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## Social Networks as Mediators of Proximal Recovery Outcomes for Veterans Living in Recovery Homes

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RUNNING HEAD: SOCIAL NETWORKS OF VETERANS

Social Networks as Mediators of Proximal Recovery Outcomes for Veterans  
Living in Recovery Homes

A Thesis  
Presented in  
Partial Fulfillment of the  
Requirements for the Degree of  
Master of Arts

By  
Mayra Guerrero  
June 2019

Department of Psychology  
College of Science and Health  
DePaul University  
Chicago, Illinois

## SOCIAL NETWORKS AND VETERANS

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## SOCIAL NETWORKS AND VETERANS

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## SOCIAL NETWORKS AND VETERANS

### Biography

The author was born in the Bronx, New York, May 11, 1991. She graduated from Jonathan Levin High School in 2009, received an Associates of Arts in Liberal Arts degree in 2011 from the Borough of Manhattan Community College, and a Bachelor of Arts in Psychology degree with honors in 2014 from the City College of New York.

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## Abstract

Although the prevalence of alcohol and substance abuse among veterans has been long documented (Kulka et al., 1988; Tanielian et al., 2008), insufficient work has been done on veterans living within recovery homes such as Oxford House (OH). Approximately 18% of OH residents in the United States are veterans (Oxford House, 2015); however, only one study has looked at veteran status within OH (Majer, Jason, Ferrari, Venable, & Olson, 2002). In addition, no study has examined the social networks of veterans within recovery homes. Furthermore, although the relationship between length of stay (LOS) in an OH and various positive outcomes such as lower recidivism and higher abstinence self-efficacy have been demonstrated in previous studies (Jason, Davis, & Ferrari, 2007), the relationship between LOS and quality of life has not been examined among veterans. The current study aimed to: (a) determine if veterans living with other veterans have more cohesive social networks compared to veterans living with non-veterans; (b) assess whether there is a direct relationship between veteran status and quality of life; and (c) determine if social network cohesion mediates the relationship between veteran status and quality of life. Findings indicated that veterans living with other veterans had greater close friendship ties compared to veterans living with only non-veterans. However, veterans in either house type did not differ in regard to friendship density and reciprocity. No relationship was found between veteran status and quality of life. The study's limitations and implications for future research are also discussed.

## CHAPTER I: INTRODUCTION

## Literature Review

*Problem Statement*

Veterans from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) are a heterogeneous group facing unique challenges upon returning to civilian life. Among these challenges are veteran's increased risk of developing a mental health condition due to experiences related to their military service. In particular, OEF and OIF are at a higher risk of developing alcohol and/or substance dependence than other comparable segments of the U.S. population (Wagner et al., 2007). Furthermore, compared to other populations with a substance use disorder, veterans have a higher rate of post-traumatic stress disorder, traumatic brain injury, and substance abuse co-morbidity (Substance Abuse and Mental Health Services Administration, 2007; Tanielian, 2008). Additionally, veterans tend to have a later on-set of (SUD) (Fink et al., 2016). Given the challenges faced by the Veteran Affairs medical centers in providing long term treatment to this population, there is a need to explore the effectiveness of community-based treatment alternatives. Viable community-based alternatives are mutual-help recovery systems such as Oxford House (OH). In comparison to other OH residents, veterans have a unique set of risk factors which might be especially well addressed by the OH experience. However, little is known about veterans residing in OH and the effect of OH on populations with later on-set of SUD.

Research on Oxford House has demonstrated the effectiveness of the OH model with non-veteran populations (Jason, Olson, Ferrari, & LoSasso, 2006). OH has been found to lead to lower rates of relapse, higher abstinence self-efficacy, higher employment rates, and lower criminal justice recidivism (Jason et al., 2006). The literature on OH has shown that length of

stay and resident's social networks are associated with positive recovery outcomes. Specifically, a 6-month length of stay and a cohesive social network predicts future abstinence (Jason et al., 2007). Though there is extensive literature connecting OH to numerous positive outcomes (e.g., higher abstinence rates, higher abstinence social support, higher abstinence self-efficacy), whether OH leads to an increase in quality of life for veterans has not been examined. Given the importance of quality of life as an increasingly measured outcome in addiction research (Muller & Clausen, 2015), how quality of life relates to other recovery outcomes for veterans needs to be explored in future OH research.

Social identities have important implications for recovery from alcohol and substance abuse (Best et al., 2016). For instance, social identity plays a part in continuation of drug use, decisions to stop use, and abstinence maintenance (Frings & Albery, 2015). Furthermore, research has demonstrated that individuals change their identity associated with addiction and form a new identity associated with recovery when entering treatment and joining recovery groups (Buckingham, Frings, & Albery, 2013). However, the extent to which individuals relate to others in recovery vary. Majer, Jason, Ferrari, Venable, and Olson (2002) found that veterans living in OH had difficulties identifying with other residents due to their veteran status. This finding is consistent with the literature that shows that veterans have a preference to engage socially with other veterans (Laffeye, Cavella, Drescher, & Rosen, 2008).

The aim of this thesis is to evaluate the effectiveness of OH in helping veterans in recovery. The proposed study will examine whether veterans living with other veterans in OH have more cohesive social networks than veterans who are the single veteran in OH. In addition, the proposed study seeks to determine whether length of stay and quality of life is positively

associated with social network cohesiveness. A moderated-mediational model (see Figure 1) will be examined using multilevel modeling.

*Prevalence of Mental Health Problems among Veterans*

Approximately 2.5 million troops have deployed to Afghanistan and Iraq since the wars began in 2001 and 2003, with longer and more frequent deployments than in previous conflicts (IOM, 2012; 2014). Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), the longest sustained military operations in United States history, have also been characterized by the use of improvised explosive devices (IEDs) by insurgents, high utilization of the National Guard, an all-volunteer military force, and increased injury survival rates due to medical advancements (Armed Forces Health Surveillance Center, 2011; Goldberg, 2010). Milliken, Auchterlonie, and Hoge (2007) found that 66.5% of active duty soldiers and 69.6% of reserve soldiers had been exposed to a traumatic combat experience. Deployment stressors and exposure to combat have been linked to the development of mental health conditions among OEF and OIF veterans (IOM, 2014). These mental health conditions include post-traumatic stress disorder (PTSD), major depression, and traumatic brain injury (TBI) (Hoge et al., 2004; Polusny et al., 2011; Schell & Tanielian, 2010; Seal, Bertenthal, Miner, Sen, & Marmar, 2007; Stecker, Fortney, Hamilton, & Ajzen, 2007; Tanielian et al., 2008).

Furthermore, there have been unprecedented rates of suicide among OIF and OEF veterans. Although combat accounted for 28% of all military deaths in 2011, suicide accounted for 22%; making suicide the second leading cause of death in the U.S military (Corr, 2014). Between 2010 and 2012; 2,553 active-duty soldiers attempted suicide and, of these, 812 died (Corr, 2014). Although, historically, suicide rates have been lower in the military than in the

general population, in 2008 the suicide rate of the Army surpassed that of the civilian population (Sayer, Carlson, & Frazier, 2014).

### *Veterans and Substance Abuse*

Substance abuse and dependence affects an estimated 21.5 million Americans (8.9%) (SAMHSA, 2014). Substance and alcohol abuse lead to numerous health problems, to unemployment, and to disruptive family relations (Craig, 2004; Inaba, Cohen, & Holstein, 2007). For example, alcohol is the third leading risk factor for disease and disability globally, and it is the third cause of death in the U.S. (Kelly, Hoepfner, Stout, & Pagano, 2012). In addition, alcohol and drug abuse are among the costliest of health problems (National Drug Intelligence Center, 2011; ONDCP, 2004; Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2004). It is estimated that the illicit drug use cost in the U.S. is 180.9 billion dollars (ONDCP, 2004). In 2006, the economic costs of alcohol abuse was estimated to be 223.5 billion dollars (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011).

OEF and OIF veterans are at a higher risk of developing alcohol and/or substance dependence than other comparable segments of the U.S. population (Wagner et al., 2007). Historically, alcohol and other drug use has been a major issue for veterans (Kulka et al., 1988; Tanielian et al., 2008). The prevalence of alcohol (39.2%) and drug abuse (5.7%) were high for Vietnam veterans (Kulka et al., 1988) and continue to be elevated for OIF and OEF veterans. Richards, Goldberg, Rodin, and Anderson (1989) found that Caucasian male veterans have nearly two and a half times the lifetime prevalence of alcoholism compared to Caucasian male non-veterans, even after controlling for age, region of the U.S, marital status, education and income. The rates of alcohol misuse among OEF and OIF veterans are between 11.5% - 35.4% (Hoge et al., 2004; Jacobson et al., 2008; Milliken et al., 2007), and between 26.5% - 40% among veterans

seeking health care from a Department of Veterans Affairs (VA) facility (Jakupcak et al., 2010). Moreover, 25% of service members ages 18-25 screen positive for alcohol abuse compared to 16% of matched civilians (Bray et al., 2009). Rates of heavy drinking among service members has risen by 25% from 1998 to 2008 (Bray et al., 2009).

An analysis of data from the 2004 to 2010 National Survey on Drug Use and Health (NSDUH) found that 15% of veterans have an alcohol use disorder (AUD) and 18% have an SUD (Golub, Vazan, Bennett, & Liberty, 2013). These estimates are two to three times higher than those based on the NSDUH data from 2000-2003 (Wagner et al., 2007). Lan et al. (2016) found that the number of veterans receiving treatment for a substance use disorder (SUD) in an outpatient setting increased by 52.7% between 2005 and 2012. The number of veterans diagnosed with an opioid dependence increased by 7.3% from 2003 to 2005. A 2015 meta-analysis found that a greater prevalence of SUDs among OEF/OIF veterans compared to a matched non-deployed military sample (Kelsall et al., 2015).

Veterans with substance abuse problems constitute a unique population in that they are screened for mental health vulnerability at enlistment (Fink et al., 2016), experience traumatic events not experienced by civilians (e.g., combat), and were part of an institution where alcohol consumption is culturally acceptable (Bray, Brown, & Williams, 2013). Thus, the onset of SUD typically occur after enlistment and exposure to military specific adverse experiences.

Moreover, compared to other populations with a substance use disorder, veterans have a higher rate of PTSD, TBI, and substance abuse co-morbidity. The prevalence rate for PTSD and SUD among veterans between the ages of 18-53 is 18.2%, which is five times higher than the rate for the civilian population (SAMHSA, 2007). Seal et al. (2011) looked at veterans of OEF and OIF who were first time users of the Veterans Affairs (VA) healthcare system between 2001 and

2010 and found that 11% received a substance use disorder (SUD) diagnosis (Seal et al., 2011). Of those diagnosed with a SUD, 55-75% received a PTSD or depression diagnosis. In addition, the number of veterans with both PTSD and SUD receiving care from a VA has increased by 76% since 2008 (Allen, Crawford, & Kudler, 2015).

Furthermore, alcohol and substance abuse are associated with higher suicidality among OEF and OIF veterans (Kim et al., 2012; Smith et al., 2016). Chakravorty et al. (2014) found that among veterans with alcohol abuse problems, 39% reported suicidal ideation. Alcohol and substance abuse disorders may be associated with increased suicide risk because it is often comorbid with PTSD and depression (Maguen et al., 2015).

Individuals with substance abuse co-morbidity are more challenging to treat because co-occurring mental health problems are associated with more severe diagnostic symptoms and poorer treatment outcomes (Tanielian et al., 2008). Campbell et al. (2007) found that veterans with co-morbid PTSD and depression had more severe depression, more suicidal ideation, and lower social support than veterans with only depression. The veterans with co-morbid PTSD and depression had poorer prognosis, and they experienced a delayed response to a depression intervention.

In addition, homelessness disproportionately affects veterans. Although, male veterans make up 23% of the adult male population, they make up 20% of the homeless male population (National Coalition for Homeless Veterans, 2012). Moreover, homelessness and substance abuse problems often occur together. It is estimated that 50% of homeless individuals have alcohol and substance user disorders (Burt et al., 1999). Substance use and psychiatric symptoms have been found to be the primary risk factors for homelessness among veterans (Edens, Kaspro, Tsai, & Rosenheck, 2011). Rosenheck and Fontana (1994) found that substance use and psychiatric



symptoms were stronger predictors of homelessness than combat exposure or military service. Furthermore, homelessness affects an individual's social networks and can lead to isolation. It has long been documented that less socially integrated individuals are less healthy, both physically and psychologically (Cohen, 2004; Cohen & Janicki-Deverts, 2009; House, Landis, & Umberson, 1988). A socially supportive environment may be a crucial factor for veterans because it can help them recover from alcohol and substance abuse, and it can reduce the risks associated with social isolation for veterans affected by homelessness.

### *Mutual-Help Systems*

A wide range of services are available to address substance use dependence, such as inpatient services, outpatient services, and recovery housing. Despite the efforts to combat these problems, data from the 2014 National Survey on Drug Use and Health revealed that use and abuse of substances have remained stable (SAMHSA, 2014). In addition, only 13.4% of those with a substance use disorder obtain any treatment, and those that do receive treatment have high rates of recidivism (SAMHSA, 2014). Dutra et al. (2008) conducted a meta-analysis of psychosocial treatments for substance use disorders and found that 35% of patients dropped out before the completion of treatment, and only 31% remained abstinent one-year post-treatment. These findings suggest the potential value of studying community-based aftercare settings that provide recovery support in order to reduce relapse rates (Jason, Davis, Ferrari, & Bishop, 2001).

The VA healthcare system is the largest healthcare provider for veterans. The VA treats an estimated 1.1 million patients with a psychiatric condition or SUD annually (Rosen et al., 2008). However, VA treatment utilization rates among veterans with a SUD is low, and rates of relapse and treatment discontinuation are high (Erbes, Westermeyer, Engdahl, & Johnson, 2007; Jacobson et al., 2008; Larson, Wooten, Adams, & Merrick, 2012). For instance, although the

prevalence of alcohol abuse among veterans of OEF and OIF is estimated to be 33%, mental health service utilization is estimated among OIF and OEF veterans to be at 18%, and only 3% receive chemical dependency treatment (Erbes et al., 2007). In a report by SAMHSA (2005), only 15% of veterans who were dependent on alcohol or drugs were treated in the past year. Given the challenges faced by the VA medical centers to address the needs of veterans, community-based programs are viable alternatives for providing care for veterans with an alcohol and/or substance use problems. These community-based programs include Alcoholics Anonymous (AA; White, 2009), 12 step programs, and mutual help recovery homes such Oxford House (OH; Oxford House, 2008).

Unlike professional treatment centers, mutual-help systems are self-run and are funded by members, thus require very little of taxpayer's money to sustain (Olson et al., 2006). Furthermore, mutual self-help groups are frequently sought by those with a substance use problem. Whereas approximately 2.3 million individuals with a substance use disorder attended a formal treatment program in 2007, 5 million attended a peer-led mutual-help group (SAMHSA, 2008). Approximately 80% of adults who seek help for their alcohol addiction participate in AA (Dawson, Grant, Stinson, & Chou, 2006). Additionally, research on mutual support groups have demonstrated their positive impact (Jason et al., 2007; Kelly et al., 2012). Besides being financially accessible for patients, mutual-help programs have been shown to lead to behavioral and cognitive improvements (Dadich, 2009; Humphreys, 1997). Mutual-help group involvement has been associated with reduced psychiatric symptoms (Finn, Bishop, & Sparrow, 2007), reduced use of medications, and lower hospitalization rates (Finn & Bishop, 2001).

Twenty years of research on AA shows that it results in short and long term therapeutic benefits (Ferri, Amato, Davoli, 2006). AA has also been shown to reduce health care costs while

improving treatment outcomes (Humphreys & Moos, 2007; Kelly, Magill, & Stout, 2009).

Studies have found mutual-help participation to be associated with greater rates of abstinence across race, gender, age, substance of choice, and even among those who have both substance use and psychiatric disorders (Kelly, Stout, Zywiak, & Schneider, 2006; Moos & Moos, 2004; Tonigan, Connors, & Miller, 2003).

Ouimette, Finney and Moos (1997) compared the effectiveness of 12 step programs and cognitive behavioral models of substance abuse treatment among 3, 018 patients receiving treatment from a VA medical center. The study found that those attending a 12-step program were more likely to be abstinent at the 1-year follow-up compared to participants receiving cognitive behavioral therapy.

Although studies have demonstrated the effectiveness of mutual- help recovery systems, veterans within mutual-help recovery systems have been rarely investigated. For instance, only one study has looked at veterans living in OH. Veterans have different risk factors for SUD compared to the general population, and have higher rates of substance use co-morbidity (SAMHSA, 2007) which entails higher relapse rates (Killeen, Back, & Brady, 2015; Mills, Lynskey, Teeson, & Ross, 2005; Norman, Tate, Anderson, & Brown, 2007). Given these unique vulnerabilities, the effectiveness of OH on veteran's recovery should be explored. OH are the only type of recovery homes that have been on SAMHSA's Registry of Evidence-Based Programs and Practices (SAMSHA, 2011), thus future research should evaluate whether OH is just as effective for populations with higher rates of co-morbidity and later onset of SUD.

#### *Oxford House*

A major contributing factor to relapse appears to be continual exposure to the risks associated with an individual's living situation. These risks include high substance availability,

little or no social support for abstinence, interpersonal conflict, and poorly structured time (Jason, Davis, & Ferrari, 2007). Therefore, drug-free housing that supports risk-avoidance and recovery can be the key to a successful recovery from alcohol and substance abuse. One type of recovery homes that have been shown to improve prospects for a successful recovery are OHs. OHs are self-run and self-funded recovery homes that emphasize peer support for sobriety. The homes are single-sex and house 6 to 12 people, and are geographically grouped together to form Chapters that come together to meet regularly for business, recovery, and recreational purposes. The houses are chartered and expected to follow guidelines and traditions as suggested by OH, Inc. (OH, 2008). Mandatory rules for OHs are abstinence from substance use, payment of weekly rent, and compliance with house chores.

Currently, there are over 2,000 OHs throughout the U.S. and over 20,000 people live in these houses, making them the largest group of residential recovery homes in the U.S. (Jason et al., 2007). Research has demonstrated the effectiveness of the OH model (Jason et al., 2006). OH has been found to lead to lower rates of relapse and greater employment outcomes compared to traditional recovery homes and other community-based after-care services (Usual Care) (Jason et al., 2006; Jason, Olson et al., 2007). Jason et al. (2006) found lower relapse for OH (31.6%) than participants in Usual Care (64.8%) at 24 months post-discharge from residential treatment. In addition, OH residents were more likely to be employed (76.1% vs. 48.6%) and less likely to report engagement in illegal activities (0.9% vs. 1.8%). The effectiveness of OH has also been studied across subpopulations (Alvarez, Adebajo, Davidson, Jason, & Davis, 2006; Alvarez, Jason, Davis, Olson, & Ferrari, 2009; Jason, Davis, Ferrari, & Bishop, 2001). However, the effectiveness of the OH model with veterans needs to be further explored.

*Length of Stay in Oxford House*

The literature on residential treatment for substance abuse indicates that a 6-month length of stay is associated with better outcomes (Bleiberg, Devlin, Croan, & Briscoe, 1994; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997). Research on OH has found that durations of six months or more have led to overall better outcomes for individuals recovering from substance use compared to those who stay less than six months (Jason et al., 2007). These positive outcomes include lower rates of relapse, higher employment rates, and lower criminal justice recidivism (Aase et al., 2009; Jason et al., 2007). In addition, Jason, Stevens, Ferrari, Thompson, & Legler (2012) found that abstinence self-efficacy and percentage of sober members in the residents' social networks increased after 6 months. These studies reveal that a minimum of a 6 month stay in an OH may be a critical factor to maintaining abstinence. The relationship between length of stay in an OH and positive recovery related outcomes needs to be examined among the veteran population. The proposed study will examine whether veterans have a shorter or longer length of stay compared to non-veterans living in OH, and whether LOS is predictive of positive recovery outcomes among veterans (e.g., quality of life).

*Social Identity Theory and Substance Abuse Recovery*

The social identity theory (SIT; Tajfel & Turner, 1979; 1986) is a social psychological theory of intergroup relations and the social self. The theory emphasizes the importance of group memberships and their significant effects on behavior. SIT postulates that people define their sense of self in terms of group memberships. People have a repertoire of discrete group memberships that differ in the extent to which they are perceived to be psychologically meaningful descriptors of the self (Haslem, Jetten, Postmes, & Haslam, 2009; Hogg, Terry & White, 1995). The theory states that through the process of social comparison, persons who are

similar to the self are categorized as the in-group and persons who differ from the self are categorized as the out-group. Social identification leads to behaviors and attitudes that are congruent with the in-group identity, stereotypical perceptions of the in-group and out-group members, and reinforcements of antecedents of identification (Ashforth & Mael, 1989).

Self-categorization and social comparison are two important socio-cognitive processes involved in social identity formation which produce different outcomes (Stets & Burke, 2000). Self-categorization results in the accentuation of the perceived similarities between the self and the in-group, and the accentuation of the differences between the out-group and the self. Social comparison results in the selective application of the accentuation effect to those dimensions that will enhance the self. For instance, one's self-esteem is enhanced by evaluating the in-group positively and the out-group negatively (Stets et al., 2000).

Individuals belong to multiple social groups and to groups of different types (Roccas & Brewer, 2002). However, group memberships do not have equivalent psychological meaning or influence over behavior. One reason is that social identities can be more or less salient depending on the environment and the context (Jetten & Pachana, 2012; Sani & Bennett, 2009). Identity salience is defined as the probability that an identity will be activated across different situations, and thus the higher probability of behavioral choices in congruence with the expectations attached to that identity (Oakes, 1987; Stryker, 1980). Certain group memberships have cognitive prominence within an individual's concept of the self.

Moreover, social identities play a critical role in health outcomes (Haslam, et al., 2009). Individuals that feel socially connected to other group members experience positive physical and psychological health benefits (Jetten, Haslam, & Haslam, 2012). For instance, people experiencing mental health difficulties benefit from joining meaningful social groups (Cruwys et

al., 2013; Cruwys et al., 2014). Social identities have also been found to improve health and well-being for stroke patients (Haslam et al., 2008), individuals with PTSD (Jones et al., 2012), individuals with multiple sclerosis (Wakefield, Bickley, & Sani, 2013), and individuals with physical disabilities (Fernandez, Branscobe, Gomez, & Morales, 2012). Social identity norms also underpin people's engagement in healthy behaviors. Laverie (1998) found that people's willingness to engage in aerobics classes was associated with the development of an identity associated with membership in an aerobics group.

A few studies have examined the relationship between social identity, group membership, and recovery from alcohol and drug addiction (Biernacki, 1986; Blonigen, Finney, Moos, & Moos, 2011; Kelly et al., 2012; Orford, 2001). The social identity approach applied to recovery focuses on the substance use related values and behaviors that characterize groups in the social networks, the importance of groups that are abstinent, and the incongruence of substance using groups with the recovery goals of the individual (Best, Beck, Dingle, & Lubman, 2015). Within this model, social identity change occurs when there is a poor fit between earlier substance using groups and the recovery goals of the individual. Whereas previous associations and embeddedness with drug using groups supported the emergence of a drug using identity (Anderson, 1998), access to recovery-congruent groups supports the emergence of a recovery identity (Rodriguez & Smith, 2014).

Research on substance abuse recovery has demonstrated the importance of identity change processes (Best et al., 2016). Dingle, Stark, Cruwys, and Best (2015) found that a greater transition from a "user" to "recovery" social identity accounted for substantial variance in drinking quantity (34%), drinking frequency (41%), and life satisfaction (49%) at treatment completion, even after controlling for substance use severity and social identity ratings at

treatment entry. Buckingham et al. (2013) found that during group therapy or participation in 12-step group meetings, individuals change their identity associated with addiction to a new identity associated with recovery. A newly formed identity as an individual in recovery provides a chance to affiliate with others who identify the same way and provides an opportunity to create distance from previous associations.

Although individuals may adopt a new identity associated with recovery, the extent to which they identify with members in their abstinence social support networks may vary (Majer, Jason, Ferrari, Venable, and Olson, 2002). Previous research suggests that substance abusers' socialization is connected to social identities beyond substance abuse such as gender, race (Anderson, 1998), age, and educational level (Neve, Lemmens, & Drop, 1997). Thus, it can be expected that veterans identify more with other veterans in recovery than with non-veterans in recovery. The proposed study will evaluate whether veterans living in OH with other veterans is predictive of positive recovery outcomes.

#### *Veteran Status and Veteran Identity*

The veteran population consists of former military service members who served in any of the U.S. Department of Defense military branches including the Army, Navy, Marine Corps, Air Force, Coast Guard, and Reserve Components that include the National Guard. The veteran status is given to the former military service member whether they deployed or not. For health care benefit eligibility, a veteran is defined by the VHA as "a person who served in the active military, naval, or air service and who was discharged or released under conditions other than dishonorable" (Congressional Research Service, 2016). Service member is a referent of all active duty military personnel.



Military veterans have been studied as a community with a distinct culture and social identity (Hall, 2011; Koenig, Maguen, Monroy, Mayott, & Seal, 2014). Culture has been traditionally defined as the shared values, language, perspectives, norms, and practices of a community (Koenig et al., 2014). Service members are acculturated into military culture during basic training, which transforms their civilian identity into a military identity (Demers, 2011). In the military, individuals adopt the values of duty, honor, loyalty, and commitment to comrades, unit, and nation (Demers, 2011). As a total institution, the military also prioritizes obedience, regimentation, and collectivism (Smith & True, 2014). The service member's identity transformation continues and extends for those that deploy to a combat zone and for those that exit the military (Smith & True, 2014). The veteran's identity is defined as veterans' self-concept that derives from their previous military experience within a sociohistorical context post military service (Harada et al., 2002).

Veterans constitute a distinct subculture because they have their own shared language, norms, and beliefs (Reger, Etherage, Reger, & Gahm, 2008). Although each branch of the military has cultural components unique to that service, there are also cultural components shared across branches. Some shared cultural components are service to one's country, shared training experiences, and the preparation for national defense (Strom et al., 2012). Reger and colleagues (2008) contend that there is a set of basic cultural beliefs and norms that distinguish veterans from civilians and these beliefs have important implications for psychologists. A few publications have discussed the role of military experience in identity formation (Strom et al., 2012). Arredondo and Glauner (1992) developed the Dimensions of Personal Identity Model which serves as a tool for examining individual differences. The model views military service as

a dimension of personal identity similar to religion or educational background (Arredondo et al., 1996).

Majer et al. (2002) investigated the association between social identities, abstinence social support, and abstinence self-efficacy among residents of OH. Veteran status was reported to be an identification issue which made identifying with other residents difficult. The study found that veteran status and prior incarceration were the only identification issues that were related to significantly lower levels of abstinence social support and abstinence self-efficacy. This finding suggests that identifying as a veteran may be more salient than identifying as an individual in recovery for veterans living in OH. This is consistent with body of literature that indicates that social support is more likely to be given, received, and interpreted positively to the extent that the individual on the receiving end of the support perceives themselves to share a sense of social identity (Haslam et al., 2009). Beck, Best, Dingle, Perryman, and Lubman (2015) found that stronger identification with a therapeutic community predicted better retention and completion rates among new members. The proposed study will examine how situating veterans together in OH effects recovery outcomes.

#### *Social Networks and Substance Abuse Recovery*

Social networks map the types of dyadic relationships between the focal individual and other people in their network. Examples of dyadic characteristics include the extent to which resources and support are both given and received (reciprocity), whether they involve multiple relations between dyads (multiplex), the extent to which the relationships are emotionally close (intensity), and the extent to which a relationship serves several functions (complexity). Examples of characteristics of whole networks are the extent to which members are similar in terms of a social identity (homogeneity), and the extent to which members interact with each

other (density) (Heaney & Israel, 2008). Empirically, social networks can be measured by asking every individual within a social group to report on relevant social connections (e.g. trust, friendships, mentor relationships) with every other individual within that group. Social networks can be visually represented in graphs as nodes (individual actors) and ties (relationships or interactions) that connect them.

There is extensive documentation of the association between social networks and one's psychological and physical well-being (Barnett & Gotlib, 1988; Cohen, 2004; Cohen & Wills, 1985; Heaney & Israel, 2008; Kawachi & Berkman, 2001; Smith & Christakis, 2008). Social networks affect health through various mechanisms: (a) the provision of social support; (b) social influence (e.g., norms and social control; (c) social engagement; (d) pathogen exposure; and (e) access to resources (Smith et al., 2008). Christakis and Fowler (2007) found that a person's likelihood of becoming obese was partially determined by whether someone in their network had become obese during the same time. Bearman and Moody (2004) found that having a friend who attempted suicide increased the risk of suicidal ideation and suicide attempts among adolescents.

Social networks also have important implications for alcohol and substance abuse recovery. Social networks and their associated norms influence the initiation and maintenance of substance use (Hawkins, Catalona, & Miller, 1992), and attrition from substance use treatment (Dobkin, Civita, Paraherakis, & Gill, 2002). The literature on relapse prevention shows that social support and support for abstinence and drug use predict a lower risk of relapse (Havassey, Hall, & Wasserman, 1991). On the other hand individuals with social network members who drink or do drugs have increased likelihood of relapse (Ellis, Bernichon, Yu, Roberts, & Herrell, 2004). Zywiak et al. (2009) found that among individuals receiving treatment for cocaine dependency, individuals that had better outcomes were those who were more socially connected

and those that had an increase in the proportion of people in their social network that were abstinent. Litt, Kadden, Kabel-Cormier, and Perry (2007, 2009) conducted a study in which people who completed detoxification from alcohol were randomly assigned to either usual aftercare or to a “network support” intervention which involved adding at least one non-drinking peer to their network. Those in the network support intervention had a 27% increased likelihood of treatment success at 12 months.

The influence of social networks on recovery outcomes has also been explored in mutual-help systems. Data analysis from 1,726 adults who participated in AA revealed that adaptive social network changes and increases in abstinence self-efficacy were the mechanisms that had the largest influence on recovery (Kelly, Hoepfner, Stout, & Pagano, 2011). Majer, Callahan, Stevick, and Jason (2016) found that individuals in mutual-help recovery homes that report stronger relationships with other residents have higher levels of abstinence self-efficacy. Best et al. (2011) found that belonging to a social network that included others that were abstinent was one of the strongest predictors of a positive quality of life post-treatment.

#### *Oxford House and Social Networks*

The effects of social networks on recovery outcomes have also been explored in OH. Jason et al. (2012) found that social network size and presence of relationships with other residents predicted future abstinence in OH. In addition, individuals with other OH residents as part of their social networks were more likely to remain in OH six months and were less likely to relapse. Furthermore, a minimum of a 6-month stay in OH, higher abstinence self-efficacy, more recovery supportive personal associates outside the house, and more cohesive house social ecology mediated the rates of relapse (Jason, Davis, Ferrari, & Anderson, 2007; Jason, Olson et

al., 2006; Jason et al., 2012). These studies demonstrate that having other OH residents in one's social network is the most predictive factor of a successful recovery.

### *Social Network Cohesion*

A social network is considered cohesive to the extent that its members are connected to others in the network, and the extent that pairs of its members have multiple social connections within the group that pull the network together (White & Harary, 2001). Network cohesion has been found to be associated with positive outcomes, such as work-group performance and psychological well-being (Beal, Cohen, Burke, & McLendon, 2003; Mullen & Cooper, 1994). Members of a cohesive group demonstrate a high preference to interact with one another, more than with others outside of the group, and demonstrate highly self-preference segregative attitudes or behaviors (Fershtman, 1997). Attitudes and behaviors exhibited by cohesive social networks include high morale, trust, friendship, cooperation, communication, commitment, and high identification with the group (Andrews, Kacmar, Blakely, & Bucklew, 2008; Carless & DePaola, 2000, Chen, Tang & Wang, 2009; Friedkin, 2004; Kidwell, Mossholder, & Benett, 1997; McLeod & Treuer, 2013).

Social cohesion can be determined by measuring the size, density, boundedness, centrality, and homogeneity of a group. Size refers to the number of network members; density describes how the different members are connected; boundedness is used to describe group structures; centrality refers to the importance or influence of an individual in a group; and homogeneity refers to how similar members of a network are to each other (Faust, 1997; Flatt, Agimi, & Albert, 2012; Igarashi et al., 2008).

The presence of network cohesive ties promotes social norms and sanctions that facilitate trust and cooperation between network members (Coleman, 1988; Gargulo & Benassi, 2000). In

addition, cohesive networks facilitate social control, and recovery social capital– a set of resources that exist within the structure of relations between dyads (Bourdieu, 1986) that are the hypothesized crucial ingredients in the effective treatment of SUDs (Best, & Laudet, 2010; Moos, 2007; 2008). According to social control theory, cohesive ties with others that are abstinent, motivates individuals to refrain from substance use (Moos, 2007; 2008). These strong ties provide goal direction and monitoring which helps the individual maintain their recovery. If these social ties are weak or absent, the individual is more likely to engage in problematic behaviors such as substance use. Cloud and Granfield (2008) defined recovery social capital as the sum of resources that each individual has as a result of their relationships. The presence of cohesive ties are thought to facilitate the transmission of social capital (Coleman, 1988).

The bonds that residents build within OH serves as motivation to engage in pro-social behaviors and refrain from destructive behaviors that can lead an individual to relapse (Polcin, 2009). Since veterans tend to identify more with others that share their veteran status, they may build stronger bonds with other veterans living in OH than with non-veteran residents. Thus, veterans that reside with other veterans may have more cohesive social networks, and in turn may benefit more from social processes i.e. social control and recovery social capital. The proposed study seeks to determine whether veterans that live with other veterans have more cohesive social networks.

#### *Homophily and Substance Abuse Recovery*

The term homophily refers to the social phenomenon in which people tend to develop relationships or have more frequent contact with others who are similar to them (Flatt, Agini, & Albert, 2012; McPherson, Smith-Lovin, & Cook, 2001). Patterns of homophily have been found across different relationship types, and have been found to be critical to the formation of

interpersonal bonds (Smith et al., 2008). There is homophily that stems from (1) surface level features of individuals such as demographic variables and group memberships (e.g., occupational statuses, gender, race, ethnicity, religion, and social class) (Harrison, Price, & Bell, 1998; McPherson et al., 2001) and (2) from deep-level features such as personality, cognitive ability, attitudes, and beliefs (Massen & Koski, 2014). Compared to deep-level features, surface-level attributes are overt characteristics that are readily detectable and easily measurable. On the other hand, deep-level features are covert attributes that are only learned after extended interaction with the individual (Harrison et al., 1998). Empirical research has supported that surface-level characteristics tend to predict affiliation and attraction, more so than deep-level characteristics (Berscheid, 1985; Mannix & Neale, 2005). However, surface-level characteristics can contribute to a set of life experiences that are likely to affect attitudes (e.g., previous military experience) (Mannix et al., 2005).

Lau and Murnighan (1998) introduced the concept of group faultlines – hypothetical dividing lines that split groups into subgroups on the basis of one or more attributes. Faultlines vary in strength and become stronger as more attributes align. Specifically, the strength of group faultlines depend on: (1) the number of individual attributes apparent to group members, (2) the alignment of individual attributes within a group, and (3) the number of potential homogeneous sub-groups (Lau et al., 1998). According to the faultline model, when groups split into subgroups, the member's identities are associated more with the subgroup than with their entire group. Conversely, members of groups with weaker faultlines are more likely to identify with their entire group rather than with their subgroup (Lau & Murnighan, 2005). Furthermore, strong faultlines can result in less interpersonal attraction, less feelings of belongingness, and lower social network cohesiveness (Flache & Mas, 2008; Lau et al., 2005).

Furthermore, the benefits of social support for recovery seem to be dependent on the degree to which those that provide the support are perceived to similar and connected to the self (Best et al., 2016). Studies have shown that support is most effective when those providing and receiving it share a sense of identity (Jettern, Haslam, Haslam, Dingle, & Jones, 2014; Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005). For instance, Vik, Grizzle, and Brown (1992) found that the positive effects of recovery support from abstinent social network members was greater when participants rated these network members as similar to themselves. This finding suggests that homophily moderates the impact of social network support on recovery.

Veteran status is an example of surface-level individual attribute. Research on veterans shows that they are more likely to engage socially with other veterans, suggesting that they have stronger relationships with similar others (Laffeye, Cavella, Drescher, & Rosen, 2008). Veteran status is a significant point of connection and for homophilic friendship formation. However, the tendency for veterans to form bonds based on surface-level homophily, can hinder the formation of cohesive ties with non-veterans in OH. Given the impact of homophily on substance use recovery and faultlines on inter-group dynamics, future research should examine whether veterans living with other veterans in OH have stronger social network cohesiveness and better recovery outcomes than veterans who are the only veteran in OH.

### *Social Networks and Veterans*

There is some literature demonstrating the relationship between a veteran's "personal network" (individuals named as friends or sources of support) and mental health outcomes (Escobar et al., 1983; Hatch et al., 2013; King, King, Fairbank, Keane, & Adams, 1998). Having greater satisfaction with one's social network (Jakupcak et al., 2010) and increased post-deployment social support (Pietrzak et al., 2010) is associated with a reduced risk in suicidal



ideation among OEF/OIF veterans. Hatch et al. (2013) found an inverse linear relationship between personal network size and mental health outcomes in veterans. For instance, there was a 38.3% probability of having a mental health condition for veterans reporting no social network members, 28.1% for those reporting one to two members, 18.5% for those reporting three to five members, and 13.1% for those reporting six or more members.

Personal network size is also negatively correlated with the severity of mental health problems (Escobar et al., 1983). Sripada et al. (2015) found that large social network size, high social network diversity, high perceived social support and high military unit support were each associated with a lower likelihood of having a mental health problem among National Guard veterans. Similarly, Horesh, Solomon, Keinan and Ein-Dor (2013) found that larger and higher quality social networks was associated with the delayed-onset of post-traumatic stress disorder among Israeli veterans of the 1982 Lebanon War. In addition, Humphreys, Mankowski, Moos, and Finney (1999) found that higher quality social networks mediated the relationship between involvement in self-help groups and reduced substance use at a 1 year follow up among veterans recovering from substance use problems.

Taken together, these studies suggest that veterans benefit from supportive social relationships. Therefore, it is reasonable to hypothesize that homeless and substance abusing veterans would benefit from the general and recovery-specific social support thought to be the primary mechanism by which OH residences facilitate recovery, personal transformation, and re-integration into society. Moreover, peer support is recognized to improve the psychological well-being of veterans (MacEachron & Gustavsson, 2012). Peer support is also viewed to be congruent with veterans' shared experience of military culture which values comradery and unit cohesion (Barber, Rosenhack, Armstrong, & Resnick, 2008). However, personal networks

represent *chosen* social affiliations, whereas OHs typically do not. For this reason, it may be that veterans feel particularly understood and supported in a house with other veterans. Therefore, it is of interest to compare outcomes for veterans on the basis of the number of their co-residents who are also veterans.

### *Quality of Life*

Traditionally, morbidity and mortality were assessed to determine the health of populations in the U.S. (Bonomi, Patrick, Bushnell, & Martin, 2000). However, these measures focused on deficits and failed to assess an individual's subjective perspective of their general well-being. In recent years, there has been a shift away from these pathological models of substance use disorders towards a multidimensional health model. Due to this shift, quality of life (QoL) has become an increasingly measured outcome in addiction research (Muller & Clausen, 2015). QoL is an important outcome criterion that incorporates an individual's subjective view of their well-being and utilizes domains not captured by traditional severity measures such as the Addiction Severity Index (ASI) (Donnavan et al., 2005). While substance abuse treatments should aim to achieve abstinence or a reduction in substance use, they should also emphasize improving a patient's QoL. Furthermore, there is increasing evidence that QoL has a prognostic value. For instance, higher pre-treatment QoL predicts better outcomes in inpatient psychiatric units, independent of baseline psychiatric status (Smith & Larson, 2003).

In addition, there is evidence that QoL is relevant in substance use treatment and recovery. Laudet, Becker, & White (2009) found that higher QoL at treatment completion predicts abstinence 1- and 2-years post treatment among individuals recovering from substance addiction. Moreover, improvement in quality of life is regarded as an important outcome of treatment by those in recovery. Laudet and White (2010) found that in addition to remaining abstinent,

participants at different stages of recovery expressed concerns about multiple areas of functioning.

### *Veterans and Quality of Life*

Research studies have linked veterans with lower quality of life compared to the general population (Hoerster et al., 2012; Opezzo et al., 2016). The prevalence of mental health issues and substance addiction among veterans have been shown to have an adverse effect on QoL (Foote, Kinnon, Robbins, Pessagno, & Portner, 2015). Zatzick et al. (1997) and others have found that a diminished QoL among Vietnam veterans was attributable to PTSD (Lunney & Schnurr, 2007; Schnurr, Hayes, Lunney, McFall, & Uddo, 2006). Schnurr, Lunney, Bovin, and Marx (2009) reviewed the literature on PTSD and QoL among veterans and found that the negative effect of PTSD on quality of life among OEF and OIF veterans is comparable to findings obtained from previous war veterans. Furthermore, Erbes et al. (2007) found that self-reported physical health, emotional well-being, and energy were significantly lower among OEF and OIF veterans with a PTSD diagnosis.

### *Rationale*

While the prevalence of alcohol and substance abuse among veterans has been long documented, OHs have been little evaluated as a potential solution to the difficulties faced by many veterans. Approximately 22% of OH residents in the United States are veterans (Oxford House, 2007); however, only one study has looked at veteran status within OH (Majer et al., 2002). In addition, no study has looked at the social networks of veterans within recovery homes. Furthermore, although the relationship between length of stay (LOS) in an OH and various positive outcomes such as lower recidivism and higher abstinence self-efficacy have been demonstrated in previous studies, the relationship between LOS and QoL has not been examined among veterans and other populations. The purpose of this study is to: (a) determine if veterans

living with other veterans have more cohesive social networks compared to veterans living with non-veterans; (b) assess whether there is a direct relationship between veteran status and quality of life; (c) examine whether there is a relationship between length of stay and quality of life; and (d) determine if length of stay and quality of life will be positively related to social network cohesiveness. The proposed study will produce research that fills this gap in the literature.

## CHAPTER II: DESIGN

### Statement of Hypothesis

Hypothesis I. Veterans residing in Oxford Houses with one or more veterans will have a more cohesive social network compared to veterans living with all non-veterans.

Hypothesis II. Veterans will have lower levels of quality of life compared to non-veterans, and veterans living in OHs with one or more veterans will have higher quality of life compared to veterans in houses with no other veterans.

Hypothesis III. Social network cohesiveness will mediate the relationship between veteran status and quality of life.

### Method

This cross-sectional investigation recruited participants from OHs in Oklahoma, Texas, and North Carolina. Variables to be examined include: demographics, house composition, veteran status, social networks, length of stay in OH, and quality of life. The study tested the multi-level model in Figure 1 with veterans in OHs with more than one veteran positively related to social network cohesion, and social network cohesion mediating the relationship between veteran status and quality of life.

*Participants*

This study included 85 participants from 13 all male OHs. Each house had an average of 6.54 residents. Their mean age of 37.37 years ( $SD = 10.57$ ). Participants identified as White (81.2%), African American/Black (7%), American Indian (7%), and Latinx (6%). The average length of stay in an OH was 8.9 months ( $SD = 9.44$ , range from 2 days to 4 years). Seventy-six percent of participants were non-veterans and 24% were veterans.

*Procedures*

The current study included 7 OHs with only one veteran in the residence and 6 OHs with two or more veterans. Data were collected from OHs located in Oklahoma, North Carolina, Texas, and Oregon. The participating houses from North Carolina, Texas, and Oregon were part of a longitudinal study which collected information every four months over a 2-year period (the current study involves baseline data). Houses from these three different geographical regions were included to increase the generalizability of findings. State organizations helped field staff assemble lists of residences to approach, and recruitment attempts were made in approximately in the order that residence contact information became available. Member-elected house presidents were asked to introduce the study to residents by reading a description of it from a project-provided script. Five additional OHs were recruited from Oklahoma to include houses with two or more veterans. Workers from the Oklahoma OH state organization identified the houses with two or more veterans. Fully defined, whole networks can be constructed with full participation or a single non-participant. Houses with more than one non-participant at the baseline were not included in the study.

All participants were interviewed by field research staff during individual face-to-face meetings. The interview began with an overview of the study. Each questionnaire was assigned a

random identification number to ensure participant confidentiality. At the initial conversation with an interviewer, participants were assured of confidentiality. Participants were compensated \$20 for completing their interviews. Permission to do this study was obtained by the DePaul University Institutional Review Board.

### *Measures*

**Demographics.** Participant demographics were collected including veteran status, age, race/ethnicity. Participants' log of the length of stay in months were computed and used as a continuous variable. The battery of measures also included questions regarding length of substance use, comorbidity, length of sobriety, and drug of choice.

**House Composition.** OHs were dichotomized into houses with only one veteran and houses with two or more veterans, and were coded as 0 and 1, respectively.

**Length of Stay.** Length of stay in Oxford House (LOS) is a continuous variable that details the amount of time residents have been living in an Oxford House. Participants' log of the length of stay in months were computed and was used as a covariate. The LOS for each resident was obtained from OH records.

**Quality of life.** The World Health Organization Quality of Life Assessment-Brief (Quality of Life; WHOQOL Group, 1998) was used to measure participant's quality of life. The WHOQOL-brief is a 26-item questionnaire that assesses quality of life across four dimensions: social relationships, environment, physical, and psychosocial. The subscales vary in their reliability ( $\alpha$ 's = .66 for the social relationship subscale, .75 for psychological, .80 for environment, and .82 for physical). The  $\alpha$  for the whole measure was .89. A total score was computed and used as a continuous dependent variable. The instrument has strong discriminant

and convergent validity (Skevington et al., 2004). It has also been validated with substance using populations (da Silva Lima et al., 2005; Garcia-Rea & LaPage, 2010).

**Social Network Cohesion.** The *Social Network Instrument* (SNI; Jason & Stevens, 2017) was utilized to capture different measures of individual-level social network cohesion. This instrument has been used in several investigations on the social networks of recovery home residents (Jason et al., 2014; Jason & Stevens, 2017; Jason et al., 2018; Light et al., 2016). The SNI measures six relationship characteristics, including friendships, willingness to loan money, advice-seeking, help, relationship strength, and frequency of contact. Each social network item was measured on a 5-point likert scale (0-4). Friendship, which taps into non-judgmental social support, was determined by asking “How friendly are you with this person?” Ratings ranged from “close friend” to “adversary.” *Loan*ing money asked respondents if they would be willing to loan another resident and the responses were \$0, \$10, \$50, \$100, and \$500. Willingness to loan was reverse scored. *Advice-seeking* asked respondents how often they sought advice from another resident and answers range from very often to never. Help, which measures how likely a person would help an individual, was determined by asking “If this person needed help for a day, how likely would you be to help?” Ratings ranged from very likely to wouldn’t. *Frequency*, which is how frequently a person interacts with an individual, was determined by asking “How often do you have a personal conversation with this person?” Ratings ranged from very often to never. Lastly, *strength*, which taps into an individual's perception of the overall quality of their relationship with an individual, was determined by asking “Overall, how strong would you rate your relationship with this person?” Ratings ranged from very strong to negative.

Social network instruments have been found to be reliable measures (Hlebec & Ferligoj, 2002). Each item in the SNI can be examined separately as different types of networks and can

also be utilized as whole scale measuring social network cohesion. The SNI had a Cronbach's alpha of .85 and all items contributed positively. A multilevel confirmatory factor analysis of the SNI found an excellent fit and per-item contribution, and neither age nor sex were significantly correlated with this instrument (Jason & Stevens, 2017).

The current study examined four different measures of network cohesion: (1) the social network mean, (2) number of friendship ties, (3) friendship density, and (4) friendship reciprocity. The social network mean was calculated by averaging participant's responses across the six items from the Social Network Instrument. A friendship tie or relationship was considered present if a participant nominated an alter as a 'close friend.' *Density* is the sum of the edges divided by the number of possible edges. The values for density range from 0 to 1, with higher values indicating more connections and lower values indicating fewer connections with others in the network. *Reciprocity* is the proportion of all of edges for which a reciprocal edge is present. Two edges are considered reciprocal if an edge goes to vertex A to vertex B, and another from B to A. Reciprocity is used to determine whether individuals in a network have the tendency for mutual connection, with higher values indicating more directed relationships and greater reciprocity. Lower values indicate fewer mutual relationships and lower reciprocity.

### CHAPTER III: ANALYSES AND RESULTS

#### *Analytic Approach*

Before conducting analysis with network density and reciprocity, participant's friendship nominations were transformed into adjacent matrices with rows signifying an ego (senders of friendship nominations) and a column with alters (receivers of friendship nominations). If a nomination was present between an ego and an alter it would represent a degree. All values were



dichotomized (0 = no degree; 1 = degree) and entered into the corresponding element of the matrix. The density and reciprocity for each participant were then calculated.

Intercorrelations were conducted to evaluate the relationships between the continuous independent and dependent variables and are presented in Table 1. Means and standard deviations are also presented in Table 1. Given the nested design of the data (i.e. residents nested into houses), the intra-class correlation coefficients (ICC1) were generated for all outcome variables (social network mean, friendship density, friendship reciprocity, number of friendship ties, and quality of life) to determine the amount of variance in these outcomes that could be explained at the house level. The ICC1 for the social network mean, friendship reciprocity, and quality of life were all greater than .10 (range from .28 to .58), indicating that a great deal of variation in the outcomes could be explained at the house level. Thus, analysis with these measures proceeded utilizing random effects models. The ICC1's for density and number of friendship ties were, .08 and .01, respectively, indicating that the variations in the outcomes are not sufficiently explained by the variations between houses.

To test hypothesis I, separate multilevel models were conducted in R to determine whether there was a cross-level interaction between house composition and veteran status on two social network cohesion measures: social network mean, friendship density, friendship reciprocity, and friendship ties. Houses were used as a random intercept. Veteran status, house composition, and the interaction between these two variables were entered into the models as a fixed effect. Length of stay was used as a covariate and it was also entered into the models as a fixed effect. Lastly, visual representations (i.e. sociograms) of friendship networks for each house composition were generated using the *igraph* package and are included in the appendix (see figures 2 and 3).

To test hypothesis II, a multilevel model was conducted to test the main effects of veteran status on quality of life and to determine if there was a cross-level interaction between house composition and veteran status on quality of life. Similarly, to the analysis above, houses were used as a random intercept and veteran status, house composition, and the interaction between these two variables were entered into the models as a fixed effect. Length of stay was used as a covariate and it was also entered into the models as a fixed effect. Given the findings from hypothesis I and II, the path model analysis proposed to test hypothesis III was not conducted.

### *Hypotheses I*

*Multilevel Modeling Analysis.* Four multilevel models were utilized to account for house level effects on the four social network cohesion measures. Model 1 was used to predict participant's social network mean, Model 2 was used to predict friendship density, Model 3 was used to predict reciprocity, and Model 4 was used to predict the number of friendship ties. Parameters of the fixed effects for the individual level predictor, house level predictor, and the cross-level interactions for the four models are displayed in Tables 2-5. Appendix A contains the R code for the multilevel models tested.

Model 1, tested whether veteran status and house composition predicted participant's social network mean while accounting for length of stay. The variance components of the null model for Level 1 were  $\sigma^2 = 0.22$  and Level 2 were  $\tau = 0.10$  for an ICC of .31,  $\chi^2_{(12)} = 2.47$ ,  $p < .001$ . Overall, a significant relationship was found between an individual's social network mean and the house in which they were a resident. Thus, analysis proceeded utilizing a random effects model and individual level predictors were added to investigate the possible relation between veteran status and house composition to participant's social network mean, while controlling for

length of stay. When examining social network mean as an outcome, none of the variables entered into the model were significant predictors.

Model 2 tested whether veteran status and house composition predicted friendship density while accounting for length of stay. The variance components of the null model for Level 1 were  $\sigma^2 = 0.06$  and Level 2 were  $\tau = 0.01$  for an ICC of .15  $\chi^2_{(12)} = 0.20, p < .001$ . Overall, a significant relationship was found between an individual's friendship density and the house in which they reside in. Thus, analysis proceeded utilizing a random effects model and individual level predictors were added to investigate the possible relation between veteran status and house composition to friendship density, while controlling for length of stay. When examining the friendship density as an outcome, none of the variables entered into the model were significant predictors. Interestingly, the coefficients for house composition ( $\beta = 0.13, SE = 0.07, p = 0.07$ ) and length of stay ( $\beta = 0.04, SE = 0.02, p = 0.06$ ) were close to significance. A plot of the estimated marginal means for friendship ties by house composition and veteran status are displayed in Figure 4.

Model 3 tested whether veteran status and house composition predicted friendship reciprocity while accounting for length of stay. The variance components of the null model for Level 1 were  $\sigma^2 = 0.12$  and Level 2 were  $\tau = 0.04$  for an ICC of .26,  $\chi^2_{(11)} = 0.26, p < .01$ . Overall, a significant relationship was found between an individual's friendship reciprocity and the house in which they reside in. Thus, analysis proceeded utilizing a random effects model and individual level predictors were added to investigate the possible relation between veteran status and house composition to friendship reciprocity, while controlling for length of stay. When examining reciprocity as an outcome, neither veteran status nor house composition were significant predictors. However, length of stay was found to be a significant predictor of

friendship reciprocity ( $\beta = 0.10$ ,  $SE = 0.03$ ,  $p < .01$ ), providing evidence that a longer length of stay in OH is associated with mutual connections for both veterans and non-veterans.

Model 4 tested whether veteran status and house composition predicted number of friendship ties while accounting for length of stay. The variance components of the null model for Level 1 were  $\sigma^2 = 2.44$  and Level 2 were  $\tau = 0.31$  for an ICC of .11,  $\chi^2_{(12)} = 1.24$ ,  $p < .001$ . Overall, a significant relationship was found between number of friendship ties and the house in which they reside in. Thus, analysis proceeded utilizing a random effects model and individual level predictors were added to investigate the possible relation between veteran status and house composition to friendship ties, while controlling for length of stay. When examining number of friendship ties as an outcome, house composition was predictive of number of friendship ties ( $\beta = 1.02$ ,  $SE = 0.40$ ,  $p < .05$ ), indicating that houses with more veterans tended to have more close friendships among residents. A plot of the estimated marginal means for friendship ties by house composition and veteran status are displayed in Figure 5.

### *Hypotheses II*

*Multilevel Modeling Analysis.* A multilevel model was utilized to account for the house level effects on quality of life. Parameters of the fixed effects for the individual level predictor, house level predictor, and the cross-level interactions for the model are displayed in Table 5.

Model 5 was used to test whether veteran status and house composition predicted quality of life while accounting for length of stay. The variance components of the null model for Level 1 were  $\sigma^2 = 90.69$  and Level 2 were  $\tau = 32.03$  for an ICC of .26,  $\chi^2_{(12)} = 69.86$ ,  $p < .001$ . Overall, a significant relationship was found between an individual's quality of life and the house in which they reside in. Thus, analysis proceeded utilizing a random effects model and individual level predictors were added to investigate the possible relation between veteran status and house

composition to quality of life, while controlling for length of stay. No significant relationship was found between quality of life, house composition, and veteran status after controlling for length of stay. This indicates that veterans in either house type did differ in overall quality of life compared to non-veterans.

## CHAPTER IV: DISCUSSION

The current study provides the first examination of the social networks of veterans with substance use disorders living in recovery homes. Based on the literature on social identity theory (Turner & Tajfel, 1986), homophily (McPherson, Smith-Lovin, & Cook, 2001), group faultlines (Lau & Murnighan, 1998), and on studies that suggests that veterans are more willing to socially engage with other veterans (Laffeye, Cavella, Drescher & Rosen, 2008), the present study investigated whether the social networks of veterans residing with other veterans were more cohesive compared to veterans living with only non-veterans. In addition, the study sought to determine whether social network cohesion mediated the relationship between veteran status and quality of life. Several measures of social network cohesion (i.e. friendship density, friendship reciprocity, and friendship ties) (i.e. number of close friendship ties) were explored. An overview of the findings, implications, limitations, and future research directions are provided in the next sections.

### *Overview of Findings*

Overall, results showed that houses with more than one veteran had greater close friendship ties compared to houses with just one veteran. Regarding participant's veteran status, veterans residing with other veterans had more close friendships compared to veterans that live with only non-veterans. Non-veterans also had greater number of ties in houses with more than one veteran. This pattern can be visually observed in the sociograms in Figures 2 and 3 and the

plots of the estimated marginal means provided in Figure 5. The sociograms show that veterans that lived with only non-veterans tended to be the sole isolates in houses where other residents were connected with each other compared to veterans in houses with multiple veterans. Non-veterans also had higher friendship ties in the houses with multiple veterans. There were no significant differences in friendship density and friendship reciprocity across house composition and veteran status. However, it is worth highlighting that the effect of house composition is close to significance (see Table 3), with houses with multiple veterans having greater density.

Although the relationships between veteran status and house composition and the other social network cohesion measures (i.e. density and reciprocity) were not significant, their coefficients were positive, indicating that the directionality of these relationships were as hypothesized. Further, results revealed that length of stay was positively related to friendship reciprocity, indicating that longer length of stay in Oxford House is associated with mutual connections among residents. Lastly, this study found no differences in overall quality of life among veterans and non-veterans after controlling for length of stay.

### *Implications*

Findings have several implications for theory and practice. Results suggest that veterans may benefit from living with other veterans in the home when considering the number of friendship ties as a measure of network cohesion. While further research is needed before recommendations are made on how the OH model should be modified to best meet the needs of military veterans, results highlight the need to consider housing veterans with similar peers as a way to facilitate their development of connections within the homes. Although based on the literature on homophily and faultlines one could have expected to see veterans clustering in the houses with multiple veterans, this was not the case. Veterans in houses with multiple veterans

tended to be connected to both veterans and non-veterans (see Figure 3). It may be the case that having the presence of a similar other in the house can help facilitate connections with other less similar residents. Previous research has shown that being connected to other OH residents is predictive of positive outcomes such as longer length of stay and lower relapse rates (Jason et al., 2012), therefore our finding that veterans living with other veterans have more friendship ties is important. Contrary to findings from previous research that found that veterans have lower quality of life compared to the general population (Opezzo et al., 2016), this study found no differences in quality of life after controlling for length of stay. This may indicate that although the quality of life among veterans is lower compared to the general population, the quality of life among veterans and non-veterans with substance use disorders does not differ.

### *Limitations*

There are several limitations in the current study that should be taken into consideration when interpreting the findings. The sample is homogenous in regards to demographic characteristics such as race/ethnicity and gender. Although houses with only one veteran were recruited from three different regions in the US, five out of the six houses with two or more veterans were recruited from Oklahoma. Thus, findings may reflect a region effect. Furthermore, data from these houses do not represent a random sample. Future studies should collect data from a national sample to increase the generalizability of the findings. Second, the study's cross-sectional design does not allow for causal inferences to be made and limits interpretations on the temporal sequence of the relationships between our variables. Longitudinal studies should be conducted to investigate the how the networks of veterans in these homes evolve over time and how network cohesion may relate to other recovery outcomes such as relapse and turnover for this population. Further, the study was limited by the number of observations in each group

which may have prevented the detection of an effect for the multilevel models predicting friendship density, reciprocity, and quality of life.

### *Future Directions*

Further research is needed to understand the dynamics of having multiple veterans in OH. A potential future direction would be to explore different thresholds or proportion of veterans per house that would be most beneficial for veterans. It is possible that houses that have a mix of veterans and non-veterans would be the most beneficial for veterans. These types of homes would allow veterans to form connections with those that share a military culture and veteran identity and it would also allow veterans to derive benefits they would not get if they lived in all veteran homes. Such benefits may include learning to reintegrate with civilians and learning to connect with others that do not share their military identity. In addition, longitudinal research should be conducted to examine the evolution of the connections veterans form in both types of home and how these tie formation predict long-term recovery outcomes such as relapse.

## CHAPTER V: CONCLUSION

The current study contributes to the literature on veterans in recovery and on social networks. The present study examined whether veterans living with other veterans had more cohesive social networks compared to those living with all non-veteran and whether veterans differed in their quality of life compared to non-veterans. Results found that veterans in houses with multiple veterans had greater number of friendship ties and ties were form with both veterans and non-veterans. Veterans did not differ in their quality of life compared to non-veteran. Despite the many limitations, our findings highlight the need for additional research.



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Figure 1: Hypothetical model of social network cohesion

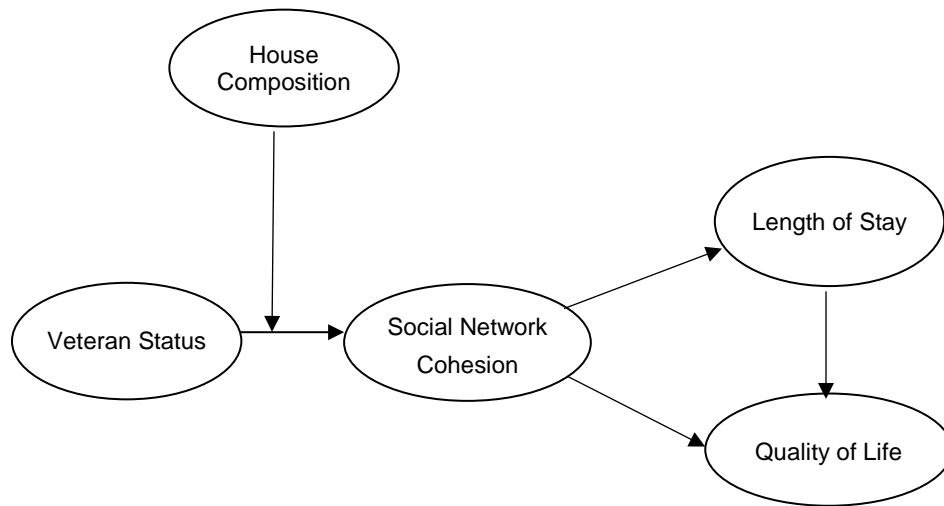


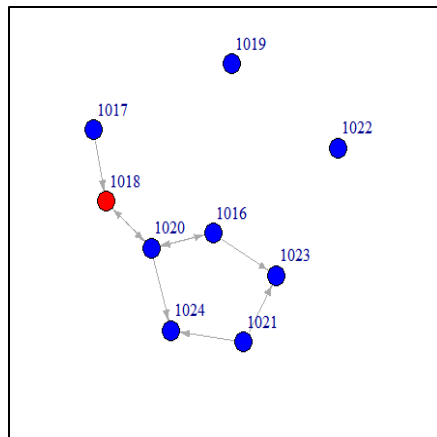
Table 1. Inter-correlations and descriptive statistics of continuous independent and dependent variables

Measure	1	2	3	4	5	6
1. Social Network	--					
2. Friendship Density	-.41**	--				
3. Friendship Reciprocity	-.12	.46**	--			
4. Friendship Ties	-.35**	.94**	.39**	--		
5. Quality of Life	-.36**	-.00	-.26*	-.01	--	
6. Log of Length of Stay	-.08	.24*	.33**	.23*	.13	--
<i>M</i>	2.53	.20	.27	1.29	69.1	1.65
<i>SD</i>	.57	.26	.40	1.67	11.14	1.95

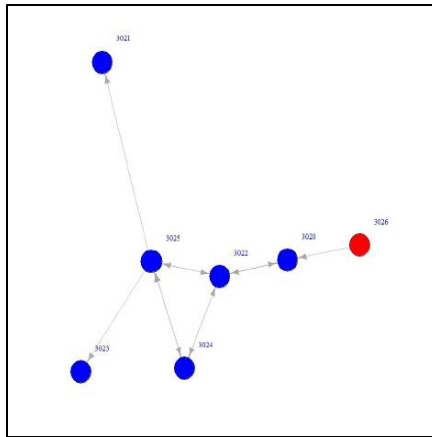
Note: \* $p < 0.05$ , \*\* $p < 0.01$ .

Figure 2: Sociograms of friendship networks for houses with one veteran

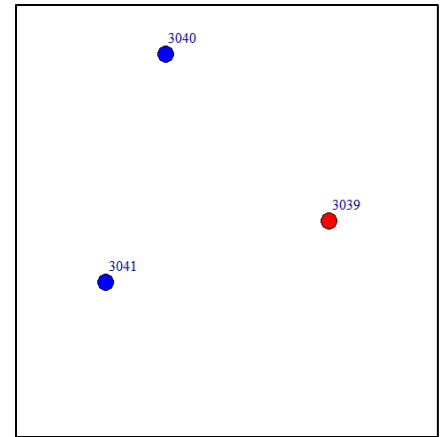
House 11



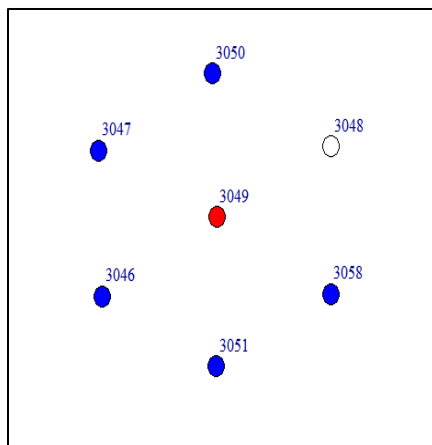
House 43



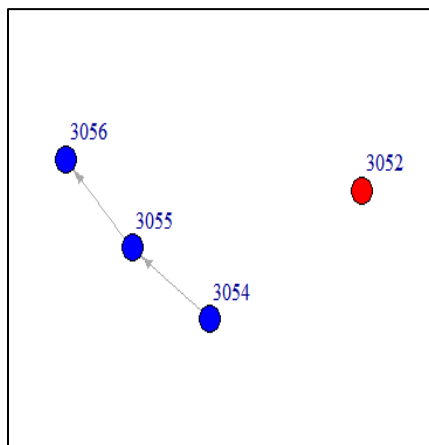
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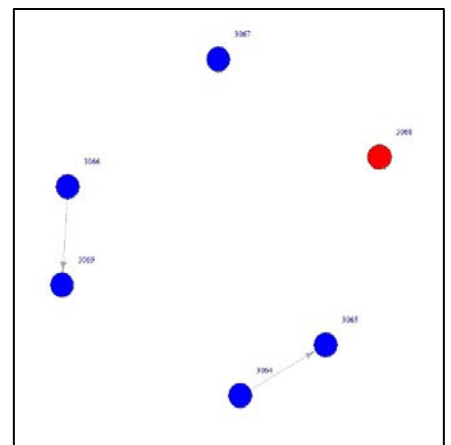
House 48



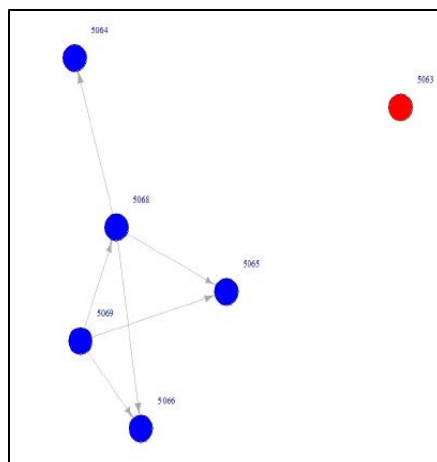
House 49



House 51



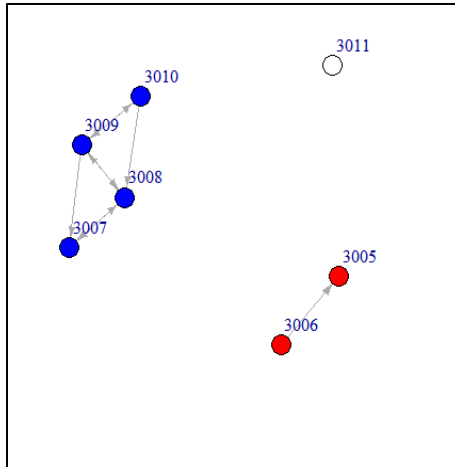
House 89



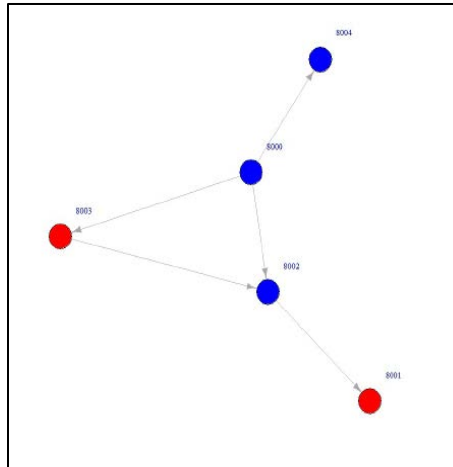
Note: Red nodes are veterans, blue nodes are non-veterans, and white nodes non-participants

Figure 3: Sociograms of friendship networks for houses with more than one veteran

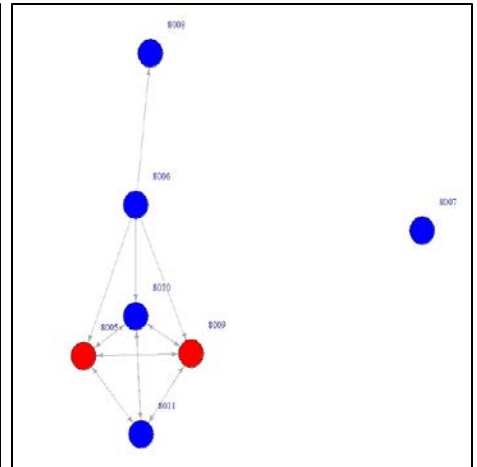
House 41



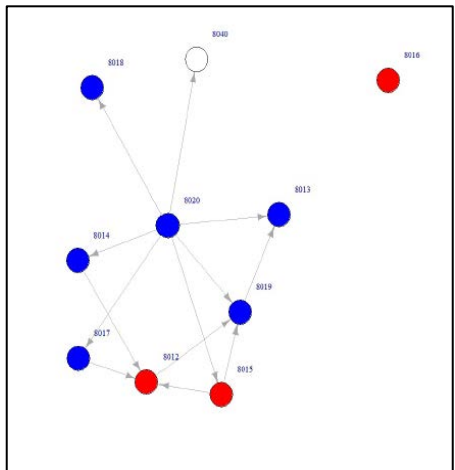
House 60



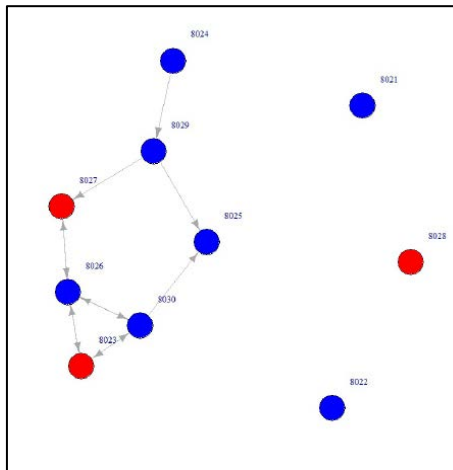
House 61



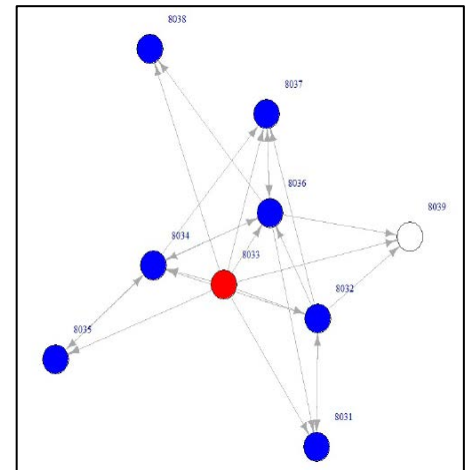
House 62



House 63



House 64



Note: Red nodes are veterans, blue nodes are non-veterans, and white nodes non-participants. Participant 8039 in House 64 did not participate in the study but self-identified as a veteran.

Table 2. Final estimation of fixed effects for the multilevel model predicting social networks

<i>Predictors</i>	<b>snmean</b>		
	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	2.55	2.23 – 2.88	<0.001
vet status	-0.10	-0.49 – 0.29	0.618
house comp	-0.07	-0.49 – 0.34	0.731
lnlos	-0.03	-0.11 – 0.06	0.573
vet_status:house_comp	0.12	-0.37 – 0.61	0.636
<b>Random Effects</b>			
$\sigma^2$	0.22		
$\tau_{00}$ house_id	0.10		
ICC	0.31		
N <sub>house_id</sub>	13		
Observations	84		
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.008 / 0.320		

Note: Going down the rows: Vet status is a dichotomous variable which represents whether a participant is a veteran or not (0 = no, 1 = yes). House comp is a dichotomous variable representing two types of houses: houses that have 1 veteran (coded as 0) and houses with more than one veteran (coded as 1). Lnlos is the log of length of stay. Vet\_status:house\_comp is the interaction term of veteran status and house composition.

Table 3. Final estimation of fixed effects for the multilevel model predicting friendship density

<b>frd Den 1</b>			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	0.06	-0.05 – 0.18	0.289
vet status	-0.04	-0.23 – 0.15	0.693
house comp	0.13	-0.00 – 0.27	0.072
lnlos	0.04	-0.00 – 0.08	0.057
vet_status:house_comp	0.05	-0.19 – 0.30	0.660
<b>Random Effects</b>			
$\sigma^2$	0.05		
$\tau_{00}$ house_id	0.00		
ICC	0.08		
$N_{\text{house\_id}}$	13		
Observations	83		
Marginal $R^2$ / Conditional $R^2$	0.138 / 0.207		

Note: Going down the rows: Vet status is a dichotomous variable which represents whether a participant is a veteran or not (0 = no, 1 = yes). House comp is a dichotomous variable representing two types of houses: houses that have 1 veteran (coded as 0) and houses with more than one veteran (coded as 1). Lnlos is the log of length of stay. Vet\_status:house\_comp is the interaction term of veteran status and house composition.



Table 4. Final estimation of fixed effects for the multilevel model predicting friendship reciprocity

<b>frd Rec 1</b>			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	-0.02	-0.24 – 0.21	0.870
vet status	0.09	-0.19 – 0.38	0.519
house comp	0.19	-0.09 – 0.48	0.207
lnlos	0.10	0.04 – 0.17	<b>0.002</b>
vet_status:house_comp	-0.07	-0.43 – 0.29	0.710
<b>Random Effects</b>			
$\sigma^2$	0.10		
$\tau_{00}$ house_id	0.04		
ICC	0.28		
N <sub>house_id</sub>	12		
Observations	72		
<b>Marginal R<sup>2</sup> / Conditional R<sup>2</sup></b>			
0.177 / 0.410			

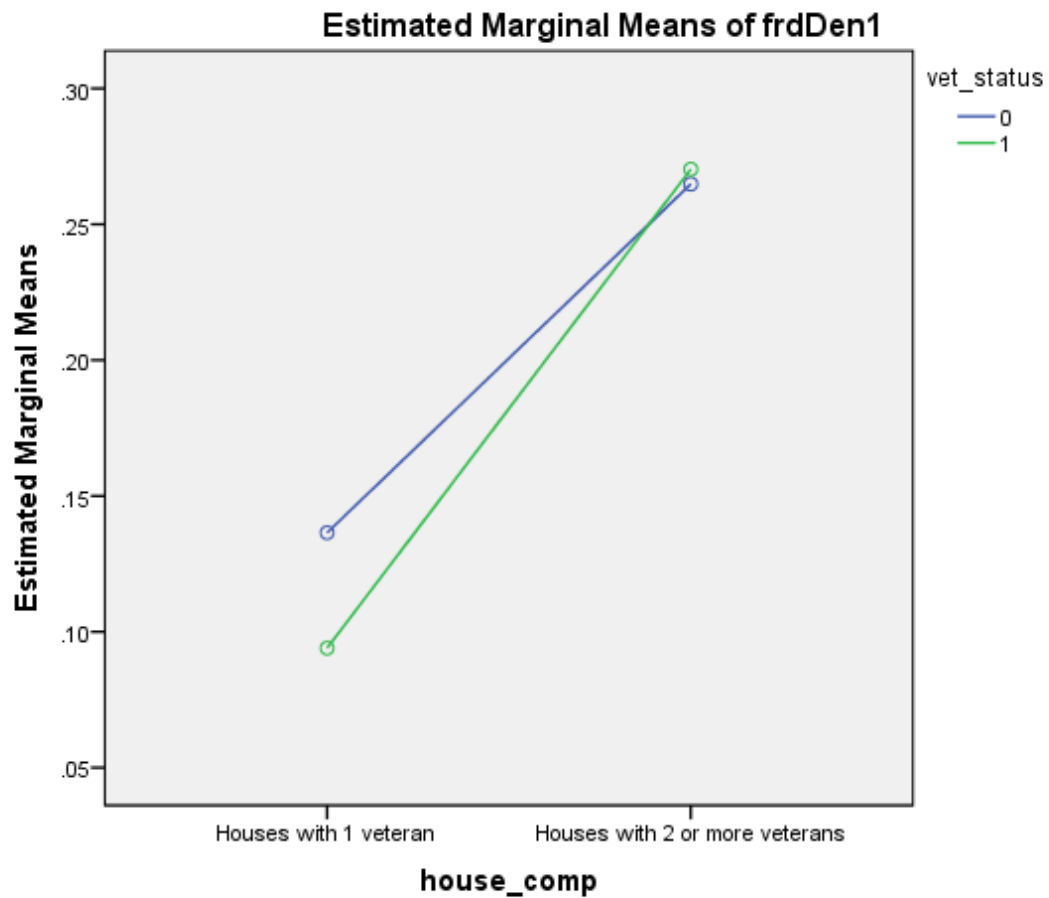
Note: Going down the rows: Vet status is a dichotomous variable which represents whether a participant is a veteran or not (0 = no, 1= yes). House comp is a dichotomous variable representing two types of houses: houses that have 1 veteran (coded as 0) and houses with more than one veteran (coded as 1). Lnlos is the log of length of stay. Vet\_status:house\_comp is the interaction term of veteran status and house composition.

Table 5. Final estimation of fixed effects for the multilevel model predicting number of friendship ties

<i>Predictors</i>	<b>n friends</b>		
	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	0.43	-0.27 – 1.13	0.234
vet status	-0.24	-1.51 – 1.02	0.708
house comp	1.03	0.23 – 1.82	<b>0.020</b>
lnlos	0.24	-0.04 – 0.52	0.094
vet_status:house_comp	-0.09	-1.70 – 1.52	0.912
<b>Random Effects</b>			
$\sigma^2$	2.36		
$\tau_{00}$ house_id	0.03		
ICC	0.01		
$N_{\text{house\_id}}$	13		
Observations	83		
Marginal $R^2$ / Conditional $R^2$	0.141 / 0.153		

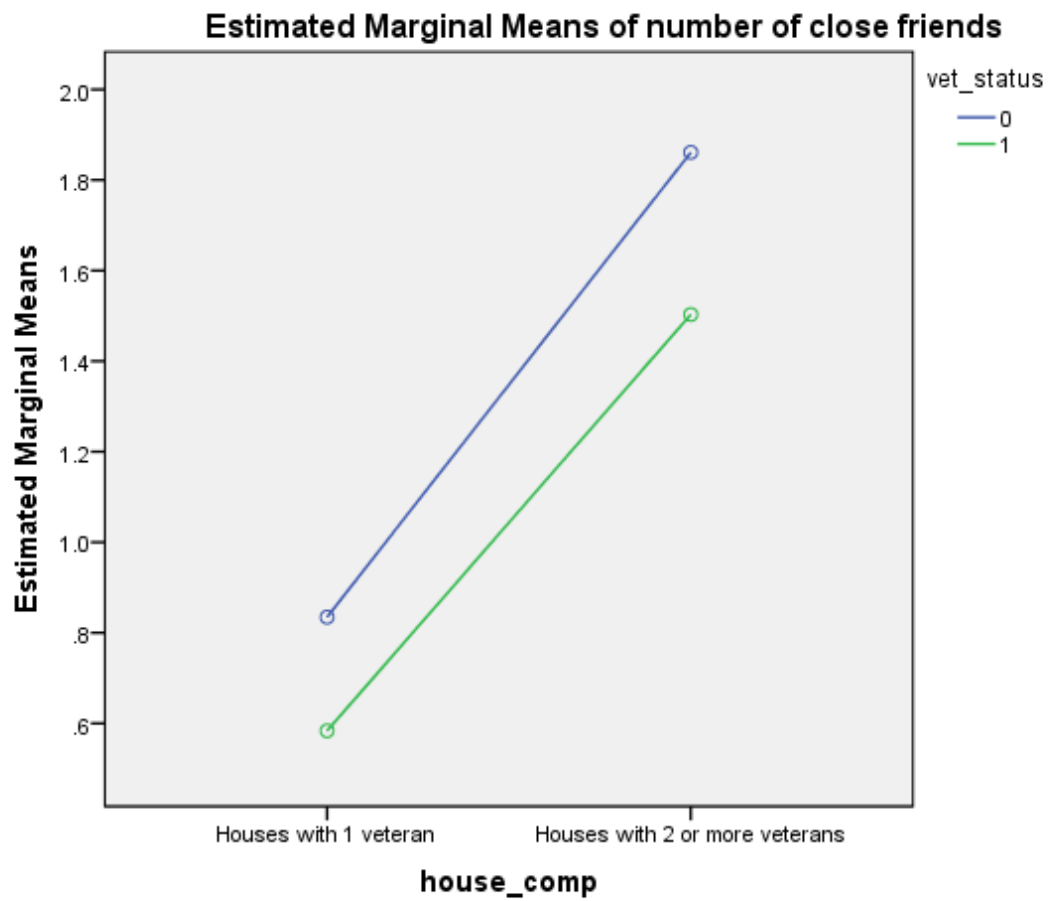
Note: Going down the rows: Vet status is a dichotomous variable which represents whether a participant is a veteran or not (0 = no, 1 = yes). House comp is a dichotomous variable representing two types of houses: houses that have 1 veteran (coded as 0) and houses with more than one veteran (coded as 1). Lnlos is the log of length of stay. Vet\_status:house\_comp is the interaction term of veteran status and house composition.

Figure 4. Plot of estimated marginal means of friendship density by house composition and veteran status after controlling for length of stay



Covariates appearing in the model are evaluated at the following values: lnlos = 1.65

Figure 5. Plot of estimated marginal means of friendship ties by house composition and veteran status after controlling for length of stay



Covariates appearing in the model are evaluated at the following values: Inlos = 1.65

Table 6. Final estimation of fixed effects for the multilevel model predicting quality of life

<i>Predictors</i>	<b>qol trans</b>		
	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	71.63	65.95 – 77.31	<0.001
vet status	-1.10	-9.01 – 6.81	0.786
house comp	-5.50	-12.59 – 1.58	0.147
lnlos	0.79	-1.02 – 2.60	0.395
vet_status:house_comp	-1.30	-11.34 – 8.74	0.800
<b>Random Effects</b>			
$\sigma^2$	90.61		
$\tau_{00}$ house_id	22.04		
ICC	0.20		
N <sub>house_id</sub>	13		
Observations	83		
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>	0.084 / 0.263		

Note: Going down the rows: Vet status is a dichotomous variable which represents whether a participant is a veteran or not (0 = no, 1 = yes). House comp is a dichotomous variable representing two types of houses: houses that have 1 veteran (coded as 0) and houses with more than one veteran (coded as 1). Lnlos is the log of length of stay. Vet\_status:house\_comp is the interaction term of veteran status and house composition.

## APPENDIX A

## R Code for the Multilevel Models

```
###Code for Hypothesis I
```

```
##### Random Intercept model predicting social network mean
```

```
##Null model
```

```
NullMod.1 <-lmer(snmean ~ (1| house_id),data=data, REML=FALSE)
```

```
summary(NullMod.1)
```

```
tab_model(NullMod.1)
```

```
##RI Model 1 with snmean as the outcome
```

```
RImodel.1 <-lmer(snmean ~ vet_status + house_comp + lnlos + vet_status : house_comp + (1|  
house_id),data=data, REML=FALSE)
```

```
summary(RImodel.1)
```

```
tab_model(RImodel.1)
```

```
###Random Intercept model predicting density
```

```
NullMod.2 <-lmer(frdDen1 ~ (1| house_id),data=data, REML=FALSE)
```

```
summary(NullMod.2)
```

```
tab_model(NullMod.2)
```

```
RImodel.2 <-lmer(frdDen1 ~ vet_status + house_comp + lnlos + vet_status : house_comp + (1|  
house_id),data=data, REML=FALSE)
```

```
summary(RImodel.2)
```

```
tab_model(RImodel.2)
```

```
### Random Intercept model predicting reciprocity
```

```
NullMod.3 <-lmer(frdRec1 ~ (1| house_id),data=data, REML=FALSE)
```

```
summary(NullMod.3)
```

```
tab_model(NullMod.3)
```

```
RImodel.3 <-lmer(frdRec1 ~ vet_status + house_comp + lnlos + vet_status : house_comp + (1|  
house_id),data=data, REML=FALSE)
```

```
summary(RImodel.3)
```

```
tab_model(RImodel.3)
```

```
### Random Intercept model predicting number of friendship ties
```

```
NullMod.4 <-lmer(n_friends ~ (1| house_id),data=data, REML=FALSE)
```

```
summary(NullMod.4)
```

```
tab_model(NullMod.4)
```

```
RImodel.4 <-lmer(n_friends ~ vet_status + house_comp + lnlos + vet_status : house_comp + (1|  
  house_id),data=data, REML=FALSE)  
summary(RImodel.4)  
tab_model(RImodel.4)
```

```
###Code for Hypothesis II
```

```
##### Random Intercept model predicting quality of life
```

```
NullMod.5 <-lmer(qol_trans ~ (1| house_id),data=data, REML=FALSE)  
summary(NullMod.5)  
tab_model(NullMod.5)
```

```
RImodel.5 <-lmer(qol_trans ~ vet_status + house_comp + lnlos + vet_status:house_comp + (1|  
  house_id),data=data, REML=FALSE)  
summary(RImodel.5)  
tab_model(RImodel.5)
```

## APPENDIX B

### Measures

# Oxford House Member Social Network Instrument

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend   Friend   Acquaintance   Stranger   Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?

\$0   \$10   \$50   \$100   \$500

3. If this person needed help for a day, how likely would you be to help?

Very Likely   Likely   Maybe   Probably   Not Wouldn't

4. How often do you have a personal conversation with this person?

Daily   Almost Daily   Every Few Days   Weekly   Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?

Very Often   Quite Often   Regularly   Rarely   Never

6. Overall, how strong would you relate your relationship with this person?

Very   Strong   Strong   Weak   None   Negative

### Oxford House Member 2

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend   Friend   Acquaintance   Stranger   Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?

\$0   \$10   \$50   \$100   \$500

3. If this person needed help for a day, how likely would you be to help?

Very Likely   Likely   Maybe   Probably   Not Wouldn't

4. How often do you have a personal conversation with this person?

Daily   Almost Daily   Every Few Days   Weekly   Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?

Very Often   Quite Often   Regularly   Rarely   Never

6. Overall, how strong would you relate your relationship with this person?

Very   Strong   Strong   Weak   None   Negative

### Oxford House Member 3

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend   Friend   Acquaintance   Stranger   Adversary



2. If this person asked to borrow money from you, how much would you be willing to lend them?  
\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?  
Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?  
Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?  
Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?  
Very    Strong    Strong    Weak    None    Negative

#### **Oxford House Member 4**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?  
Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?  
\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?  
Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?  
Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?  
Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?  
Very    Strong    Strong    Weak    None    Negative

#### **Oxford House Member 5**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?  
Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?  
\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?  
Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?  
Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?

Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?

Very    Strong    Strong    Weak    None    Negative

### **Oxford House Member 6**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?

\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?

Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?

Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?

Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?

Very    Strong    Strong    Weak    None    Negative

### **Oxford House Member 7**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?

\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?

Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?

Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?

Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?

Very    Strong    Strong    Weak    None    Negative

### **Oxford House Member 8**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?

Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?  
\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?  
Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?  
Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?  
Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?  
Very Strong    Strong    Weak    None    Negative

### **Oxford House Member 9**

Record ID \_\_\_\_\_

Member First & Last Initial \_\_\_\_\_

1. How friendly are you with this person?  
Close Friend    Friend    Acquaintance    Stranger    Adversary

2. If this person asked to borrow money from you, how much would you be willing to lend them?  
\$0    \$10    \$50    \$100    \$500

3. If this person needed help for a day, how likely would you be to help?  
Very Likely    Likely    Maybe    Probably    Not Wouldn't

4. How often do you have a personal conversation with this person?  
Daily    Almost Daily    Every Few Days    Weekly    Almost Never

5. How often do you go to this person for advice on your recovery and other important life issues?  
Very Often    Quite Often    Regularly    Rarely    Never

6. Overall, how strong would you relate your relationship with this person?  
Very Strong    Strong    Weak    None    Negative

## WHOQOL-BREF

Record ID \_\_\_\_\_

**The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life since your last interview.**

1. How would you rate your quality of life?

1. Very poor
2. Poor
3. Neither poor nor good
4. Good
5. Very good

2. How satisfied are you with your health?

1. Very dissatisfied
2. Dissatisfied
3. Neither satisfied nor dissatisfied
4. Satisfied
5. Very satisfied

**The following questions ask about how much you have experienced certain things in the last four weeks.**

3. To what extent do you feel that physical pain prevents you from doing what you need to do?

5. Not at all
4. A little
3. A moderate amount
2. Very much
1. An extreme amount

4. How much do you need any medical treatment to function in your daily life?

5. Not at all
4. A little
3. A moderate amount
2. Very much
1. An extreme amount

5. How much do you enjoy life?

1. Not at all
2. A little
3. A moderate amount
4. Very much
5. An extreme amount

6. To what extent do you feel your life to be meaningful?

1. Not at all
2. A little
3. A moderate amount
4. Very much
5. An extreme amount

7. How well are you able to concentrate?

1. Not at all
2. A little
3. A moderate amount
4. Very much
5. Extremely

8. How safe do you feel in your daily life?

1. Not at all
2. A little
3. A moderate amount
4. Very much
5. Extremely

9. How healthy is your physical environment?

1. Not at all
2. A little
3. A moderate amount
4. Very much
5. Extremely

**The following questions ask about how completely you experience or were able to do certain things in the last four weeks.**

10. Do you have enough energy for everyday life?

1. Not at all
2. A little
3. Moderately
4. Mostly
5. Completely

11. Are you able to accept your bodily appearance?

1. Not at all
2. A little
3. Moderately
4. Mostly
5. Completely

12. Have you enough money to meet your needs?

1. Not at all
2. A little
3. Moderately
4. Mostly
5. Completely

13. How available to you is the information that you need in your day-to-day life?

1. Not at all
2. A little
3. Moderately
4. Mostly
5. Completely

14. To what extent do you have the opportunity for leisure activities?

1. Not at all
2. A little
3. Moderately

4. Mostly
  5. Completely
15. How well are you able to get around?
1. Very poor
  2. Poor
  3. Neither poor nor good
  4. Good
  5. Very good
16. How satisfied are you with your sleep?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
17. How satisfied are you with your ability to perform your daily living activities?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
18. How satisfied are you with your capacity for work?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
19. How satisfied are you with yourself?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
20. How satisfied are you with your personal relationships?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
21. How satisfied are you with your sex life?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied
  4. Satisfied
  5. Very satisfied
22. How satisfied are you with the support you get from your friends?
1. Very dissatisfied
  2. Dissatisfied
  3. Neither satisfied nor dissatisfied

- 4. Satisfied
- 5. Very satisfied

23. How satisfied are you with the conditions of your living place?

- 1. Very dissatisfied
- 2. Dissatisfied
- 3. Neither satisfied nor dissatisfied
- 4. Satisfied
- 5. Very satisfied

24. How satisfied are you with your access to health services?

- 1. Very dissatisfied
- 2. Dissatisfied
- 3. Neither satisfied nor dissatisfied
- 4. Satisfied
- 5. Very satisfied

25. How satisfied are you with your transport?

- 1. Very dissatisfied
- 2. Dissatisfied
- 3. Neither satisfied nor dissatisfied
- 4. Satisfied
- 5. Very satisfied

**The following question refers to how often you have felt or experienced certain things in the last four weeks.**

26. How often do you have negative feeling such as blue mood, despair, anxiety, depression?

- 5. Never
- 4. Seldom
- 3. Quite often
- 2. Very often
- 1. Always

Do you have any comments about the assessment? \_\_\_\_\_





