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Housing, Relationships, and Substance Use among Female Ex-Offenders

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Housing, Relationships, and Substance Use among Female Ex-Offenders

A Thesis

Presented in

Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

By

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July, 2018

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Biography

The author was born in Tijuana, Mexico, November 23, 1987. He graduated from Desert Pines High School, in Las Vegas. He received his Bachelor of Arts degree from University of Nevada Las Vegas in 2013.
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Abstract

Female ex-offenders with histories of substance abuse face many difficulties upon reentry into the general population, such as acquiring adequate housing. The purpose of this proposal is to explore the relations between housing settings, relationships, and substance use. Two hundred adult females participated in the initial baseline study. Two methods of data analyses were proposed to predict substance use: one clustering participants into groups based on the endorsement of those settings and relationships, and one using multi-level modeling examining housing settings and relationships both independently as well as unique settings comprised of housing setting and relationship. Participants fell into one of three clusters: recovery alone, mutual living with family and friends, and catch all. Participants in homeless, and mutual settings had significantly more usage than participants living in their own house or apartment. Participants that were in controlled, residential and transitional settings had significantly less substance usage than those living in their own house or apartment. Participants that lived with their parents, family, or sexual partner with or without their children had significantly higher substance usage than those living alone. Participants that were living with family were likelier to engage in substance use compared to those living alone. Compared to participants living alone in one’s house or apartment, those living alone in transitional settings were significantly less likely to use substances, and those living alone in homeless settings were significantly more likely to use substance. These results are useful when creating housing plans for incarcerated women before they are released from correctional facilities.
Introduction

The prevalence rates of substance use disorder for incarcerated women are about 40% (Fries, Fedock, & Kubiak, 2015). About 60 percent of women used drugs a month before they were convicted of a crime and about 40% to 50% were under the influence while committing a crime (Center for Substance Abuse Treatment, 2005; Richie, 2001). Women who abuse substances are more likely to endorse illegal activities as a source of income putting them at risk for incarceration (Mallik-Kane & Visher, 2008). Substance use treatment could help reduce recidivism among this population, but as it is about forty percent of women who had endorsed substance abuse problems received treatment while in prison and only one-quarter of them continued to receive treatment 10 months after release (Mallik-Kane & Visher, 2008). The number of women in prison has steadily increased over the past few decades. Many face struggles with substance abuse, resulting in an urgent need for effective interventions to reduce this alarming statistic (Alemagno, 2001). Once released, female ex-offenders with histories of substance abuse face many difficulties upon reentry into the general population, such as acquiring good paying jobs, adequate housing, federal assistance, and the attachment of stigma that help perpetuate the cycle of incarceration (Johnson et al., 2013; van Olphen et al., 2009).

There are significant costs attributed to substance abuse. It is estimated that substance abuse costs Americans $600 billion every year (Center for Behavioral Health Statistics and Quality, 2015). About 17,000 individuals die every year due to substance use related events (Mokdad, Marks, Stroup, &
Gerberding, 2004). According to Bureau of Justice, about 94,000 inmates under federal jurisdiction were incarcerated for drug offenses and about 237,000 were incarcerated under state jurisdiction (Carson & Sabol, 2012). The FBI’s Uniform Crime Reporting Program (2015) estimates that over 1.5 million individuals in the United States were arrested for drug abuse violations in 2014; 83% of those violations were for possession. Taken all together, one can see how drug use can make life even more difficult for someone who is involved with the criminal justice system. As soon as they are released, they have to contend with the stigma attached to being an ex-offender, find and maintain housing and employment, as well as keep up with their probation officer to maintain freedom (van Olphen et al., 2009). Drug use could significantly affect housing and employment by lowering the likelihood of securing and maintaining a well-paying job or place to live (Huang et al., 2011; van Olphen et al., 2009).

Social Ecological Framework

Bronfenbrenner’s (1979) Social Ecological framework has been used to examine risk and protective factors of substance use (Mason, Cheung, & Walker, 2004). By using Bronfenbrenner’s framework, one can examine differences among individuals’ risks between groups. For example, ex-offenders have a vastly different social ecological model compared to the general population. The social ecological framework consists of four nested structures. At the center lies the microsystem, which consists of the interpersonal relationships of an individual, such as one’s family, coworkers, and friends. At the microsystem level, female ex-offenders are more likely to have strained relationships (Richie, 2011). In fact,
the literature has demonstrated some of the difficulties female ex-offenders encounter when living with family, such as conflict with family members and substance use within the family (Martin et al., 2012). Female offenders are likelier to enter treatment if they have a good relationship with their family, something not true for male offenders (Pelissier, 2004). These interpersonal relationships also interact with one another to form mesosystems, such as the relationship between the family environment and residential treatment centers. Female ex-offenders are less likely to enter residential treatment if childcare is not provided (Luther et al., 2011). This is an additional barrier that affects female ex-offenders much more so than male ex-offenders. Outside of this structure lies the exosystem, which include settings that do not involve the individual directly, such as local politics and community-based resources. Finally, the macrosystem consists of the culture and values that affect the settings within the micro, meso, and exosystems. For example, the stigma against ex-offenders affects how a landlord may decide to rent to an ex-offender or not. This can be affected within the microsystem level and exosystem level. At the microsystem level, a landlord could meet directly with the individual and decide based on the individual whether or not to lease him or her an apartment. At the exosystem level, policies set forth by leasing agencies may decide to make no exceptions to renting to ex-offenders with felonies.

It is important to examine the environmental and social structures that surround ex-offenders and how these structures may influence their housing situation. It is estimated that about a little over half a million people experienced
homeless on any night in January of 2015, and about one-third of them spent the night on the street or somewhere not fit for adequate shelter (National Alliance to End Homelessness, 2016). About half of all homeless individuals have been incarcerated at some point in their lives (Fries, Fedock, Kubiak, 2015). Those that have been incarcerated are up to 6 to 7.5 times more likely to experience homelessness than the general population (Fries, Fedock, & Kubiak, 2015; Lutze, Rosky, & Hamilton, 2014). Some individuals go to jail or prison to acquire shelter and in some cases for substance abuse treatment (Center for Substance Abuse Treatment, 2005). Ex-offenders may become homeless because of their time in prison. This is due to loss of resources such as employment and housing due to lack of keeping up with rent/mortgage, and many do not have a plan on where they will live after release (Center for Substance Abuse Treatment, 2005). In fact, women who are incarcerated are more likely to anticipate and spend time homeless than their male-counterparts; this might be due to severing of family ties which removes the most common place most ex-offenders stay once they’re released (Fries, Fedock, Kubiak, 2015; Richie, 2001). This is also compounded by the fact that female ex-offenders have high rates of severe mental illness, and those with severe mental illness and comorbid substance use disorder are likely to experience housing instability and homelessness (Fries, Fedock, Kubiak, 2015; Tsai et al., 2010). The fact that their microsystems and kinship networks work against them means that they have to rely on system level resources for support (e.g., exosystem level resources), or non-kinship social networks to either provide them shelter or guide them to the appropriate resources. Depending on their
community, there might not be resources to help them get back onto their feet. For
example, a community may be lacking in public transportation, affordable
housing or shelters, and programs to help reintegrate into the community
(Severance, 2004). Accordingly, ex-offenders have a difficult time securing
employment upon release from correctional institutions due to stigma and lack of
employment in the poor areas they reside (Luther et al., 2011). As each system
works against a female ex-offender, they have to rely on themselves more and
more to obtain the resources needed and to remain substance free.

Acquiring and maintaining housing stability is a large part of successful
reintegration into the community for many ex-offenders (Lutze, Rosky, &
Hamilton, 2014). Women with substance abuse problems often need housing
assistance after release as they have difficulties with homelessness (Mallik-Kane
& Visher, 2008). The need for housing is an important concern for most women
about to be released from prison, especially by those that need substance abuse
treatment (Alemagno, 2001). Many women who are released from prison return to
the same neighborhoods and don’t receive adequate services to help with
successful reintegration (Richie, 2001). Ex-offenders have a difficult time
securing housing and are not eligible for public housing due to felony status.
Additionally, they face financial obstacles to renting in safe neighborhoods and
landlords unwilling to rent to ex-offenders. As a result, female ex-offenders often
either have to resort to going back to the same neighborhoods where they were
arrested or to becoming homeless (Lutze, Rosky, & Hamilton, 2014). Stable
housing can provide safety and a sense of control so one can pursue employment,
build and maintain social networks, and focus on mental health and substance abuse treatment (Lutzke, Rosky, & Hamilton, 2014). In fact, having a stable housing environment is associated with lower rates of hospitalization, a reduction in psychological symptoms as well as substance use (Chan et al., 2014; Kloos & Shah, 2009). Many individuals that experience homelessness report that housing is their greatest need (Patterson & Tweed, 2009). The scarce availability of affordable housing makes it difficult for ex-offenders to obtain adequate housing, especially when economic prospects are limited due to past involvement with the criminal justice system. This is especially true for single women with children (Robertson, 1991). As one can see, once ex-offenders encounter homelessness, it then becomes very difficult for them to escape it without an adequate social network and resources to get them back on their feet.

The type of housing arrangement can also be important as it can have an effect on quality of life. There are independent, mutual, and temporary housing arrangements. Independent housing refers to a housing arrangement where an individual is making a full contribution towards rent, whether they live by themselves or with roommates. Mutual housing refers to a housing arrangement where individuals make little to no contribution toward rent, but have not agreed to a predetermined length of stay. Temporary housing arrangements refer to couch surfing or living in a motel. While they may all share the same physical characteristics (e.g., walls, a roof, bathroom, bedrooms), they do not have the same outcomes. In fact, one study examined changes in the quality of life of homeless individuals when they remained homeless, or obtained dependent
housing, or independent housing arrangements, and found those that moved into independent housing had the largest increase in quality of life (Wolf et al., 2001). Individuals living independently have much more control over their environment than those living in a group setting. In fact, many parents that have “doubled up” with another family have expressed how challenging it is to concede their own rules for that of the host family (Mayberry, Shinn, Benton, & Wise, 2014). An individual that is living in a dwelling with someone else other than their significant other while making no contributions toward rent is at the mercy of others; they could be asked to leave the dwelling for any reason at any moment. This could also lead to more stress (Choi & Snyder, 1999), which would even be higher if their host uses substances within the home, and if they have no other available housing opportunities.

**Housing settings and substance use**

One study demonstrated that drug offenders are more likely to use at home in their living room with friends in comparison to any other location (Sussman, Ames, Dent, & Stacy, 2001). While this may mean that one could live independently and still use at home whenever friends are over, it also means that if a newly sober individual lives with someone else, their perceived self-efficacy to maintain abstinence may be affected by their roommate’s use of substances. Research findings on substance use outcomes for the formerly homeless are mixed. Some demonstrate there are no significant reductions in drug use among the homeless once they are housed in independent permanent supportive housing (Kirst et al., 2015; Somers et al., 2015), while others have reported significant
reductions in alcohol consumption over time (Collins et al., 2012). Although these studies focused on comparisons of substance use between Housing First and treatment as usual, and not time spent homeless and substance use. One study found that housing predicted cocaine use for homeless individuals (North, Eyrich-Garg, Pollio, & Thirthalli, 2010). Those that were consistently housed had much lower rates of cocaine use than those that failed to acquire or maintain housing.

Different housing options are available for ex-offenders upon release. Some of these housing options include housing with family, residential treatment, therapeutic communities, homeless shelters, halfway-homes, and recovery housing. However, access to these options may be limited depending on where they live and restrictions placed upon them. For example, public housing often has restrictions to providing access to those with felonies (Lutzke, Rosky, & Hamilton, 2014). Mothers may also have difficulty obtaining housing if there are no accommodations for children. When failing to secure housing ex-offenders may have to rely on shelters when transitioning from prison to the community. This option is not feasible in the long-run due to limited space and issues with safety. One study found that ex-offenders struggled to stay safe from relapse and violence in shelters because of the drug trafficking in the area (Binswanger et al 2012).

Residential treatment programs are designed to house and treat those with addictions, typically staffed with professionals to help assist those on the road to recovery. There are some drawbacks to residential treatment, as in the loss of autonomy and adherence to strict guidelines. One study found that women on
parole were reluctant to attend residential treatment due to factors such as restrictive environments, not accepting children, and not being available in their area (Hall et al., 2001). In a study that examined a residential treatment program, about 40% of ex-offending women interviewed that entered a residential treatment program stated that housing was a need of theirs (Prendergast, Wellisch, & Wong, 1996).

Therapeutic communities (TCs) are communities female ex-offenders can reside in and are based on focusing on recovery, maintaining abstinence, using the community as a resource, self-help, and the use of a hierarchal system and structured groups (Haigh & Lees, 2008). TCs can be in the community as well as in the institution one is transitioning from. For example, there are in-prison TCs to help offenders transition toward the end of their sentencing toward reintegration. One study found that those that enter therapeutic communities do not have benefit from long-term effects, as close to 80% of those that complete treatment end up relapsing within 5 years (Inciardi, Martin, and Butzin, 2004). While therapeutic communities may provide housing, they fail to keep them housed as the majority of graduates relapse and end up back in correctional facilities (Inciardi, Martin, & Butzin, 2004).

Recovery housing is another option female ex-offenders have post release. They are mainly focused on providing an environment that promotes sobriety. Some like Oxford House are self-sustaining democratic households (Jason et al., 2006). Residents have the opportunity to take on leadership positions. Typically a small sum is required to pay rent and sobriety is required. Unlike therapeutic
communities, Oxford House residents may stay at their residence as long as they wish. Half-way housing are another option for those that are recently released from prison. Like recovery housing, they require residents to remain sober throughout their stay as well as contributing toward rent.

If available, female ex-offenders could seek permanent supportive housing. This sort of housing is typically reserved for those with very high needs, such as the chronically homeless and those with severe mental illness. Those in criminal justice programs can be referred to supportive housing programs (Somers et al., 2013). Permanent supportive housing may provide housing that is not contingent upon treatment, whether mental health or substance use. This sort of housing may appeal to those that are not ready to engage in substance use treatment but still need a place to live. However, recently there have been programs that target those that are at high-risk for use that are about to be released from prison (Kriegel, Henwood, & Gilmer, 2016). These programs are court-mandated, meaning that even if the individual that is about to be released has secured housing a judge could mandate that they enter the supportive housing because of risk for using and recidivism.

Additionally, some female ex-offenders may choose to live on their own, or contribute to rent with someone else. One study found about one-third of female ex-offenders lived in their own house or apartment three months post-release, and about half lived with somebody else (Lindquist et al., 2009). Because of their substance use histories and criminal justice involvement good housing is
difficult to obtain. Typically this means that they will return to the same neighborhoods they abused substances in (Malik-Kane & Visher, 2008).

**Relationships and substance use**

Substance abusing mothers have lower substance use rates and lower recidivism rates than those without children (Slesnick & Erdem, 2013). Although substance using mothers are also less likely to seek treatment than those without children, this is due to fear of protective services taking their children away (Slesnick & Erdem, 2013). Single mothers with children are also under more stress to provide adequate shelter and care for their child. This is compounded when they have factors such as substance abuse and criminal convictions which make ascertaining these needed resources much more difficult. One study demonstrated that women with dependent children were able to secure and maintain housing through a housing program much quicker than through shelter services, but by 9 months those differences were negligible (Slesnick & Erdem, 2013). Drug use did decrease over time. Their findings demonstrated an association between housing and a decrease in drug use. There was a 20 percent difference in percentage of days used for drugs between those that had housing and those that did not. It is important to note that this program offered up to 6 months of rental support and the difference between the two groups was still greater than 20%, but the drug use between both groups was the same throughout the study time frame. This finding makes it unclear if substance use had any impact once the rental assistance was gone.
Women who abuse substances receive less family support compared to other ex-offenders (Mallik-Kane & Visher, 2008). According to a report by Mallik-Kane and Visher (2008), over half of all women that were incarcerated in large metropolitan areas served time for drug offenses. Women are less likely to live with family members and more likely to experience homelessness than men (Mallik-Kane & Visher, 2008). The person one resides with could have an impact on a successful transition from prison, one third of women report that they live with ex-offenders and current substance abusers, and this increases to 40% by 10 months after release (Mallik-Kane & Visher, 2008). Living with one’s family can be a concern for many women who return from prison as their families often have legal and or substance abuse problems (Mallik-Kane & Visher, 2008). Substance abusing women who have been incarcerated are more likely to have a significant other or close friend that abuse drugs than their male counterparts (Johnson et al., 2013). If they return to these relationships after being released, they put themselves at risk for relapse as well as a host of other issues associated with substance abuse.

Rationale

Women who have been incarcerated face many difficulties reintegrating into the community. Some of the biggest difficulties are acquiring and maintaining housing, as well as maintaining sobriety (Biswainger et al., 2012; Johnson et al., 2013; Martin et al., 2012; Salem et al., 2013). Currently, there is no literature that directly measures the relationship between distinct housing settings, as well as the relationships that exist within them and substance use. Because the
majority of women who are released from prison do not typically live on their own, it is important to examine the relationships of the people they live with and if it influences substance use (Mallik-Kane & Visher, 2008). It is also important to examine if there are any associations between the type of relationship and housing setting. For example, do families expect financial contributions or do they accept these women regardless of what they can contribute financially? This could occur if more participants endorsed living with a family in either shared or mutual living settings, respectively. If they are alone, are they more likely to live in homeless settings or independent settings? By forming distinct groups among participants based on the similarities of housing settings and relationships, conclusions can be drawn as to whether certain living situations, that is housing setting and the relationship that exists in that setting, are predictive of less substance use. Descriptives of the entire sample may provide some insight as to where most participants live and what the overall odds for substance use are in those settings and/or relationships. The implications of this study can determine if housing settings, as well as the relationships within them, have an influence on individuals reducing substance use or maintaining sobriety. If housing settings and/or relationships matter, then programs that facilitate the transition from prison or jail to an appropriate living situation can be developed to reduce substance use, which in turn may reduce recidivism.

**Research Questions**

The purpose of this proposal is to explore the relations between housing settings, relationships, and substance use. Given the lack of literature on the
subject, research questions will drive the direction of this study. The research questions for are as follows:

Research question I: Are there distinct clusters, based on housing settings and relationships within the setting?

Research question II: Are housing settings predictive of substance use in female ex-offender populations?

Research question III: Are relationships within housing settings predictive of substance use in female ex-offender populations?

Research question IV: Are specific living situations, including type of housing and relationships, predictive of substance use among female ex-offenders?

Methods

Participants

The proposed research utilizes archived data obtained through a parent study funded by the National Institutes of Health (for more information, see Jason, Salina, & Ram, 2016). In order to be eligible for the study, all participants had to report some involvement with the criminal justice system in the past 2 years. All participants were recruited from the Cook County Sheriff’s Women’s Justice Programs at Cook County Jail, substance abuse treatment sites throughout the Chicagoland area, or using snowball techniques. Participants were interviewed and tracked over a 24-month period. This proposal will focus on the data collected at baseline interviews.
Two hundred (200) adult females participated in the initial baseline study. The mean age for participants was 39.9 years ($SD = 8.6$ years). In terms of race and ethnicity, 149 participants ($74.5\%$) were African-American, 45 ($22.5\%$) were White, 4 ($2\%$) were Latina, and 2 ($1\%$) were Other. $59.5\%$ of participants had a high school diploma or equivalent. The majority of the sample were mothers ($N = 169$, $84.5\%$) with almost half ($N = 72$, $42.6\%$) having custody of their children. Only a small portion ($N = 42$, $21\%$) were awaiting charges, trial, or sentence. More than half ($N = 115$, $57.8\%$) were either on probation or parole. The most reported main substance of abuse was heroin ($N = 94$, $47\%$) followed by: crack cocaine ($N = 59$, $29.5\%$), alcohol ($N = 25$, $12.5\%$), marijuana ($N = 15$, $7.5\%$), other opiates ($N = 3$, $1.5\%$), methamphetamine ($N = 2$, $1\%$), and hallucinogens ($N = 2$, $1\%$).

**Materials**

The Form-90 Timeline Follow-back (TLFB; Miller, 1996), consisting of a 90 day calendar, was used to track participant’s alcohol and drug usage over the past 180 days. Although the original TLFB is based on a 90 day calendar, it has been adapted to a 180 day calendar in previous studies (Jason, Davis, & Ferrari, 2007). The TLFB provides a measure of what a standard drink constitutes to assist participants in accurately reporting their drinking. Illicit drug usage is reported as having used that day, but quantity is not noted. Test-retest reliability is excellent for alcohol related variables such as total consumption ($r = 0.91$ to $0.97$), drinks per drinking day ($r = 0.88$ to $0.93$), percent days abstinent ($r = 0.96$ to $0.98$; Tonigan, Miller, & Brown, 1997). Test-retest reliability for illicit drug usage
varied: marijuana ($r = 0.71$ to $0.98$), cocaine ($r = 0.91$ to $0.99$), and opiates ($r = 0.37$ to $0.99$; Tonigan, Miller, & Brown, 1997). The TLFB’s drinking measures that participants reported were noted to be consistent with their drinking frequency reported in the Alcohol Use Disorders Identification Test (AUDIT) for in outpatient populations ($r = 0.67$; Miller, 1996).

The Housing Timeline Follow-Back (HTLFB; New Hampshire Dartmouth Psychiatric Research Center, 1995) was used to track participant’s living situation, including the setting, who they were living with at the time, and why they left that setting during the past 180 days. The HTLFB was adapted from the timeline follow-back and it uses a calendar to track participant’s living situations. The HTLFB uses personal events and holidays to help the participant recall living situations in the past 180 days. There are 11 settings that are available to endorse including: controlled environment, homeless, residential program with staff, transitional housing without staff, shared living, mutual living, temporary housing, house/apartment, nursing home, medical setting, and other. Controlled environments included jail, prison, and non-voluntary settings. Homeless environments included the participant’s car, a bus station, park, shelter, tent, and Dunkin Donuts. Residential programs where a staff is present included halfway houses or sober houses. Transitional housing where a staff is not present included Oxford Houses, where some participants were living in at baseline. Shared housing included living with roommates and contributing financially. Mutual living included living in someone else’s home but providing little or no financial contribution. Temporary housing included couch surfing or living in a hotel room.
House/apartment included owning or renting your own home or apartment.

Medical setting included detox settings, medical hospitals, and voluntary placement settings. The HTLFB also assessed the types of relationships participants endorsed within their living environment. The 8 options included: living with sexual partner and children, with sexual partner alone, with children alone, with parents, with family, with friends, alone, and other.

**Procedure**

Participants were recruited through substance use treatment centers in the Chicagoland area and by distributing flyers to community-based organizations that served formerly incarcerated women and/or substance users. Once participants were recruited, the study was outlined to them and informed consent was received. Once informed consent was received, research assistants collected demographic and tracking information, as well as conducted a standardized survey interview including the HTLFB and TLFB. The initial interview was two hours long. Participants received $45 for the baseline interview. Participants were also assigned to either the Usual Aftercare or Oxford House condition.

**Analyses**

Several analyses were undertaken for this proposal. In order to make the analyses feasible, participants’ TLFB and HTLFB were converted into excel files from their paper form. Afterward, the data were entered into a new excel file with columns for the past 180 days and rows for each participant. This was done for housing settings, relationships within those settings, illicit drug use, and alcohol. Because endorsement of substance use is being examined, alcohol data was
converted from number of drinks per day to endorsement of a drink or not. Excel macros sorted the data into a matrix that accounted for where the participant lived and with who, as well as their substance use. A macro that counts the frequency of endorsement for specific situations was used. For example, if the cell asked for endorsement of being homeless, living alone, and substance use, the macro counted the amount of days that endorsed all three criteria by any participant across the past 180 days. A manual count of the settings and relationships that are endorsed for each participant was also conducted. Two methods of data analyses were proposed to predict substance use: one clustering participants into groups based on the endorsement of those settings and relationships, and one using multi-level modeling examining housing settings and relationships both independently as well as unique settings comprised of housing setting and relationship.

In order to answer the first research question: are there distinct clusters, based on housing settings and relationships within the setting? Hierarchical Class Analysis (HCA) was used to determine if there were distinct groups or not using the given characteristics (housing and relationship settings). Variables that identified the endorsement of the following: controlled setting, homeless setting, residential setting, transitional setting, mutual setting, shared setting, temporary setting, own home/apt setting, sexual partner relationship, sexual partner with children relationship, alone with children relationship, parent relationship, family relationship, friend relationship, alone relationship, and other relationship. Since this data is binary (use or no use), Jaccard distance was used as the distance.
metric to run the analyses (Finch, 2005). Ward’s method was used to form the dendogram to discern the different clusters that were formed.

Multilevel modeling was used to answer research questions II through IV. In order to answer research question II: Are housing settings predictive of substance use in female ex-offender populations? Total amount of days in each housing setting was extracted from each participant’s Timeline Follow-Back form. Participant data that demonstrates whether they used substances in the housing or relationship setting was used. This dataset was compiled by verifying whether each participant ever endorsed substance use (including alcohol) at any point during their stay in the particular setting. For example, if a participant endorsed living in their own home and at one point they did not use any substance but at another time point they did, they would be marked down as used within the setting. Their housing situation was cross-referenced with the days they used substances in order to create the dichotomous and continuous variables of substance use. A multilevel model that incorporates days lived in the setting as well as usage in the setting was developed. (See Figure 1). Specifically, one model used housing setting and used each participant as a random intercept to predict total amount of days substances were used in each setting. The second model used housing setting and used each participant as a random intercept to predict the endorsement of substance use in each setting.

In order to answer research question III: Are relationships within housing settings predictive of substance use in female ex-offender populations? Total amount of days in each relationship setting was extracted from each participant’s
Timeline Follow-Back form. Their relationship situation was cross-referenced with the days they used substances in order to create the dichotomous and interval variables of substance use. A multilevel model that incorporates days lived with relationship as well as usage within the relationship was developed. (See Figure 2). Specifically, one model used relationship type and used each participant as a random intercept to predict total amount of days substances were used in each relationship. The second model used relationship type and used each participant as a random intercept to predict the endorsement of substance use in each relationship.

In order to answer research question IV: Are specific living situations, including type of housing and relationships, predictive of substance use among female ex-offenders? A multi-level model was developed that used both housing and relationship as a predictor variable, whether they used and how many days they used as outcome variables. (See Figure 3). Specifically, one model used the combined housing setting and relationship as the predictor variable, and used each participant as a random intercept to predict total amount of days substances were used in each setting. The second model used the combined housing setting and relationship as the predictor variable, and used each participant as a random intercept to predict the endorsement of substance use in each setting. This research question differs from research question I by examining the effects of each specific living situation (e.g., living alone in one’s own house/apartment) and not a cluster of living situations (e.g., living with family or friends in mutual living settings, or living alone in controlled and recovery settings).
Results

The majority of participants endorsed having lived in a residential setting (66.8%, n = 133), followed by controlled settings (37.7%, n = 75), transitional settings (37.2%, n = 74), mutual settings (27.1%, n = 54), own house/apartment (19.6%, n = 39), shared settings (11.1%, n = 22), homeless settings (10.6%, n = 21), and temporary settings (7.0%, n = 14). The majority of participants endorsed having lived alone at one point (84.9%, n = 169), followed by family (21.6%, n = 43), sexual partner (11.1%, n = 22), friend (10.6%, n = 21), alone with child (5.0%, n = 10), with other (4.5%, n = 9), sexual partner and child (3.5%, n = 7), and finally living with parents (2.5%, n = 5). The mean average amount of transitions was 1.5 ($SD = 1.06$) and ranged from 0 to 5 transitions. About half of all participants (48.7%, n = 97) endorsed any substance use within the past 180 days.

Several hierarchical class analyses were conducted with different amounts of clusters, ranging from two to six clusters. Due to there being no consensus on the number of appropriate clusters to aim for analysis is based on the author’s interpretation of what constitutes the clearest clusters. The analysis that was the clearest indicated there are three distinct clusters based on housing settings and who participants lived with. These three clusters include participants who mainly lived alone in recovery settings and controlled settings, those who lived in mutual settings with friends and family, and those who did not fit in those categories (See Figure 4 and 5). The three clusters that emerged represent 1) participants that tend to stay/move from controlled settings to recovery settings and are typically alone
due to the environment (recovery alone), 2) participants that stay with family and/or friends without having to contribute to rent (mutual family/friends), 3) participants that do not fall in a specific area and can be anywhere with anyone (catch all). These clusters are not unexpected as those that live in recovery housing typically stay for about one year (Jason et al., 2006). Additionally, due to limited options, offenders that are due for release typically live with friends or family if ties have not been severed (Mallik-Kane & Visher, 2008). Taking that into consideration, it is surprising that mutually living with family and friends were not clustered with living in controlled settings. Perhaps because it is only a 6 month snapshot of participant living situation, participants could have left a controlled setting much longer than 6 months prior to baseline.

Descriptives of each cluster group revealed that only 29.1% of participants that were part of the catch all cluster endorsed substance use within the past 6 months. In comparison, 45.3% of those in the mutual living with family and friends cluster, and 55% of those in the recovery alone cluster endorsed substance use within the past 6 months. The average total days of substance use within the past 6 months for the catch all cluster was 20.94 days. Those in the recovery alone cluster averaged 44.92 total days, and those in the mutual living with family and friends cluster averaged 26.11 total days. The average number of transitions between housing settings also varied between clusters. Participants in the catch all cluster averaged 1.23 transitions. Participants in the mutual living with family and friends cluster averaged 1.3 transitions. Participants in the recovery alone cluster averaged 2.07 transitions.
All three multilevel models predicting endorsement of substance use produced ICCs lower than 0.1. Multilevel models predicting for amount of substance use produced ICCs between 0.24 and 0.43. Two different models were used to predict substance use within different relationships. Model 1, lmer(days used in relationship ~ relationship + (1|Participant)), was used to predict if the type of relationship predicted the amount of days they used while using each participant as a random intercept. Model 2, glmer(used in relationship ~ relationship + (1|Participant)), to predict substance use in relationship.

Model 1 used relationship alone as the reference category. Due to issues with the model converging, the categories sexual partner alone and sexual partner with child were collapsed into the category sexual partner with/without a child. Living with sexual partner with/without a child, living with parents, and living with family were all significant predictors. Compared to participants living alone, living with a sexual partner with/without a child is associated with an increase of 18.4 days of substance use \[ t(240.95) = 2.59, p<.05 \]. Compared to participants living alone, living with parents is associated with an increase of 40.58 days of substance use \[ t(260.24) = 2.51, p<.05 \]. Compared to participants living alone, living with family is associated with an increase of 11.96 days of substance use \[ t(229.07) = 1.98, p<.05 \]. Model 2 used alone as the reference category. The only category that was significant was living with family \( (O/R = 4.9, p<.01) \). Participants that lived with their family were 4.9 times more likely to use substances than those living alone.
Two different models were used to predict substance use within different housing settings. Model 1, \text{lmer}(\text{days used in setting} \sim \text{Housing} + (1|\text{Participant}))\), was used to predict if the type of setting predicted the amount of days they used while using each participant as a random intercept. Model 2, \text{glmer}(\text{used in setting} \sim \text{Housing} + (1|\text{Participant}))\), was used to predict if they type of setting predicted any use while using each participant as a random intercept.

Housing setting of house/apartment was used as the reference category for model 1. Due to issues with the model converging, the categories homeless and temporary were collapsed into the category homeless. The categories that were significant were controlled, homeless, residential, transitional, and mutual. Compared to participants living in their own house/apartment, living in a controlled setting was associated with a decrease of 21.32 days of substance use \([t(392.5) = -3.85, p<.001]\). Compared to participants living in their own house/apartment, living in a homeless setting was associated with an increase of 20.17 days of substance use \([t(417.6) = 3.09, p<.01]\). Compared to participants living in their own house/apartment, living in a residential setting was associated with a decrease of 18.22 days of substance use \([t(399.6) = -3.57, p<.001]\). Compared to participants living in their own house/apartment, living in a transitional setting was associated with a decrease of 24.27 days of substance use \([t(403.7) = -4.38, p<.001]\). Compared to participants living in their own house/apartment, living in a mutual setting was associated with an increase of 12.45 days of substance use \([t(419.8) = 2.12, p<.05]\). Model 2 used
house/apartment as the reference category. The categories that were significant were controlled (O/R = 0.17, p<.01), homeless (O/R = 19.6, p<.001), transitional (O/R = 0.041, p<.001), and mutual (O/R = 4.32, p<.05). Participants living in their own house/apartment were 5.9 times more likely to use substances than those in controlled settings. Participants that were homeless were 19.6 times more likely to use substances than those living in their own house/apartment.

Participants living in their own house/apartment were 24.3 times more likely to use substances than those living in a transitional setting. Participants that were living in a mutual setting were 4.3 times more likely to use substances than those living in their own house/apartment.

Two different models were used to predict substance use with interactions of housing and relationship settings. Model 1, lmer(days used in setting ~ Interaction + (1|Participant)), was used to predict if the type of interaction predicted the amount of days they used while using each participant as a random intercept. Model 2, glmer(used in setting ~ Interaction + (1|Participant)), was used to predict if they type of interaction predicted any use while using each participant as a random intercept.

Housing setting of living in own house/apartment alone was used as the reference category for model 1. The categories that were significant were living homeless and alone, living in a temporary situation and alone, and living in own house/apartment with sexual partner. Compared to participants living in their own house/apartment alone, living in a homeless setting alone was associated with an increase of 27.19 days of substance use [t(429.5) = 2.77, p<.01].
Compared to participants living in their own house/apartment alone, living in a temporary setting alone was associated with an increase of 39.26 days of substance use \([t(430.7) = 3.65, p<.001]\). Compared to participants living in their own house/apartment alone, living in a house/apartment with a sexual partner was associated with an increase of 23.32 days of substance use \([t(427.9) = 2.02, p<.05]\). Model 2 used living in own house/apartment alone as the reference category. The categories that were significant were living in a homeless situation alone \((O/R = 12.9, p<.05)\), and living in a transitional setting alone \((O/R = 0.04, p<.01)\). Participants living in a homeless situation alone were 12.9 times more likely to use substances than those living in their own house/apartment alone. Participants that were living alone in their own house/apartment alone were 24.4 times more likely to use substances than those living in a transitional setting alone.

**Discussion**

This study explored the clusters participants fell in based on their living arrangements in the past 90 days before baseline. Hierarchical class analysis revealed that there are fewer clusters of participants than what would typically be expected. Living conditions have been clustered into 4 or 5 groups in previous studies (Tsemberis et al., 2007), such as literal homelessness, temporary settings, institutional settings, stable residences, and functional homelessness. However, the current study found that participants fell into one of three clusters: recovery alone, mutual living with family and friends, and catch all. This informs us that they have difficulty securing and maintaining independent living. This is not
surprising as it would be difficult for those coming out of correctional facilities to obtain their own housing. This population endorsed few instances of literal homelessness. Descriptives revealed that those in the recovery alone cluster had the highest rates of substance use and engaged in more days of substance use compared to the other clusters. The substance use rates and usage are based on the past 6 months and it is possible that participants engaged in heavy use prior to entering recovery settings.

This study also explored whether housing setting could predict substance use. Type of housing setting had an effect on substance use. Both models were able to significantly predict substance use. There were some significant differences between different types of housing settings and the amount of days participants used substances. Results indicated that those in homeless, and mutual settings had significantly more usage than participants living in their own house or apartment. Participants that were in controlled, residential and transitional settings had significantly less substance usage than those living in their own house or apartment. Surprisingly, when examining likelihood of engaging in substance, there was no significant difference between living in one’s house or apartment and living in a residential setting. One would have expected residential settings to have less likelihood of engaging in substance use as they are designed to maintain abstinence. These results have implications on how female offenders are guided toward successful re-entry into communities. If residential settings and living mutually with others are not producing significantly better results than those
living in their own home or apartment, then transitional settings such as Oxford House may be considered a viable option for re-integration.

This study also explored whether relationships within a living situation could predict substance use. Those that lived with their parents, family, or sexual partner with or without their children had significantly higher substance usage than those living alone. However, only participants that were living with family (not including parents) were likelier to engage in substance use compared to those living alone. Participants living with family were 4.9 times more likely to use substances than participants living alone. This finding is consistent with literature as research suggests that women are more at risk using when living with friends or family (Hall et al., 2001; Severance, 2004). However, these results did not support that living with friends would be associated with higher likelihood of engaging in substance use. The literature states that a large portion formerly incarcerated women live with individuals that have criminal records and engage in substance use after release from correctional facilities (Mallik-Kane & Visher, 2008). It is possible that there is variability in friendships and the friends participants reported living with are not substance users. There could be several reasons explaining why living with parents was not associated with a higher risk of engaging in substance use including lack of conflict within the family and their family having positive attitudes towards recovery. Higher usage rate could be explained through conflict and lower abstinence support. Unfortunately attitudes toward substance use was not measured.
This study also explored whether housing setting and relationships within the setting could predict substance use. We found that compared to living alone in one’s house or apartment, those living alone in transitional settings were significantly less likely to use substances, and those living alone in homeless settings were significantly more likely to use substance. Because ex-offenders are likely to be alone, due to strained relationships and reluctance to live with others that use, transitional settings may be the most conducive environment to substance use recovery.

Taken together, not only do participants filter into distinct clusters (recovery alone, mutual living with family/friends, and catch all) but those clusters also have different rates of usage and likelihoods of substance use. These results are useful when participants plan on where they are going to live once they are released from correctional facilities. Living in settings that are associated with increased likelihood of substance use, such as homeless and mutual, might be replaced in favor of settings that reduce substance use such as transitional settings. Due to limited availability of subsidized housing, establishing new recovery homes could be more feasible than the development of new subsidized housing units. Existing homes can be leased for recovery housing. Funding sources can be diverted to recovery settings that make housing much more affordable.

**Limitations**

Limitations of this study include its cross-sectional design. Causal inferences cannot be made through these results. Longitudinal analyses would be
needed to determine how accurate these results are over time. The lack of characteristics of living environments also limited our analyses. It is possible that housing settings were not equal to one another. For example, two participants could have endorsed living in their own house or apartment, but one participant could have lived in a house that was large, in good condition, and in a low-crime neighborhood while the other participant may have lived in an apartment that was small, in a dilapidated condition, and in a high-crime neighborhood. It is possible that these characteristics could have had an influence on substance use which were not detected through the current study. Characteristics of housing could have implications on the type of housing that is made available for those seeking recovery. For example, funding could be restricted to aesthetically pleasing housing that is deemed safe to live in (not condemned) in low-crime neighborhoods with resources that promote reintegration into communities, such as access to public transportation and community-based organizations.

Another issue to consider was the measurement of attitudes toward substance use, general and abstinent social support. The parent study used the Important People and Activities (IPA) measure which assessed how supportive family, friends, and sexual partners were towards their recovery. However, this study did not incorporate the IPA into analyses because the HTLFB did not state whether who the participant lived with was an important person or not. In addition, living with someone does not guarantee they would be considered an important person.
In conclusion, clusters of living situations, the association between housing setting and substance use, the association between relationships within a housing setting and substance, and the association between the housing setting and relationship within it and substance use were explored in this study. Findings indicated that participants fell into one of three clusters: recovery alone, mutual living with family and friends, and catch all. Those in homeless and mutual settings were significantly more likely to engage in substance use, while those living in controlled and transitional settings were significantly less likely to engage in substance use compared to those living in their own house or apartment. Participants that were living with family (not including parents) were 4.9 times more likely to use substances than participants living alone. Compared to living alone in one’s house or apartment, those living alone in transitional settings were significantly less likely to use substances, and those living alone in homeless settings were significantly more likely to use substance. Future studies can examine randomization of living situations, however ethical standards could prevent such a study as randomizing participants to homeless situation could be deemed unsafe. Future studies can also strengthen the current study by measuring substance use and abstinence attitudes of the people that are living with participants. Additionally, measuring the physical characteristics and surrounding environment can help future studies control for these variables. There is a need for research to examine how much variability housing settings and who individuals live with controlling for their attitudes, physical characteristics, and resources surrounding their living situation.
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Appendix A

HTLFB

In the past 6 Months:

With whom did you live? Where did you live?

1. With Sexual Partner and Children
   A. Controlled environment (jail/prison, non-voluntary)
2. With Sexual Partner Alone
   B. Homeless (car, bus station, park, shelter, tent, Dunkin Donuts)
3. With Children Alone
   C. Residential program with staff (halfway house, sober house)
4. With Parents
   D. Transitional housing without staff (Oxford house)
5. With Family
   E. Shared housing (roommates, contributing financially)
6. With Friends
   F. Mutual living (living in someone else’s home but providing little or no set financial contribution)
7. Alone
   G. Temporary housing (couch surfing, hotel room)
8. Other __________

Why did you leave?

! Was removed from the setting for disruptive behavior
@ Was removed from the setting for relapsing
$ Was removed from the setting for failure to pay bills
# Left setting in good standing
% Left setting for other reason, specify:

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TIMELINE FOLLOWBACK CALENDAR: 2012

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Appendix B

Figure 1. Multi-level model for Research Question II

Figure 2. Multi-level model for Research Question III
Figure 3. Multi-level Model for Research Question IV

Participant

Living Situation 1

Predictor: Housing/Relationship Setting
Outcome: Endorsement of Substance Use

Living Situation 2

Predictor: Housing/Relationship Setting
Outcome: Days of Substance Use

Predictor: Housing/Relationship Setting
Outcome: Endorsement of Substance Use

Predictor: Housing/Relationship Setting
Outcome: Days of Substance Use
Figure 4. Cluster Plot for Hierarchical Analysis
Figure 5. Dendogram from Hierarchical Analysis

Cluster Dendrogram

situation_distances
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