Americans account for 41 percent and Latinos account for 31 percent of reported AIDS cases (New York City Department Of Health, 1999).

Awareness of AIDS was followed by large-scale risk reduction among IDUs during the early 1980s (Des Jarlais, Friedman, Hopkins, 1985). Community outreach and other AIDS education programs for IDUs were implemented beginning in the middle 1980s, and bleach distribution was implemented in the late 1980s. Community underground syringe exchange programs were begun in 1990. Syringe exchange programs received official authorization and funding in 1992, and expanded after that. In the early-to-middle 1980s HIV seroprevalence among IDUs stabilized at approximately 50 percent, and remained stable up to the late 1980s (Des Jarlais; Friedman; Sotheran, et al., 1994).

Since 1992, the HIV epidemic among IDUs in New York City appears to have entered a new phase. This phase is characterized by decreasing HIV seroprevalence, increasing immunosuppression among HIV seropositives,

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increasing risk reduction, and a decreasing rate of HIV infection among newer drug injectors. Des Jarlais, et al (1997) found that seroprevalence among IDUs declined from 49% in 1991 to 39% in 1993 and to 31% in 1995. However, IDU remains an important factor of the HIV epidemic in New York City (Holmberg, 1996).

HIV/AIDS among mainland and island Puerto Ricans

Puerto Ricans are disproportionately over represented among AIDS cases in the U.S. Puerto Rico ranks third in the rate of AIDS cases per 100,000, after the District of Columbia and New York State. However, the rate of injection related AIDS in Puerto Rico is higher than the rate in New York State (CDC, 1999). HIV serostatus studies of Puerto Rican IDUs in San Juan, Puerto Rico and New York City have found very high rates of seropositivity, (i.e., approximately 50%, in both locations) (Colón, et al., 1993). High rates of seropositivity among crack smokers have also been reported (Andía, et al., 1997). IDUs who reside in Puerto Rico, compared with IDUs of all mainland ethnic groups, have been found to have the highest rates of risky injection practices, including frequency of injection, sharing used injection equipment, and use of drug "shooting galleries" (Robles, et al., 1993; Andía, et al., 1997)

Injection drug use represents 56 percent of all U.S. Latino AIDS cases and it has been identified as the primary risk factor in 13,806 cases of Latinos with AIDS in New York City and among adult women in NYC, women IDUs

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make up 53 percent of all New York City AIDS cases among women (New York City Department Of Health, 1999).

The cultural and social context of drug use varies between Island and mainland Puerto Ricans. A higher rate of use of "shooting galleries" has been reported among Island than mainland Puerto Ricans (81% Vs 51%) (Robles, et al., 1993). The "galleries" are associated with increased likelihood of sharing needles and of HIV infection (Latkin, et al., 1994). Another social indicator to predict HIV risk is violence and sexual abuse. In a study of 2,794 female sexual partners of IDUs in the US, Mexico and Puerto Rico, Klein and collaborators (1995) found that having been a victim of sexual abuse between childhood and adolescence is a key predictor of having sex while high on drugs and overall HIV risk in adulthood.

Risk factors for HIV infection among IDUs

The most common routes of transmission of HIV infection among IDUs are parenteral (i.e., intravenous or intramuscular administration of drugs) and sexual. A review of the literature on risk factors for HIV infection among IDUs reveals that drug-injection-related risk variables, rather than sexual risk variables, were often found as the predominant predictors of HIV infection (Auerbach, et al., 1994; Leite, et al., 1995).

Several drug-injection related variables have been found to be positively associated with HIV infection. They include (1)frequency of drug injection

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(Chaisson, et al., 1987; Marmor, et al., 1987), (2) syringe-sharing (Des Jarlais, Friedman, & Stoneburner, 1988; Chaisson, et al., 1989), (3) sharing of other injection paraphernalia such as cookers, (Koester, et al., 1990), (4) sharing of drug mixtures through previously used syringes (Jose, et al., 1993), and (5) "Indirect sharing", to denote the activity of drug injectors who share injection paraphernalia and/or divide a shared or jointly purchased drug (Koester and Hoffer, 1994)

Other studies have shown that HIV seroposivity among IDUs is positively associated with the length of time an individual has been injecting drugs, which is, to a certain extent, an indicator of cumulative exposure time. (Friedman, et al., 1989; Robles, et al., 1992). Studies among IDUs in New York City show that, while more than 75% of IDUs remain uninfected in the first five years of their injection career, a steep rise in seroprevalence occurs in the next three years (Friedman, et al., 1989).

Some environmental factors were found to be related to reduction of HIV risk behaviors among IDUs. Research has demonstrated that drug abuse treatment (Metzger, 1997; Rockwell, et al., 1998), outreach and counseling, (Needle, & Coyle, 1997; Friedman, et al., 1992; Brown, & Beschner, 1993), and syringe availability programs (Lurie, et al., 1993) can reduce risk of HIV infection among injection drug users.

Numerous studies have documented that drug abuse treatment, particularly methadone maintenance programs, significantly reduce needle-

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related risk behaviors, such as frequency of drug injection. (Metzger, 1997; Singer, 1998; Rockwell, et al., 1998). Persons in treatment (compared to those out-of treatment), were more likely to use new needles, and thus reduced the risk of HIV transmission (Provots & Moterroso, 1995). Further, Deren and colleagues (1998) found that reductions in HIV risk behaviors might be due to knowledge of HIV serostatus. Therefore, the importance of HIV testing as a health/preventive related service maybe related to declines in HIV risk behaviors.

Social factors also influence risk behaviors (Des Jarlais, et al., 1985). The ability to negotiate either drug consumption or safe activity is related to social considerations (e.g., laws, norms, and values about roles and behaviors). For instance, the multiperson use of syringes is a complex behavior frequently found in the subculture of the drug world. Some investigators had argued, however, that sharing is a reflection of social bonding in the drug use community (Des Jarlais, et al., 1988; Donoghoe, et al., 1989; Magura, et al., 1989; Koester, et al., 1990; Celentano, et al., 1991).

Ethnographic work has been undertaken to explore major contextual factors that influence unprotected sexual risk among IDUs (Clatts, et al, 1994; Bourgois, 1997). Some studies have found that peer influence is associated with sexual risk reduction and condom use among IDUs (Abdul-Quader et al., 1989). Friedman and collaborators' (1987), study with methadone clients, found a strong association between subjects' reports indicating that they had attempted

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to reduce their drug-related risk and their reports that their friends had also done so.

Role functions in HIV risk behavior are a topic of recent investigation (Zule, 1992; Needle, et al., 1998; Friedman, et al.,1998). Drug role scenes have been studied primarily by ethnographers (e.g., Preble & Casey, 1969; Fleisher 1995; Bourgois, 1997; Dunlap, et al., 1990), however, little is known about the effects of role strain [the felt difficulty in meeting the obligations of a role] in HIV risk behaviors.

Social stratification studies have examined the economic roles of IDUs and other related drugs (Friedman, et al., 1999; Preble & Casey, et al, 1969). The economic roles of IDUs are related to their risk behaviors and their network characteristics (e.g., role of a drug seller and the "hit doctor" in a "shooting gallery")[1]. To some degree suggested that the "gallery" roles are carried over to a relationship between role holding and having been infected with the HIV virus. Further, the economically least well off drug injectors seem to be most likely to engage in many drug related roles and to be exposed to additional HIV risk. (Friedman, et al., 1999).

There are other indicators, which suggest that the risk of HIV infection is also related to geographical location and place of birth. Local prevalence of HIV influences the likelihood that uninfected person comes in contact with an infected person (Leite, et al., 1995; Jose, 1996). This, in turn, is driven by individual behaviors that put people at risk of infection (e.g., prostitution, using

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shooting galleries). These behaviors, may in turn, be driven by a variety of factors, including levels of addiction, poverty, unequal relationship between men and women, or by cultural norms that leave people with little control over their exposure to the virus. The social, economic and cultural conditions that create this kind of vulnerability to HIV infection have not been adequately studied or explained (World Health Organization report, 1998).

Furthermore, the study of setting and its influence in drug use is not new in the drug-related literature. Zinberg (1980) proposed a model –drug, set and setting--to understand the problem of drug addiction. He said that the individual's decision to use drugs, the effects it has on the user, and the ongoing psychological and social implications of that use depend not only on the pharmaceutical properties of the intoxicant (the drug) and the attitudes and personality of the user (the set), but also on the physical and social setting in which such use takes place (the setting). The influence of the social setting and its relation on drug use was extensively discussed in relation to studies about the experience of the American soldiers in Vietnam (Robins et al. 1977). It was estimated that at least 35 percent of enlisted men in Vietnam used heroin, and 54 percent of these become addicted to it. Nevertheless, Robins and collaborators (1974) shown in a follow-up study of army enlisted men "returnees" from Vietnam that about 10 percent had some experience with opiates in a 8-12 month period in the United States, but less than 1 percent had shown signs of opiate dependence. According to Zinberg (1980) the 'abhorrent social setting of

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1 "Hit doctors" are subjects who generally are being paid by others to help them inject drugs.

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Vietnam led men who ordinarily would not have considered using heroin to use it and often to become addicted to it'. Clearly, the Vietnam experience demonstrated the importance and the power of social setting and its relation to drug activity and drug use. Vietnam also showed that heroin, despite its tremendous pharmaceutically addictive potential, is not universally or inevitably addicting.

Structural and cultural aspects related to HIV/AIDS among the urban poor

The importance of structural as well as cultural factors is central for the understanding of the HIV epidemic among the urban poor, mainly people of color. In a landmark study, Wallace, R. (1990) discussed how urban desertification and poor access to health service are related to the destruction of community networks, violence, substance abuse and AIDS in the Bronx. Singer (1996), using data from a set of ethnographic and survey research projects in the Puerto Rican community of Hartford, CT, has developed a cultural conceptualization of close interconnections among three health and social problems 1) substance abuse, 2) violence, and 3) AIDS. Focus on the interrelationship among these three phenomena, which continue to take a significant toll on the lives and well being of the urban poor, is important.

The formulations about these structural and cultural factors are related to arguments drawing a distinction between structure versus agency (Giddens, 1994) or the relationship between individual responsibility and social structural

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constraints. Structural and cultural factors are interrelated in the reproduction and transmission of poverty and other social problems (MacLeod, 1995). The unequal distribution of job opportunities for the underclass has been an influential factor in the growth of the underground economy and for sociocultural consequences such as violence and social marginalization (Wilson, 1996). Historically, the urban poor have been racially segregated, economically devastated, socially stigmatized, and politically abandoned in this country (Macleod, 1995; Bourgois, 1995). Kornblum (1991) mentioned that urban gentrification in New York City was related to structural conditions of new immigrants and their relationship with the informal economy. In this regard, he stresses the historical problem of urban poor, racial segregation and social stigmatization. According to Friedman, (1980) the United States socio-economic system is characterized by 1) an institutionalized power imbalance in which social relationships are related to a)patterns of ownership and control of corporate and other capital; b) unequal representation of people of color who do not hold top political positions; and c)differential treatment of poor and people of color by key institutions such as criminal justice systems, employment markets (both for initial hiring and for promotions), housing markets and school systems. 2) Distributional inequality: members of racial/ethnic categories (i.e., minority drug injectors) have less access to desirable "personal attributes" in the form of income, wealth, and education, and a concomitant increased share of unemployment, poor jobs, reliance in welfare, and unemployment (Singer,

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1998). These 'personal attributes' may be related to major socio-historical and structural problems of racial and social inequalities that may put some ethnic minorities and other disenfranchised groups in the United States (e.g., injection drug users) at higher risk for HIV.

The Puerto Rican experience in the United States

The Puerto Rican immigration and social experience in the United States has reflected some of the social contradictions presented above. The Puerto Rican migration to the United States has been influenced by the economic, social, cultural and political status of Puerto Rico with the United States since 1898. That year, the United States invaded Puerto Rico as part of its war with Spain and proceeded to make Puerto Rico an unincorporated territory of the United States. (Rodriguez, 1989). The political relationship between Puerto Rico and the United States made Puerto Rico not just politically dependent, but also an economically dependent society. After the invasion, the Puerto Rican economy went from a diversified economy, to a sugar-crop economy (Gonzalez, 1966). The decline of the cane-based industry in the 1920s resulted in high unemployment, poverty and desperate conditions in Puerto Rico. These factors propelled the first waves of Puerto Rican migrants to the United States, mainly displaced farmers and farm laborers. Padilla and others (1985) have noted that the Puerto Rican migration to the U.S. was one of the earliest examples of the international flows of labor and capital that characterized the post-World War II

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period from 1947-1951 (Rodriguez, 1989). As Padilla, (1985) states: "The emigration of Puerto Rican workers to the United States took place within the context of an ever-increasing capitalist penetration of the Island and its concomitant absorption into the world capitalist economy." Generally, the Puerto Rican migrants to the United States were described by a number of scholars as consisting of people who were employed in predominantly working-class positions.

As rural Puerto Ricans migrated to this country in the middle of the twentieth century to replace Italians and Jews in the garment factories and reflecting historical segregation practices, they had to confront cultural and psychological issues in how to adapt to the new territory. The memories of Bernando de la Vega are a clear reflection of the terrible experiences of the Puerto Rican working class people that migrated to the mainland (Campos & Flores, 1981). Jesus Colón (1993) also described the adaptation and the problems that most Puerto Rican migrants faced in the new country. Puerto Ricans usually became the target of physical and ideological assault (Sanchez-Korrol, 1983; Bourgois, 1995). Piri Thomas's (1997) Down These Mean Streets documented how newly arrived young rural Puerto Ricans felt as they fought the Italian-American youths who were "defending" their traditional turf from the newest, darker-skinned immigrants. On the cultural level, and according to Padilla, (1987) one of the historical forms of resistance of Puerto Ricans to the main culture has been the struggle to 'retain the culture and language '. Flores

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(1996) in a series of essays about the Puerto Rican identity, argues that the Puerto Rican identity is not a static phenomenon. It is forged out of interactions in the mainland between workers, ethnic groups, immigrants and others as they resist hegemonic demands to assimilate to the mainstream culture. He mentioned that language and culture serve to affirm a self-fashioned identity that is neither mainstream nor isolationist.

In a landmark study, Bourgois, (1995) studied forms of resistance among two dozen Puerto Rican street level drug users in East Harlem. He mentions that the concentration of poverty and deviant behavior in East Harlem is the product of state policy and free market forces. These policies have spatially inscribed the rising levels of social inequality, and this in turn generates powerful resistance in the form of street aggression and struggles for respect (Bourgois, 1995)

The reproduction of deviant and some pathological behavior among some poor Puerto Ricans families was documented by Oscar Lewis in his controversial culture of poverty theory (Lewis, 1966). Including the culture of poverty theory in their formulation, Wolfgang and Ferracuti (1982) developed the concept of the subculture of violence among different groups, with Puerto Rico one of their central sites.

In Lewis's (1966) book La Vida, a lower class Puerto Rican extended family in which most of the women were involved in prostitution is examined. His cultural/psychological approach describes the deviant values and patterns in a poor extended family that happens to live in the slums in San Juan and New

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York. Lewis focused in the pathology of the intergenerational transmission of destructive values and behaviors reflected in deviant forms of machismo, manhood and dysfunctional family structures. However, he does not explain class exploitation, racial discrimination and gender power as contributing factors in deviant behavior.

American sociologist Wolfgang and Italian criminologist Ferracuti, (1982) looked at homicide rates in several racial and ethnic groups, including Puerto Ricans. They emphasized the understanding of the definition of cultural situations. They asserted that the existence of patterns of subculture of violence could receive cross-cultural confirmation. For instance, they said that there are class cultures in which a male is usually expected to defend the name and honor of his mother, the virtue of womanhood and his masculinity. For them the focus of the violent behavior may be related to learning behavior and the transmission of subcultural values and norms among members of a subgroup.

Relevant values and norms are also discussed in Santiago's (1993) book When I Was Puerto Rican. She tells the story of immigration, her Puerto Rican childhood and her transformation when she acquired (paraphrasing Bourdieu), the necessary "cultural capital" (i.e., language, culture and a Harvard degree). In very difficult conditions, Santiago acquired the necessary cultural tools of the dominant culture in order to achieve success in this society. For the cultural capital perspective, education is essential in the acquired patterns of the dominant culture (Bourdieu, 1977).

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The socio-historical background of the Puerto Rican experience in the United States and the problems regarding its adaptation to a new socio-structural reality, the racial segregation, and poverty among other social difficulties, gives a contextual frame to understand that the problem of HIV/AIDS among Puerto Rican IDUs is not only a problem on individual dynamics but a socio-structural one.

Theoretical framework - Importance of role theory approach

Most theories on HIV/AIDS research are limited to specific situations or individual personality traits that correlate significantly with HIV risk behaviors. They included the Health Belief Model (Becker, 1988; Montgomery, et al., 1989), Social Cognitive Learning Theory (e.g., Bandura, 1991), the Theory of Reasoned Action (Ajzen, & Fishbein, 1980), and the Transtheoretical or the Stages of Change Model (Prochaska, et al., 1994).

These theories have generally been utilized as part of an individually based cognitive approach, and have helped identify both barriers and facilitators to behavior change (Jose, 1996). Although some of these theories are able to incorporate social, cultural or environmental levels, they have generally been utilized in a more limited framework of intervention and analysis focused on the individual. Research based on individual factors has demonstrated the importance of individual level variables, for example, psychiatric symptomatology (Metzger, et al., 1991), in understanding differences in risk behaviors. Research

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on social networks (e.g., Neiagus, et al., 1994; Price, et al., 1995) indicates that understanding more about the interpersonal relationships of drug users can help us understand risk behaviors. Clatts and associates (1994) reported that understanding the behaviors within the structure of the environment where they are carried out is critical before developing any quantitative methodology.

A broader theory is needed to not only explain personality traits in relation to HIV risk behavior, but to explain them in the context of the social system and social structure. According to Goode (1960), social structures can be viewed as made up of roles. He approached both social action and social structure in society through the notion of dissensus and "role strain" or the felt difficulty in fulfilling role obligations. Role relations are seen as a sequence of "role bargains" and as a continuing process of selection among alternative role behaviors, in which each individual seeks to reduce his role strain (Goode, 1960). Role is a dynamic concept that can substitute and or integrate several concepts of psychological importance. Much of the stress of life in modern societies is due to the anxiety people experience as they attempt to balance the demands of various roles. This anxiety is evident in the terms of role conflict and role strain. As defined by Kornblum, (1997), role conflict occurs when, in order to perform one role well, a person must violate another important role. For instance the dual responsibilities of job and family. However, role strain is a condition wherein a single role brings conflicting expectations. Different from role conflict, which involves tensions between two roles, role strain involves conflicts within a

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single role (Anderson, & Taylor, 2000). For instance, the role of an IDU often involves role strain. IDUs are expected to maintain their drug habits and successfully accomplish their drug routine. Yet in order to maintain their drug habits they often have to successfully accomplish different set of expectations that may generate tension: to get money, obtain drugs, obtain new or clean injection equipment, and deal with their drug cravings. The tensions between these competing expectations are an example of role strain among IDUs.

As C. Wright Mills (1959) pointed out in his discussion of the sociological imagination, the origins of role conflict and role strain are social structural. Even though role conflict and role strain are experienced at the individual level, their origins are societal.

Understanding roles and role strain/deprivation in relation to HIV risk behavior among IDUs can change the way we understand HIV risk behaviors. Looking at role strain will direct our attention to the social structure and social interactions involved in drug procurement, sexual activity and drug injection. These behaviors are closely associated with HIV transmission.

An HIV role theory will emphasize that people become HIV infected not only to meet their personal needs but will suggest that it is possible to locate the structural sources of role strain/and or deprivation within the social system in order to examine HIV risk behaviors.

Once we have located the sources of role strain/and or deprivation in the social structure (e.g., environmental - access to needles, drugs, money to buy

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drugs, norms and values against drugs, stressors, etc) we can specify those role situations which are likely to show a high incidence of risk behaviors. It ought to be possible for us to identify locations in the social structure, which affect and or influence role strain and/or deprivation differently.

A change of paradigm is necessary and the dynamic inclusion of environmental, social and role strain/deprivation factors combined into a theoretical paradigm may help us understand, predict and re-define actual policy recommendations to confront HIV/AIDS and others transmissible diseases.

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CHAPTER III

Methodology and data collection

Methodology and data collection

This chapter provides an overview of data collection procedures. It describes the data set used for statistical analyses. It describes the variables within each theoretically defined domain and specifies their conceptualization and measurement. Finally, it presents an overall description of the sample and the analysis procedures.

The data for this dissertation were collected by the Puerto Rican Drug Users in New York and Puerto Rico (Alliance for Research in Bayamón and El Barrio -ARIBBA) study between January 1998 and August 1999. Two locations were selected for this study, East Harlem in New York and Bayamón in Puerto Rico. This research project was supported by a grant # R01DA10425 from the National Institute of Drug Abuse (NIDA) and the principal investigator was Dr. Sherry Deren. In Puerto Rico Dr. Rafaela Robles was the co-investigator.

East Harlem is located in the northern part of Manhattan. The East Harlem population of 110,508 is 55% female (City of New York, August 1992. Based on 1990 census data), and primarily Latino (49%) and African-American (46%). The population is also relatively young, with 31.3% under 18 years old; 40% are receiving public assistance or are on a fixed income (City of New York, 1993, September); and 51% graduated from high school (City of New York, March, 1993).

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East Harlem has the second highest AIDS rate in the borough of Manhattan. Only Chelsea-Clinton has the highest concentration, because of high rates of men who have sex with men (MSMs). As of June 1999 the rate for East Harlem was 4,535 cases per 100,000. (NYC AIDS Surveillance Report, January, 1999). East Harlem has three hospitals, Mount Sinai Medical Center, Metropolitan Hospital Medical Center and North General Hospital. Three of these hospitals offer outpatient methadone maintenance programs in a form of community clinics. In addition, there are several other free standing medical providers including Borinquen, Settlement Health, Union Settlement and Paul Robesen Centers as well as several free standing drug treatment programs, some with multiple locations within the neighborhood. East Harlem has three needle exchange programs.

Bayamon, in northeast Puerto Rico, is part of the San Juan metropolitan area. The town is located in the San Juan AIDS epicenter, and is the largest municipality of the San Juan Health Region, with a population of 220,262. Almost 44% of Bayamon residents lived below the poverty level with 14.1% unemployed (U.S. Bureau of the Census, 1992).

In Bayamon, there are 18 public housing projects and many inner city poor neighborhoods, where drugs, crime and prostitution are among the main sources of income. Data from previous studies (Robles, 1993) indicate that around 50% of drug injectors out-of-treatment were HIV positive. In Bayamón

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there is one methadone treatment program and one needle exchange program (Finlinson, et al., 1999).

The ARIBBA project is a four year longitudinal study that was developed to examine the determinants of HIV risk behaviors and the determinants of changes in risk behaviors over time, (6 month period) in five domains: psychological (intrapersonal, cognitive), social (interpersonal, network-related), health-related (health status and health behaviors), cultural (related to Hispanic cultural values) and environmental (structural elements of the general environment), among two populations of injection drug users and crack smokers in Bayamón Puerto Rico and East Harlem, New York City.

This project used the PRECEDE model (Green, et al., 1980) a theoretical model that identifies three types of influences on health behaviors: (a) Predisposing Factors- characteristics of the individual that motivate behaviors related to health, usually in the cognitive level (e.g., concern about HIV). (b) Enabling Factors – characteristics of the environment that facilitates health behavior and skills or resources required to attain the behavior (e.g., laws regarding syringes); and (c) Reinforcing Factors - rewards or punishments following a health behavior (e.g., norms in peer group regarding condom use).

Participants were recruited through street outreach using a targeted sampling procedure (Watters & Biernacki 1989). In both sites, the primary sampling units was "sectors," geographical areas that encompass copping (drug buying) areas, drug use locations, areas of prostitution and sites of medical and

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social services accessed by study participants. These sectors were developed using ethnographic mapping in each location (Oliver-Velez, et al., 2000 in press). Outreach workers recruited drug users following a plan of computer-generated random selected sectors.

All participants had to meet the following criteria: (a) age 18 or over; (b) injected drugs or smoked crack within the prior 48 hours (verified by drug test); and 3) self-identification as Puerto Rican. The study had secured a federal certificate of confidentiality to assure participants that everything they reported would remain confidential. Research protocols were approved by an institutional review board. Instruments were developed in hard copy in both languages and pilot tested to assess comparability of meaning in both locations. Translation (from English to Spanish) and then back translation (from Spanish to English) was performed to assure comparability of meaning. A computer assisted interview version was developed to improve interview accuracy with skip patterns and reduced cost in data entry procedures (Sawtooth Software, Inc). Trained bilingual (English-Spanish) interviewers at the research sites in East Harlem and Bayamón conducted the interviews which lasted approximately 90 minutes. Two written consent forms were obtained for the interview process and the HIV testing procedure. After the interview was completed participants were offered HIV pre-test counseling for a voluntary HIV testing procedure. Participants who were tested were given an appointment two weeks later to return for their post-test counseling and to obtain the test results and pre and

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post HIV test counseling was provided by a qualified counselor. HIV testing was performed using the Orasure HIV-1 oral collection device (SmithLline Beecham, Pittsburgh, PA 15230). This device checks for HIV-1 antibodies from the tissue of the cheek and gum. In clinical trials this device received over 99% correct results. All participants were paid $15 for the interview session in New York and $20 in Puerto Rico.

Data set used for this analysis

The ARIBBA project used both quantitative and qualitative methodologies.

Quantitative component

The quantitative component -baseline and follow-up data collection- was conducted from January 1998 to March 2000. The study has recruited 1201 IDUs and crack smokers. Participants were interviewed twice, baseline and 6 month follow-up interview after baseline. This dissertation uses the baseline data of the ARIBBA project collected from January 1998 through August 1999. The focus is only in IDUs. For the present study, analyses were conducted for a total of 874 (561 from New York and 313 from Puerto Rico). The data files from the original ARIBBA instrument used in this study were: socio-demographic, drug treatment history, health and drug related services, injection risk behaviors and health condition.

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Data were analyzed with SPSS (Statistical Package for the Social Sciences) version 9.0. For the qualitative part, data were analyzed with the DTSearch 5.2 search engine program for qualitative analysis. (DT software, 5.2)

Qualitative component

The first phase of the project (from September 1995 to December 1997) was a qualitative study headed by ethnographer Dr. Finlinson, from Puerto Rico and Miss Oliver-Velez, from New York. The ethnographic teams performed participant observation, geographic mapping, focus groups, key informant interviews and life history interviews. These data collection activities provided information about the two communities and helped in the development of the quantitative instrument (Oliver-Velez, 1997).

Cross-site visits by the ethnographic teams were performed to assess issues of comparability and discussions of cultural specific characteristics (for instance, identifying language and terminology differences to be used in the survey to ensure comparability in meaning). During the first phase, 21 life history interviews (10 in Puerto Rico/11 in New York) were conducted by the ethnographic team in both sites. Participants were recruited from copping areas, shooting galleries, and crack houses and were selected to provide a broad range of drug using and sexual risk behaviors (e.g., injectors, crack smokers, gallery managers, and prostitutes). For New York, indigenous outreach workers in coordination with the ethnographer recruited the subjects and were brought

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for an interview to the research site in East Harlem. In Bayamón, life histories were generally performed in the home of the subjects by a member of the ethnographic team. Subjects were compensated $15 each time they were interviewed. These interviews were tape recorded and transcribed by experienced translators on the local drug vernacular by each site (Spanish/English/Spanish-English). The reliability of the transcriptions was monitored by the ethnographers for each site. Life histories covered several topics: family background and composition, socialization into drug use, drug use history, sexual history, social, cultural and environmental influences on risk behaviors, injection practices, perceived barriers to and facilitators of risk reduction, perception of risks and riskiness of behaviors among other issues.

Although these interviews did not specifically examine theoretically defined role strain/deprivation factors, they provide a rich description and a sense of the quality of life of drug users in both locations. This dissertation performs a secondary analysis of the original 21 life histories performed by the ARIBBA project in both sites and it will use them as background data (Alford, 1998) in the discussion section.

Description of variables

Variables were grouped into several theoretical-defined domains. The conceptualization and measurement are presented below. All variables listed below are based on self-reports. Unless otherwise specified, injection related

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risk variables, norms and role strain variables were measured for the last 30 days prior to the day of the interview.

Dependent variables: Dependent measures for this dissertation are drug injection related behaviors.

Syringe sharing (either direction). This is a dichotomous variable that measures the presence of receptive (subject receives used syringe from others) and distributive (subject uses a syringe then gives it to others) syringe sharing practices in the last month of the interview and thus possible exposure (either direction) to HIV infection.

Sharing of injection paraphernalia (e.g., cotton, cookers, rinse water) This is a dichotomous variable that measures the sharing of other injection paraphernalia (e.g., cotton, cookers or rinse water) in either direction. Several studies have found that sharing injection paraphernalia (e.g., cotton, cookers and rinse water) is related to exposure to HIV infection. Further, some studies have shown that drug preparation risk behaviors are practiced more often that the shared use of syringes.

Independent variables

The independent variables used in this analysis correspond to the following theoretically defined domains 1. Socio-demographic characteristics, 2. Peer norms (related to injection risk behaviors), and 3. Role strain/deprivation indicators.

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Socio-demographics and other Covariates

1. Site: New York=1 and Puerto Rico=2.

2. Place of birth (Puerto Rico=1 and New York=0): Place of birth is an indicator of immigration status.

3. Gender (female=0 and male=1): This variable is conceptualized in its social relational aspects of role orientation, relative power, and control over resources, which all may influence risk behaviors.

4. Income: This variable measures self-report annual income. If annual income is reported as ≤10,000 the individual is coded as 1 (level of poverty); if annual income is ≥10,000 the variable is coded as 0. Individual income may be associated with lack of access of several basic conditions of life (e.g., housing, health condition and access to health services) as well as related to access to drugs.

5. Education (high school graduate): Coded as 1 if the respondent had graduated from high school, GED (Graduate Equivalence Diploma) or some college; otherwise as 0. This variable is an aspect of socioeconomic status.

6. HIV serotatus This is a dichotomous variable measuring self-report serostatus at baseline. Coded as 1=yes and 0=no. Several studies (Deren, et al., 1998a; 1998b) have found that HIV status may alter the level of risk behavior practices. The proposed model will control for serostatus.

7. Ever in drug treatment program: This dichotomous variable measures the respondent's participation in health-drug related services. Several studies have

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shown that story of drug treatment involvement may be related to safe injection practices.

8. Used needle exchange program (NEP) in the last month: This is a dichotomous variable that measures the current involvement of injectors in needle exchange programs. Access to new syringes and to NEP have been found to influence safe injection behaviors.

9. Years of injection: This is a continuous variable that measures the number of years a subject may be injecting drugs. This variable is an indicator of addiction severity of the participant. Several studies have demonstrated the increase probability of risk behavior practices and being infected to HIV in relation to the number of years injected. Furthermore, this variable [used as a control variable] will assess whether the proposed role strain variables are really indirect measures of length and intensity of addiction.

10. Frequency of injection: This is a continuous variable that measures the frequency of injection in the prior month. The original frequency distribution presented skewness to the right (range 1 to 750 times a month), and in order to control for this problem, a log of injection frequency was developed in order to normalize its distribution. The original variable is presented in table 1 (sample characteristics), however, for bivariate and other inferential statistics the log of injection frequency is used as a covariate. Additionally, since frequency of injection may be related to higher levels of illness condition and physical discomfort and to avoid issues of causation, this variable will be used as a

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control variable in the covariate domain. Several studies report a strong relationship between frequency of injection and risk behaviors and HIV infection.

Peer group norms related to HIV risk behaviors: This is a seven-item scale that measures the peer group norms (beliefs) about some injection related risk behaviors. "How many of your friends who inject drugs believe that it's OK for drug injectors to....

1. Share needles with other people they know?
2. Share needles or syringes with other people they don't know?
3. Share cookers, cotton or rinse water with people they know?
4. Share cookers, cotton or rinse water with people they don't know?
5. Lend their used needles to someone else?
6. Borrow used needles from someone else?
7. Share needles with each other if they bought the drugs together?

Likert's scaling was used to assess these questions. Scales were: 1=none of my friends, 2=some of my friends, 3=most of my friends and 4=all of my friends. The range index score of this scale was from 7 to 28 points. Indicating that higher scores mean higher agreement with peer group norms and lowest scores indicates less agreement. Those who totally agreed to all seven items got a score of 28 (7x4). Reliability analysis shows alpha levels of .93 (see appendix)

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Role strain domain. It is composed of three independent indicators of strain: (a) physical discomfort related to drug cravings; (b) pool money to buy drugs, and (c) current illness condition.

1. Physical discomfort (from drug withdrawing or cravings)

This variable measures the level of physical discomfort due to drug withdrawing or drug cravings. The participant was asked: "In the past 30 days, how many times did you feel sick because you had not used drugs, or had not used drugs in enough quantity? This variable was dichotomized and coded 1=high (two or more cravings per month) and 0=low (one or less cravings per month). Drug cravings are related to physical dependency, drug hunger and withdrawal. Several studies of heroin craving cited its uniqueness in terms of withdrawal reactions. When involved with daily compulsive use driven by drug hunger and craving, addicts may accidentally administer excessive amounts of the drug, depressing the respiratory center of the brain with lethal results (Dole, et al., 1966). If contaminated syringes are used, addicts can transmit or inject in themselves HIV, hepatitis and other pathogens (Novick, et al., 1990). The majority of heroin addicts probably cannot hold down jobs and are dependent on street economic roles to obtain money for heroin and crack (Courtwright, et al., 1989).

2. Pooling money to buy drugs with others. This variable assesses the economic difficulty that some IDUs have in obtaining money to get drugs. The participant was asked: "How may times in the past 30 days did you pool money with other

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persons to buy drugs?" This variable was coded as 1 if any pooling of money was present during the month and otherwise it was coded as 0. The research literature and ethnographic data confirm that drugs are expensive and addicts go broke over time feeding their drug habits. This dichotomous variable measures the economic difficulty of IDUs in order to buy drugs. This is defined as the difficulty of some IDUs in obtaining economic resources to fulfill their role obligations, and it is defined as a form of economic deprivation. IDUs and other drug users experience greater economic strain since they present higher patterns of unemployment, poor jobs, reliance on welfare and membership in the reserve labor force.

3. Current illness condition (Health strain)

This variable is related to the question: Do you have any chronic medical problem or physical disabilities, which interfere with your life". This self-reported variable tries to measure participants' medical health perception other than HIV condition. Illness condition of IDUs may be associated with problems of access to health services, self-neglect and risky health behaviors. It is measured as a dichotomous variable 1=yes; 0=no.

Sample characteristics

A total of 874 eligible IDUs from the ARIBBA project were selected for this study. Two injection-related HIV risk behaviors were used as dependent variables, syringe sharing (either direction) and sharing other injection paraphernalia (e.g., cotton, cooker or rinse water. Table 1 shows that a total of

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165 (19.2%) of the sample shared syringes in the prior month, and 406 (46.6%) reported sharing other injection paraphernalia. The sample consisted of 561 (64.2%) participants interviewed in New York and 313 (35.8%) interviewed in Puerto Rico. Most IDUs reported Puerto Rico as their place of birth. Of the total sample, 256 (30.4%) were born in New York and 587 (69.6%) in Puerto Rico and 711 (81.4%) of the participants were male. More than half of the sample (61%) reported an annual income of less than $10,000 and did not graduate from high school (56.4%). The mean age was 36.6 and the mean year of injection was 16 years. Injectors reported a mean frequency of monthly injections of 110.

IDUs, in general, report a sizable degree of contact with drug abuse treatment. More than 90.0% of IDUs had ever been in some kind of drug abuse treatment in their lifetimes but less than half report having contact with needle exchange programs in the prior 30 days. A fifth of the participants (19.3%) reported ever been told they had HIV.

The norm scale is shown in panel 2 of Table 1. The scale's scores range from 7 to 28 points (higher scores indicates higher agreement with peer group norms and lower scores indicates less agreement); the norm mean score for the total sample was 10.8.

The variables of the proposed role strain/deprivation domain are set forth in panel 3 of table 1. Most participants (63.5%) reported higher proportion of physical discomfort due to drug withdrawing or drug cravings during the prior 30 days. More than half of the IDUs (53.1%) reported pooling money to buy drugs

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with other injectors (a form of lack of economic resources) and a quarter of the sample (25.8%) reported having some form of health related condition or illness (other than HIV/AIDS).

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TABLE 1
Characteristics of the sample of injectors in New York and Puerto Rico

Variables		N	%
Sample Size		874	
Dependent Variables (last 30 days)			
Syringe sharing (either direction)			
	No	695	80.8
	Yes	165	19.2
Sharing of other paraphernalia (e.g., cotton, cookers, rinse water)			
(either direction)	No	465	53.4
	Yes	406	46.6
Independent Variables (Covariates):			
Site			
	New York	561	64.2
	Puerto Rico	313	35.8
Place of Birth			
	New York	256	30.4
	Puerto Rico	587	69.6
Gender			
	Male	711	81.4
	Female	163	18.6
Income last 12 months			
	≤$10,000	526	61.0
	≥$10,000	337	39.0
Education (HS graduate or better)			
	No	493	56.4
	Yes	381	43.6
Age (mean)		36.6	sd=8.2
Years of Injection (mean)		15.8	sd=10.3

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Table 1 continued from previous page

Variables	N	%
Frequency of injection last 30 days (mean)	110	sd=1.39
Ever in Drug Treatment Program		
No	76	9.0
Yes	798	91.0
Use Needle Exchange Program		
No	462	52.9
Yes	412	47.1
Ever told HIV positive		
No	705	80.7
Yes	169	19.3
2.Peer Norms Domain:		
Norms scale (mean)	10.8	4.3
3.Role Strain/Deprivation Domain:		
Physical discomfort (from drug withdrawal or cravings)		
Low	318	36.5
High	554	63.5
Economic deprivation (Pooled money to buy drugs)		
No	405	46.9
Yes	459	53.1
Current chronic illness (no HIV/AIDS condition)		
No	646	74.2
Yes	225	25.8

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Sample characteristics by site

Table 2 presents bivariate analyses of background characteristics and other important related covariates of the sample by site (New York and Puerto Rico). The sample consists of 561 respondents from New York and 313 from Puerto Rico. The New York sample is older (39 vs.33) and most New York Puerto Ricans reported that they were born in Puerto Rico (58.5%) ($p<.001$). One fifth and a tenth of the sample is female in New York and Puerto Rico respectively ($p<.01$). Around two thirds in each site (New York /Puerto Rico) reported annual earnings of less than $10,000. Less than half in each site reported not having a high school education or a GED equivalent.

New York IDUs were more likely to report higher number of years injecting than their Puerto Rican counterparts (17.6% vs. 12.5%) respectively. And the majority of New York IDUs (94%) reported ever being in a drug treatment program in comparison with 86 percent for Puerto Rican IDUs. More than 50 percent of injectors in New York have used the needle exchange program vs. 39 percent of their Puerto Ricans counterparts. Additionally, around a quarter of New York IDUs (22 %) were told they had HIV vs. only 15 percent for those in Puerto Rico. This may be related to the availability of testing and health related services in New York.

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Table 2. Characteristics of the Sample by Site (n=874).
Background Variables and other covariates

Variables	NY	PR	p
	N	N	
Site	561	313	
Place of Birth (%)			
New York	41.5	10.6	.001
Puerto Rico	58.5	89.4	
Gender (%)			
Female	21.2	14.1	.01
Male	78.8	85.9	
Income last 12 month			
<$10,000	59.5	63.7	ns
>$10,000	40.5	36.3	
Education (HS graduate or better)			
No	57.6	54.3	ns
Yes	42.4	45.7	
Age (mean)	38.5	33.1	ns
Years of injection (mean)	17.6 [sd=10.2]	12.5 [sd=9.4]	.045
Ever in drug treatment program			
No	5.7	14.1	.001
Yes	94.3	85.9	
Use Needle Exchange Program			
No	48.5	60.7	.001
Yes	51.5	39.3	
Ever told HIV positive			
No	78.1	85.3	.01
Yes	21.9	14.7	

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Table 3 shows related injection behaviors in the last 30 days by site. Injectors from Puerto Rico reported consistently higher proportions of risky behavior practices than their New York counterparts. Island Puerto Ricans injected more frequently than those living in New York (178 vs. 78 p.<.001); they showed higher proportions of syringe sharing (either direction) than New York Puerto Ricans (36% vs 10% p<.001) and reported higher proportions of sharing other injection paraphernalia (e.g., cotton, cooker and rinse water) than New York Puerto Ricans (72% vs 33%).

Table 3 Related injection behaviors by site (last 30 days)

	NY	PR	p
Frequency of Injection			
Mean	77.8 [sd=95.6]	178.4 [sd=147.1]	.001
Syringe sharing (any direction)			
No	89.8%	64.1%	.001
Yes	10.2	35.9	
Sharing of other paraphernalia (any direction) (e.g., cotton, cooker and rinse water)			
No	67.2%	28.4%	.001
Yes	32.8	71.6	

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Analysis procedure

The major analytical goal of the present study is to assess the contribution of peer norms and role strain indicators on HIV risk behaviors after controlling for socio-demographic and other covariates. In doing so, certain preliminary analyses become essential.

Chapter IV presents the process of selection of empirical and theoretical variables with syringe sharing (dependent variable). Pearson correlation coefficients, bivariate associations in the form of independent logistic regression by domain are examined. Then, multivariate analyses in the form of hierarchical logistic analysis is presented for the total sample and independently by site. The aim of these analyses was to isolate the influencing factors of role strain and norms in two different socio-demographic contexts (New York and Puerto Rico).

The hierarchical logistic regression, the covariates, and selected independent variables from each domain are entered into the regression model in the following order: 1) sociodemographic and other covariates; 2) peer norms scale; 3) role strain/deprivation variables.

Chapter V presents the same process but uses other HIV risk dependent variable, sharing other injection paraphernalia (e.g., cotton, cookers, and rinse water) in either direction. This chapter presents Pearson correlation coefficients, bivariate associations of variables and multivariate analyses in the form of hierarchical logistic regression analyses. Analysis was conducted by site.

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Statistical significance levels were determined using two-tailed test at the .05 probability level. The bivariate associations between independent variables are measured by adjusted odds ratios 95% confidence intervals. The analysis was performed independently for each dependent variable. For the final multivariate analyses, a hierarchical logistic regression was conducted (given the dichotomous nature of the dependent variables). In hierarchical logistic regression analyses, the improvement of the model with every addition of independent variable domains was assessed through the likelihood ratio test. The goodness-of-fit of logistic regression models is tested using the Hosmer-Lemeshow statistic (Hosmer and Lemeshow, 1989).

Summary

This chapter presented variations in several drug-related characteristics and HIV risk indicators among Island and New York City Puerto Ricans. This initial analysis shows that New York Puerto Ricans IDUs have higher mean number of years of injection (17.6 vs. 12.5, $p<.05$) than Island Puerto Ricans; the majority of New York IDUs reported ever being in drug treatment (94% vs. 86%; $p<.001$) and more than half of the New York IDUs used the needle exchange program (52% vs. 39%; $p<.001$). However, New York IDUs reported higher rates of HIV infection than their Puerto Rican counterparts (22% vs. 15%, $p<.01$). These findings may indicate some interesting contextual characteristics for New York and Puerto Rican IDUs. First, it appears that New York IDUs have greater participation/and or access to drug and health related programs than their

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Puerto Rican counterpart. Second, since New York IDUs report, on average, higher number of years of injection and HIV seropositivity this may well be associated with greater access to health related services, included HIV testing.

Another important difference appears to be related to practice of high risk behavior between Island and NY Puerto Ricans. Island Puerto Rican reported higher frequency of injection (178 vs. 78, $p<.001$) than their New York counterparts. They are more likely to share syringes (36% vs. 10%, $p<.001$) and more likely to share other injection paraphernalia (e.g., cotton, cookers and rinse water) (33% vs. 72%, $p<.001$) than New York IDUs. Several studies (Des Jarlais, et al., 1998; 1999; Center for Drug Use and HIV Research, 1999) have reported that syringe sharing has decreased substantially in New York City. However, according to this finding, this appears not to be true for Island Puerto Ricans.

Finally, the preliminary results of this chapter demonstrate that even though we are studying Puerto Ricans IDUs, we have two distinct groups with two different socio-contextual realities.

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CHAPTER IV

Related independent variables with syringe sharing

Covariates and other predictors for proposed HIV role model by syringe sharing (either direction)

This chapter examines the relationship between independent variables (covariates), norms and role strain/deprivation indicators with the dependent variable (syringe sharing). First, it presents Pearson correlation coefficients of covariates with syringe sharing (either direction). Then, it presents independent bivariate associations with covariates and other theoretical domains and the dependent variable to see whether independent variables are associated with the dependent variable. The aim of these analyses is to select a limited number of theoretically- and empirically relevant variables related with syringe sharing. This method is used to deal with the problem of multicollinearity of independent variables (Robles, et al., 1992b) and to see which variables will be considered in the final model. Finally, a model in the form of hierarchical multiple logistic model will be presented with the most relevant theoretical and empirical variables of interest.

Pearson correlation coefficients

Pearson correlation coefficients of selected independent variables with syringe are shown in Table 4. Coefficients larger than r=0.25 were estimated for site (r=0.311) and pooling money to buy drugs (r=0.266). Most of the coefficients

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were low but statistically significant in two-tailed significance tests. Three independent variables did not show any significant levels with the dependent variable, they were gender, use of needle exchange program (last 30 days) and illness condition. Two independent variables, age and years of injection, show a high level of correlation (r=0.723). To avoid problems of multicollinearity, the age variable was dropped from the model (see appendix for completed correlation matrix).

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Table 4 Pearson correlation coefficients of selected background variables and other covariates with syringe sharing (n=874)

	Dependent variable	
Independent variables	Syringe sharing Correlation coefficient	p
1. Covariates		
Site	0.311	<0.01
Place of birth	0.101	<0.01
Gender	0.061	0.07
Annual income	-0.073	<0.05
HS graduate or better	0.019	<0.01
Years of injection	-0.100	<0.01
Frequency of injection	0.184	<0.01
Ever drug treatment	-0.147	<0.01
Use NEP last 30 days	-0.016	0.64
HIV status	0.010	0.77
2. Norm indicator		
Norms	0.174	<0.01
1. Role strain/deprivation indicators		
Physical discomfort due to drug craving	0.151	<0.01
Pool money to buy drugs (economic deprivation)	0.266	<0.01
Illness condition (no HIV)	0.010	0.77

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Independent bivariate associations of covariates, norms and role strain/deprivation indicators with syringe sharing (either direction)

Background variables and other covariates may influence the probability of syringe sharing and therefore HIV infection. The following analyses examined how background variables and other covariates, and theoretical domains of interest (e.g., norms and role strain/deprivation indicators), when considered independently in logistic regression analysis, may influence the odds of syringe sharing among IDUs in the sample. The goal of these analyses is to select a limited number of empirically and theoretically important covariates to be used in the final analyses. This method has effectively been used in earlier studies of risk factors for HIV among IDUs (Robles, et al., 1992) to deal with collinearity of independent variables, and in multivariate analyses within relatively smaller samples (Friedman, et al., 1995)

The first regression analysis in table 5 showed a bivariate association of background variables and other covariates with syringe sharing (either direction). As was mentioned earlier (see Pearson correlation coefficients) most covariates were statistical significant. Only two variables presented statistical significant levels (site and income), showing that the odds of syringe sharing were significantly higher for those who lived in Puerto Rico than those who live in New York. This may be due to variations in population seroprevalence or due to differences in the social environments experienced by IDUs who live in Puerto Rico. Further, the odds of syringe sharing decreases for those who reported

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income levels under $10,000. This may be due to the fact that for the poor, IDUs are more deprived economically and therefore have more difficulty to obtain drugs and/or to share syringes. Syringe sharing among IDUs did not vary significantly by gender, level of education, years of injection, frequency of injection, ever in drug treatment, use of needle exchange program or HIV serostatus.

Table 5. Bivariate relationships of background variables and other covariates with syringe sharing (either direction)

Independent variable	O.R. ¶	95% C.I. †	p
Site	4.60	2.87-7.36	0.001
Place of birth	1.05	0.65-1.71	0.818
Gender	1.21	0.68-2.15	0.504
Annual Income	0.60	0.40-0.89	0.012
Education (HS or better)	0.99	0.66-1.47	0.970
Years of injection	0.99	0.97-1.01	0.555
Frequency of injection	1.12	0.94-1.33	0.177
Ever in drug treatment	1.76	0.85-3.66	0.124
Used NEP last 30 days	1.02	0.68-1.53	0.915
HIV status	0.67	0.38-1.17	0.164
Model chi-square	90.44 (10 d.f.)		0.001

¶ Logistic regression adjusted odds ratio
† 95% confidence interval

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Peer norms and role strain/deprivation domains

Independent logistic regression by peer norms (panel a) and role strain/deprivation indicators (panel b) are shown in tables 6. The odds of syringe sharing increased with each unit increase in the peer norm scale (odds ratio= 1.09 95%CI 1.05-1.13). And in panel b, two role strain/deprivation indicators (physical discomfort and pool money to buy drugs) show statistically significant levels. Illness condition did not show any statistical significance at the bivariate level of analysis.

Table 6. Bivariate relationships of norms and role strain/deprivation indicators with syringe sharing (either direction)

Independent variable		O.R. ¶	95% C.I. †	p
a) Norms scale				
Norms		1.09	1.05-1.13	0.001
Model chi-square	22.34 (1 d.f.)			0.001
b) Role strain/deprivation indicators				
Physical discomfort due to drug cravings		1.86	1.22-2.82	0.003
Economic deprivation (pool money to buy drugs)		4.24	2.79-6.42	0.000
Current illness condition (no HIV)		1.18	0.79-1.77	0.408

¶ Logistic regression adjusted odds ratio
† 95% confidence interval

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Final list of HIV role model variables as predictors of syringe sharing

Prior analyses identified important bivariate predictors of syringe sharing. The domains used in these analyses were: background variables and other covariates; norm scale and role strain/deprivation indicators. The last two domains (norms and role strain/deprivation domains) are based on the conceptual model from chapter I.

Figure 1 shows a list of selected variables to be used in the multivariate analyses of the HIV role model.

First, a list of selected variables to be used in the final multivariate analyses of HIV role model with syringe sharing is presented. Site (New York=1 and Puerto Rico=2) and income (<$10,000=1 vs >$10,000=0) were the two significant predictors of syringe sharing within the background and other covariates domain. Although not statistically significant, place of birth, gender, education, years of injection, frequency of injection, ever in drug treatment, use of NEP in prior month, and ever told of HIV positive status were also selected for the final hierarchical logistic regression model as control variables due to their theoretical importance. The analyses found norms to be significant predictors of syringe sharing (p<.001) within the norm domain. Within the role strain/deprivation domain, physical discomfort due to drug withdrawal or cravings (p<.003) and pooling money to buy drugs (<.001) [a form of economic deprivation] were associated with syringe sharing. The variable of current illness

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condition was not found significant but because of its theoretical importance it will be considered in the final model within that domain.

Figure 1: Final list of variables used in the analyses of HIV role model by syringe sharing by domain.

1. Covariates domain
   - Site: location where interview was done. (NY=1/PR=2)
   - Place of birth: (PR=1/NY=0)
   - Gender (male=1/female=0)
   - Annual income (<$10k vs.>$10k)
   - Years of injection (since first drug injection)/continuous
   - Frequency of injection (how many times last month)/continuos
   - Ever in drug treatment (1=yes; 0=no)
   - Ever told HIV positive (1=yes; 0=no)

2. Norm domain
   - Norms (scale)

3. Role strain/deprivation domain
   - Physical discomfort due to drug cravings (1=high/ 0=low)
   - Pooling money to buy drugs (1=yes; 0=no)
   - Current illness condition (1=yes; 0=no).

Summary

This chapter provided useful insights on the relationships of variables from each theoretical domain with the likelihood of syringe sharing among IDUs. The results suggest that two socio-demographic variables (site and income) and proposed theoretical model variables (norms, physical discomfort and pooling money) affect the odds of syringe sharing. The next chapter presents results from hierarchical regression analysis of HIV role model with syringe sharing among sample IDUs.

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CHAPTER V

Peer norms, role strain/deprivation and other covariates as predictors of syringe sharing

Analysis procedures

The analyses so far have shown statistical significant predictors for syringe sharing among background variables (site and income), norms, and role strain indicators. According to this study's model, norms and role strain indicators when considered together, should explain the likelihood of HIV risk behaviors, in this case of syringe sharing. The analysis conducted to test this hypothesis was a hierarchical logistic regression model.

The independent variables (covariates) and the theory-defined domains included in the hierarchical logistic model, were those selected through the preliminary analyses presented in chapter IV. A set of important empirical and theoretical covariates was the first domain entered into the model. A norm scale was entered into the model in the second step; and role strain/deprivation indicators (physical discomfort, pooling money to buy drugs and current illness condition) were entered in the third step.

Statistical significance of the change in model chi-square with inclusion of variables in every additional step was determined through the likelihood ratio test (Hosmer & Lemeshow 1989) The overall adequacy of the final logistic regression model was ascertained by the Hosmer-Lemeshow goodness-of-fit statistic.

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Table 7 presents the results of hierarchical logistic regression analysis of proposed HIV role model with syringe sharing. In step one, eight covariates were entered into the model, and only two covariates, site and annual income, were significantly associated with syringe sharing. Addiction severity indicators (e.g., frequency of injection and years of injection) were not statistically significant.

Norms were entered in the model in step two. After controlling for all variables in the model, this variable shows statistically significant association with syringe sharing (odds ratio=1.08,95% C.I:1.03-1.12). In step two and controlling for all other variables in the equation, site and annual income remained significant.

Role strain/deprivation indicators were entered in step three. In this final step, and controlling for all other variables in the model, site, income, norms and pooling money to buy drugs were statistically significant. For site, the odds of syringe sharing is 3.74 times higher in Puerto Rico than in New York (odds ratio=3.74,95% C.I:2.28-6.12). Poverty (represented by annual income) reduce the odds of syringe sharing (odds ratio=0.61,95% C.I:0.39-0.93). This finding might suggest that for those very poor IDUs (defined as those who earn less than $10,000) the issue of access to economic resources might very well inhibit their ability to even buy drugs. A situation that may induce pooling money to buy drugs with other IDUs. A factor that might increase the probabilities of risky behavior practices. After controlling for all variables in the model, peer norms

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showed statistical significant levels (odds ratio=1.07,95% C.I:1.02-1.12) and for the role strain/deprivation domain, the odds of syringe sharing is 3.53 times higher for those who pool money to buy drugs than for those who do not (odds ratio 3.53, 95% C.I:2.17-5.75). The analysis also shows that, for the total sample, two prongs (norms and role strain/deprivation) of the proposed HIV role model significantly predict syringe sharing. Further, the model correctly classified 95% of the IDUs whose syringe sharing was not observed and 29% for whom the behavior was observed. Overall, 82% of the IDUs were correctly classified for the model.

Table 7. Hierarchical logistic regression analysis of proposed HIV role model with syringe sharing among IDUs in Bayamón PR, and East Harlem NYC.

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Site	4.25	2.66-6.79	0.001	4.07	2.53-6.54	0.001	3.74	2.28-6.12	0.001
Place of birth	1.27	0.77-2.10	0.345	1.25	0.75-2.09	0.382	1.26	0.75-2.13	0.371
Gender	1.20	0.66-2.19	0.533	1.25	0.68-2.29	0.463	1.28	0.69-2.39	0.426
Annual income	0.60	0.40-0.90	0.015	0.62	0.41-0.95	0.028	0.61	0.39-0.93	0.024
Year of injection	0.99	0.96-1.01	0.376	0.98	0.96-1.00	0.238	0.98	0.96-1.00	0.176
Frequency injection	1.15	0.97-1.37	0.102	1.12	0.94-1.34	0.194	0.97	0.80-1.18	0.822
Ever drug treatment	1.71	0.82-3.57	0.147	1.94	0.91-4.14	0.083	1.65	0.76-3.59	0.204
Told HIV positive	0.74	0.42-1.31	0.311	0.79	0.44-1.40	0.429	0.84	0.46-1.52	0.576
2. Peer norms domain									
Norms scale				1.08	1.03-1.12	0.001	1.07	1.02-1.12	0.001
3. Role strain domain									
Physical discomfort							1.38	0.84-2.28	0.199
Pool money buy drug							3.53	2.17-5.75	0.001
Illness condition							1.21	0.73-1.99	0.444
-2 log likelihood		621.81			609.53			576.93	
Model chi-square		89.06**			101.33**			133.94**	
Degrees of freedom		8			9			12	
Change in chi-square		89.06**			12.27**			32.60**	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

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Testing the HIV role model with syringe sharing by site

So far, the findings suggest that the proposed HIV role model explains syringe sharing using norms and role strain/deprivation indicators. Since one of the study's aim was to assess whether this model can be used in two different geographical locations (New York and Puerto Rico) the following multivariate analysis were conducted by site.

Proposed HIV role model with syringe sharing for East Harlem, New York City

Table 8 presents the results of hierarchical logistic regression analysis of proposed HIV role model with syringe sharing for East Harlem, New York city only (n=561). In step one, socio-demographic and other covariates were entered into the model, only annual income was significantly associated with syringe sharing (odds ratio. 0.51, 95%C.I..27-.94 p<.03). After controlling for all variables in the final model, frequency of injection and years of injection were not statistically significant. Norms were entered in the model in step two. In this step, income was not longer significant (p<.07). Controlling for all other variables in the equation, norms show a statistically significant association with syringe sharing (odds ratio.1.11, 95% C.I:1.05-1.17 p<.001). Role strain/deprivation indicators were entered in step three. Pooling money to buy drugs (economic deprivation) showed statistical significantly levels (odds ratio=3.13,95% C.I:1.58-6.18). For the New York sample it seems that the norms and role

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strain/deprivation domain can predict syringe sharing. Further, even though this model is statistically significant, it predicts very well for those whose syringe sharing is not observed (99%) but it predicts very poorly for those whose behavior is observed (4%). Overall, 90% of the IDUs were correctly classified for the model.

Several studies have shown that drug treatment programs and participation in needle exchange program tend to help in the reduction of syringe sharing. Other studies have suggested that intensive outreach and educational programs in New York City may have an impact in the reduction of syringe sharing. For New York the model has a very low prediction power, which may be the result of other intervening variables influencing the ability of prediction. Additional research should be conducted with psychological variables to assess their performance with this model.

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Table 8 Hierarchical logistic regression analysis of proposed HIV role model with syringe sharing among IDUs in East Harlem NYC (n=561)

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Place of birth	1.60	0.84-3.07	0.150	1.61	0.82-3.13	0.160	1.52	0.77-2.99	0.219
Gender	1.19	0.53-2.65	0.661	1.29	0.57-2.90	0.538	1.28	0.56-2.94	0.550
Annual income	0.51	0.27-0.94	0.033	0.56	0.29-1.06	0.075	0.54	0.28-1.03	0.062
Year of injection	0.97	0.94-1.00	0.145	0.97	0.93-1.00	0.074	0.96	0.93-1.00	0.060
Frequency injection	1.10	0.87-1.38	0.410	1.06	0.84-1.34	0.586	0.99	0.77-1.28	0.973
Ever drug treatment	4.04	0.52-31.20	0.179	3.97	0.50-31.42	0.190	3.82	0.48-30.40	0.204
Told HIV positive	0.63	0.26-1.50	0.301	0.67	0.28-1.61	0.380	0.69	0.28-1.71	0.432
2. Peer norms domain									
Norms scale				1.11	1.05-1.17	0.001	1.11	1.05-1.18	0.001
3. Role strain domain									
Physical discomfort							0.75	0.39-1.47	0.413
Pool money buy drug							3.13	1.58-6.18	0.001
Illness condition							1.06	0.52-2.13	0.862
-2 log likelihood		306.60			293.75			281.77	
Model chi-square		13.72			26.57**			38.56**	
Degrees of freedom		7			8			11	
Change in chi-square		13.72			12.85**			11.98*	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

Proposed HIV role model with syringe sharing for Bayamón, Puerto Rico

Table 9 presents the results of hierarchical logistic regression analysis of the proposed HIV role model with syringe sharing for Bayamón, Puerto Rico only (n=313). In step one, none of the socio-demographic and other covariates considered in the analysis were statistically significant. Norms were entered in

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the model in step two and contrary to theoretical expectations, norms as well the other control variables did not show statistical significance. Role strain/deprivation indicators were entered in step three. In this final step, and controlling for all other variables in the model, physical discomfort due to drug cravings and pooling money to buy drugs showed statistical significance. The final model suggests that the odds of syringe sharing are 3.23 times greater for those IDUs who have high levels of physical discomfort than for those who do not (odds ratio 3.23, 95% C.I:1.41-7.41); and the odds of syringe sharing are 4.40 times higher for those who pool money to buy drugs than those who do not pool (odds ratio 4.40, 95% C.I:2.12-9.11). The final proposed HIV role strain model for Puerto Rico correctly classifies 56% of those who reported syringe sharing and 76% for those who do not. Overall, 68% of the cases were correctly classified. This finding indicates that role strain factors are highly related to syringe sharing in Puerto Rico. Several studies have shown that injectors in Puerto Rico may be in need of more health related services and drug treatment programs (e.g., methadome treatment programs).

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Table 9. Hierarchical logistic regression analysis of proposed HIV role model with syringe sharing among IDUs in Bayamón, Puerto Rico (n=313)

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Place of birth	0.88	0.38-2.00	0.764	0.86	0.38-1.97	0.735	0.89	0.37-2.16	0.812
Gender	1.33	0.53-3.34	0.541	1.33	0.53-3.36	0.538	1.23	0.45-3.36	0.675
Annual income	0.68	0.39-1.19	0.184	0.69	0.40-1.20	0.195	0.70	0.39-1.28	0.256
Year of injection	1.00	0.97-1.03	0.852	1.00	0.97-1.03	0.931	1.00	0.96-1.03	0.879
Frequency injection	1.27	0.95-1.68	0.094	1.24	0.93-1.65	0.129	1.01	0.73-1.40	0.928
Ever drug treatment	1.40	0.61-3.19	0.414	1.52	0.65-3.50	0.325	1.03	0.41-2.59	0.942
Told HIV positive	0.81	0.36-1.81	0.613	0.84	0.37-1.89	0.681	0.85	0.35-2.01	0.712
2. Peer norms domain									
Norms scale				1.04	0.97-1.11	0.232	1.02	0.96-1.10	0.414
3. Role strain domain									
Physical discomfort							3.23	1.41-7.41	0.005
Pool money buy drug							4.40	2.12-9.11	0.001
Illness condition							1.35	0.63-2.88	0.429
-2 log likelihood		310.63			309.19			279.09	
Model chi-square		6.96			8.40			38.50**	
Degrees of freedom		7			8			11	
Change in chi-square		6.96			1.43			30.10**	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

Summary

The analyses presented in this chapter demonstrated that the proposed hypothesis work for the total sample and the New York one. In this case, both theoretical proposed prongs -peer norms and role strain/deprivation domains- influenced the odds of syringe sharing. However, the findings also suggest that

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this is not always true. It showed that for the Island sample, only the role strain/deprivation prong affects the odds of syringe sharing. This finding may be related with access and utilization of health related services in Puerto Rico.

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CHAPTER VII

Related independent variables with sharing other paraphernalia (e.g. cotton, cooker and rinse water)

Theoretical covariates and other predictors for sharing other paraphernalia

The objective of this chapter is to select independent variables and to examine the relationship between the proposed HIV role model with sharing of other paraphernalia (cotton, cookers and rinse water). First, it presents Pearson correlation coefficients of covariates with the proposed dependent variable. Then, it presents independent bivariate associations in the form of logistic regressions with other theoretical domains to see whether independent variables are associated with sharing other paraphernalia. As in the prior chapter, the aim of this analysis was to select a limited number of theoretically and empirically relevant variables related to sharing other paraphernalia. Finally, a hierarchical multiple regression will be presented for the total sample and independently by site.

Pearson correlation coefficients

Pearson correlation coefficients are shown in Table 10. Coefficients larger than r=0.25 were estimated for site (r=0.373), gender (r=0.74), frequency of injection (r=0.286) and pooling money to buy drugs (r=0.503). Most of the coefficients were low but statistically significant at two-tailed significant levels. Four independent variables did not show any significance levels with the

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dependent variable:annual income, HS graduate, use NEP last 30 days and illness condition.

Table 10. Pearson correlation coefficient of selected background variables and other covariates with sharing of other paraphernalia (cotton, cooker and rinse water) (n=874)

	Dependent variable: Sharing other paraphernalia	
Independent variables	Correlation coefficient	p
1. Covariates		
Site	0.373	<0.01
Place of birth	0.186	<0.01
Gender	0.74	<0.05
Annual income	-0.048	0.160
HS graduate or better	-0.038	0.26
Years of injection	-0.074	<0.05
Frequency of injection	0.286	<0.01
Ever drug treatment	-0.212	<0.01
Use NEP last 30 days	0.064	0.06
HIV status	-0.00	0.91
2. Norm indicator		
Norms	0.182	<0.01

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Table 10 continued from previous page

2. Role strain/deprivation indicators		
Physical discomfort due to drug craving	0.172	<0.01
Pool money to buy drugs (economic deprivation)	0.503	<0.01
Illness condition (no HIV)	-0.004	0.911

Independent bivariate associations of covariates, norms and role strain/ deprivation with sharing of other paraphernalia (either direction)

As in prior analysis, the following examined how independent variables when considered independently in a logistic regression model, may influence the odds of sharing of other paraphernalia among IDUs. Table 11 shows a bivariate association of socio-demographic variables and other covariates. Five covariates showed statistically significant levels at p<.05 or better. By site, the odds of sharing other paraphernalia is 4.19 greater in Puerto Rico than in New York (odds ratio=4.19; 95% C.I:2.81-6.24). Those who have HS education are less likely to share other paraphernalia (odds ratio=0.65; 95% C.I:0.47-0.90). Frequency of injection, (odds ratio=1.29, 95% C.I:1.13-1.47), ever being in a drug treatment program (odds ratio=2.68; 95% C.I:1.45-4.97) and use of the needle exchange program in the last 30 days (odds ratio=1.41; 95% C.I:1.01-1.96) were also statistically related to sharing other paraphernalia.

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Table 11. Bivariate relationships of background variables and other covariates with sharing other paraphernalia (e.g., cotton, cookers, rinse water) (either direction)

Independent variable	O.R. ¶	95% C.I. ŧ	p
Site	4.19	2.81-624	0.001
Place of birth	1.39	0.97-1.98	0.068
Gender	1.35	0.88-2.09	0.166
Annual Income	0.80	0.58-1.11	0.202
Education (HS or better)	0.65	0.47-0.90	0.009
Years of injection	0.99	0.98-1.01	0.889
Frequency of injection	1.29	1.13-1.47	0.001
Ever in drug treatment	2.68	1.45-4.97	0.001
Used NEP last 30 days	1.41	1.01-1.96	0.037
HIV status	1.10	0.73-1.64	0.636
Model chi-square	147.04 (df=10)		0.001

¶ Logistic regression adjusted odds ratio
ŧ 95% confidence interval

Peer norms and role strain/deprivation domains

Independent bivariate relationship of peer norms (panel a) and role strain/deprivation indicators (panel b) with sharing of other paraphernalia are shown in tables 12. The odds of sharing other paraphernalia increased with each unit increase in the peer norm scale (odds ratio= 1.09 95%CI 1.05-1.12).

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On the other hand, the odds of sharing other paraphernalia were directly associated with the presence of physical discomfort due to drug craving (odds ratio=1.45, 95% C.I:1.04-2.02) and with pooling money to buy drugs (odds ratio=8.84 95% C.I: 6.42-12.18). Both show statistically significant levels, $p<.05$ or better. Illness condition did not show any statistical significance at the bivariate level.

Table 12. Bivariate relationships of norms and role strain/deprivation indicators with sharing other paraphernalia (e.g., cotton, cookers, rinse water) (either direction)

Independent variable		O.R. ¶	95% C.I. ŧ	p
a) Norms scale				
Norms		1.09	1.05-1.12	0.001
Model chi-square	27.40 (df=1)			0.001
b) Role strain/deprivation indicators				
Physical discomfort due to drug cravings		1.45	1.04-2.02	0.026
Pool money to buy drugs (Economic deprivation)		8.84	6.42-12.18	0.001
Current illness condition (no HIV)		1.16	0.81-1.67	0.391

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

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List of HIV role model variables as predictors for sharing other paraphernalia

All the socio-demographic and other covariates in the proposed bivariate associations (see tables 11 and 12) were selected for the final multivariate analyses.

Summary

The results of this chapter suggest that several independent variables: site, HS graduate, frequency of injection, ever in drug treatment, use of NEP in the last 30 days, as well as theoretically defined indicators like norms, physical discomfort and pooling money to buy drugs, are predictors for sharing other paraphernalia. The next chapter examines these predictors as well as theoretically relevant variables in an hierarchical logistic regression model to examine which factors are of relevance to our dependent variable.

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CHAPTER VII

Peer norms, role strain/deprivation and other covariates as predictors sharing other paraphernalia (e.g., cotton, cooker and rinse water)

Analysis procedure

Table 13 presents the results of hierarchical logistic regression analysis of proposed HIV role model with sharing of other paraphernalia. In step one, 10 independent variables were entered into the model, and six of them, site, place of birth, HS graduate, frequency of injection, ever in drug treatment and used NEP in last 30 days were significantly associated with sharing other paraphernalia ($p<.05$ or better). In step two, peer norm was entered in the model and all the significant covariates from step one remained significantly associated with sharing of other paraphernalia. In this step and after controlling for all other variables, peer norms were found significantly associated with sharing other paraphernalia (odds ratio=1.07, 95% C.I.1.03-1.11).

Role strain/deprivation indicators were entered in step three. When all other variables where controlled, only site, place of birth and ever in drug treatment maintained significant levels at $p<.05$ or better. Two variables, HS graduate and used NEP in the last 30 days, lost their significance in step three. Finally, controlling for all variables in the model, the odds of sharing other paraphernalia increased with each unit increase in the peer norm scale (odds ratio= 1.06 95%CI 1.02-1.11). The odds of sharing other paraphernalia was around 8 times higher for those who reported pooling money to buy drugs than

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for those who do not (odds ratio=7.96, 95% C.I:5.43-11.67) and the odds of sharing other paraphernalia is 1.60 times higher for those who have current illness condition than for those who do not (odds ratio=1.60 95% C.I: 1.04-2.46).

Two prongs of the proposed HIV role model predicted sharing of other paraphernalia. In assessing the goodness of the fit of the regression model of the IDUs who did not report the behavior (share other paraphernalia), 76% were correctly predicted by the model and for those who the behavior was observed, 76% were correctly classified. Overall with this model, 76% of the total sample of IDUs were corrected classified.

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Table 13. Hierarchical logistic regression analysis of proposed HIV role model with sharing of other paraphernalia (e.g., cotton, cooker, and rinse water) among IDUs in Bayamón, PR and East Harlem NYC (n=874)

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Site	3.66	2.43-5.52	0.001	3.45	2.28-5.23	0.001	3.41	2.14-5.42	0.001
Place of birth	1.56	1.09-2.30	0.014	1.57	1.08-2.29	0.017	1.62	1.06-2.46	0.023
Gender	1.40	0.89-2.20	0.145	1.45	0.92-2.29	0.108	1.60	0.96-2.66	0.069
Annual income	0.78	0.55-1.09	0.155	0.81	0.58-1.14	0.246	0.78	0.53-1.14	0.205
HS graduate/better	0.66	0.47-0.93	0.018	0.69	0.49-0.96	0.032	0.74	0.50-1.08	0.122
Year of injection	0.99	0.97-1.00	0.398	0.99	0.97-1.00	0.272	0.98	0.96-1.00	0.105
Frequency injection	1.30	1.14-1.48	0.001	1.28	1.12-1.46	0.001	1.09	0.93-1.27	0.257
Ever drug treatment	2.55	1.36-4.80	0.003	2.71	1.42-5.19	0.002	2.64	1.30-5.37	0.006
NEP used	1.43	1.02-2.01	0.036	1.46	1.04-2.06	0.028	1.28	0.87-1.88	0.200
Told HIV positive	1.20	0.79-1.83	0.380	1.23	0.81-1.89	0.322	1.66	1.01-2.72	0.042
2. Peer norms domain									
Norms scale				1.07	1.03-1.11	0.001	1.06	1.02-1.11	0.002
3. Role strain domain									
Physical discomfort							1.02	0.68-1.54	0.888
Pool money buy drug							7.96	5.43-11.67	0.001
Illness condition							1.60	1.04-2.46	0.031
-2 log likelihood		866.20			853.58			719.95	
Model chi-square		135.87**			148.49**			282.12**	
Degrees of freedom		10			11			14	
Change in chi-square		135.87**			12.61**			133.63**	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

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Testing the proposed HIV role model with sharing of other paraphernalia by site

As in chapter 7, the following multivariate analysis examined the proposed model independently by site.

Proposed HIV role model with sharing of other paraphernalia for East Harlem, New York City

Table 14 examines the results of hierarchical logistic regression analysis for East Harlem, New York City (n=561). In step one, 9 covariates were entered into the model, only place of birth (odds ratio=1.53, 95% C.I: 1.01-2.32), HS graduate (odds ratio=0.64, 95% C.I: 0.49-1.10) and frequency of injection (odds ratio=1.28, 95% C.I: 1.10-1.49) were significantly associated with sharing of other paraphernalia. Norms were entered in the model in step two. In this step, the same variables from step one retained their significance levels at $p<.05$ or better. After controlling for all other variables, norms showed statistical significance with sharing of other paraphernalia (odds ratio=1.09, 95% C.I:1.04-1.14). Role strain/deprivation indicators were entered in step three. In this step all the initial significant variables from prior steps lost their significant levels and one variable, 'HIV status' gained statistical significance (odds ratio=2.00; 95%C.I:1.13-3.54), and the odds of sharing other paraphernalia was around 8 times higher for those who pool money to buy drugs (odds ratio=7.98 95% C.I: 5.00-12.73).

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In examining this model for New York, the proposed two prongs (norms and roles strain/deprivation) predicted sharing of paraphernalia for the New York sample. In assessing the goodness of the fit of the model, of the IDUs who did not share other paraphernalia, 82% were correctly predicted and for those who did share other paraphernalia, 67% were correctly classified by the model. Overall, 77% were correctly classified by the model.

Table 14. Hierarchical logistic regression analysis of proposed HIV role model with sharing of other paraphernalia (e.g., cotton, cooker, and rinse water) among IDUs in East Harlem NYC (n=561)

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Place of birth	1.53	1.01-2.32	0.042	1.52	1.00-2.32	0.048	1.47	0.92-2.35	0.101
Gender	1.45	0.86-2.44	0.158	1.55	0.91-2.64	0.100	1.77	0.98-3.21	0.057
Annual income	0.73	0.49-1.10	0.141	0.79	0.52-1.19	0.260	0.76	0.48-1.20	0.251
HS graduate/better	0.64	0.42-0.96	0.032	0.65	0.43-0.98	0.041	0.67	0.42-1.07	0.095
Year of injection	0.99	0.97-1.01	0.809	0.99	0.97-1.01	0.591	0.98	0.96-1.01	0.342
Frequency injection	1.28	1.10-1.49	0.001	1.26	1.08-1.48	0.002	1.08	0.90-1.29	0.376
Ever drug treatment	2.10	0.79-5.53	0.131	2.03	0.76-5.40	0.156	2.03	0.72-5.68	0.177
NEP used	1.19	0.79-1.77	0.391	1.25	0.83-1.87	0.280	1.14	0.72-1.80	0.563
Told HIV positive	1.49	0.92-2.40	0.099	1.53	0.94-2.48	0.084	2.00	1.13-3.54	0.017
2. Peer norms domain									
Norms scale				1.09	1.04-1.14	0.001	1.09	1.04-1.15	0.001
3. Role strain domain									
Physical discomfort							0.99	0.61-1.59	0.979
Pool money buy drug							7.98	5.00-12.73	0.001
Illness condition							1.20	0.72-2.00	0.473
-2 log likelihood		591.14			576.24			486.71	
Model chi-square		32.84**			47.74**			137.27**	
Degrees of freedom		9			10			13	
Change in chi-square		32.84**			14.90**			89.52**	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

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Proposed HIV role model with sharing of other paraphernalia for Bayamón, Puerto Rico

Table 15 presents the results of hierarchical logistic regression analysis of proposed HIV role model with sharing of other paraphernalia for Bayamón, Puerto Rico (n=313). In step one, covariates were entered into the model, only two covariates, ever in drug treatment and use of NEP in the last 30 days, showed statistical significance levels of p<.05 or better. Norms were entered in the model in step two. Controlling for all variables in step two, three variables show significant levels at p<.05 or better (frequency of injection, ever in drug treatment and used NEP last 30 days). Role strain/deprivation indicators were entered in step three. In this final step, and controlling for all variable in this step, history of drug treatment program (ever being in drug treatment) was statistically significant (odds ratio= 3.37 95%CI 1.25-9.08). After controlling for all variables in this last step, the odds of sharing other paraphernalia were 9.57 times greater for those who pool money to buy drugs than for those who do not (odds ratio= 9.57 95%CI 4.63-19.80). Finally, controlling for all variables, the odds of sharing other paraphernalia is 5.29 times higher for those who reported current illness conditions than for those who do not (odds ratio=5.29, 95% C.I:1.90-14.69).

For the Puerto Rico sample, only one prong (role strain/deprivation domain) predicted risk behaviors. The assessment of the goodness of the fit of the model revealed that for those whose sharing other paraphernalia was not

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observed, the model correctly classified 59%. And for those in which the behavior was observed, the model predicted 92%. Overall, 83% were correctly classified.

Table 15. Hierarchical logistic regression analysis of proposed HIV role model with sharing of other paraphernalia (e.g., cotton, cooker, and rinse water) among IDUs in Bayamón, Puerto Rico(n=313)

	Step one			Step two			Step three		
	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p	O.R. ¶	C.I. ŧ	p
1. Covariates domain									
Place of birth	1.52	0.63-3.68	0.343	1.52	0.63-3.67	0.348	1.89	0.69-5.21	0.214
Gender	1.06	0.38-2.98	0.900	1.06	0.38-2.98	0.901	1.10	0.34-3.50	0.864
Annual income	0.84	0.44-1.57	0.593	0.84	0.45-1.58	0.598	0.83	0.40-1.72	0.623
HS graduate/better	0.62	0.33-1.16	0.140	0.63	0.33-1.18	0.153	0.68	0.32-1.43	0.315
Year of injection	0.98	0.95-1.01	0.419	0.98	0.95-1.01	0.409	0.97	0.93-1.01	0.235
Frequency injection	1.33	1.00-1.77	0.045	1.32	0.99-1.76	0.050	1.14	0.81-1.61	0.434
Ever drug treatment	3.20	1.38-7.41	0.006	3.26	1.39-7.61	0.006	3.37	1.25-9.08	0.016
NEP used	2.56	1.28-5.11	0.007	2.55	1.27-5.10	0.007	2.09	0.94-4-64	0.068
Told HIV positive	0.56	0.23-1.32	0.189	0.56	0.23-1.34	0.197	0.70	0.25-1.96	0.506
2. Peer norms domain									
Norms scale				1.01	0.93-1.08	0.777	0.99	0.91-1.08	0.943
3. Role strain domain									
Physical discomfort							1.22	0.53-2.77	0.635
Pool money buy drug							9.57	4.63-19.80	0.001
Illness condition							5.29	1.90-14-69	0.001
-2 log likelihood		265.96			265.88			214.27	
Model chi-square		24.67**			24.75**			76.36**	
Degrees of freedom		9			10			13	
Change in chi-square		24.67**			0.08			51.60**	

¶ Logistic regression adjusted odds ratio

ŧ 95% confidence interval

Significant level at *p<.05; ** p<.001

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Summary

The two proposed prongs -peer norms and role strain/deprivation domains- can affect the odds of sharing other paraphernalia for the total sample in general and for New York in particular. However, for the Island sample only the role strain/deprivation prong affects the odds of sharing other paraphernalia.

a) Total sample: Four covariates showed statistical significance. For instance, the odds of sharing other paraphernalia are 3.41 times higher in Puerto Rico than in New York and the odds of sharing other paraphernalia are 1.62 times greater if the participant was born in Puerto Rico than in New York. The odds of sharing other paraphernalia are 2.64 times higher for those who reported ever being in a drug program in comparison with those who do not. HIV status was also related to sharing other paraphernalia.

b) New York sample: The final model showed that HIV status was a predictor of sharing other paraphernalia. The odds of sharing other paraphernalia are 2.0 times higher for those who are HIV positive than for those who do not. This finding may have some important policy consequences. Furthermore, the proposed two prongs -norms and role strain/deprivation- predicted sharing other paraphernalia for the New York sample.

c) Puerto Rican sample: It appears that the model only predicts the odds of sharing other paraphernalia with the role strain/deprivation indicators (e.g., pool money to buy drugs and current illness condition). These may reflect that participants from Puerto Rico may be more prone to have strain due to

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their drug habits and to the need to fulfill their role obligations as injectors (e.g., obtain money to buy drugs) and their health condition. Several empirical and theoretical explanations will be offered later in the discussion section in this dissertation.

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Chapter VIII

Summary and discussion

This chapter provides an overview of the study, its aims and the research hypotheses. It reviews and discusses the results for each sample (New York and Puerto Rico) and for each dependent variable. Findings from the qualitative component of the study are used to help contextualize the results. In addition, conceptual and methodological limitations are identified, and research and policy implications of the findings examined.

Study background

HIV infection and AIDS have been increasingly associated with injection drug users (IDUs) and other drug related categories. Among several ethnic groups in the United States, Puerto Rican drug injectors in both mainland and Puerto Rico have shown one of the highest rates of HIV infection. Understanding the implications of this phenomenon requires not only basic scientific and behavioral research but also a broad theoretical understanding of the socio-cultural and structural conditions with which this epidemic is associated.

A sociological theory that integrates different levels of influences for HIV risk behaviors and that improves our ability to understand and optimize prediction is necessary to advance our understanding of the AIDS epidemic. This study used role theory (Winick, 1980) as a heuristic tool to understand and

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predict HIV risk behaviors among injection drug users and to broaden our theoretical understanding of the social phenomena of the HIV/AIDS epidemic.

Objectives of the study

The study assesses whether HIV risk behaviors can be understood using Winick's model that highlights (1) peer norms, and (2) role strain/deprivation (the felt difficulty in meeting the obligations of a role) as predictors of HIV risk behaviors among Puerto Rican IDUs from New York and Puerto Rico.

The major aims of this study were: 1) To examine the contributions of role theory in the form of peer norms, and role strain indicators, on HIV risk behaviors among Puerto IDUs in East Harlem, New York and Bayamon, Puerto Rico. 2) To assess whether and how the influences on risk behaviors are moderated by geographical location. 3) To assess whether and how the influences on risk behaviors are moderated by socio-demographic variables (e.g., gender, place of birth, income, and education) and or by addiction severity indicators (e.g., years of injection, frequency of injection), and HIV serostatus. 4) To develop policy-related recommendations to reduce HIV risk behaviors.

This was the first empirical study to propose an HIV role theory based on role strain/deprivation to understand HIV risk behaviors among injection drug users. This study incorporates sociological factors (e.g., peer norms, role, role strain, socio-demographic indicators) and quantitative and qualitative methodologies to specify the factors and to understand the contextual realities of

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drug injectors and their lives. The first set of analyses involved descriptive analysis of the characteristics of the sample and independently by each site. Later, the analyses focused on the selection of independent variables and theoretical domains to predict syringe sharing (either direction). Finally, a similar analysis was conducted for another dependent variable, sharing other paraphernalia (cotton, cooker and rinse water-either direction) among Puerto Rican injection drug users. Statistical procedures used in this dissertation were chi-squares, t-test, Pearson correlation coefficients and hierarchical logistic regression analyses.

Proposed hypothesis

Two general hypotheses were developed to assess of proposed theory. First, it can be suggested that the level of HIV risk behaviors will be higher if an individual follows the norms of the peer group, which support risky behaviors, and second, it can be suggested that the level of HIV risk behavior will be higher if an individual experiences role strain and/or deprivation.

Peer norms and role strain/deprivation as predictors of HIV risk behaviors (syringe sharing and sharing other paraphernalia)

Hypothesis 1 stated that the level of HIV risk behaviors will be higher if an individual follows the norms of the peer group, which support risky behaviors.

The analyses identified significant relationships between drug related peer norms and HIV risk behaviors (syringe sharing and sharing of other

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paraphernalia) after controlling for all variables in the model. Examining this hypothesis by site, the results supported the hypothesis that HIV risk behaviors among IDUs are related to peer norms in New York but not in Puerto Rico.These findings are similar to other research on peer norms and HIV risk behaviors (Friedman, et al., 1993a; Abu-Quader, 1989, Des Jarlais, Casriel, et al., 1989a). They demonstrated that sharing behaviors (syringe sharing and sharing other paraphernalia) are not only an individualistic phenomenon but may be related to complex influences from the peer group, its norms and its social structure.

A 42 years old male speedball injector born in New York but interviewed in Puerto Rico demonstrates the level of interaction and association between the drug scenes and peer norms.

(Translated from Spanish)

"Once you are an addict, you know everybody that is in the same thing with you. Because, you visit the same places, they know you. Because, every time that one goes, from time to time one talks with them and talking under the same, under the same flare, one continues speaking with them and you make friendships, you know. They are people you know rather, they are not friends, they are people you know"

Friedman, in a study on networks and HIV, found that peer norms can mandate receptive syringe sharing (who will rotate or who goes first in the case of sharing) and can support and legitimate the refusal to give used syringes to other injectors, as a sign of 'true friendship (Friedman, et al., 1999). Peer norms are also associated with positive influences for reducing risk behaviors among people at risk. Quader (1989) found that peer influence is associated with sexual

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risk reduction and condom use among IDUs (Abdul-Quader et al 1989). Friedman, et al., (1987a), studying methadone clients, found a strong association between subjects' reports that they had attempted to reduce their drug-related risk and their reports that their friends had also done so.

The finding also shows that peer norms are not significantly associated with risk behaviors in Puerto Rico. A discussion of hypothesis 2 may shed some light in explaining this finding. According to hypothesis 2, the extent of HIV risk behaviors will be high if an individual experiences role strain and/or deprivation relevant to difficulties in performing the role of a drug injector. The study's results suggest that for the total sample and across geographical boundaries, role strain/deprivation indicators are significantly related to HIV risk behaviors (syringe sharing and sharing other paraphernalia). The data supported the hypothesis of higher HIV risk behaviors for those IDUs who experience some kind of role strain/deprivation.

After controlling for all variables in the proposed HIV role model for the total sample, two role strain/deprivation indicators (physical discomfort due to drug cravings and pooling money to buy drugs) were predictors for sharing other paraphernalia and one predictor (pool money to buy drugs) for syringe sharing.

The same analysis was conducted independently by site to assess the contribution of the proposed HIV role model. For New York, pooling money to buy drugs was the role strain/deprivation indicator that predicted HIV risk behaviors. For Puerto Rico, the influence of the role strain/deprivation factors,

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appear to be more complex. Two role strain indicators (physical discomfort due to drug cravings and pooling money to buy drugs) were predictors for syringe sharing and two role strain indicators (pooling money to buy drugs and current illness condition) showed predictability for sharing other paraphernalia after controlling for other variables.

These findings are similar to other research on drug cravings and risky behaviors. Koester and associate (1994) observed that injectors might be more likely to practice risky behaviors if they have symptoms of withdrawal. Gabriel, an injector interviewed in the New York site of the ARIBBA project, mentioned his experience about physical discomfort due to drug withdrawals and its relationship with risk behaviors:

Gabriel:*..."It's so dangerous, when a dope fiend is sick, because you do the stupidest things in the world. You'd do anything to try to get that fix. You see, heroin is a body thing. Your body needs it. You go through diarrhea, throwing up, puking, runny nose, back pains, you feel like shit, you feel like, you feel fucked up, it's a fucked up feeling. So you gonna do anything to try to get, to try to feel straight. You know what I'm saying? Anything to take, to feel the –haaaa"* ***(interviewer comment****: 'he makes a sound like a sigh of relief')*

Most injectors in New York and Puerto Rico mentioned that physical discomfort due to drug cravings might induce the practice of risk behaviors. Viejo, an old time injector from New York in his early 50's, suggested that drug cravings are associated with risky moments in the injector's drug career:

Viejo*: "The risky moment is, that risky moment. You, you, you're spike breaks. Your 'aparato' [syringe] breaks and there's no other 'aparato' but this guy has an 'aparato'. Should I use it or should I go get 'aparatos'. That's the risky moment."*

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Later Viejo mentioned another risky moment associated with the physical discomfort caused by drug cravings:

***Viejo**: "in the morning you're more susceptible to making that error [share works] because you're sick and don't care. You just want to get that sickness off you and don't care about anything."*

The relationship between physical discomfort due to drug cravings and economic deprivation [in the form of pooling money to buy drugs] has a dynamic and close relationship. According to Koester (1990): "Due to their drug cravings, drug injectors waste little time to procure their drugs, even though they may not have enough money to "get well". Similar descriptions were found in the qualitative data. José, an injector from New York, explains the relationship between physical discomfort due to drug cravings during specific times of the day and economic strain very eloquently:

***Interviewer**: You're saying in the morning when you are sick that's when you are more at risk?*
***José**: "Yeah, because, you are sick. You wanna get straight. You want your body to feel right, you know what I mean? So you..you're running to the spot to get straight, you know, (**interviewer comment**: he slaps his arm miming injecting) that's why, you're you know like that. See like me, I used to always try to wake up with a bag, [heroin or cocaine] but sometimes you don't have that kind of money, you know, to wake up with a bag every day, or two three bags, depends on the habit that you have. You know, but it's a lot..."*

The results indicated that 'pooling money to buy drugs' was a predictor of HIV risk behaviors in both locations. This finding suggests that the constant problem for IDUs is procuring and or obtaining money to buy drugs. Other investigators found that pooling money to buy drugs is related to drug

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preparation (Needle, et al., 1998; Koester & Hoffer 1994; Colón et al.,1999). To obtain sufficient money to buy drugs may be the single most important role related activity for IDUs in both locations.

Analysis of the qualitative data shows evidence that among IDUs, pooling money to buy drugs is a common practice. In Puerto Rico, this activity is called "hacer un caballo" (make a horse) or "hacer un serrucho" (make a handsaw) and in New York "hacer un ángulo" (make an angle). People can pool money with friends and with people they do not know.

Ofelia, a Puerto Rican female injector in her 40's made some relevant comments: (translated from Spanish)

***Interviewer**: You have commented before that in many occasions you make "caballos" (horses) with your friends and that do you also make "serruchos" (handsaws) with them, How often does this situation happen in your daily life?*
***Ofelia**: Daily, I can say daily, daily, this is a thing that is daily, daily.*
***Interviewer**: With whom do you make a handsaw?*
***Ofelia**: Friends, friends, friendships*
***Interviewer**: Friends?*
***Ofelia**: I would not say friends, just people I know. In this area nobody is a friend of anybody. Here you try to survive.*
***Interviewer**: What do you mean for this 'area'?*
***Ofelia**: The daily life of addicts, of us, the addicts [life] because I include myself, this is a daily battle, here the one who can survive has the best thinking. This is survival.*

***Interviewer**: And how are the agreements on money when you make the handsaws?*
***Ofelia**: Okay, one puts one [bag] of heroin, and the other one of cocaine and we go half-and-half.*

As explained above, several investigators have mentioned the relationship of this practice with sharing syringes and other paraphernalia. However, the analysis of the qualitative data suggests that pooling money to buy

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drugs may be associated with more factors that need to be investigated. These factors might be related to 1) peer norms [rules for sharing and preparation], 2) The frequency of doing "caballos" might be related to the sharing of lower drug doses, this condition, might intensify drug cravings and therefore frequency of injection (another recognized HIV risk behavior –Colón, 1993)

Juan, a male island injector in his 40's, explains the procedure of doing a "caballo" (the reference of CC's is related to the syringe measure system)

***Juan**: If we have half-and-half then we go half-and-half. Or if I have less[money] than the other, or the other has less than me, we come to an agreement. Okay, you have fewer "chavos" [dinero] than I do, then [the contract is] I am going to give you so much.*
Usually to a bag of drug, [heroin or cocaine] a dose, you put twenty of water, 20cc of water. But, if you make a "caballo" (horse), almost always you put 40 [40cc], that they are 20 [cc] and 20 [cc] if it is half-and-half.
Then, you divide 20cc 20cc although you throw [extra] water, less strong is the dose, this is related to your 'arrebato' [being high]

Needle (1998) reported that pooling of money to buy drugs usually leads to splitting drugs, an HIV risk behavior when it is done through using a syringe to measure and distribute drugs. However, pooling money to buy drugs is a fundamental economic issue that should be recognized not only at the individual level but also at the social structural one. As Koester and Hoffer suggested (1994) "IDUs use a variety of legal, quasi-legal, and illegal activities –few of which are particularly secure or financially rewarding – to make a living. As a result, injectors develop ways to obtain drugs even when they are short of cash" (pag 103).

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The proposed HIV role model relates the sources of individual role strain/deprivation to the social structure. The findings by site showed that physical discomfort due to drug craving is a predictor for HIV risk behaviors for Puerto Rico but not for New York. This may be due to availability of health related services (e.g., methadone treatment programs) for injectors. Methadone is more readily available in East Harlem, New York (with several methadone treatment programs) than in Bayamón, Puerto Rico (with one methadone treatment program). The drug and health related structure of East Harlem, with respect to access and availability of drug treatment programs, makes this of the highest concentrations of drug treatment/methadone treatment programs in New York. A very different situation exits in Bayamón, Puerto Rico. The availability of methadone treatment to heroin injectors may contribute to decrease the levels of drug craving especially for New York injectors. Injectors in New York can get an early "cure" for their drug cravings due to the availability and access to drug treatments. This site differential may explain, in part, the increase in sharing of syringes due to drug cravings that appears to be the case in Puerto Rico. José a New York injector in his late thirties mentions the importance of methadone treatment for the 'early cure':

Interviewer: *So you were saying something about you thought there should be more methadone programs in Puerto Rico?*
José: *Well yeah...they should have more methadone programs....*
Interviewer: why?
José: *Because that helps. Well people, you know, 'cause early in the morning you're sick, and you know, you're very sick and you'll use anything you try to get high, you'll use anything, you know the first thing comes you'll get high on it...now with meth, you can go to the program and be straight and then you have*

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your mind more set, you know, what you're gonna do, what you're gonna get high, what you're gonna do to get high, you don't have to be running to the spot, to the gallery and start shootin', shoot whatever, with whatever works, you know. Once, once you start the day you're straight, so you can go buy your works, you do you things more calm, like you know.

The model also shows that 'Illness condition' is a predictor for sharing other paraphernalia in Puerto Rico. It appears that IDUs in Puerto Rico have more difficulty in obtaining adequate health care and this may be a precursor for some to perform risky behaviors. Gabriel, a gay injector in his 30s, living in New York mentions:

***Gabriel**: Speaking about the situation in Puerto Rico because I've visited several galleries—I wish, you see 'cause I got people that come over here who go over there. I wish that every "tecato" [Injector] in Puerto Rico, 'supiera' [knew], or 'tuviera' [have], the assets that I have over here today, you know what I'm saying? They would not be dying, they would not be sick like that, you know what I'm saying? If the government would help them, at least getting their medication, you know what I'm saying? Having the assets, the programs that we have over here, being a 'tecato' over there wouldn't be that bad you know what I'm saying? People wouldn't knock them out the way they do, you know what I'm saying?*

For those IDUs who are ill, the issue of work, performing errands or the daily 'hassle' to obtain money to buy drugs may be more difficult. Their ill condition may impede their ability to inject (for instance more difficult to find veins due to sores in the body) and therefore ask for peer assistance in the form of a hit doctor'. This, in turn, may be a factor for sharing other paraphernalia with drug peers (Friedman, 1999). And may explain why this particular segment of the IDU population is at more risk to share other paraphernalia than others.

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Qualitative reports suggest that social, economic and health conditions (e.g., lack of money, health conditions, etc.) may lead to increased daily strain and anxieties of IDUs. These conditions and the reality of their daily drug habits may induce injectors to perform risky behaviors. Bobby, a New York injector in his late 30's and a frequent traveler between New York and Puerto Rico, explained:

"In Puerto Rico it's not like that, see... I feel sorry, every time I go over there and I hang out with that, you know, it hurts me 'cause all my friends, you know, the shoes, the clothes, the weight, the body is all skinny, they are consumed by drugs, you know. They look like skeletons, walking skeletons and they are my friends, you know. The people that went to school with me and we used to go to the beach together and play".

Later he mentioned:

"They are real addicts and they just stay in the spots twenty-four hours a day and that's just their life, you know. See, and I go over there and those are the people I know, you know, those are the only people that give me love. So I don't feel comfortable no more."

These social conditions and the difficulty in obtaining drugs, other drug injection paraphernalia or money may promote among some the development of coping mechanisms and value sets that promote 'distrust' and 'isolation' among them.

Charo, a 39 years old female speeball injector from Bayamón, states (Translated from Spanish)

"Not, not. I always struggle alone, you know, because in these things of drugs I say 'from a thousand one hundred and from one hundred nobody'. There are no friends. There are no friends because they take on you. If you rely on a person and you send [the person] away to ride out, the person comes and it embezzles you".

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Several studies have shown that the life conditions of IDUs in the United States are extremely difficult (Rockwell, 1998; Friedman, 1998, Des Jarlais, Singer, 1998; Robles, 1993), however, it seems that life for IDUs in Puerto Rico is more severe. This may explain, in part, why some injectors in Puerto Rico develop copping mechanism of 'isolation" and "distrust" among their drug peers. This 'distrust' mechanism may explain in part why the peer norm domain did not have any significant level for Puerto Rico (hypothesis 1). There may be other intervening conditions that may influence peer normative behaviors among Island IUDs. Network theory may be very useful in understanding this situation. Thus, Jose (1996) explained that injectors tend to share needles and other injection paraphernalia with people of the same ethnic background and or with close persons like sex partners.

Other relevant findings of this study

This study found that setting is a predictor for HIV risk behaviors. Island injectors reported higher levels of syringe sharing and sharing other paraphernalia than New York injectors. These findings are similar to other research that had found higher injection rates of IDUs in Puerto Rico than any mainland U.S. group (Colón, et al., 1994). Robles and collaborators reported a higher rate of use of shooting galleries among Island IDUs as compared with mainland Puerto Ricans (Robles, et al., 1993), a behavior which has been

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related with increased probability of syringe sharing and of HIV infection (Latkin, et al., 1994).

Having been born in Puerto Rico also was a predictor for sharing other paraphernalia. Reports have indicated that migration patterns between mainland and the island is a dynamic reality between both communities (Colón, 1992). Recent migrants to the mainland may be more at risk due to their unstable condition in the new society.

The findings of this study may shed light on the importance of the study of "setting" and the understanding of the particularities of HIV risk behaviors practices between IDUs in New York and Puerto Rico. The importance of the study of settings was emphasized by Zinberg (1980), who proposed a dynamic model of drug dependence –drug, set and setting. He stated that the individual's decision to use drugs might depend – among other influences- on the physical and social setting. Robins, et al (1977) in her landmark study on Vietnam veteran 'returnees' discussed the decreased levels of heroin dependency, from about one-fifth (in Vietnam) to less than one percent who showed signs of dependency at an 8-12 month follow-up period (in the mainland). Being in Vietnam, "the setting" was an important variable for many veterans who tried heroin. The particularities of the Vietnam setting: easy access to cheap drugs and the tremendous tensions of war, as well as the ambiguity of the American role in Vietnam, might have influenced the conditions to raise the level of strain in the soldiers who tried heroin. As Zinberg (1980) put it " the abhorrent social

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setting of Vietnam led men who ordinarily would not have considered using heroin to use it". The Vietnam experience and the decreasing drug use among Vietnam veterans showed by Robins (1977) might be related to site considerations. Site differentials between New York and Puerto (e.g., access to drugs and kind of drugs, availability of drug treatment programs, needle exchange programs and other health services in New York) may be related to differential levels of HIV risk behaviors.

HIV status was a predictor of sharing other paraphernalia for the total sample. Other studies have found that HIV status may be related to decreased practices of risk behaviors (Deren, et al., 1998; 1998a). Most risk behavior prevention messages are tailored to stop sharing of needles or syringes. However, several studies have documented that preparation and distribution of injectable drugs are practiced more often than shared use of syringes (Deren, et al., 1995; Koester & Hoffer, 1994). This finding might indicate that, especially for New York, HIV positive injectors might reduce the practice of syringe sharing but not the practice of sharing other injection paraphernalia. A problem of urgent concern due to the fact that HIV positive injectors might be transmitting the HIV virus through mechanisms that are not well recognized by injectors.

The importance of the proposed HIV role model is in its ability to analyze individual role related to HIV risk behaviors taking into consideration the social structure in which the role is performing. The predictive power of the model varies by HIV risk behavior and by geographical location.

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Integration of methodologies

This dissertation attempted to answer this question: To what extent are peer norms and role strain/deprivation variables related to HIV risk behaviors? This theoretical question was addressed using quantitative techniques. The empirical exploration was always guided by the theoretical interpretation regarding the factors that may influence HIV risk behaviors.

For this dissertation, the selection of the multivariate argument was related to the initial theoretical question and not to personal preferences related to methodologies. As explained above, the proposed question has some empirical implications best related to the model of causation of the quantitative method, therefore a series of empirical relationships between independent variables (correlations and bivariate analysis) and the use of logistic regression technique were applied to explain the proposed model.

The implications of this multivariate model and the associations between predictors and behaviors were somewhat 'tested' and or confirmed and discussed using the qualitative methods in the form of personal in-depth interviews and supported by prior studies (historical argument). In using these two methodologies, multivariate (foreground of the argument) and interpretative (background of the argument) this study attempted to demonstrate the richness of the sociological method (Alford, 1998) and the usefulness of using both methodologies as a model for future studies.

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Limitations of the study

The study participants were recruited through direct targeted sampling, a methodology that did not take into consideration any random selection process. Therefore, the samples may be limited to the extent that they do not represent the populations of IDUs in Puerto Rico and New York. In the absence of a truly randomized sample, ethnographic mapping of potential recruitment areas and their randomization by daytime (morning-afternoon) was conducted. This procedure allowed the equal proportionality of selecting participants around the entire community. The difficulties of sampling IDUs or hard to reach individuals are well recognized in the sampling literature, and targeted sampling has been utilized in earlier studies among IDUs (Watters & Bienacki, 1989).

The behavioral data used in these analyses were based on self-reports, therefore, the accuracy, validity and reliability of those self-reports may be of concern. Furthermore, the chances of socially acceptable response patterns have to be considered. Since most of the risk behaviors were measured for the last 30 days, recall problems may be minimized and not resolved (Dowling et al., 1994; Weatherby et al., 1994).

The ARIBBA project recruited self-identified Puerto Ricans injectors and smoke crack users in both locations. The meaning of being a Puerto Rican in New York may be a confusing one. Puerto Rican self-identification was examined by the study and it was found regardless of place of birth. However,

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chances of conscious or unconscious misrepresentation and or re-definition of a Puerto Rican identity cannot be completely ruled out.

Another possible limitation may be in the introduction in the survey instrument, of two different languages and the larger issue of language comparability and meaning. The survey instrument used in the study was prepared jointly by researchers in both sites, verified through back translation, and pilot tested, however issues of reliability of meaning may be present.

Recommendations – policy, service and research issues

Among the many recommendations raised by the findings of this study are the influences of peer groups, access and availability of health related services, access to alternatives economic resources and the larger issues of health care for the urban poor, which are highlighted in the extreme by injection drug users and AIDS.

One of the advantages of focusing on peer norms is to address the issue of risk behaviors from the group perspective and how this may influence the individual. The inclusion of peer norms as a predictor of HIV risk behaviors suggest that sharing norms and sharing behaviors are part of dynamic factors that can be found in the analysis of the individual social structure in the peer group. The development of interventions must recognize the dynamic mechanism of the peer group in order to reduce the practice of HIV risk behaviors. Several studies have shown that IDUs can function as risk reduction

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agents by suggesting that peers clean syringes with bleach and that they use condoms (Friedman, 1993; Jose, et al., 1996a).

Drug use is such a pervasive feature in the lives of IDUs that it deserves special attention. Several studies have shown that IDUs understand how HIV is transmitted, however, most feel that their drug habit is so ingrained and extends over so long that, despite their awareness of the risks, they consciously choose to continue using drugs. As the findings of this dissertation suggest, physical strain related to physical discomfort due to drug cravings and illness condition may influence the practice of risk behaviors. Effective drug treatment programs and health related service utilization, accessible to drug users, injectors and HIV positive people specifically, might be effective tools to reduce risk behaviors. The findings demonstrate that such resources to reduce risk behaviors are not sufficiently available to this population. Methods for evaluating the effectiveness of such health related service programs should be developed.

Furthermore, the issue of health related service access and utilization is not enough to reduce role strain and HIV risk behaviors. The social situation of most IDUs is so marginal and fragmented that getting off drugs could have a minimal effect in their lives. This is related to another finding of this dissertation and related to pooling money to buy drugs, a form of economic strain. The issue of effective rehabilitation programs for addicts should provide a component for a durable economic opportunities and drug rehabilitation (e.g., job training, jobs,

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counseling, housing) in this way reducing IDUs' related economic strain and therefore the probabilities of practicing HIV risky behaviors.

The issue of HIV/AIDS highlights the unequal distribution of health in the United States in general and in particular it highlights the poor status of Puerto Ricans injectors in the mainland and those injectors who live on the Island. Most people in this study are member of the urban underclass, a concept that recognizes people's behavior –rather than unemployment or poverty – as the condition of their low status, as defined by Kornblum (1991). All of our subjects were current injectors and most poly-drug users. Most people in the study lived in poverty, did not have regular jobs and participated in the informal economy performing act jobs or dealing or participating in the drug economy. Around half of them 'felt' homeless and a quarter of them lived in the streets or shelter system. A great proportion of them were HIV positive or have other illness symptoms. Because their double condition of subordination (Friedman, 1998) - injectors and people of color- they might be more likely to experience institutional violence (in the form of police abuse), street violence, crime and other forms of physical or psychological abuse. As Ayala (1996) suggested, "drug abuse was [is] part of the fabric of their lives" and might be a coping mechanism for facing the daily struggles of life.

As the study findings demonstrate, there is a relationship between predictors of HIV risk behaviors (e.g., physical discomfort, pooling money to buy drugs, illness condition) and the social structure (e.g., access to drug treatment

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programs, health service utilization for IUDs, employment). A central approach to these social/individual problems should start with effective community programs to reduce crime related activities at the community level (e.g., drug consumption and distribution) emphasizing employment intervention and community empowerment, community health and drug rehabilitation (Kornblum & Boggs, 1984).

Major conclusions

For syringe sharing:

The final analyses showed that for the total sample two socio-demographic variables (site and income) and two proposed theoretical prongs: norms and role strain (e.g., physical discomfort and pooling money to buy drugs) were predictors to syringe sharing. In the case of New York, the two proposed prongs (e.g., norms and pooling money to buy drugs) were related to syringe sharing. However, in the case of Puerto Rico, only role strain/deprivation domain (e.g., physical discomfort and pooling money to buy drugs) was related to syringe sharing.

For sharing other paraphernalia:

The findings revealed that for the total sample, four socio-demographic variables: site, place of birth, ever in treatment program and HIV serostatus and two proposed domains: norms and role strain/deprivation (e.g., pooling money to buy drugs and illness condition) were related to sharing other paraphernalia. In the case of New York, HIV serostatus, norms and role strain/deprivation (e.g.,

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pooling money to buy drugs) were associated with sharing other paraphernalia. For Puerto Rico, ever in drug treatment, and roles strain/deprivation domain (e.g., pooling money to buy drugs and illness condition) were predictors of sharing other paraphernalia.

The vitality of role analysis and role strain/deprivation in particular is that this theoretical construct looks at the interrelation between the individual role (micro level) and social structural level (macro level) in order to explain a phenomena. This theoretical 'flexibility' may be significant if we want to study not only individual behaviors but also issues related to more external influences (e.g., norms, settings and the social structure) in relationship with the HIV/AIDS epidemic.

As this study has demonstrated, socio-demographic variables (e.g., setting) played a fundamental role in explaining HIV risk behaviors. It is important to recognize that HIV risk behaviors may depend not only on individual factors but in physical and social setting influences. For instance, the availability of needle exchange programs or drug treatment programs in the community might help in the reduction of HIV risk behaviors. The analysis of site as well as role strain and drug consumption might provide a synergistic model to understand HIV risk behaviors among IDUs.

New York City has experienced the largest AIDS epidemic among IDUs anywhere in the world, making this the largest local epidemic in the industrialized countries. In analyzing predictors for HIV risk behavior (e.g., socio-

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demographics, norms and role strain/deprivation variables) for urban Puerto Rican drug users in New York and Puerto Rico, the conclusions and findings apply most directly to these two groups. However, the magnitude and characteristics of the sample (874) should gave us important clues to generalize to other groups of IDUs in New York and elsewhere.

Finally, the proposed HIV role theory is a multivariate causal argument that relates norms and role strain/deprivation characteristics to the social structure. The proposed HIV role theory may be another way (e.g., social network theory, individual/cognitive theories of HIV) to help us understand the very complex social dilemma presented by this epidemic.

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Descriptive Statistics

	Mean	Std. Deviation	N
site	1.3581	.4797	874
place birth	.6963	.4601	843
gender	.8135	.3897	874
age	36.6407	8.2327	873
high school	.4359	.4962	874
income	.6095	.4881	863
years injection	15.8514	10.3089	868
log freq injection	4.0007	1.3938	826
drug tx program	.4108	.4923	874
NEP	.4714	.4995	874
norms	10.8601	4.3727	815
physical discomfort	.6353	.4816	872
pooling money	.5313	.4993	864
chronic illness	.2583	.4380	871
syringe sharing	.1919	.3940	860
sharing paraphema	.4661	.4991	871

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Correlations

		Site	Place of birth	Gender	Age
Site	Pearson Correlation	1.000	.323**	.088**	-.317**
	Sig. (2-tailed)	.	.000	.009	.000
	N	874	843	874	873
Place of birth	Pearson Correlation	.323**	1.000	.201**	-.036
	Sig. (2-tailed)	.000	.	.000	.301
	N	843	843	843	842
Gender	Pearson Correlation	.088**	.201**	1.000	.002
	Sig. (2-tailed)	.009	.000	.	.959
	N	874	843	874	873
Age	Pearson Correlation	-.317**	-.036	.002	1.000
	Sig. (2-tailed)	.000	.301	.959	.
	N	873	842	873	873
High school graduate	Pearson Correlation	.032	-.050	.148**	.034
	Sig. (2-tailed)	.352	.149	.000	.316
	N	874	843	874	873
Annual income	Pearson Correlation	.041	.098**	-.002	.070*
	Sig. (2-tailed)	.224	.005	.963	.041
	N	863	832	863	862
Years of injection	Pearson Correlation	-.238**	.036	.109**	.772**
	Sig. (2-tailed)	.000	.293	.001	.000
	N	868	838	868	868
Log injection frequency 30 days	Pearson Correlation	.393**	.097**	.083*	-.216**
	Sig. (2-tailed)	.000	.006	.018	.000
	N	826	796	826	825
Drug treatment program	Pearson Correlation	-.459**	-.161**	-.173**	.228**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	874	843	874	873
Needle exchange program	Pearson Correlation	-.117**	.006	-.054	.118**
	Sig. (2-tailed)	.001	.861	.111	.000
	N	874	843	874	873
Norms	Pearson Correlation	.127**	.054	-.019	-.036
	Sig. (2-tailed)	.000	.127	.592	.309
	N	815	787	815	814
Physical discomfort	Pearson Correlation	.191**	-.001	.055	-.121**
	Sig. (2-tailed)	.000	.978	.107	.000
	N	872	841	872	871
Pooling money to buy drugs	Pearson Correlation	.256**	.118**	.012	-.084*
	Sig. (2-tailed)	.000	.001	.726	.014
	N	864	834	864	863
Chronic illness (no HIV/AIDS)	Pearson Correlation	-.103**	-.032	-.046	.095**
	Sig. (2-tailed)	.002	.347	.172	.005
	N	871	840	871	870
Syringe sharing (either direction)	Pearson Correlation	.311**	.101**	.061	-.124**
	Sig. (2-tailed)	.000	.004	.074	.000
	N	860	831	860	859
Sharing paraphernalia	Pearson Correlation	.373**	.186**	.074*	-.152**
	Sig. (2-tailed)	.000	.000	.029	.000
	N	871	841	871	870

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Correlations

		High School Graduate	Annual Income	Years of Injection	Log injecition frequency 30 days
Site	Pearson Correlation	.032	.041	-.238**	.393**
	Sig. (2-tailed)	.352	.224	.000	.000
	N	874	863	868	826
Place of birth	Pearson Correlation	-.050	.098**	.036	.097**
	Sig. (2-tailed)	.149	.005	.293	.006
	N	843	832	838	796
Gender	Pearson Correlation	.148**	-.002	.109**	.083*
	Sig. (2-tailed)	.000	.963	.001	.018
	N	874	863	868	826
Age	Pearson Correlation	.034	.070*	.772**	-.216**
	Sig. (2-tailed)	.316	.041	.000	.000
	N	873	862	868	825
High school graduate	Pearson Correlation	1.000	-.068*	.007	.059
	Sig. (2-tailed)	.	.046	.833	.091
	N	874	863	868	826
Annual income	Pearson Correlation	-.068*	1.000	.041	-.132**
	Sig. (2-tailed)	.046	.	.235	.000
	N	863	863	857	819
Years of injection	Pearson Correlation	.007	.041	1.000	-.135**
	Sig. (2-tailed)	.833	.235	.	.000
	N	868	857	868	820
Log injection frequency 30 days	Pearson Correlation	.059	-.132**	-.135**	1.000
	Sig. (2-tailed)	.091	.000	.000	.
	N	826	819	820	820
Drug treatment program	Pearson Correlation	-.063	-.001	.210**	-.332
	Sig. (2-tailed)	.061	.977	.000	.000
	N	874	863	868	826
Needle exchange program	Pearson Correlation	.030	.025	.107**	.116**
	Sig. (2-tailed)	.383	.457	.002	.001
	N	874	863	868	826
Norms	Pearson Correlation	-.052	-.071*	.008	.157**
	Sig. (2-tailed)	.141	.044	.814	.000
	N	815	805	809	768
Physical discomfort	Pearson Correlation	.065	-.090**	-.040	.349**
	Sig. (2-tailed)	.054	.008	.236	.000
	N	872	862	866	825
Pooling money to buy drugs	Pearson Correlation	-.041	-.024	-.051	.306**
	Sig. (2-tailed)	.226	.487	.138	.000
	N	864	853	858	825
Chronic illness (no HIV/AIDS)	Pearson Correlation	.015	.019	.078*	-.051
	Sig. (2-tailed)	.658	.576	.023	.143
	N	871	860	865	823
Syringe sharing (either direction)	Pearson Correlation	.019	-.073*	-.100**	.184**
	Sig. (2-tailed)	.571	.035	.003	.000
	N	860	849	855	816
Sharing paraphernalia	Pearson Correlation	-.038	-.048	-.074*	.286**
	Sig. (2-tailed)	.266	.160	.030	.000
	N	871	860	865	825

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Correlations

		Drug treatment program 30 days	Needle exchange program 30 days	Norms	Physical discomfort
Site	Pearson Correlation	-.459**	-.117**	.127**	.191**
	Sig. (2-tailed)	.000	.001	.000	.000
	N	874	874	815	872
Place of birth	Pearson Correlation	-.161**	.006	.054	-.001
	Sig. (2-tailed)	.000	.861	.127	.978
	N	843	843	787	841
Gender	Pearson Correlation	-.173**	-.054	-.019	.055
	Sig. (2-tailed)	.000	.111	.592	.107
	N	874	874	815	872
Age	Pearson Correlation	.228**	.118**	-.036	-.121**
	Sig. (2-tailed)	.000	.000	.309	.000
	N	873	873	814	871
High school graduate	Pearson Correlation	-.063	.030	-.052	.065
	Sig. (2-tailed)	.061	.383	.141	.054
	N	874	874	815	872
Annual income	Pearson Correlation	-.001	.025	-.071*	-.090**
	Sig. (2-tailed)	.977	.457	.044	.008
	N	863	863	805	862
Years of injection	Pearson Correlation	.210**	.107**	.008	-.040
	Sig. (2-tailed)	.000	.002	.814	.236
	N	868	868	809	866
Log injection frequency 30 days	Pearson Correlation	-.332**	.116**	.157**	.349**
	Sig. (2-tailed)	.000	.001	.000	.000
	N	826	826	768	825
Drug treatment program	Pearson Correlation	1.000	.092**	-.128**	-.344**
	Sig. (2-tailed)	.	.006	.000	.000
	N	874	874	815	872
Needle exchange program	Pearson Correlation	.092**	1.000	-.015	.031
	Sig. (2-tailed)	.006	.	.677	.359
	N	874	874	815	872
Norms	Pearson Correlation	-.128**	-.015	1.000	.134**
	Sig. (2-tailed)	.000	.677	.	.000
	N	815	815	815	813
Physical discomfort	Pearson Correlation	-.344**	.031	.134**	1.000
	Sig. (2-tailed)	.000	.359	.000	.
	N	872	872	813	872
Pooling money to buy drugs	Pearson Correlation	-.177**	.110**	.101**	.212**
	Sig. (2-tailed)	.000	.001	.004	.000
	N	864	864	806	862
Chronic illness (no HIV/AIDS)	Pearson Correlation	.079*	.007	-.021	-.072*
	Sig. (2-tailed)	.020	.835	.560	.034
	N	871	871	812	869
Syringe sharing (either direction)	Pearson Correlation	-.147**	-.016	.174**	.151**
	Sig. (2-tailed)	.000	.640	.000	.000
	N	860	860	802	858
Sharing paraphernalia	Pearson Correlation	-.212**	.064	.182**	.172**
	Sig. (2-tailed)	.000	.059	.000	.000
	N	871	871	812	869

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Correlations

		Pooling money to buy drugs 30 days	Chronic illness (no HIV/AIDS)	Syringe sharing (either direction)	Sharing other paraphernalia (either direction)
Site	Pearson Correlation	.256**	-.103**	.311**	.373**
	Sig. (2-tailed)	.000	.002	.000	.000
	N	864	871	860	871
Place of birth	Pearson Correlation	.118**	-.032	.101**	.186**
	Sig. (2-tailed)	.001	.347	.004	.000
	N	834	840	831	841
Gender	Pearson Correlation	.012	-.046	.061	.074*
	Sig. (2-tailed)	.726	.172	.074	.029
	N	864	871	860	871
Age	Pearson Correlation	-.084*	.095**	-.124**	-.152**
	Sig. (2-tailed)	.014	.005	.000	.000
	N	863	870	859	870
High school graduate	Pearson Correlation	-.041	.015	.019	-.038
	Sig. (2-tailed)	.226	.658	.571	.266
	N	864	871	860	871
Annual income	Pearson Correlation	-.024	.019	-.073*	-.048
	Sig. (2-tailed)	.487	.576	.035	.160
	N	853	860	849	860
Years of injection	Pearson Correlation	-.051	.078*	-.100**	-.074*
	Sig. (2-tailed)	.138	.023	.003	.030
	N	858	865	855	865
Log injection frequency 30 days	Pearson Correlation	.306**	-.051	.184**	.286**
	Sig. (2-tailed)	.000	.143	.000	.000
	N	825	823	816	825
Drug treatment program	Pearson Correlation	-.177**	.079*	-.147**	-.212**
	Sig. (2-tailed)	.000	.020	.000	.000
	N	864	871	860	871
Needle exchange program	Pearson Correlation	.110**	.007	-.016	.064
	Sig. (2-tailed)	.001	.835	.640	.059
	N	864	871	860	871
Norms	Pearson Correlation	.101**	-.021	.174**	.182**
	Sig. (2-tailed)	.004	.560	.000	.000
	N	806	812	802	812
Physical discomfort	Pearson Correlation	.212**	-.072*	.151**	.172**
	Sig. (2-tailed)	.000	.034	.000	.000
	N	862	869	858	869
Pooling money to buy drugs	Pearson Correlation	1.000	-.047	.266**	.503**
	Sig. (2-tailed)	.	.167	.000	.000
	N	864	861	852	863
Chronic illness (no HIV/AIDS)	Pearson Correlation	-.047	1.000	.010	-.004
	Sig. (2-tailed)	.167	.	.774	.911
	N	861	871	857	868
Syringe sharing (either direction)	Pearson Correlation	.266**	.010	1.000	.463**
	Sig. (2-tailed)	.000	.774	.	.000
	N	852	857	860	859
Sharing paraphernalia	Pearson Correlation	.503**	-.004	.463**	1.000
	Sig. (2-tailed)	.000	.911	.000	.
	N	863	868	859	871

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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R E L I A B I L I T Y A N A L Y S I S - S C A L E (N O R M 3)

		Mean	Std Dev	Cases
1.	NORM1A	1.4687	.7089	783.0
2.	NORM2A	1.3716	.6325	783.0
3.	NORM3A	1.7982	.8804	783.0
4.	NORM4A	1.6258	.8181	783.0
5.	NORM5A	1.4891	.7131	783.0
6.	NORM6A	1.5045	.7096	783.0
7.	NORM7A	1.5849	.7519	783.0

Correlation Matrix

	NORM1A	NORM2A	NORM3A	NORM4A	NORM5A
NORM1A	1.0000				
NORM2A	.7689	1.0000			
NORM3A	.5820	.5528	1.0000		
NORM4A	.5410	.6151	.7881	1.0000	
NORM5A	.6690	.7390	.5465	.5904	1.0000
NORM6A	.6606	.7214	.5460	.5878	.8259
NORM7A	.6653	.6636	.5649	.5205	.7584

	NORM6A	NORM7A
NORM6A	1.0000	
NORM7A	.7884	1.0000

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R E L I A B I L I T Y A N A L Y S I S - S C A L E (N O R M 3)

N of Cases = 783.0

Statistics for Scale	Mean	Variance	Std Dev	N of Variables
	10.8429	18.9689	4.3553	7

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	1.5490	1.3716	1.7982	.4266	1.3110	.0188

Inter-item Correlations	Mean	Minimum	Maximum	Range	Max/Min	Variance
	.6522	.5205	.8259	.3053	1.5866	.0092

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
NORM1A	9.3742	14.3726	.7616	.6558	.9143
NORM2A	9.4713	14.6817	.8019	.7107	.9119
NORM3A	9.0447	13.6003	.7074	.6720	.9221
NORM4A	9.2171	13.8889	.7234	.6849	.9188
NORM5A	9.3538	14.0934	.8156	.7462	.9092
NORM6A	9.3384	14.1117	.8167	.7602	.9091
NORM7A	9.2580	14.0203	.7784	.6910	.9125

Reliability Coefficients 7 items

Alpha = .9253 Standardized item alpha = .9292

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