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The Role of Social Capital in Drug Use and Dependence in Four Canadian Provinces

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by
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Abstract

Using data from the Canadian Community Health Survey collected between 2008 and 2012, this study explores the relationships between individual-level social capital and illicit drug use and dependence. The results showed that when controlling for relevant socio-demographic and socioeconomic factors, the influences of network size and marital status on prevalence of illicit drug use were significant and varied by type of drug, while social support showed a consistent protective effect. When measuring drug dependence, all three dimensions of social capital measured in this study showed protective effects. These findings lend support to the notion that drug use outcomes cannot be fully understood without appreciating the social contexts in which individuals use and become dependent on drugs. As such, this study suggests that effective policy interventions aimed at mitigating adverse consequences of drug use must address social and economic inequalities that impede the development of social capital at the individual level[1].

[1] The analysis in this thesis is based on public use microdata accessed from Statistics Canada, and the opinions expressed do not represent the views of Statistics Canada.

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It is these particular moments which allow me to reflect on how lucky I am to have great people around me. They are the reasons for my past accomplishments and continuing success and without their help and care I would not be where I am today.

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Chapter 1: Introduction

Study Overview

Researchers have demonstrated that social capital resources accrued from social relationships have the potential to enhance the availability of social support for individuals coping with drug use problems (Dobkin, De Cevita, Paraherakis, & Gill, 2002; Knowlton, 2004; Warren, Stein, & Grella, 2007; Wasserman, Stewart, & Delucchi, 2001) as well as encourage and constrain drug-related behaviours through mechanisms of informal social control (Bolin, Lindgren, Lindstrom, & Nystedt, 2003; Curran, 2007; Wright, Cullen, & Miller, 2001), peer influence and persuasion (Wister & Avison, 1982), and through the transmission of information that can potentially be used to mitigate harms associated with illicit drug use (Jackson, Parker, Dykeman, Gahagan, & Karabanow, 2010; Lin, 2002; Lundborg, 2005). However, the role of social capital in the study of drug use remains a relatively neglected field of inquiry despite its theoretical potential. To date, few studies have analyzed the influence of social capital on different types of illicit drugs; only one other study has examined the relationship between social capital and drug dependence (see Winstanley et al., 2008).

In order to address this shortcoming, the present study draws data from three cycles of the *Canadian Community Health Survey* (CCHS) conducted between 2007 and 2012. The objectives of the present study are to: (i) examine whether and to what extent social capital influences the use of eight different illicit drugs (marijuana, cocaine/crack, amphetamines, ecstasy, hallucinogens, inhalants, heroin, and steroids) and to (ii) examine whether and to what extent social capital can predict drug dependence and interference.

This thesis is organized into six main chapters. Following this study overview is a brief background and outline of the research problem which together constitutes Chapter

1. Chapter 2 consists of a literature review on both the social correlates of illicit drug use and social capital theory. A methodology section in Chapter 3 follows, detailing the sample, data source, and data analysis techniques used in this study. Chapter 4 presents the results of the study and Chapter 5 discusses the findings in greater detail while addressing limitations, policy implications, and avenues for further research. This thesis ends with concluding remarks in the sixth and final chapter.

Background

For over a century, drug use has been understood and problematized through a number of diverse and seemingly contradictory paradigms. Each has elicited its own sets of knowledge, assumptions, and governing rationalities that inform questions of the day of 'what should be done' about drug use (Garland, 1985). Shifting and overlapping perspectives have framed drug use as a crime problem, a medical problem, and a moral problem, each offering unique prescriptions for individuals singled out for intervention (Moore, 2007; O'Malley, 2009). In some instances, governing rationalities have merged together to simultaneously criminalize, pathologize, and castigate drug users, enabling the criminal justice system to serve as a primary site for their ostensible rehabilitation and reform (Moore, 2007). The expansion of the carceral system in its many forms and the continuation of punitive drug laws suggest that in a neoliberal age of disposability (Giroux, 2008), coercive social control is regarded as a more suitable option for confronting the social disorders of the most disadvantaged than addressing the underlying structural factors that forge their fate. Indeed, in the most austere expressions of the War on Drugs, burgeoning prison industries in the United States have emerged and have

become dependent on the arrest and incarceration of large segments of the population who, upon release, are politically disenfranchised, publicly discredited, and incapable of mobilizing any resistance to the various oppressive forms of social control imposed upon them (Alexander, 2010; Wacquant, 2009). This war has almost exclusively been waged in underserved communities of colour and on those who have been propelled into marginality by their exclusion from the labour market and by the gradual erosion of the welfare state (Provine, 2007; Simon, 1993; Wacquant, 2009). The result has been decades of racially disproportionate rates of arrest and incarceration, an influx of non-violent offenders into correctional facilities already filled to the brim, and even larger carceral population under penal supervision through other apparatuses of the criminal justice system (Simon, 2007; Wacquant, 2009).

In Canada, a similar tradition of stringent drug policy galvanized by the carceral model of the United States has been upheld (Bourgois, 2003). Despite a short-lived divergence from American drug policy in the early 2000s characterized by the adoption of harm reduction policies and a softer stance towards marijuana, the introduction of mandatory minimum sentences for certain drug offenses[2], restrictions on community-based sentencing, and the dismantling of harm reduction initiatives by the Conservative government of Canada revealed a reinvigorated tough-on-drugs agenda (Marshall, 2015; Mosher, 2011). This punitive stance towards drugs is also reflected in rates of police-reported drug offenses that have generally been increasing since 1993, reaching their highest points in 30 years in 2007, in spite of *decreases* in overall crime rates during the same period (Dauvergne, 2009). Dauvergne (2009) suggests that contradictory trends

[2] Recent rulings from the Supreme Court of Canada have struck down some mandatory minimum sentences related to drugs (see Harris, 2016).

between rates of drug arrests and overall crime rates are likely related to policing practices and increased efforts by law enforcement to address drug-related crime rather than actual increases in drug-related incidents. In addition, such policies have had disproportionate effects on some of the most marginalized populations across Canada. Speaking of the experiences of Aboriginal populations across Canada, Marshall (2015) states that, "A complex of intersecting historical, structural, and social pathways have positioned First Nations, Métis, and Inuit peoples in Canada at greater risk for illicit substance involvement and greater surveillance of illicit substance use" (p.5). This, in addition to many other experiences of disadvantage, has translated into observable patterns of incarceration of Indigenous peoples who, while representing only 4% of the general population, constitute an astounding 23% of those housed in correctional facilities (Sapers, 2014). Many of these marginalized offenders have entered the system for drug offences and suffer from severe mental health and substance use problems that often go untreated in the correctional system and in their own communities (Corrado, Kuehn, & Margaritescu, 2014; Marshall, 2015). Having yet to demonstrate any reductions in crime or drug use, the global War on Drugs continues to operate under the same ill-founded notions about the 'inherent dangers of illicit drugs' that were invalidated many decades ago (Alexander et al., 1985; Alexander, 2001a; Reinarman & Levine, 1997).

Although there have been some efforts in North America to liberalize the use of certain illicit drugs such as marijuana (Pacula & Sevigny, 2013), these movements continue to be met with a familiar prohibitionist rhetoric alleging serious long-term adverse effects on its users, high potential for abuse, and a threat to today's youth

(Bourgois, 2003). In a statement made by the leader of the Canadian Conservative party, Prime Minister Stephen Harper recently commented:

> When you go down that route [legalization of marijuana], marijuana becomes more readily available to children, more people become addicted to it and the health outcomes become worse… I think it is actually tragic, in fact, we have more and more data about the consequences of long-term marijuana use and how really bad they are for health on so many levels (Peat, 2015).

Despite a plethora of research studies that have dispelled the possibility of any serious long-term effects of marijuana use and have even demonstrated highly beneficial medical applications (Grotenhermen & Müller-Vahl, 2012; Hall, Room, & Bondy, 1998), some law-makers remain fiercely opposed to a departure from the prohibitionist agenda, citing intolerable harms to public health and safety (Gerber, 2004; Mosher, 2011).

Much scholarly attention has been paid to the social construction of harms associated with consciousness-altering drugs (O'Malley, 2009; O'Malley & Valverde, 2004; Reinarman, 1994; Sneddon, 2006). This research has revealed that constructions about drug harms have rarely been stable, often grounded in changing ideas about 'disreputable' groups of people, and with intricate ties to the political and economic contexts in which these groups have been disciplined and regulated (Reinarman, 1994; Simon, 1993; Wacquant, 2009). Indeed, the very first drug laws were mobilized around social imaginings and anxieties of the moral turpitude and disorder that supposedly characterized immigrants in North America at the turn of the 20th century (Cohen, 2006).

Towards the latter half of the twentieth century, the globalized discourse of exaggerated drug harms has adhered to understandings of illicit drugs largely shaped by both contemporary and historical media accounts, government statements, and biomedical research that have portrayed illicit drugs as dangerously addictive on account

of their pharmacological properties (Alexander, 2001a; Vrecko, 2010). The social construction of drug harms is perhaps most evident in the crusade against crack-cocaine in the 80s' in which it was commonly believed that mere exposure to the drug was sufficient to induce addiction and propel drug users into a life of crime to feed their insatiable habits (Hart, 2013; Reinarman & Levine, 1997).

Today, a renewed hysteria about 'unprecedented levels of methamphetamine use' follows in the footsteps of the preceding war on crack, informed by the very same notion that the underlying problem of addiction and compulsive drug use lies solely in the drug and its effects on the body (Hart, 2013). Foregoing any consideration of the possible influence of the social world, biomedical research has, for several decades, reinforced the notion that addiction can be reduced to a 'disease of the brain' (Hart, 2013; Maté, 2009; Vrecko, 2010). As the leading provider of funding for research in addiction and driver of global drug policy (Vrecko, 2010), the stance of the National Institute of Drug Abuse is clear:

> Addiction is defined as a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. It is considered a brain disease because drugs change the brain—they change its structure and how it works. These brain changes can be long-lasting, and can lead to the harmful behaviors seen in people who abuse drugs (National Institute of Drug Abuse, 2015).

For proponents of drug criminalization, these biological explanations have been cast as politically-neutral and evidence-based justifications for why the mere presence of illicit drugs should be a primary concern for civil society and for why the use of some drugs deserves a greater punishment than others. To declare that addicts suffer from abnormalities existing on the sub-microscopic level of the brain works to decontextualize their suffering and overlook the importance of factors such as adverse childhood

environments or stressors in present life that may better explain their plight (Maté, 2009). Such individualistic and biologically-based assumptions are convenient, however, for concealing the historical injustices and broader structural arrangements that have anchored certain segments of the population to a life of poverty and dislocation (Marshall, 2015; Wilson, 1987). This is not to say that more affluent populations are invulnerable to drug addiction and problems associated with drug use. Rather, research suggests that individuals and communities that are socially and economically marginalized experience the most serious social, legal, and medical consequences associated with illicit drug use (Sneddon, 2006).

What becomes evident in an examination of contemporary drug policy is its resounding disregard for the social and cultural context of drug use that is so vital to understanding drug use behaviours. For some, drugs can be used in a controlled, recreational, and relatively non-problematic manner for which there are no serious health effects; a finding that is true of even the most 'dangerous' drugs such as cocaine and heroin (Dalgarno & Shewan, 2005; Hart, 2013; Sneddon, 2006). In fact, shifts in cultural meanings (Weinberg, 2002) and social acceptability associated with certain drugs such as marijuana have shaped an environment in which transitory experimentation with illicit drugs has become "commonplace rather than unusual activity" (Sneddon, 2006, p. 681). For a small subset of vulnerable others, however, drugs are viewed as a means to cope with a host of problems including personal experiences of physical and emotional trauma, stress, anxiety, material deprivation, family dissolution, and social isolation (Hoffman, 2002; Lloyd, 1998; Maté, 2009; Wilson, 1987). As research has repeatedly suggested, these adverse conditions often go hand-in-hand with neighbourhood disadvantage and

social disorganization; factors at the community-level which have been associated with higher rates of problematic drug use and addiction (Boardman, Finch, Ellison, Williams, & Jackson, 2001; Hayes-Smith & Whaley, 2009; Karriker-Jaffe, 2013; Sneddon, 2006; Wilson, 2011).

With that said, one objective of the present study is to contribute to efforts by sociologists who wish to re-emphasize the 'social' in the discourse about drug use and addiction that has for too long been dominated by research confined to the biomedical sciences (Campbell, 2012; Clark, 2011). Their aim is not to displace biology as a valid explanatory concept, but rather to lend support to the argument that drug use is a product of the mutual interaction between a range of factors from biological, psychological, and social planes (Buchman, Skinner, & Illes, 2010; Griffiths & Larking, 2004; Marlatt, Baer, Donovan, & Kivlahan, 1988; Ogborne, Harrison, & Carver, 2004). A re-emphasis of the social context of drug use may also add to our understandings of why most individuals who use or experiment with drugs do so without any significant risks to health, while a small proportion of drug users develop compulsive or risky drug habits that have detrimental health consequences (Degenhardt, 2012). As government agencies have increasingly tasked themselves with reducing health disparities across the nation (Public Health Agency of Canada, 2004), clearer understandings of how social factors influence differential drug use may prove to be beneficial to a comprehensive and coordinated strategy that addresses the social, psychological, and medical aspects of drug use problems. Indeed, as the next section shows, drug-related health disparities are not randomly distributed, but are concentrated among the most disadvantaged groups (Galea & Vlahov, 2002).

Disparities in Health: A Cause for Concern

There is an abundance of evidence suggesting that marginalized populations including persons of ethno-racial minority, socioeconomic disadvantage, and those with mental illness experience a greater burden of health inequalities due to their economic and social standing (Marmot, 1997). Several important works have explored the relationship between health disparities associated with the use of *licit* substances, suggesting that the use of alcohol and tobacco may mediate or modify social inequalities in health (Marmot, 1997; Marmot & Wilkinson, 2003). More recent studies examining the relationship between drug use and health disparities have broadened the range of substances to include both licit and illicit types (Adelson, 2005; Buka, 2002; Galea & Rudenstine, 2005; Galea & Vlahov, 2002; Wallace et al., 2002). Some have demonstrated that while addiction and illicit drug use transcend race and social class, there are measurable disparities in health outcomes across the socioeconomic gradient in which mortality and morbidity associated with illicit drug use are concentrated among groups belonging to the lowest rungs of the social ladder (Galea & Rudenstine, 2005; Marmot, 1997; Marmot & Wilkinson, 2005). For example, Darke and colleagues (2007) argue that disadvantaged communities exhibit higher rates of early initiation of alcohol and illicit drug use which often translate into more severe substance use problems. These problems include greater rates of substance use and dependence among those of lower socioeconomic status (Compton, Thomas, Stinson, & Grant, 2007; Spooner, Hall, & Lynskey, 2001), higher incidence of fatal opioid and cocaine overdose that has been associated with the level of poverty and inequality in a community (Galea & Vlahov, 2002; Marzuk et al., 1997), and higher prevalence of diabetes, blood-borne disease, and

cirrhosis of the liver among marginalized ethnic groups (Buka, 2002). Perhaps most illustrative of these inequities have been the numerous studies revealing ethno-racial differences in drug-related morbidity including significantly higher prevalence rates of HIV, Hepatitis B, and Hepatitis C among African Americans and Hispanics largely attributable to risky injection practices (Estrada, 2005; Galea & Vlahov, 2002; Galea & Rudenstine, 2005; Lemstra, Rogers, Thompson, Moraros, & Buckingham, 2012). In his study, Estrada (2005) explained that while African-American and Hispanic individuals represented 32% of the population in the United States in 2003, they accounted for nearly 70% of reported HIV/AIDS cases. When focusing solely on HIV/AIDS acquired from injection drug use, Estrada reported that Hispanic (33%) and non-Hispanic Black (32%) males accounted for a disproportionate share of cases compared to non-Hispanic White (9%) males.

Aboriginal Canadians have also been shown to be particularly vulnerable to drug-related harms with disproportionate rates of drug-related HIV infection (Lemstra et al., 2012), elevated mortality rates due to overdose (Milloy et al., 2010), earlier ages of drug use initiation than non-Aboriginal persons (Currie, 2001), and higher rates of substance use and substance disorders than other ethno-racial groups (Currie, Wild, Schopflocher, Laing, & Veugelers, 2013; Marshall, 2015). Marshall (2015) argues that these disparities cannot be fully understood in isolation from a history of colonization, cultural oppression, and dislocation that have shaped the experiences and material conditions of Aboriginal peoples across Canada. She adds, “Although most substance use is not harmful, social dislocation, trauma, and poverty can create conditions for problematic drug use, defined as use that has become habitual and compulsive despite negative health and social

effects" (Marshall, 2015, p.5). Indeed, there has been a great deal of research dedicated to illuminating how the social and economic dislocation of Indigenous populations in North America has influenced disproportionate rates of physical and emotional trauma, mental health issues, suicide, and risky sexual and drug-related practices (Kirmayer, Simpson, & Cargo, 2003; Pearce et al., 2008).

Furthermore, various studies have documented differential impacts of illicit drug use on the overall health of Aboriginal peoples (Currie et al., 2013; Elton-Marshall & Leatherdale, 2011). This includes research showing an exceptionally high incidence of HIV infection and drug-related mortality among Aboriginal drug users relative to other ethno-racial groups (Craib et al., 2003; Lemstra et al., 2012; Pearce et al., 2008). For example, in a representative sample of injection drug users in the Saskatoon Health Region, Aboriginal peoples made up 88.1% of the study population despite only representing 9.2% of the general population (Lemstra et al., 2012). The authors of the study noted the results of a previous study which found that 77.4% of positive HIV tests associated with injection drug use in Saskatchewan were from those who identified as Aboriginal (as cited in Lemstra et al., 2012). In another study by the National Native Addictions Partnership Foundation, Aboriginal deaths due to illicit drugs were estimated to be approximately three times the general population (NNAPF, 2000).

There are several factors to be considered when analyzing these disparate trends in drug-related health outcomes. First, individuals who occupy the most marginal positions in society are faced with various barriers to medical care and social resources necessary for coping with addiction (Estrada, 2005; Galea & Rudenstine, 2005). There is a plethora of evidence which suggests that ethno-racial minority substance users with

dependence issues are underrepresented in treatment services, indicating a potential failure of agencies to make themselves accessible and adaptable to the needs of particular groups of drug users (Galea & Rudenstine, 2005; Rassool, 2009). One study by Wood et al. (2005) found that among a cohort of injection drug users in Vancouver, Aboriginal peoples experienced the highest burden of HIV infection, yet were less likely to receive treatment for drug-related problems when compared to non-Aboriginal persons. Findings from the National Survey on Drug Use and Health (NSDUH) conducted between 2006 and 2008 reveal that among persons living in poverty and in need of substance abuse treatment, only 17.9 percent actually received treatment in the past year (SAMHSA, 2010). Barriers to access are also a function of geography as remote, isolated, and rural communities home to large populations of Aboriginal Canadians regularly experience inadequacies in healthcare funding and difficulties with retention of qualified healthcare providers (Hollenberg, Lytle, Walji, & Cooley, 2013). In addition, long distances to urban centres and lack of transportation may impede utilization of necessary mental and general healthcare services (Boydell et al., 2006). Researchers have also highlighted the difficulties in delivering drug treatment services to those with co-occurring mental illness and substance use problems which include more difficult recovery trajectories, complex diagnoses, misaligned treatment modalities, and reluctance or fear on the part of affected individuals that serves to impede help-seeking behaviour (Green, Yarborough, Polen, Janoff, & Yarborough, 2015; Greenfield et al., 1995; Mericle, Alvidrez, & Havassy, 2007).

A second consideration is the impact of criminal justice policies that exacerbate existing social and health disparities among the most marginalized users of illicit drugs

and those of colour. The use of substances that have been deemed illegal carries considerable legal consequences of which the poor and those of colour are more likely to receive (Provine, 2007; Sneddon, 2006; Wacquant, 2009). This is due to a mixture of factors that include greater attention from police to drug-related behaviours in areas of socioeconomic deprivation where a disproportionate number of minority groups reside (Alexander 2012; Provine, 2007) as well as inter-class disparities in police discretion and judicial sentencing (Reiman & Leighton, 2012). Perhaps the most glaring example of systemic legal inequality in drug policy has been the multi-decade preservation of racially discriminatory crack-cocaine sentencing laws in the United States that have only recently received partial reform (Abrams, 2010; Provine, 2007). The result has been an overrepresentation of poor, ethno-racial minorities channelled through the criminal justice system for low-level drug offenses who, upon release, have experienced severe deterioration in physical and mental health, are further excluded from legitimate employment, denied opportunities for civic engagement, and distanced from society by their label as convicted criminals (Freudenberg, 2002; Wacquant, 2009). Rather than ameliorating problems associated with drug misuse and addiction, carceral forms of punishment seem to erode the very elements that keep individuals integrated in society and protected from the harmful effects of drug use (Rose & Clear, 1988). More immediate influences of prohibitionist drug policies have been mediated through policing practices that constrain the ability of injection drug users to use safe injection practices. In this regard, it has been widely acknowledged that proactive enforcement and surveillance of drug users increases risk of adverse health problems and disease transmission when injection drug users inject in risky locations (e.g., shooting galleries),

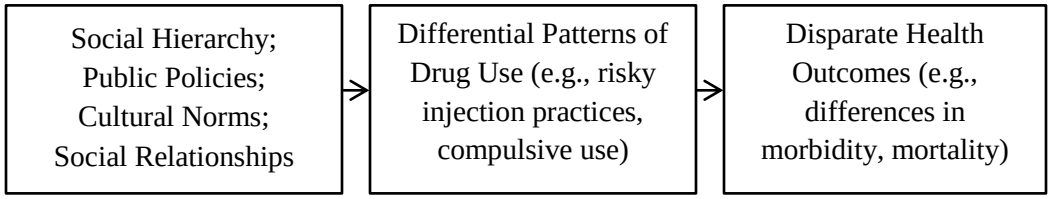
are rushed to inject out of fear of apprehension, and when they are reprimanded for the possession of sterile injection equipment (Friedman et al., 2006; Pan et al., 2013). Thus it seems that policing initiatives aimed at the deterrence and reduction of drug use in the name of public health and safety have had counter-productive effects especially on those in the lower stratum of society.

However, despite significant impacts to health, barriers to treatment and increased influence from the criminal justice system alone cannot fully account for disparities in drug-related morbidity and mortality. As several researchers have argued, such disparities result from a mixture of characteristics of the "social hierarchy (income distribution, workplace control), broader public policies (housing, education), cultural norms, and social relationships (social networks, discrimination)" (Galea & Vlahov, 2002, p.136). They argue that these social determinants can indirectly affect health by shaping health risk behaviours and can lead a small minority of drug users to consume drugs in ways that are detrimental to health (Galea & Vlahov, 2002) (see Figure 1.1). Modes of drug consumption that are most often associated with immediate adverse health consequences include risky injection practices, binge use that can result in overdose, certain forms of polydrug use, and use of contaminated drugs (Degenhardt, 2012; Galea & Vlahov, 2002). However, sustained and chronic use associated with drug dependence also can result in increased risk of chronic disease such as liver cirrhosis, cardiovascular disease, and infection[3] (Degenhardt, 2012; Degenhardt et al., 2013; Galea, Nandi, & Vlahov, 2004; Nutt, King, Saulsbury, & Blakemore, 2007). Others have emphasized the adverse social

[3] Despite some research demonstrating long-term health risks of chronic use of certain illicit drugs, chronic use of licit substances such as tobacco continues to be the leading cause of preventable death and morbidity (WHO, 2015). While the focus of this study is on *illicit* drug use, the harms associated with *licit* forms of substance use such as the use of tobacco, alcohol and prescription drugs must be acknowledged.

costs of compulsive drug use such as work-place related problems, domestic issues, and impairments to social functioning that in turn have consequences for mental health and well-being (Dalgarno & Shewan, 2005; UNODC, n.d.).

Figure 1.1: Suggested Pathway to Disparate Health Outcomes



Up to this point, it has been argued that current drug policy in Canada and the United States has largely failed to address the underlying factors that many social scientists argue are at the heart of problematic forms of illicit drug use, in favour of propogating the inherent dangers of illicit drugs to public health and safety (Buka, 2002; Estrada, 2005; Galea & Rudenstine, 2005; Galea & Vlahov, 2002). The persistence of drug-related harms that are disproportionately borne by certain marginalized groups across North America has important implications for social justice and opens up avenues for research that can support new directions in drug policy.

As governments aim to address health disparities, one particular area of inquiry which researchers have identified as salient is the relationship between social context and differential patterns of drug use. Many have argued for the primacy of socioeconomic status as an underlying factor in this relationship and assert that it is generally found that those who suffer from material deprivation are more likely to use drugs in ways that produce significant health consequences (i.e., risky injection practices, needle sharing, polydrug use, binge use, compulsive use) (Galea & Vlahov, 2002; Marmot, 1997;

Spooner et al., 2001). However, focusing solely on socioeconomic status as a causal factor for differential patterns of drug use may obscure more proximate influences of the social environment such as those derived from social networks and social relations. One particular body of work that has become increasingly prevalent in the sociological study of health behaviours is research using social capital theory (Kawachi, Kennedy, & Glass, 1999; Lindstrom, 2008). Social capital as defined by the sum of the actual or potential resources granted to individuals through their social networks has been increasingly utilized to explain disparate outcomes in deviance, crime, and health (Bourdieu & Wacquant, 1992). However, few studies have examined the influence of social capital on substance use (Reynoso-Vallejo, 2011). Those that have incorporated social capital into their analysis of drug use have primarily focused on cessation efforts of drug users in treatment programs (Cheung & Cheung, 2003; Granfield & Cloud, 2001), engagement in risky drug use behaviours (Lovell, 2002) and differential patterns of drug use among various population samples (Aslund & Nilsson, 2013; Flores et al., 2013; Lundborg, 2005; Marmot, 1997; Reynoso-Vallejo, 2011; Weitzman & Chen, 2005). In addition, the majority of studies examining the relationship between social capital and substance use have focused on the use of *licit* substances such as tobacco and alcohol (Marmot, 1997; Weitzman & Chen, 2005; Wright et al., 2001). The few studies that have explored the role of social capital on the use of illicit substances have used overall measures of illicit substance use as outcome measures (Aslund & Nilsson, 2013; Curran, 2007; Lundborg, 2005). Rarely have studies analyzed the influence of social capital on the use of specific types of illicit drugs (but see Flores et al., 2013; Reynoso-Vallejo, 2011). Given that drugs are ascribed certain subjectivities that influence assessments of harm, stigma, and

social acceptability (Moore, 2007), an analysis broken down by drug type may reveal that social capital interacts differently across a range of drugs. Furthermore, only one study has included measures of drug dependence (but see Winstanley et al., 2008). Attempting to explain *any* drug use, as many studies have done, may obscure different modes of drug use that may arise from different causes and have different outcomes on its users. Galea and Rudenstine (2005) argue that drug use cannot be reduced to a single behaviour, but is instead a number of heterogeneous behaviours; some relatively benign and others with lasting social and medical consequences (Adrian, 2003; Degenhardt, 2012). Thus making distinctions between experimental use, more habitual use, and dependent use should be an important objective of research on drug use.

Purpose of the Study

Given the above-mentioned gaps in research, this study aims to determine to what extent individuals' embeddedness in social networks of trust, reciprocity, and obligation is important in predicting illicit drug use and dependence. Using data from three cycles of the Canadian Community Health Survey (CCHS) conducted between 2007 and 2012, the present study examined whether and in what direction social capital influences the use of eight different illicit drugs (marijuana, cocaine/crack, amphetamines, ecstasy, hallucinogens, inhalants, heroin, and steroids). The inclusion of a wide range of illicit drugs not only allows for a more comprehensive comparative analysis between different types of drugs, but also supplements social capital literature which has tended to focus on the most frequently used drugs such as marijuana and cocaine, while ignoring other drugs such as amphetamines, heroin, and inhalants. The present study also examined whether social capital can predict drug dependence and interference and whether or whether not it serves as a protective factor against various types of drug use.

The following section reviews previous research on the social correlates of illicit drug use and then draws on existing literature on social capital to outline the theoretical framework that guided this study.

Chapter 2: Literature Review

The majority of data on trends in illicit drug use have been derived primarily from large, cross-national surveys. The most recognized national surveys on illicit drug use include the National Survey on Drug Use and Health (NSDUH) and the Monitoring the Future Survey (MTF) in the United States as well as the Canadian Community Health Survey (CCHS) in Canada. These surveys ask respondents to disclose information about drug use including whether they have ever tried illicit drugs, how many times or at what frequency they have used illicit drugs, and the ways in which they have used drugs (e.g., modes of consumption, polydrug use). These surveys also explore drug dependence and whether the respondents' illicit drug use interferes with particular aspects of their lives. Data on trends in illicit drug use and dependence are not limited to national survey data as there have been studies using various random sampling designs, specific population samples (e.g., based on age, ethnicity, regions), and clinical samples for hard-to-reach hidden populations, all demonstrating that illicit drug use tends to vary in the population. What follows is a review of three types of research focusing on 1) socio-demographic, 2) socioeconomic, and 3) social capital predictors of illicit drug use.

With regard to socio-demographic predictors of illicit drug use, it is generally found in both national-level and specific population survey data that frequency of illicit drug use increases during adolescence and into early adulthood when individuals commonly gain relative independence from parental authority, but decreases into middle and late adulthood when individuals are exposed to greater attachments and responsibilities (Johnston, O'Malley, & Bachman, 2005; Mosher & Akins, 2007). Studies show that age also has a similar relationship with drug dependence. For example,

Teesson, Baillie, Lynskey, Manor, and Degenhardt (2006) analyzed two national cross-sectional surveys in the United States and Australia and found that the odds of drug dependence were greatest among those between 18 and 24 and then decreased steadily with age. In terms of sex differences, males have been shown to be more likely than females to use illicit drugs and develop drug dependence (Becker & Hu, 2008; Brady & Randall, 1999; SAMHSA, 2014; Teesson et al., 2006). However, Mosher and Akins (2007) suggest that the effect of sex on illicit drug use varies by age as rates between males and females are generally equivalent during late adolescence, but diverge into adulthood. Cross-provincial comparisons reveal variation in illicit drug use as well. In a sample of 10,076 respondents drawn from 2011 Canadian Alcohol and Drug Use Monitoring Survey (2012), lifetime prevalence of any illicit drug use was highest in British Columbia at 47.9% of the sample population followed by Nova Scotia (44.9%), Alberta (44.6%), Quebec (41.6%), New Brunswick (38.7%), Saskatchewan (38%), Ontario (37.6%), Manitoba (37.4%), P.E.I. (36.7%), and Newfoundland (35.8%). Unfortunately, most national surveys have excluded prevalence estimates from the three Canadian territories and available cross-national statistics on illicit drug use are scarce. However, a number of territorial-level studies have pointed to higher prevalence of drug use among residents in these areas including the 2009 Northwest Territories Addictions Survey which reported 59% lifetime prevalence of any illicit drug use (n=1,160), the 2007-2008 Inuit Health Survey which reported 62% lifetime prevalence of experimentation with substances in order to get high (n=1,710), and the 2005 Yukon Addictions Survey which found comparable rates of cocaine use and elevated rates of marijuana use in the Yukon in the past year when compared to other provinces (n=1,240)

(Galloway & Saudny, 2012; Northwest Territories Health and Social Services, 2010; Yukon Department of Health and Social Services, 2005). While scarcity of data and varying study methodologies limit the ability to directly compare these findings across provinces and territories, it has been suggested that these regions are home to some of Canada's most isolated and high-risk populations and that further initiatives to examine the full scope of substance use in Canada are needed.

Some researchers have shown that community type also affects rates of illicit drug use among its inhabitants (Gfroerer, Larson, & Colliver, 2007; Mosher & Akins, 2007), but Ompad and Fuller (2005) caution that there is a general inconsistency among existing research on urban-rural differences as drug use tends to vary by region and sub-populations. It has been hypothesized that size of a community may determine supply of illicit drugs and that small and rural areas are generally more likely to use legal substances such as alcohol, prescription drugs, and inhalants due to lower availability of illicit drugs (Mosher & Akins, 2007). Others have highlighted drug-specific trends such as higher prevalence of inhalant and methamphetamine use in rural areas, higher prevalence of ecstasy use in urban areas, but generally similar trends for other types of illicit drugs for both urban and rural areas (Gfroerer et al., 2007; Howard, Bowen, Garland, Perron, & Vaughn, 2011; Johnston, O'Malley, & Backman, 1992; Medina-Mora & Real, 2008).

Literature has also demonstrated some differences between ethno-racial groups (Johnston, O'Malley, & Bachman, 2011; Wallace et al., 2002). For example, a large number of studies have found that Blacks tend to report lower levels of illicit drug use than Whites (Johnston et al., 2005; McCabe et al., 2007; Wallace et al., 2002). Aboriginal

populations on the other hand are more likely to report higher levels of illicit drug use across a wide range of illicit drugs (SAMSHA, 2013) and are at greater risk for substance use disorders (Mitchell, Beals, Novins, & Spicer, 2003). These findings have been associated with high levels of social and economic deprivation and have negatively shaped the living environments of Aboriginal peoples in North America (Mosher & Akins, 2007).

With respect to socioeconomic variables, findings have been mixed. For example, in a study of correlates of drug use and dependence in a representative sample of the U.S. population, Grant (1996) showed that higher income and education were associated with a greater likelihood of illicit drug use, but were protective against drug dependence. In a cross-sectional research study conducted in Sweden with a sample of 23,482 men, Stenbecka, Allebeck, and Roemlsjo (1993) found that low SES was associated with lower likelihood of marijuana use. Similarly, Legleye, Beck, Khlat, Peretti-Watel, and Chau. (2012) conducted a cross-sectional study of 39,542 French youth and found that while adolescents from affluent families were more likely to experiment with marijuana, they were less likely to engage in frequent, heavy, or problematic use when compared with other SES categories. In a cross-sectional study conducted in the United States using data from the Monitoring the Future Study, researchers found that adolescents who had the lowest levels of parental SES were more likely to report use of heroin and cocaine, while middle-class adolescents were most likely to report use of marijuana, amphetamines, hallucinogens, and other narcotics (Johnston et al., 2005). These findings suggest that the effects of socio-demographic and socio-economic variables vary depending on the type of drug in question and whether use is characterized by dependence.

In addition, some researchers have highlighted that while links between poverty and increased use of illicit drugs are generally weak and inconsistent, extreme levels of poverty have been associated with greater substance use frequency and disorders (Mosher & Akins, 2007). Others have suggested that area-level socioeconomic status that takes into account geographical location and neighbourhood characteristics may be important predictors, but empirical findings have been limited by confounding factors such as age, ethnicity, and size of area (Karriker-Jaffe, 2011). For example, in a cross-sectional study of 1305 adults from 249 neighbourhoods in the United States, Williams and Latkin (2007) found that neighbourhood poverty was significantly associated with current heroin or cocaine use.

While the literature suggests that socio-demographic and socioeconomic factors play important roles in predicting drug use outcomes, these sets of factors often fail to take into account the complexities of social processes that are theorized to be more proximately and directly associated with drug use behaviours and patterns. Consequently, this has led researchers to explore how features of one's immediate social environment can shape differential drug use behaviours by providing or constraining access to certain types of resources.

Bourdieu perceives individuals as occupying positions in the social hierarchy that are determined by access to capital vested in economic, cultural, and social means (as cited in Lovell, 2002). His framework departs from using single measures based in labour market criteria to define one's social standing and is more inclusive of resources embedded in immaterial and non-economic forms of capital (Hyyppä, 2010; Veenstra, 2007). Similarly, Buka (2002) suggests that resources that can help individuals avoid

drug-related harms exist in various forms including: “money, knowledge, power, prestige, and the kinds of interpersonal resources embodied in the concepts of social support and social network[s]” (p.121). In particular, social capital, defined by the sum of the actual or potential resources granted to individuals through their social networks, has become increasingly important in the explanation of disparate outcomes in deviance, crime, health, and more specifically, drug use (Bourdieu & Wacquant, 1992). Theorists assert that social capital can be utilized to attain resources in the presence or absence of other forms of capital (Carpiano, 2006), transferred from or into other types of capital (Bourdieu, 1986; Wacquant, 1998), and leveraged to achieve particular goals (Carpiano, 2006; Wakefield & Poland, 2004). Coleman (1998) explains that certain features of social organization including obligations, expectations, norms of reciprocity, trust, information channels, and sanctions make social capital available as a resource facilitating both individual and collective action. Rather than existing as a resource possessed by an individual, social capital is considered to be a property ingrained in the contextual nature of informal relations, family ties, and group membership (Coleman, 1998; Curran, 2007).

Theorists have also suggested that there are two dimensions of social capital: structural and relational social capital (Granovetter, 1992; Nahapiet & Ghoshal, 1997; Putnam, 2000; Uphoff, 2000). The structural dimension refers to social interaction ties that link people together and are objective and externally observable (Grootaert & van Bastelaer, 2002). Several studies have operationalized this dimension by using measures of size or density of network ties (Häuberer, 2010; Kirst, 2009; Lin, Cook, & Burt, 2001). The relational dimension describes subjective and intangible assets such as trust, reciprocity, obligation, perceived social support, and norms about how individuals should

act in society (Aslund & Nilsson, 2013; Häuberer, 2010; Tsai & Ghoshal, 1998; Uphoff, 2000). Trust is an important relational dimension of social capital (Bourdieu, 1986). For Uphoff (2000), the stability and durability of reciprocal exchanges are underpinned by notions of interpersonal trust and the confidence in others that they will carry out their obligations. Tsai and Ghoshal (1998) suggest that individuals who trust each other are more willing to share resources because they believe that opposing parties will act in a mutually beneficial manner.

The following sections further elaborate on key elements of the concept of social capital by exploring the various ways in which social capital is conceptualized and discussing the most appropriate framework that guided this study.

Level of Analysis

Often a source of critique, social capital is considered to operate on various levels of analysis ranging from macro-level social organization to individual or micro-level relations. Hagan (1994), for example, has described capital disinvestment as the process by which marginalized communities experience gradual erosion of conventional forms of social capital only to have them replaced with criminal networks as a cultural adaptation to material deprivation and concentrated poverty. Like Hagan, Wacquant's (1998) analysis rests at the macro-institutional level where degradation of 'state social capital' is characterized by the retraction or disassembly of formal institutions that have traditionally provided civic goods and services to underprivileged communities including physical safety, legal protection, welfare, education, housing, and healthcare. Their works echo Bourdieu's (1986) sentiment regarding the reproduction of inequality by which

forms of capital are accumulated and transmitted within affluent groups and withheld from groups that are socially and politically excluded from access (Stephens, 2008; Van Hout, 2010).

The communitarian approach, popularized by Putnam (2000), characterizes social capital as being generated from civic and social engagement which fosters generalized reciprocity between members of a community. He argues that high levels of interpersonal trust, pro-social norms, and networks provide an environment in which cooperation, coordination, and collective efficacy can flourish to further community goals and subsequently improve positive functioning of the community (Wakefield & Poland, 2004). In contrast, low levels of social capital characterized by a lack of community interaction and shared obligation are considered to constrain mechanisms of informal social control and weaken the inclination of community members to sanction deviant behaviour and criminality (Browning, 2009; Friedman et al., 2007; Laub & Sampson, 1993; Rose & Clear, 1998). Indeed, a large body of research has validated the importance of systems of friendship, kinship, acquaintanceship, parochial networks, associational ties, and other forms of durable social ties that arise from civic engagement, reinforce normative consistency, maintain effective social controls, and reduce crime and drug use (Kawachi et al., 1999; Lee & Thomas, 2010; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997; Sampson, Morenoff, & Earls, 1999; Shaw & McKay, 1942). Thus one may expect that communities exhibiting greater levels of social capital would be more personally invested in tackling drug-related problems whether through social policy, treatment, or aggressive law enforcement strategies. Most researchers agree that the development of social capital is impeded in communities characterized by

concentrated disadvantage and where institutional supports are lacking (Rose & Clear, 1998; Wacquant, 1998). Additionally, Erickson and Cheung (1999) suggest that residents who reside in socio-economically advantaged communities and who are exposed to high social capital are likely to be "embedded in a social network that values conventional life involving a stable career, an intact family, and a reputable social identity… and they are thus more likely to exhibit controlled and responsible use" (p.242). While this suggestion makes several assumptions about what a conventional life entails, it is clear that the authors' claims about conformity follow lines of reasoning mirrored in social bond/control theory (Hirschi, 1969; Sampson & Laub, 1993).

Several studies contributing to social capital literature at the community level have yielded significant findings. For example, Aslund and Nilsson (2013) found that higher scores of neighbourhood social capital and general social trust were associated with lower levels of alcohol, cigarette, and illicit drug consumption. They suggested that the relationship might be mediated by social control, community reinforcement norms, and the extent to which such norms were internalized (Aslund & Nilsson, 2013). Using secondary data analysis of national data of substance use trends, Winstanley et al. (2008) found that after controlling for individual and family-level characteristics, neighbourhood disorganization and low social capital were associated with higher levels of alcohol use, drug use, and drug dependence among adolescents. These studies seem to suggest that community-level social capital may constrain illicit drug use and that levels of social capital appear to be contingent on socioeconomic characteristics of the community.

At the micro-individual level of analysis, social capital is primarily viewed as a beneficial resource accrued by individuals rather than by collective society. It is inherent

in the structure of networks and relations found in families, friendships, and informal social institutions consisting of trust, information channels, norms, and effective sanctions (Coleman, 1988; McCarthy & Hagan, 2001). When mobilized, the social and psychological resources made available through these relations can serve a number of functions that may enhance life and health trajectories of drug users (Lin, 2007; Wright et al., 2001). For example, Granfield and Cloud (2001) suggest that social capital embedded in interpersonal relations aids individuals in a process of 'natural recovery' from drug-related dependence without the use of formal planned or mutual-help treatment modalities. Cheung and Cheung (2003) reveal that family support, participation in conventional social groups, and licit employment are inversely related to the risk of post-treatment drug use. They also argue that trusting social bonds serve as sources of social support that encourage help-seeking behaviour, enhance coping mechanisms, and ease adjustments to chronic illness.

Given its application to a wide variety of settings and its use in predicting various outcomes, the mechanisms by which social capital facilitates actions by individuals are often obscured and the boundary between types of social capital is not clearly delineated. To present the theory in a more organized fashion, I propose that social networks, as a structural form of social capital, influence illicit substance use by granting individuals access to relational forms of social capital that can be organized into three primary categories:

a) **social support** provided by trusting others that can be used as a coping mechanism
b) **information flows** that provide advice and reveal beneficial opportunities to the recipient

c) **informal social control** in the form of values and norms that denounce illicit substance use.

Each form of relational social capital is discussed further in the following sections.

Social Support

The literature on social support proposes several models which conceptualize networks as encompassing structural, functional, and relational components (Knowlton et al., 2004). Similar to social capital, structural properties of social support include size, density, and interconnectedness of social networks which indicate the extent to which an individual is integrated into his or her social milieu (Gottlieb & Bergen, 2010). Functional characteristics refer to specific types of support such as emotional, instrumental, companionship, informational, and self-esteem support (Gottlieb & Bergen, 2010; Knowlton, 2004). According to Gottlieb and Bergen (2010): "Close relationships tend to generate a wider range of types of support than casual acquaintances, and social ties that are more strictly defined by normative role definitions tend to provide more specialized support" (p.512). Generally, these close ties facilitate *bonding* whereby intimate support such as caregiving, love, and affection are most abundant. Less intimate social ties are said to facilitate *bridging* relationships characterized by dissemination of information, advice, and the provision of practical assistance (Gottlieb & Bergen, 2010; Putnam, 2000). Lastly, relational characteristics represent the social roles and qualities of social network ties that may include assessments of adequacy (Gottlieb & Bergen, 2010; Knowlton, 2004). In other words, relational characteristics may reflect how often and to what extent these types of supports are readily available or received.

Prior research has shown that, in the context of drug use, social support is associated with lower rates of relapse (Pettus-Davis, Howard, Roberts-Lewis, & Scheyett, 2011), more positive treatment outcomes for individuals in substance abuse treatment (Dobkin et al., 2002; Warren et al., 2007; Wasserman et al., 2001), increased medical service use and adherence (Knowlton, 2004), lower rates of drug initiation and drug use (Brown & Riley, 2005), and lower rates of high-risk drug use (El-Bassel, Chen, & Cooper, 1998). Of the studies reviewed, only few give a clear explanation as to what specific kinds of social support are most attributable to positive drug outcomes. Dobkin (2002) refers to several studies that found that higher levels of pre-treatment functional support were associated with greater psychosocial well-being and greater chances of remaining abstinent after treatment. Some studies have alluded to notions of maternal warmth as playing a significant role in dictating adolescent problem behaviour (Frauenglass, Routh, Pantin, & Mason, 1997) while others have emphasized the importance of being loved by another as a key component of social support systems for health and well-being (Nakhaie & Arnold, 2010). Some researchers have focused more on the mechanisms through which social support yields positive outcomes. Lundborg (2005), for example, suggests that social capital in the form of social support may replace substance use as a mechanism for reducing stress in which emotional and instrumental forms of social support can be called upon in times of adversity. This explanation closely resembles what has been described previously as the 'buffering hypothesis' (Cohen & Wills, 1985) and has been elaborated upon by Maté (2009) who associates addictive tendencies with a disturbed ability to internally regulate stress and a constant drive to find

external sources of relief such as supportive social relations or chemical substances when the latter are inadequate.

Information Flows

Social networks may also facilitate information flows which help communicate the risks involved in illicit drug use, endorse safer drug use practices, and reveal beneficial opportunities for treatment (Jackson et al., 2010; Lin, 2002; Lundborg, 2005). Treloar and Abelson (2005) in their study of injection drug users in Australia found that peer groups served as natural sources of information and that most study participants exchanged information (both accurate and inaccurate) related to harm reduction practices with other users. They also suggest that users who begin injection typically do not have substantial access to peer networks of information exchange and possess only 'common sense' knowledge that is insufficient to protect them from disease transmission. Thus policy implications drawn from their study suggest a need to mobilize social capital to facilitate information flows by establishing informal peer education groups comprised of fellow users who can disseminate helpful and accurate information about safe consumption practices (Treloar & Abelson, 2005).

Benefits of information flows may also extend beyond the scope of drug use as individuals in one's social network may relay information that may enhance one's social circumstances such as job, educational, and housing opportunities (Lin, 2002). Both social support and social capital theorists consider informational flows to be a domain predominantly occupied by less intimate ties which aid individuals in the pursuit of goals and resources (Gottlieb & Bergen, 2010; Granovetter, 1973; McCarthy & Hagan, 2001).

Informal Social Control

Another aspect of social capital that is said to influence illicit drug use is the level of informal social control that is exerted by one's social network and grounded in family, school, organizations, or the wider community (Curran, 2007). For example, Laub and Sampson's (1993) age-graded theory of informal social control suggests that marriage and stable employment serve as important social bonds that facilitate positive trajectories in life. These social bonds are suggested to facilitate the internalization of commonly held norms of 'pro-social' behaviour that influence desistance from deviant behaviours such as illicit drug use (Cheung & Cheung, 2003; Halpern, 2004; MacMillan, 1995). Curran (2007) found that parental rules and expectations were the strongest predictors of substance use by high school students. His research supports Coleman's (1998) notion that family constitutes an important institution that mediates the transmission and development of social capital through effective socialization, knowledge and norm transmission, guidelines that dictate acceptable behaviour, and punishment when guidelines are violated (Bolin et al., 2003; Curran, 2007; Wright et al., 2001). Similarly, social relations derived from voluntarism and associational involvement in secular and religious organizations have been said to invoke informal social control and thus to discourage engagement in substance use including smoking, binge drinking, marijuana, and other illicit drugs (Bartkowski & Xu, 2007; Bolin et al., 2003; Lundborg, 2005; Weitzman & Kawachi, 2000; Winstanley et al., 2008).

Given the various types and forms of social capital that are used to predict a wide variety of outcomes, social capital is prone to theoretical obscurities. The following

section discusses several further criticisms of social capital theory and some challenges in applying its concepts to study drug use.

Theoretical Obscurities

Despite many studies having emphasized the positive aspects of social capital that foster resilience to substance use, Portes (1998) along with many other scholars has elucidated the often overlooked potential for social capital embedded in interpersonal networks to encourage drug use behaviours (Becker, 1963; Cheung & Cheung, 2003; Gideon, 2010; Jackson et al., 2010; Kirst, 2009; Wister & Avison, 1982). Rather than solely being a result of fragmented ties to supportive social networks, some researchers have argued that drug use is facilitated by 'negative'[4] forms of social capital in the context of illicit and deviant group membership. Flores et al. (2013) for example define negative social capital as being "made of assets, resources, and networks established by nonconventional groups or systems, such as gangs and organized criminal networks" where illicit drug use may be considered the norm (p.126). Research supports the assertion that social capital derived from social networks can have differential and even contradictory outcomes. For example, in a qualitative study by Van Hout (2010), experiences of discrimination, social exclusion, low levels of institutional trust, and significant ostracism from the wider community were found to engender close-knit networks of family members and friends as well as a strong sense of ethnic identity

[4] Categorizing social capital in this way presupposes a normative appraisal of social relationships which may be problematic; either they are inherently 'good' or 'bad', 'conventional' or 'nonconventional'. We know interpersonal relationships are much more complex than what a 'good' versus 'bad' dichotomy offers. With that said, it must be acknowledged that social relations have both the ability to *reinforce* and *constrain* drug use. Whether such relations are characterized by delinquent or 'nonconventional' attachment is beyond the scope of this study.

among the Irish Traveller community. While these networks were seen to traditionally instil anti-drug norms and values, Van Hout underlined their potential to escalate drug use as well. Similarly, Flores et al. (2013) point to the divergent ways in which social capital is utilized among drug users: either to support cessation efforts or to sustain drug use behaviours through the maintenance of stable drug-using networks. Akin to the differential association perspective (Sutherland & Cressey, 1978), some researchers suggest that personal associations with other drug users may provide greater opportunities for the procurement of drugs and provide a context for social learning that facilitates the dissemination of techniques, motives, norms, and values conducive to substance use and misuse (Becker, 1963; Cheung & Cheung, 2003; Gideon, 2010; Jackson et al., 2010; Kirst, 2009). Literature confirms that participation in interconnected networks of intravenous drug users greatly increases the likelihood of disease transmission through which social influence and social learning are primary mechanisms for the diffusion of risky injection practices (Lovell, 2002; Suh, Mandell, Latkin, & Kim, 1997). Additionally, there is consistent evidence which suggests that intimate and trusting relations with other injection drug users has a tendency to allay engagement in safer drug use practices as harm reduction practices are often relaxed (Jackson et al., 2010; Kirst, 2009). Given its ability to promote contrasting outcomes with respect to drug use behaviours, it is acknowledged that high levels of social capital do not always predict resilience or desistance towards drug use as is commonly suggested in the literature. This may have empirical implications especially if we are to take into account that some forms of illicit drug use commonly occur in group or recreational settings (Becker, 1963; Zinberg, 1984). One way to address this issue is to pinpoint what types of social capital

have positive or negative effects on illicit drug use and how these effects vary among different types of drugs.

Furthermore, despite its popularity within the domains of social science and public health, the theory has been criticized for incorporating elements of social support and social integration into a vague, ill-defined, and under-theorized construct (Carpiano, 2006; Pearce & Smith, 2003; Stephens, 2008). Indeed, there is the possibility that either social support or social control explanations may provide more conclusive evidence for their effects on substance use independently rather than being fused into what may be perceived as a non-cohesive theory. Alternatively, different types of social capital may be more appropriately operationalized into distinct dimensions, but organized along structural and relational axes.

Lastly, there are wide disparities in the operationalization of the concept due to a lack of consensus on the most appropriate indicators and scale used to measure social capital (Aslund & Nilsson, 2013; Lin & Erickson, 2008; Nakhaie & Sacco, 2009). While Putnam's (2000) communitarian approach has shifted the emphasis away from the individual and the state to the civic space in between (Arneil, 2006), it has been criticized on several fronts. First, it is claimed to represent "a conservative political construct that ignores issues of social and class conflict, inequality and political power" (Friedman et al., 2007, p.160) by legitimizing the transferral of social responsibility onto families and communities (Baron, Field, & Schuller, 2000). Secondly, the prerequisite of trust and consensus as cognitive components of social capital have been thrown into question by case studies demonstrating collective community action in the context of contrasting values and widespread mistrust among community residents (Friedman et al., 2007).

Lastly, and arguably most damning to its theoretical validity is the criticism of being tautological; being both a cause as well as an effect (Lin, 2002; Portes, 1998). Portes explains:

> As a property of communities and nations rather than individuals, social capital is simultaneously a cause and an effect. It leads to positive outcomes, such as economic development and less crime, and its existence is inferred from the same outcomes. Cities that are well governed and moving ahead economically do so because they have high social capital; poorer cities lack in this civic virtue (p.19).

For these reasons, several scholars have suggested that social capital may demonstrate its greatest worth at the individual level of analysis and in the context of social networks of direct and indirect ties (Friedman et al., 2007; Lin 2001; Lundborg, 2005; Portes, 1998). Accordingly, this study employed an individual level analysis of supportive social networks, the resources they provide, and their consequent effects on illicit drug use.

In the next section, the inclusion of marital status as a measure of social capital often overlooked in studies on social capital and drug use is proposed.

Marital Status as a Measure of Social Capital

A plethora of research has been dedicated to exploring the family as an important source of social capital with the majority of research focused on the effects of relations between parents and children on outcome measures such as children's success in school (Coleman, 1988), children's overall health (Eriksson, Hockwalder, Carlsund, & Sellstrom, 2012), adolescent delinquency and risk-taking (Wright et al., 2001), and adolescent substance use (Dufur, Parcel, & McKune, 2012; McPherson, Kerr, Morgan, McGee, & Cheater, 2013). However, relational bonds between spouses and/or partners appears to be relatively overlooked in studies of social capital and drug use despite it

serving as one of the most proximate sources of mutual support, companionship, trust, reciprocity, and shared objectives that may enhance well-being and enable the achievement of common goals (Coleman 1988; Furstenberg, 2005). A large body of research has associated marriage and long-term partnership with greater overall physical and mental health, decreased health-risk behaviours, and decreased substance use (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Bachman et al., 2002; Duncan, Wilkerson, & England, 2006; Green, Doherty, Fothergill, & Ensminger, 2012; Homis, Leonard, & Cornelius, 2007; Lo, Tenorio, K& Cheng, 2012; Umberson, 1987; Waldron, Hughes, & Brooks, 1996). For example, Duncan et al. (2006) found that marriage reduced binge drinking and marijuana use among men while marriage and cohabitation reduced binge drinking for women. They also found that marriage had a greater protective effect for men; a finding that has been replicated in other studies as well (Umberson, 1987; Waite, 1995). Additionally, Merline, O'Malley, Schulenberg, Bachman, and Johnston (2004) found that after controlling for parental status and history of use, those who were married were less likely to report heavy smoking, marijuana use, cocaine use, and misuse of prescription drugs when compared to those not married or separated. For dependent drug users entering addiction treatment, Heinz, Wu, Witkiewitz, Epstein, and Preston (2009) found that being married predicted less cocaine and heroin use, and thus more successful treatment outcomes relative to those who were single, separated, or cohabiting. They also found that those who had a close relationship with their partner demonstrated even greater reductions in substance use.

Some proposed explanations for why married individuals exhibit lower rates of substance use include spousal monitoring of health-related behaviours (Duncan et al.,

2006; Umberson, 1987), increased availability of social support in times of stress and adversity (Heinz et al., 2009), decreased involvement in social activities outside of the relationship (Lee, Chassin, & MacKinnon, 2010), changes in religiosity, and the adoption of normative views of substance use (Leonard & Eiden, 2007). These explanations echo several conceptual components theorized to be constitutive of social capital including social support and social control. However, it is also important to consider that while marriage is often associated with a range of benefits, these benefits are often contingent on the quality of the relationship rather than merely being married (Wong & Waite, 2015). In contrast to findings that suggest that marriage reduces substance use, some studies have shown that low marital satisfaction, increased stress, and other adverse consequences of marriage have the potential to increase substance use or interfere with treatment outcomes (Heinz et al., 2009). Spousal influence too has been shown to affect drinking and other substance consumption patterns, especially in studies of vulnerable individuals in recovery who have been found to relapse at higher rates if their spouses were using alcohol or drugs (McAweeney, Zucker, Fitzgerald, Puttler, & Wong, 2005). Additionally, several studies have suggested that spousal relationships and the trust and intimacy they engender can expose men and women to risky injection and needle-sharing practices (Fitzgerald, Lundgren, & Chassler, 2007; Stein, Nyamathi, Ullman, & Bentler, 2007). These studies suggest that much like other types of social capital, marriage and cohabitation may have the ability to encourage rather than merely constrain drug-use behaviours. Furthermore, research has consistently linked separation, marital dissolution, and losing a partner to increased consumption of alcohol, prescription medications, and other licit and illicit substances (Bachman et al., 1997; Grimby & Johansson, 2009;

Power, Rodgers, & Hope, 1999). It has been suggested that increased frequencies of use are largely attributable to acute psychological stresses associated with these negative life events (Power et al., 1999); however, substance use behaviours have also been shown to continue long after the loss of a spouse (Grimby & Johansson, 2009). It may be the case that persistent substance use among separated, divorced, and widowed individuals may also be explained by a prolonged absence of social capital formerly provided by the spouse (Gähler, 2006). In other words, the prolonged withdrawal of marital social capital may be potentially more devastating than not having had marital social capital in the first place. For this reason, it is necessary to distinguish those who are single from those who are separated/divorced/widowed to test empirically for differences between these two groups.

In sum, much of the literature on drug use has focused primarily on socio-demographic and socioeconomic predictors of illicit drug use. Little attention has been paid to the importance of social capital in predicting illicit drug use. In the few empirical studies of illicit drug use that have incorporated social capital theory, the focus has been on its specific relational dimensions (e.g., social support, informal social control), ignoring the effects of its structural elements (e.g., network size). Furthermore, the importance of social capital for predicting various types of drug use (i.e., different types of illicit drugs), drug dependence, and drug interference has not received due attention. In order to address some of these shortcomings, the present study used several indicators of structural and relational forms of social capital to predict illicit drug use and dependence. Key research questions include:

1) Does social capital affect illicit drug use and dependence?

2) If so, what types of social capital are important in predicting illicit drug use and dependence?

3) To the extent that social capital is an important predictor, what types of drug use can be best predicted from these different types of social capital?

4) And finally, does social capital mediate the relationship between socio-demographic/socioeconomic variables and the prevalence of illicit drug use, drug dependence, and drug interference?

Research Hypotheses

In line with the literature reviewed earlier, the following hypotheses were tested:

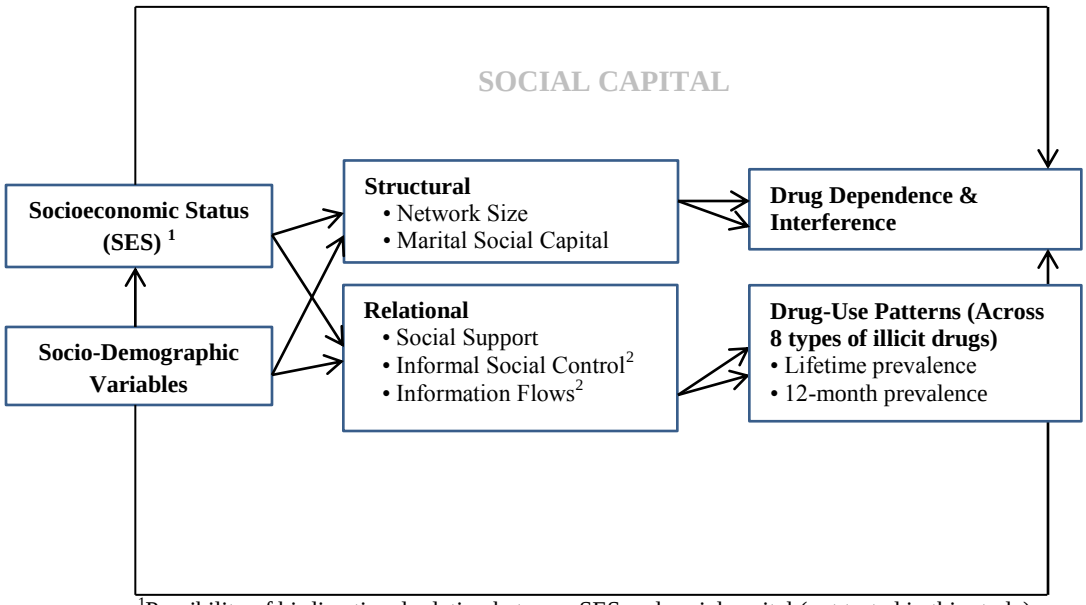
H1: Social capital is inversely related to *lifetime* prevalence of illicit drug use.

H2: Social capital is inversely related to prevalence of illicit drug use in the last *12 months*.

H3: Social capital is inversely related to dependence on illicit drug use.

H4: Social capital is inversely related to interference from illicit drug use.

Figure 2.1: Conceptual Model



[1]Possibility of bi-directional relation between SES and social capital (not tested in this study)
[2]Not directly measured in this study

Chapter 3: Methodology

Data Source

The Canadian Community Health Survey (CCHS) is a federally funded, cross-sectional survey conducted by Statistics Canada. The focus of the CCHS is on health status, healthcare utilization, and health determinants for the general Canadian population (Statistics Canada, 2013). Data collection began in 2001 and was repeated every two years until 2005. From 2007 and onwards, data were collected annually with an approximate sample size of 65,000 respondents each year. The samples included respondents aged 12 years or older who resided in private dwellings across ten provinces and three territories and excluded persons living on reserves, full time members of the Canadian Forces, institutionalized populations, and persons living in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James. The survey used a multi-stage, stratified random sampling design to ensure accurate representation of regions across Canada. Three sampling frames were used to select the sample of households including from an area frame (50%), from a list of telephone numbers (49%), and from random digit dialling (1%) (Statistics Canada, 2013). Questionnaires were administered using computer-assisted interviewing (half conducted in person and half over the phone) and annual data collection was divided into six two-month periods (Statistics Canada, 2013).

Because the CCHS collects data from a large number of Canadians and employs detailed questions about social networks and drug use behaviour, it was deemed an appropriate source of data. For the purpose of the present study, data were obtained from three, 2-year cycles of the CCHS including years 2007-2008, 2009-2010, and 2011-2012

with overall response rates of 76%, 72.3%, 87.3% at the national level for years 2007-2008, 2009-2010, and 2011-2012 respectively (Statistics Canada, 2009, 2011, 2013). The three cycles were chosen based on the consistency of the survey questionnaire after the redesign of the CCHS in 2007. That is, all relevant questions were included in each cycle and were asked in the same format.

Description of the Sample

The three cycles of the CCHS were merged to increase sample size resulting in a baseline sample of 382,474 respondents. The initial merged sample contained fairly equal distributions from the three cycles: 34.5% (n=132,049) from CCHS 2007-2008, 32.6% (n=124,780) from CCHS 2009-2010, and 32.9% (n=125,645) from CCHS 2011-2012. Given the relatively small sample of individuals who responded to questions regarding drug use, merging the data allowed for greater breadth of analysis, especially with regard to specific drug use behaviours (i.e., dependent use, use of particular types of drugs with small sample sizes such as heroin, inhalants, and steroids). A large baseline sample size was also required to accommodate several exclusion criteria. The first exclusion addressed a large number of missing data for several key variables related to social capital and illicit drug use. From initial examination of the data, it was revealed that only a select number of provinces and territories (Quebec, British Columbia, Nova Scotia, New Brunswick, Saskatchewan, Yukon, Nunavut, and North West Territories) chose to include optional survey content related to social capital measures. Out of these provinces and territories, only British Columbia[5], Nova Scotia, New Brunswick, and Saskatchewan

[5] Respondents from the survey administered to British Columbia in 2009-2010 did not answer questions about illicit drug use and were excluded from analysis.

respondents answered questions about drug use. Since this study was interested in the relationship between social capital and illicit drug use, all provinces and territories that did not include measures of social capital or illicit drug use in their survey questionnaires were excluded from analysis, leaving only the four above-mentioned provinces available for analysis. Because of this exclusion, the sample is not nationally representative and cannot be generalized to represent the larger population of Canada.

Respondents under the age of 18 were also excluded on the basis of comparability with other studies. Exclusion of this age group allowed for meaningful comparisons with other surveys that have analyzed the relationship between social capital and illicit drug use and have applied similar demographic exclusions (Granfield & Cloud, 2001; Reynoso-Vallejo, 2011; Weitzman & Chen, 2005). In addition, literature also suggests that adolescents may not accurately report drug-related behaviours, with some researchers suggesting that adolescents are more likely to underreport sensitive drug-related behaviour in household surveys especially in the presence of a parent (Gfroerer, Bose, Kroutil, Lopez, & Kann, 2012). Others have suggested that procedures for obtaining parental consent and mode of administration may also have a significant influence on adolescents' responses to drug-related survey questions (Fendrich & Rosenbaum, 2003). Given these considerations, it seemed reasonable to exclude respondents under 18 years of age. After all exclusion criteria were applied, the remaining sample retained 31,175 respondents. Finally, a sub-sample of respondents (n=2,402) who reported dependent use within the last 12 months was used to analyze drug dependence.

Merging of Datasets

Before merging the three datasets, key variables were assessed for consistency, including a close investigation of whether questions asked, variable names used, and possible responses given were identical. It was revealed that there was some variation between datasets in the income variable in terms of number of possible responses and variable names. This variable was recoded to match across all datasets. Cases in the three cycles were subsequently merged in SPSS.

Sample Weights

In order to adjust for variation in sampling and response rates, each of the individual datasets was weighted. The rationale of weighting is to preserve uniform sampling procedures and ensure the sample is balanced so that respondents from different regions are not over- or underrepresented.

Imputation of Missing Income Values

Missing values for income were addressed by using multiple imputation. Of the sample (n=31,175), 13.36% had missing values for income. Using the Markov Chain Monte Carlo (MCMC) method, income for missing cases was imputed and used as a predictor variable. Variables not imputed, but used as predictors included: age, sex, community type, race, education, marital status as well as measures of structural social capital, social support, and drug dependence.

Access to Microdata

Because the Public Use Microdata File (PUMF) only included data on the use of marijuana, requests for access to the Master file of the CCHS were made to access more detailed data on the use of other illicit drugs as well as on measures of drug dependence. Given the confidential nature of questions addressing drug use, Master file datasets required formal request and security screening before access was granted on March 23, 2015. Master files were made available through the Windsor Research Data Centre. While this study used data collected by Statistics Canada, the opinions expressed in this study do not represent the views of Statistics Canada.

Dependent Variables

Several outcome measures were used in this study and were organized by theme. The first theme involved the influence of social capital on illicit drug use patterns. These patterns were observable in the form of lifetime prevalence of illicit drug use and prevalence of illicit drug use in the last 12 months. The second theme involved the influence of social capital on illicit drug dependence and interference of illicit drugs in the respondents' lives.

The first dependent variable "Lifetime Prevalence of Illicit Drug Use" measured by whether the respondent had ever used illicit drugs during his or her lifetime. Respondents were asked, "Have you ever used or tried 1) Marijuana; 2) Cocaine/Crack; 3) Speed (amphetamines); 4) Ecstasy; 5) Hallucinogens, PCP, or LSD (acid) 6) Glue, gasoline, or other solvents (inhalants); 7) Heroin; or 8) Steroids?" Possible responses were coded into a dichotomous variable with possible responses including "yes" or "no"

in relation to each drug (see Table 3.1). In addition, an aggregate measure of prevalence of illicit drug use was computed by combining respondents who reported using at least one of the eight illicit drugs during their lifetime.

Table 3.1: Recoded Responses for Lifetime Prevalence of Illicit Drug Use

Question	**Possible Responses (Recoded)**
"Have you ever used or tried marijuana, cannabis or hashish?"	1= Yes, 0=No
"Have you ever used or tried cocaine or crack?"	1= Yes, 0=No
"Have you ever used or tried speed (amphetamines)?"	1= Yes, 0=No
"Have you ever used or tried ecstacy (MDMA)?"	1= Yes, 0=No
"Have you ever used or tried hallucinogens, PCP, or LSD (acid)?"	1= Yes, 0=No
"Did you ever sniff glue, gasoline or other solvents?"[6]	1= Yes, 0=No
"Have you ever used or tried heroin?"	1= Yes, 0=No
"Have you ever used or tried steroids, such as testosterone, dianabol or growth hormones, to increase your performance in sport or activity or to change your physical appearance?"	1= Yes, 0=No

Research has suggested that there is significant variability between lifetime use and recent use of illicit drugs (Barton, 2011; Ramsay & Partridge, 1999). In one study, researchers lamented, "lifetime use does not accurately reflect the proportion currently using drugs on an occasional or regular basis" (as cited in Barton, 2011, p.35). Therefore, questions about use within the last 12 months were included to gauge recent drug use patterns. To measure "Prevalence of Illicit Drug Use in the Last 12 months", respondents were asked: "Have you used 1) Marijuana; 2) Cocaine/Crack; 3) Speed (amphetamines); 4) Ecstasy in the past 12 months?" Possible responses included "yes" or "no" (see Table 3.2). Because of sample size limitations, analysis was not possible for hallucinogens, inhalants, heroin, or steroids.

[6] Glue, gasoline, and solvents will be referred to as inhalants

Table 3.2: Recoded Responses for Prevalence of Illicit Drug Use in the Last 12 Months

Question	Possible Responses (Recoded)
"Have you ever used marijuana, cannabis or hashish in the past 12 months?"	1= Yes, 0=No
"Have you ever used cocaine or crack in the past 12 months?"	1= Yes, 0=No
"Have you ever used speed (amphetamines) in the past 12 months?"	1= Yes, 0=No
"Have you ever used ecstacy (MDMA) in the past 12 months?"	1= Yes, 0=No

Consumption patterns and drug dependence have generally been considered to be separate, yet related constructs (Finch & Welch, 2006). Dependent use of a substance often infers excessive or high frequency of use, but the relationship does not always hold true when reversed as evidenced by those who binge or consume large quantities of substances yet show very few indicators of dependence such as physical withdrawal, tolerance, or interference into daily activities (Finch & Welch, 2006). The debate about what drug dependence and drug addiction exactly entails (and whether these two terms are synonymous or represent different constructs[7]) has been contentious, with various organizations and researchers suggesting different conceptualizations (Alexander, 2010; Pudney, 2010). The National Institute of Drug Abuse (NIDA), for example, defines drug dependence as, "A state in which an organism functions normally only in the presence of a drug" (National Institute of Drug Abuse, 2007). Such a definition is not particularly useful given its vague and ambiguous articulation of 'normal' functioning. On the other hand, the DSM-IV-TR definition describes substance dependence as a "maladaptive pattern of substance use, leading to clinically significant impairment or distress as

[7] The present study treated drug dependence and drug addiction as interchangeable terms, but see Alexander (2010) for a more in-depth exploration of these concepts.

manifested by three (or more)" of the criteria (see Table 3.3), occurring at any time in the same 12-month period (American Psychiatric Association, 2000, p.197).

Table 3.3: DSM-IV-TR Criteria for Substance Dependence Adapted from the American Psychiatric Association (2000)

1. tolerance, as defined by either of the following:
   a. a need for markedly increased amounts of the substance to achieve intoxication or desired effect
   b. markedly diminished effect with continued use of the same amount of the substance
2. withdrawal, as manifested by either of the following:
   a. the characteristic withdrawal syndrome for the substance . . .
   b. the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms
3. the substance is often taken in larger amounts or over a longer period than was intended
4. there is a persistent desire or [there are] unsuccessful efforts to cut down or control substance use
5. a great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use the substance (e.g., chain smoking), or recover from its effects
6. important social, occupational, or recreational activities are given up or reduced because of substance use
7. the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g., current cocaine use despite recognition of cocaine-induced depression, or continued drinking despite recognition that an ulcer was made worse by alcohol consumption) (American Psychiatric Association, 2000, p.197).

While providing a more comprehensive inclusion of the physical, psychological, and social elements of drug dependence compared to the definition proposed by NIDA, the DSM criteria are not without their own limitations. As many have argued, physical symptoms of tolerance and withdrawal that have been regarded as defining features of dependence among opioid users have not necessarily been the case for users of other drugs such as marijuana or cocaine (Alexander, 2010; Finch & Welch, 2006; Maté,

2009). Nevertheless, several studies have established high validity, inter-rater and post-retest reliability of the diagnostic criteria outlined by the DSM (Fein, Gelernter, Cubells, Farrer, & Kranzler, 2009; Hasin, Hatzenbuehler, Keyes, & Ogburn, 2006; Pierucci-Lagha et al., 2007).

Therefore the third dependent variable measured drug dependence using an index of aggregated indicators of illicit drug dependence derived from survey questions partially modelled after the DSM-IV criteria on substance dependence. These included questions about tolerance, withdrawal symptoms, behavioural responses to these symptoms, increased frequency of drug use, and compulsive drug-use behaviours despite negative consequences. These questions pertained to drug use generally rather than employing a specific focus on specific types of drugs. Possible responses to each question included "Yes" or "No". Responses were dummy-coded into a dichotomous variable with affirmative answers equal to 1 and negative answers equal to 0. A summary of questions and possible recoded responses of the individual components of the index are shown in table 3.4 below.

Table 3.4: Constituent Concepts of Dependence Index

Question	Concept Measured	Possible Responses (Recoded)
"During the past 12 months, did you ever need to use more drugs than usual in order to get high or did you find that you could no longer get high on the amount you usually took?"	Tolerance	1=Yes, 0=No
"During the past 12 months, did you ever have times when you stopped, cut down or went without drugs and then experienced symptoms like fatigue, headaches, diarrhea, the shakes or emotional problems?"	Physical and Emotional Withdrawal	1=Yes, 0=No
"During the past 12 months, did you ever have times when you used drugs to keep from having such symptoms?"	Response to Withdrawal	1=Yes, 0=No
"During the past 12 months, did you ever have times when you used drugs event though you promised yourself you wouldn't, or at times when you used a lot more drugs than you intended?"	Compulsion	1=Yes, 0=No
"During the past 12 months, were there ever times when you used drugs more frequently, or for more days in a row than you intended?"	Higher Frequency of Use than Intended	1=Yes, 0=No
"During the past 12 months, did you ever have periods of several days or more when you spent so much time using drugs or recovering from the effects of using drugs that you had little time for anything else?"	Great Deal of Time Spent on Use and/or Recovery	1=Yes, 0=No
"During the past 12 months, did you ever have periods of a month or longer when you gave up or greatly reduced important activities because of your use of drugs?"	Interference	1=Yes, 0=No
"During the past 12 months, did you ever continue to use drugs when you knew you had a serious physical or emotional problem that might have been caused or made worse by your use?"	Use Despite Harmful Consequences	1=Yes, 0=No

Exploratory factor analysis was used to reduce the index to a homogeneous set of questions that were associated with an underlying factor. However, all questions pertaining to drug dependence were found to be of the same factor. Cronbach's Alpha coefficient for the 8 items was .819, suggesting that the items have relatively high internal consistency. Factor loadings are shown with the first factor accounting for 46.9% of the variance (see Table 3.5).

Table 3.5: Factor Loadings for Drug Dependence Index

	Component 1
Need.+ drg than usual to get high -12 mo	0.609
Had sympt.during per.of cut down -12 mo	0.669
Used drg - prevent having sympt. - 12 mo	0.650
Used drg - promised wouldn't - 12 mo	0.700
Used drg - more freq. intented - 12 mo	0.642
Used drg - little time anyth.else -12 mo	0.732
Reduced imp. activities - b/c drg -12 mo	0.712
Cont. taking drg desp. hlth prob - 12 mo	0.750

The resulting drug dependence index was a summation of affirmative responses to each question and was treated as a continuous variable. This allowed for a consideration of the cumulative effect of multiple indicators of dependence.

The fourth dependent variable "Interference of Drug Use in the Last 12 Months" consisted of measures of drug interference in several aspects of respondents' lives. Questions were prefaced with the following statement: "Please tell me what number best describes how much your use of drugs interfered with each of the following activities during the past 12 months. For each activity, answer with a number between 0 and 10; 0 means 'no interference', while 10 means 'very severe interference'". Possible responses to each question were located on a scale from 1 to 10, with 0 representing "no

interference" and 10 representing "very severe interference". These questions pertained to drug use generally rather than employing a specific focus on each type of drug. For comparability purposes, those who did not have a regular job were excluded from the models (see Appendix A for results without exclusion). A summary of questions and possible responses is shown in Table 3.6 below.

Table 3.6: Responses for Interference of Illicit Drug Use in the Last 12 Months

Question	**Possible Responses**
How much did your use of drugs interfere with: your home responsibilities, like cleaning, shopping and taking care of the house or apartment?	Interval from 0 to 10 0 = "no interference" 10 = "very severe interference"
How much did your use of drugs interfere with: your ability to work at a regular job?	Interval from 0 to 10 0 = "no interference" 10 = "very severe interference"
How much did your use of drugs interfere with: your ability to form and maintain close relationships with other people?	Interval from 0 to 10 0 = "no interference" 10 = "very severe interference"
How much did your use of drugs interfere with: your social life?	Interval from 0 to 10 0 = "no interference" 10 = "very severe interference"

Independent Variables: Measures of Social Capital

Structural dimensions of social capital were measured by network size and marital status. Relational dimensions of social capital were measured by the availability of social support.

Network Size

Using previous conceptualizations that have made distinctions between different dimensions of social capital (Grootaert & van Bastelaer, 2002; Uphoff, 2000), the structural dimension of social capital was operationalized to include the respondent's network size and marital status (see below). The inclusion of network size follows other studies that have used similar measures to represent social capital (Häuberer, 2010; Kirst, 2009; Lin et al., 2001). Network size was determined by asking respondents, "How many close friends and close relatives do you have, that is, people you feel at ease with and can talk to about what is on your mind?" and responses were recoded into a continuous variable ranging from 0 to 99.

Marital Status

This study proposes that marital status is best operationalized as a structural form of social capital in which relational forms of social capital can be accessed. In terms of survey response, marital status was respondents reported either being: "Married", "Common-law", "Single", "Separated", "Divorced", or "Widowed". Marital status was recoded into a new variable with three separate categories by merging "Married" with "Common-law", merging "Separated", "Divorced", "Widowed", and keeping "Single" as a distinct category. A summary of the recoded variable is shown in Table 3.7 below.

Table 3.7: Recoded Marital Status

Category	Possible Responses (Recoded)	Associated Social Capital
Married/Common-law	0 (Reference)	1 Person
Separated/Divorced/Widowed	1	0 Persons
Single	1	0 Persons

The rationale for joining response categories was based on the logic that individuals who were married or in a common-law arrangement had a significant other who could act as a potential source of social capital. Following the same logic, individuals who were separated, divorced, or widowed may not have a significant other to rely on for social capital. Furthermore, it was necessary to distinguish between individuals who were single and individuals who were separated/divorced/widowed based on differences in these two groups in terms of substance use outcomes reported in the literature (Duncan et al., 2006; Heinz et al., 2009; Merline et al., 2004; Umberson, 1987; Waldron et al., 1996). Additionally, results of the post hoc Scheffe test (see Table 4.4) confirmed that those who were separated/divorced/widowed were significantly different from those who were married and from those who were single in measures of drug dependence.

Social Support

Social support has been conceptualized as belonging to the relational axes of social capital (Aslund & Nilsson, 2013; Häuberer, 2010; Tsai & Ghoshal, 1998). In terms of measurement, a social support index was developed from aggregated responses to questions about perceived social support availability[8]. Responses to each question were converted to a scale point system corresponding to how often respondents felt that certain

[8] From here on, perceived social support will be referred to as social support.

types of social support were available to them. Each question had four possible responses including “None of the time” (0), “A little of the time” (1), “Some of the time” (2), “Most of the time” (3), “All of the time” (4). The index was comprised of the following questions displayed below in Table 3.8:

Table 3.8: Questions Used to Construct Social Support Index

How often is each of the following kinds of support available to you if you need it?
a) Someone to help you if you were confined to bed
b) Someone you can count on to listen to you when you need to talk
c) Someone to give you advice about a crisis
d) Someone to take you to the doctor if you needed it
e) Someone who shows you love and affection
f) Someone to have a good time with
g) Someone to give you information in order to help you understand a situation
h) Someone to confide in or talk to about yourself or your problems
i) Someone who hugs you
j) Someone to get together for relaxation
k) Someone to prepare your meals if you were unable to do it yourself
l) Someone whose advice you really want
m) Someone to do things with to help you get your mind off things
n) Someone to help with daily chores if you were sick
o) Someone to share your private worries and fears with
p) Someone to turn to for suggestions about how to deal with a personal problem
q) Someone to do something enjoyable with
r) Someone who understands your problems
s) Someone to love you and make you feel wanted

Exploratory factor analysis was used to reduce the index to a homogeneous set of questions that were associated with an underlying factor. While 16 of the questions loaded on one factor with 65.1% of the variance accounted by the first factor, questions A (“Someone to help you if you were confined to bed”) and B (“Someone you can count on to listen to you when you need to talk”) were loaded on a different factor. These two questions were subsequently excluded, resulting in an index comprised of responses from 16 questions. Cronbach’s Alpha coefficient for the 16 items was .962, suggesting that the

items have relatively high internal consistency. The results of the factor loadings are shown below in Table 3.9:

Table 3.9: Factor Loadings for Social Support Index

	Component
	1.000
Has someone to take to doctor	0.699
Has someone who shows love and affection	0.775
Has someone to have a good time with	0.821
Has someone to receive info/help situation	0.810
Has someone to confide in	0.827
Has someone who gives hugs	0.790
Has someone to get together w/for relax.	0.831
Has someone to prepare meals	0.746
Has someone to give advice	0.801
Has someone to do things to get mind off	0.825
Has someone to help with daily chores	0.770
Has someone to share most priv. worries	0.843
Has someone to turn to for suggestions	0.851
Has someone to do something enjoyable	0.863
Has someone who understands problems	0.843
Has someone who loves/makes feel wanted	0.792

Control Variables: Socio-demographic and Socioeconomic Variables

Several socio-demographic variables were included in the analyses as controls. Studies have consistently shown age as a correlate of drug use. Research shows that illicit drug use increases during adolescence, reaching an apex in early adulthood, and then steadily decreasing throughout the remainder of an individual's life course (Mosher & Akins, 2007). Log transformation was applied to age to better model the non-linear relation between age and illicit drug use suggested by the literature, but the transformed variable was not found to be significant. Thus, age was treated as a linear, continuous variable ranging from 18 to 101 years of age.

Sex differences have also been found with respect to prevalence of illicit drug use with males more likely to use illicit substances and become dependent on illicit drugs (Becker & Hu, 2008; Cotto et al., 2010). Sex was dummy coded with "Female" equal to 0 and "Male" equal to 1.

Researchers have shown geographical variation in illicit drug use. In terms of variation among the four provinces analyzed in this study, the 2011 Canadian Alcohol and Drug Use Monitoring Survey found that among a sample of 10,076 respondents, British Columbia reported the highest prevalence of any illicit drug use during one's lifetime (47.9%) compared to Nova Scotia (44.9%), New Brunswick (38.7%), and Saskatchewan (38%). Nova Scotia, however, reported the highest prevalence of any illicit drug use in the last 12 months (14.1%) compared to British Columbia (13.8%), New Brunswick (9.6%), and Saskatchewan (9.3%) (as cited in Canadian Alcohol and Drug Use Monitoring Survey, 2012). Community type has also shown to affect rates of illicit drug use although findings are mixed (Gfroerer et al., 2007; Mosher & Akins, 2007).

Mosher and Akins (2007) have shown that rural areas are generally more likely to use legal substances such as alcohol, prescription drugs, and inhalants while Gfroerer and colleagues (2007) have shown higher prevalence of methamphetamine use in rural areas, higher prevalence of ecstasy use in urban areas, and generally similar trends between urban and rural communities with respect to other types of illicit drugs. The CCHS uses the Statistics Canada (2013) definition of 'rural and small town' to refer to "populations living outside the commuting zones of larger urban centres, specifically outside census metropolitan areas (CMA) and census agglomerations (CA)". Community type was included as a dichotomous variable and dummy coded with 0 equal to "Rural" and 1 equal to "Urban".

Literature has also demonstrated significant differences between ethno-racial groups and patterns of illicit drug use (when broken down by type of drug) and dependence (Johnston et al., 2011; Wallace et al., 2002). Many studies have reported that Blacks exhibit lower levels of illicit drug use than Whites (Johnston et al., 2005; McCabe et al., 2007; Wallace et al., 2002), but Aboriginal peoples are generally more likely to report higher levels of illicit drug use and substance use disorders when compared to other ethno-racial groups (Mitchell et al., 2003; SAMSHA, 2013). Race was initially coded to include 13 possible options including White, Aboriginal, Southeast Asian, Korean, Filipino, Japanese, Chinese, Black, South Asian, Arab, West Asian, Latin American, and Other. Due to small cell sizes the final race variable included White, Aboriginal, Asian, Black, and Other. Due to further limitations in sample size, some analyses required the collapse of Asian and Black ethno-racial categories into "Other"

and is appropriately indicated in their respective tables. This was most often the case for analyses of use of heroin, inhalants, and steroids in which cell counts were relatively low.

Lastly, personal income and education were used as measures of SES, both of which have been shown to influence illicit drug use and dependence (Grant, 1996; Legleye et al., 2012; Teesson et al., 2006). While studies have utilized different measures of SES and have consequently produced mixed findings, they generally show that higher socioeconomic status has protective effects against certain types of illicit drugs (e.g., heroin and cocaine) and against more frequent or problematic (e.g., dependent use, injection use) forms of drug use (Johnston et al., 2005; Jones, Logan, Gladden, & Bohm, 2015; Legleye et al., 2012; Williams & Latkin, 2007). Income was coded into four categories of less than $10,000, $10,000 to $29,999, $30,000 to $59,999, and over $60,000. Education was recoded into those with a high school diploma or less equal to 0 and those with more than a high school diploma equal to 1 (see Grant, 1996; Teesson et al., 2006).

Description of Data Analysis Techniques

Analysis consisted of several stages. All analyses were conducted in SPSS. Frequency distributions were provided to give an overview of the sample. Next, bivariate relationships for predictors were provided for lifetime prevalence of each type of drug. Variables that were continuous (age, social support, and network size) were recoded into manageable categories to summarize the data in a meaningful way. Next, means and standard deviations were displayed to show bivariate relationships between predictors and variables of social support, network size, and drug dependence. Additionally, Scheffe

tests were used to compare means and assess meaningful differences across all predictors with social support, network size, and drug dependence.

Multivariate analyses included several different regression models. The first set of multivariate analyses involved the use of binary logistic regressions to evaluate the relationship between social capital and *lifetime* prevalence of illicit drug use. The first logistic regression used prevalence of illicit drug use as an aggregated outcome measure to problematize treating illicit drug use as a general category. The next logistic regressions were conducted on individual types of illicit drugs. A total of eight binary logistic regressions for lifetime prevalence of marijuana, cocaine/crack, amphetamines, ecstasy, hallucinogens, inhalants, heroin, and steroids were conducted. The second set of multivariate analyses involved the use of binary logistic regressions to evaluate the relationship between social capital and prevalence of each drug *in the last 12 months*. Only four binary logistic regressions for marijuana, cocaine/crack, amphetamines, and ecstasy were conducted due to low sample size. The last two sets of multivariate analyses (sets three and four) were conducted to assess the relationship between social capital and drug dependence. Prior to conducting the analyses, all relevant assumptions of Ordinary least squares (OLS) regression such as linearity, normality, homoscedasticity, independence, and model specification were checked and no violations of OLS assumptions were observed. In addition, any potential issues regarding influence and collinearity were checked. The first analysis used a four-stage hierarchical multiple regression with drug dependence index as the outcome variable using a sub-sample of 1,903 respondents. All respondents had reported using at least one illicit drug within the last 12 months. Socio-demographic variables age, sex, race, and community were entered

in the first stage. Socioeconomic variables (income and education level) were added in the second stage. Network size and marital status measuring structural dimensions of social capital were added in the third stage. Social support as an index was entered into the model as the fourth and final stage. The rationale in separating social support from the other forms of social capital is two-fold. First, social support is considered a relational feature of social capital and is chronologically preceded by structural elements of social capital. In other words, individuals need social ties in the first place to receive social support. Second, entering social support separately allows an assessment of how structural measures of social capital change once relational measures are introduced.

The last multivariate analyses consisted of a set of linear regressions assessing the relationship between social capital and individual measures of drug interference. A total of five linear regressions were conducted.

Chapter 4: Results

Descriptive Analyses

There were two samples used in the analyses. The first sample consisted of 31,175 respondents, most of whom were distributed in the age category of 41-60 years of age (38.5%). This sample showed a fairly even distribution between males (48.1%) and females (51.9%) and consisted of a large proportion of respondents who: resided in British Columbia (53.2%), resided in an urban area (78%), identified as White (81.9%), attained more than a high school diploma (84.9%), and had income between $30,000 and $59,999 (34.2%). By contrast, the sub-sample of those who answered questions about drug dependence included respondents who were generally younger, with very few respondents over the age of 61 (2.3%). This sample showed a less even distribution between males (33.4%) and females (66.6%). Similar to the first sample, a large proportion of respondents: resided in British Columbia (60.2%), resided in an urban area (80.7%), identified as White (82.5%), and attained more than a high school diploma (85.8%). Most respondents were distributed in the middle income categories of $10,000 to $29,999 (30.6%) and $30,000 to $59,999 (33.6%). Table 4.1 below shows the distributions of the main and dependence subsample.

Table 4.1: Sample Distributions of Main Sample and Dependence Subsample

		Main Sample	Dependency Subsample
Age			
	18-25 Years	14.2%	34.0%
	26-40 Years	26.5%	36.5%
	41-60 Years	38.4%	27.2%
	61+ Years	20.8%	2.3%
Sex			
	Male	48.1%	33.4%
	Female	51.9%	66.6%
Race			
	White	81.9%	82.5%
	Aboriginal	4.8%	12.5%
	Asian	6.9%	1.2%
	Black	0.9%	1.0%
	Other (Arab, Latino, etc.)	5.6%	2.8%
Province			
	Nova Scotia	12.5%	12.4%
	New Brunswick	10.0%	7.7%
	Saskatchewan	24.3%	19.7%
	British Columbia	53.2%	60.2%
Community			
	Urban	78.0%	80.7%
	Rural	22.0%	19.3%
Income			
	$0-$9,999	13.2%	13.2%
	$10,000-$29,999	32.4%	30.6%
	$30,000-$59,999	34.2%	33.6%
	$60,000+	20.2%	22.5%
Education			
	Up to High School Diploma	15.1%	13.1%
	More than High School Diploma	84.9%	86.9%
N		31175	2402

In comparing the two samples, it is evident that some groups had higher and lower levels of drug dependence compared to their share of the population in the main sample. For instance, while respondents aged 61 and over represented 20.8% of the population in the main sample, they only accounted for 2.3% of respondents in the dependence sample. This drastic difference suggests that this age group is much less likely to report dependence on drugs compared to other age groups. Males were also underrepresented in the dependence sample, representing 48.1% of the main sample and only 33.4% of the dependence sample. Caution should be exercised in interpreting the results as the literature suggests that males are more likely to be dependent on drugs (Becker & Hu, 2008; Brady & Randall, 1999; Teesson et al., 2006). The smaller proportion of males in the dependence sample may, as a result, underestimate the effects of male drug dependence. The last major difference observed between the two samples was the relative overrepresentation of Aboriginal peoples in the dependence sample. While Aboriginal peoples represented only 4.8% of the main sample population, they represented 12.5% of the dependence sample, indicating a higher prevalence of drug dependence in this population when compared to other ethno-racial groups.

Table 4.2 shows that in the main sample (n=31,175), 46.8% of respondents reported that they had used an illicit drug at least once in their lifetime. Respondents most frequently reported having tried marijuana at least once in their lifetime (46.3%) followed by cocaine/crack (9.4%), and hallucinogens (9.4%). The least common drugs used were steroids (0.8%), heroin (0.9%), and inhalants (1%).

Table 4.2: Lifetime Prevalence of Illicit Drug Use by Drug Type

	Yes		No		Total	
	n	%	n	%	n	%
Any Illicit Drug	14600	46.8	16575	53.2	31175	100.0
Marijuana	14430	46.3	16745	53.7	31175	100.0
Cocaine	2932	9.4	28243	90.6	31175	100.0
Amphetamines	1279	4.1	29896	95.9	31175	100.0
Ecstasy	1742	5.6	29433	94.4	31175	100.0
Hallucinogens	2923	9.4	28252	90.6	31175	100.0
Inhalants	300	1.0	30875	99.0	31175	100.0
Heroin	275	0.9	30900	99.1	31175	100.0
Steroids	254	0.8	30921	99.2	31175	100.0

Table 4.3 presents the number and percentage of respondents who answered affirmatively to questions about lifetime use of illicit drugs. Significance tests were based on internal group variation and several different tests were used including Chi-square, Phi, Cramer's V, and Gamma.

Table 4.3: Distributions of Lifetime Prevalence of Illicit Drug Use by Predictors

	Total Population		Marijuana		Cocaine		Amphetamines		Ecstasy		Hallucinogens		Inhalants		Heroin		Steroids	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Age			***		***		***		***		***		***		***		***	
18-25 Years	4440	14.2	2496	56.2	485	10.9	219	4.9	655	14.8	425	9.6	21	0.5	44	1.0	60	1.4
26-40 Years	8258	26.5	4669	56.5	1086	13.2	426	5.2	828	10.0	1108	13.4	96	1.2	102	1.2	127	1.5
41-60 Years	11992	38.5	6348	52.9	1297	10.8	588	4.9	246	2.1	1293	10.8	165	1.4	117	1.0	53	0.4
61+ Years	6484	20.8	917	14.1	64	1.0	46	0.7	13	0.2	97	1.5	18	0.3	12	0.2	14	0.2
Total	31175	100.0	14430		2932		1279		1742		2923		300		275		254	
Sex			***		***		***		***		***		***		***		***	
Male	15020	48.2	7803	52.0	1773	11.8	769	5.1	979	6.5	1812	12.1	216	1.4	174	1.2	213	1.4
Female	16155	51.8	6627	41.0	1160	7.2	510	3.2	763	4.7	1110	6.9	84	0.5	101	0.6	42	0.3
Total	31175	100.0	14430		2932		1279		1742		2923		300		275		254	
Race																	*	
White	25528	81.9	12646	49.5	2410	9.4	1096	4.3	1378	5.4	2560	10.0	236	0.9	227	0.9	207	0.8
Aboriginal	1506	4.8	1061	70.5	394	26.2	136	9.0	232	15.4	280	18.6	47	3.1	43	2.9	30	2.0
Asian	2134	6.8	299	14.0	61	2.9	↓[1]	↓[1]	44	2.1	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]
Black	267	0.9	108	40.4	17	6.4	↓[1]	↓[1]	39	14.6	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]	↓[1]
Other (Arab, Latino, etc.)	1738	5.6	316	18.2	51	2.9	47	2.7	50	2.9	83	4.8	17	1.0	6	0.3		0.0
Total	31175	100.0	14430		2932		1279		1742		2923		300		275		254	
Province			*		***		***		***		***		**		***		*	
Nova Scotia	3904	12.5	1893	48.5	207	5.3	109	2.8	132	3.4	322	8.2	58	1.5	10	0.3	44	1.1
New Brunswick	3097	9.9	1320	42.6	146	4.7	111	3.6	100	3.2	200	6.5	30	1.0	11	0.4	9	0.3
Saskatchewan	7574	24.3	3298	43.5	512	6.8	188	2.5	347	4.6	472	6.2	60	0.8	27	0.4	57	0.8
British Columbia	16600	53.2	7919	47.7	2067	12.5	871	5.2	1163	7.0	1929	11.6	152	0.9	227	1.4	143	0.9
Total	31175	100.0	14430		2932		1279		1742		2923		300		275		254	
Community			***		***		**		***		***							
Urban	24334	78.1	11402	46.9	2417	9.9	1041	4.3	1515	6.2	2390	9.8	223	0.9	222	0.9	207	0.9
Rural	6841	21.9	3028	44.3	516	7.5	238	3.5	228	3.3	533	7.8	78	1.1	53	0.8	47	0.7
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	

Income			***		***				***		***		**		***		***	
$0-$9,999	4124	13.2	1541	37.4	325	7.9	153	3.7	232	5.6	315	7.6	29	0.7	54	1.3	23	0.6
$10,000-$29,999	9545	30.6	3903	40.9	826	8.7	422	4.4	624	6.5	848	8.9	112	1.2	105	1.1	56	0.6
$30,000-$59,999	10469	33.6	5173	49.4	1072	10.2	401	3.8	563	5.4	986	9.4	81	0.8	56	0.5	114	1.1
$60,000+	7037	22.6	3813	54.2	710	10.1	303	4.3	323	4.6	774	11.0	78	1.1	61	0.9	60	0.9
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	
Education			***		*						*		*		*			
Up to High School Diploma	4065	13.0	1424	35.0	425	10.5	170	4.2	218	5.4	338	8.3	51	1.3	50	1.2	39	1.0
More than High School Diploma	27111	87.0	13006	48.0	2507	9.2	1109	4.1	1524	5.6	2585	9.5	249	0.9	225	0.8	215	0.8
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	
Network Size			***		***				***		***		***		***		***	
0 Close Friends/Family	281	0.9	118	42.0	50	17.8	18	6.4	↓[2]	↓[2]	38	13.5	↓[2]	↓[2]	7	2.5	-	-
1-3 Close Friends/Family	5771	18.5	2537	44.0	539	9.3	242	4.2	↓[2]	↓[2]	474	8.2	↓[2]	↓[2]	71	1.2	-	-
4-10 Close Friends/Family	18168	58.3	8535	47.0	1694	9.3	717	3.9	1316	7.2	1719	9.5	249	1.4	140	0.8	-	-
11-20 Close Friends/Family	5398	17.3	2570	47.6	516	9.6	201	3.7	324	6.0	510	9.4	36	0.7	37	0.7	-	-
21+ Close Friends/Family	1558	5.0	671	43.1	134	8.6	102	6.5	102	6.5	182	11.7	16	1.0	21	1.3	-	-
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	
Marital Status			***		***		***		***		***		**		***		***	
Married/Common-Law	20213	64.8	8909	44.1	1599	7.9	737	3.6	723	3.6	1728	8.5	171	0.8	107	0.5	151	0.7
Separated/Divorced/Widowed	3809	12.2	1465	38.5	328	8.6	152	4.0	120	3.2	312	8.2	39	1.0	48	1.3	18	0.5
Single	7153	22.9	4056	56.7	1006	14.1	391	5.5	899	12.6	883	12.3	90	1.3	120	1.7	85	1.2
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	
Social Support			***		***		***		***		***		***		***		***	
0-21 Scale Value	544	1.7	239	43.9	84	15.4	44	8.1	29	5.3	70	12.9	12	2.2	18	3.3	10	1.8
22-42 Scale Value	3311	10.6	1488	44.9	408	12.3	172	5.2	213	6.4	401	12.1	54	1.6	44	1.3	41	1.2
43-99 Scale Value	27320	87.6	12702	46.5	2441	8.9	1063	3.9	1500	5.5	2452	9.0	234	0.9	213	0.8	204	0.7
Total	31175	100.0	14430		2933		1279		1742		2923		300		275		254	

*** p≤.001, ** p≤.01, * p≤.05

[1]Due to cell counts of less than 5, Asian and Black were merged into Other

[2]Due to cell counts of less than 5, the identified categories were merged into one category: 0-10

Cell counts for network size were less than 5 and were excluded as per requirements by Statistics Canada

Weighted frequencies were rounded to the nearest whole number

Given the importance of social capital to this study, I will first discuss the relationship between social capital measures and lifetime prevalence of illicit drug use as shown in Table 4.3. The results show that as network size increases, the relative proportions of those who reported cocaine/crack use in their lifetime decreases. In contrast, as we make the same progression from the lowest to highest categories of network size, the distribution of lifetime prevalence of marijuana, amphetamine, ecstasy, inhalant and heroin use showed a curvilinear relationship. The curvilinear relationship of marijuana was unique because more prevalent use was concentrated in the mid-ranges of network size, whereas for amphetamines, ecstasy, inhalants, and heroin, more prevalent use was concentrated at the extremes of network size. In terms of marital status, lifetime use of drugs was generally higher for those who were single compared to those who were separated/divorced/widowed and those who were married/common-law. The distributions of lifetime prevalence by categories of social support showed that as social support increases, prevalence of cocaine, amphetamine, hallucinogen, inhalant, heroin, and steroid use decreased. Lifetime prevalence of ecstasy use, however, was higher among those in the middle category of social support.

General trends with regard to socio-demographic variables included higher lifetime prevalence among those who aged 26-40, male, and of Aboriginal descent. British Columbia showed higher prevalence of cocaine/crack, amphetamine, ecstasy, hallucinogen, and heroin use compared to other provinces. Lifetime prevalence ecstasy use was lower in rural areas, but there was generally little disparity in prevalence rates between urban and rural areas for all other drugs. Furthermore, for marijuana, cocaine/crack, and hallucinogens, the proportions of lifetime prevalence of use generally

increased with income level. Lastly, those with more than a high school diploma were more likely to have tried marijuana, ecstasy, and hallucinogens in their lifetime compared to those with a high school diploma or less.

In summary, higher social support was associated with lower levels of most types of drug use except for marijuana, while married individuals were less likely to use all types of drugs when compared to those who were single.

Table 4.4 below shows average social support, network size, and drug dependence by socio-demographic, socioeconomic, and social capital variables.

Table 4.4: Means Table of Social Support, Network Size, and Drug Dependence by Predictors

	Social Support (IV)	Network Size (IV)	Dependency Index (DV)
Age			
18-25 Years[R]	55.1208	9.5137	1.1021
26-40 Years	54.2873	9.6177***	1.0196
41-60 Years	52.3837*	8.6668***	0.667***
61+ Years	52.7433*	9.6091	0.4301*
Sex			
Male	53.4963	9.823	0.8985
Female	55.0629	8.3329	1.0189
Race			
White[R]	54.0387	9.7036	0.8575
Aboriginal	53.457*	7.6938	1.4208***
Asian	45.6786***	12.7499***	0.6708
Black	55.848	2.9639	1.5321
Other (Arab, Latino, etc.)	59.1464***	6.2314***	1.049
Province			
Nova Scotia[R]	54.1821	7.8076	1.0196
New Brunswick	53.6907**	8.8563***	0.8392
Saskatchewan	53.1353	9.4129***	1.1266
British Columbia	54.3187***	9.6692	0.8733
Community			
Urban	54.1445	9.3754	0.9513
Rural	53.5034	9.1117	0.8863
Income			
$0-$9,999	51.268***	8.235***	1.744***
$10,000-$29,999	52.8901***	8.8924***	1.0205**
$30,000-$59,999	55.0315**	9.1538***	0.6864
$60,000+[R]	56.7304	11.5718	0.6513
Education			
High School Diploma or Less	51.0909	9.0787	1.4843
More than High School Diploma	54.5074	9.3652	0.8481
Marital Status			
Married/Common-Law[R]	57.6307	9.7354	0.6729
Separated/Divorced/Widowed	45.5773***	8.1265	1.5148***
Single	52.3992***	9.1771	1.0654***
Social Support (Score)			
0-21 Score (Low)	-	3.3659***	1.9533***
22-42 Score (Medium)	-	5.4719***	1.6975***
43-99 Score (High)[R]	-	10.1172	0.7873
Structural Social Capital			
0 Close Friends/Family	22.0433***	-	1.6237
1-3 Close Friends/Family[R]	47.1207	-	1.3625
4-10 Close Friends/Family	54.8958***	-	0.905***
11-20 Close Friends/Family	59.2845***	-	0.6487***
21+ Close Friends/Family	58.4471***	-	0.6697***
N	2402	2402	2402

*** p≤.001, ** p≤.01, * p≤.05 [R] = Reference Category

Table 4.4 shows that respondents were more likely to show signs of drug dependence if they were younger, female, Black or of Aboriginal ethno-racial origin, living in an urban area, had lower income, had a high school diploma or less, had reported smaller network sizes, had been separated/divorced/widowed, and had low levels of social support.

Respondents with small networks were more likely between the age of 41 and 60, female, Black, living in a rural area, had low income, had a high school diploma or less, had been separated/divorced/widowed, and had low levels of social support. Lastly, those with low social support were more likely to be older than 40, male, Asian, living in a rural area, have low income, have a high school diploma or less, have smaller network sizes, and have been separated/divorced/widowed. There were large discrepancies in social support and network size among Asians and Blacks. Asians, while reporting low levels of social support (mean of 45.6786) reported higher network size (mean of 12.7499). Blacks on the other hand demonstrated the opposite, with the second highest reported levels of social support (mean of 55.848), but exceptionally small network sizes (mean of 2.9639).

Although the bivariate relationships discussed above are generally consistent with the hypothesis (H3) stating that higher social capital predicts lower drug dependence, the pattern is mixed with respect to specific types of drug use. To some extent, these findings could be due to variation of specific types of drug use and social capital by various socio-demographic and socioeconomic variables. Therefore it is necessary to evaluate the hypotheses by accounting for the effects of other variables by using multivariate models.

Multivariate Analyses

Lifetime Prevalence

Next I present multivariate analyses for a series of logistic regressions using lifetime prevalence of illicit drug use as an outcome variable. The results of logistic regression are often displayed in the exponentiation of the B coefficient (i.e., Exp(B) value). This value is also known as an odds ratio. An Exp(B) or odds ratio of 2, for example, would mean that the outcome is twice as likely to occur for one group versus another group. Odds ratios less than 1 are considered to be negative and explain a lesser likelihood of the outcome. Furthermore, odds ratios can be converted into predicted probabilities by subtracting 1 from the odds ratio and multiplying the result by 100% (see Field, 2013, p.766).

The first logistic regression analyzes the relationship between predictors and the lifetime use of illicit drugs as a general category. Many studies have used a general or aggregated measure of illicit drug use in their analyses, but as mentioned previously, the aggregation of lifetime prevalence of various illicit drugs into one measure may obscure important differences between them. However for comparative purposes, a general measure of lifetime prevalence of illicit drug use is analyzed and results are shown below in Table 4.5.

Table 4.5: Unstandardized Logistic Regression Coefficients and Odds Ratios of Lifetime Prevalence of Illicit Drug Use (Aggregate) by Predictors, Weighted Sample

	Illicit Drugs		
	B	**Exp (B)**	***p***
(Constant)	2.525	12.491	***
Age	-0.049	0.953	***
Male[1]	0.411	1.509	***
New Brunswick[2]	-0.389	0.678	***
Saskatchewan[2]	-0.555	0.574	***
British Columbia[2]	0.194	1.214	***
Urban[3]	0.132	1.141	***
Aboriginal[4]	0.834	2.302	***
Asian[4]	-2.347	0.096	***
Black[4]	-0.813	0.443	***
Other[4]	-2.093	0.123	***
Income ($0-$9,999)[5]	-0.631	0.532	***
Income ($10,000-$29,999)[5]	-0.309	0.734	***
Income ($30,000-$59,999)[5]	-0.068	0.934	*
Education (> Highschool Degree)[6]	0.085	1.089	*
Network Size	-0.007	0.993	
Separated[7]	0.204	1.226	***
Single[7]	-0.187	0.829	***
Social Support	-0.008	0.992	***
Nagelkerke R^2	0.259		
Cox/Snell R^2	0.194		
N	31175		

*** p≤.001, ** p≤.01, * p≤.05

Regressions controlled for year

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

The results did not show a significant relationship between network size and prevalence of illicit drug use. Those who were separated/divorced/widowed were 22.6% more likely to have tried an illicit drug during their lifetime when compared to those who were married/common-law. However, those who were single were approximately 17%

less likely than those who were married/common-law to have tried an illicit drug during their lifetime. Social support was negatively associated with lifetime prevalence of illicit drug use. For every unit increase in social support, the odds of lifetime prevalence of illicit drug use decreases by nearly one percent. Therefore, social support as a relational form of social capital supported the hypothesis (H1), while marital status as a structural form of social capital only partially supported the hypothesis.

In terms of sex differences, males were found to be 50.1% more likely than females to have used an illicit drug during their lifetime; a finding that supports previous research that has shown that males are generally more likely than females to use illicit drugs (see Teesson et al., 2006). In terms of race, when compared to Whites, people of Aboriginal ethno-racial origin were approximately 2.3 times more likely to report having used an illicit drug in their lifetime while Asians were 90.4% less likely to report illicit drug use when compared to Whites. Blacks were nearly half as likely as Whites to have tried an illicit drug during their lifetime. Individuals residing in British Columbia were 21.4% more likely to have tried an illicit drug during their lifetime when compared to those residing in Nova Scotia. In terms of socioeconomic predictors, compared to the highest income group ($60,000+), those in the lower income brackets were less likely to have tried an illicit drug and those with more than a high school diploma were 8.9% more likely to have tried an illicit drug than those with a high school diploma or less. Grant (1996) similarly found higher income and education to predict greater likelihood of lifetime use of illicit drugs. However, other studies have found that higher SES does not uniformly predict higher prevalence for all types of drugs, but rather serves as a

protective factor against certain types of illicit drug use such as heroin use (for example see Jones et al., 2015).

In summary, not all of the findings are consistent with the literature, nor do the findings fully support the hypothesis (H1). These disparate findings are perhaps due to the possibility that because lifetime prevalence of illicit drug use is treated as an aggregated measure of various different types of drug use, this measure can potentially distort the relationship between predictors and outcome. Consider, for example, that those who have only tried marijuana during their lifetime are combined with those who have tried heroin. The aggregation of these potentially distinct groups of users opens up the possibility that effects of one group may be overrepresented especially if there are disproportionate distributions between the groups. The distributions of those reporting lifetime prevalence of marijuana (n=14430) and heroin (n=275) certainly provide some support for this assertion (see Table 4.3 for distributions by type of drug). Moreover, some predictors were shown to have opposite relationships with lifetime prevalence of illicit drug use that contradicts previous studies of drug use prevalence (such as the negative relationship between SES and heroin use found by Jones et al., 2015). Thus, an aggregate measure tends to mask the true nature of the relationship between predictors and specific types of drug use supported by existing literature. With that said, it is necessary to analyze the relationship between social capital and illicit drug use by examining each illicit drug separately.

Table 4.6 and Table 4.7 below show lifetime prevalence of illicit drug use broken down by type of drug.

Table 4.6: Unstandardized Logistic Regression Coefficients and Odds Ratios of Lifetime Prevalence of Illicit Drug Use (Marijuana, Cocaine/Crack, Amphetamines, Ecstasy) by Predictors, Weighted Sample

	Marijuana			Cocaine/Crack			Amphetamines			Ecstasy		
	B	Exp (B)	*p*	B	Exp (B)	*p*	B	Exp (B)	*p*	B	Exp (B)	*p*
(Constant)	2.498	12.158	***	-.432	.649	*	-1.526	.217	***	-.389	.678	
Age	-.049	.952	***	-.035	.965	***	-.030	.970	***	-.080	.923	***
Male[1]	.419	1.520	***	.525	1.690	***	.533	1.704	***	.300	1.350	***
New Brunswick[2]	-.403	.668	***	-.226	.798		.361	1.435	*	-.328	.720	*
Saskatchewan[2]	-.563	.570	***	-.095	.909		-.126	.882		-.425	.653	**
British Columbia[2]	.190	1.209	***	1.091	2.977	***	.788	2.198	***	.862	2.368	***
Urban[3]	.118	1.125	***	.092	1.096		.140	1.151		.411	1.508	***
Aboriginal[4]	.774	2.169	***	1.082	2.952	***	.665	1.944	***	.759	2.136	***
Asian[4]	-2.357	.095	***	-1.871	.154	***	-2.088	.124	***	-1.661	.190	***
Black[4]	-.791	.453	***	-.672	.511	**	-.952	.386	*	.699	2.012	***
Other[4]	-2.113	.121	***	-1.807	.164	***	-1.684	.186	***	-1.288	.276	***
Income ($0-$9,999)[5]	-.660	.517	***	-.327	.721	***	-.039	.962		-.383	.682	***
Income ($10,000-$29,999)[5]	-.321	.726	***	-.083	.921		.200	1.221	*	.188	1.206	*
Income ($30,000-$59,999)[5]	-.076	.926	*	.113	1.120	*	-.022	.979		.074	1.077	
Education (> Highschool Degree)[6]	.086	1.090	*	-.478	.620	***	-.198	.820	*	-.458	.633	***
Network Size	-.007	.993		-.007	.993		.004	1.004		.016	1.017	
Separated[7]	.219	1.245	***	.281	1.324	***	.226	1.254	*	.555	1.742	***
Single[7]	-.193	.825	***	.008	1.008		-.208	.812	**	.172	1.187	**
Social Support	-.007	.993	***	-.017	.983	***	-.017	.983	***	-.009	.991	***
Nagelkerke R^2	.260			.151			.083			.223		
Cox/Snell R^2	.195			.070			.024			.078		
Sample n	31051			31047			31023			31040		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Regressions controlled for year

Table 4.7: Unstandardized Logistic Regression Coefficients and Odds Ratios of Lifetime Prevalence of Illicit Drug Use (Hallucinogens, Inhalants, Heroin, Steroids) by Predictors, Weighted Sample

	Hallucinogens			Inhalants			Heroin			Steroids		
	B	Exp (B)	*p*	B	Exp (B)	*p*	B	Exp (B)	*p*	B	Exp (B)	*p*
(Constant)	-.636	.530	***	-3.713	.024	***	-4.042	.018	***	-2.276	.103	***
Age	-.032	.969	***	-.007	.993		-.021	.979	***	-.053	.948	***
Male[1]	.617	1.853	***	1.070	2.917	***	.707	2.028	***	1.674	5.335	***
New Brunswick[X]	-.408	.665	***	-.756	.470	**	.834	2.302		-1.800	.165	***
Saskatchewan[X]	-.688	.503	***	-1.273	.280	***	.913	2.493		-1.361	.256	***
British Columbia[X]	.497	1.644	***	-.406	.666	*	1.904	6.711	***	-.212	.809	
Urban[2]	.187	1.205	***	-.085	.918		-.142	.868		.178	1.195	
Aboriginal[3]	.637	1.891	***	1.269	3.556	***	.893	2.443	***	.685	1.985	***
Asian[3]	-2.125	.119	***	↓	↓	↓	↓	↓	↓	↓	↓	↓
Black[3]	-1.263	.283	***	↓	↓	↓	↓	↓	↓	↓	↓	↓
Other[3]	-2.380	.093	***	-.907	.404	***	-2.496	.082	***	-1.051	.350	***
Income ($0-$9,999)[4]	-.229	.795	**	-.259	.772		.456	1.578	*	-.271	.763	
Income ($10,000-$29,999)[4]	-.008	.992		.194	1.214		.261	1.298		-.120	.887	
Income ($30,000-$59,999)[4]	-.038	.963	**	-.242	.785		-.407	.666	*	.417	1.517	*
Education (> Highschool Degree)[5]	-.107	.899		-.113	.893		-.355	.701	*	-.434	.648	*
Network Size	.012	1.013		-.045	.956	*	-.054	.948	**	-.089	.915	***
Separated[6]	.162	1.176	*	.194	1.214		.908	2.480	***	.046	1.047	
Single[6]	-.191	.826	***	.124	1.132		.582	1.790	***	-.441	.643	**
Social Support	-.016	.984	***	-.013	.987	**	-.014	.986	**	-.014	.986	*
Nagelkerke R^2	.120			.062			.133			.127		
Cox/Snell R^2	.055			.006			.013			.011		
Sample n	31043			31043			31041			31035		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Notes: Due to limitations in sample size, Asian and Black race categories were merged into Other for Inhalants, Heroin, Steroids

Regressions controlled for year

Tables 4.6 and 4.7 show that after accounting for other socio-demographic and socioeconomic variables network size remains insignificant for most drugs except for inhalant, heroin, and steroid use. The results demonstrate that as network size increased, lifetime prevalence of inhalant, heroin, and steroid use decreased. With regard to marital status, we find a much more diverse set of results than when prevalence of illicit drug use is treated as an aggregate measure. While those who were separated/ divorced/widowed remain more likely to have tried most of the eight illicit drugs when compared to those who were married/common-law[9], those who were single were more likely than those who were married/common-law to have tried ecstasy (18.7% more likely) and heroin (79% more likely). It was somewhat unexpected to find that those who were single were less likely to have tried marijuana (17.5% less likely), amphetamines (18.8% less likely), hallucinogens (17.4% less likely), and steroids (35.7% less likely) than those who were married/common-law. The most dramatic findings were those related to heroin use where those who were separated/divorced/widowed (2.48 times) or single (1.79 times) were more likely to have tried heroin than those who were married/common-law.

Consistent with bivariate analyses and the aggregated measure of lifetime prevalence, social support was associated with a lower likelihood of lifetime prevalence of each of the eight illicit drugs even after accounting for other relevant variables, and thus behaved in the expected direction outlined in hypothesis (H1) stating that social capital is inversely related to lifetime prevalence of illicit drug use.

In terms of other variables, age was negatively related to lifetime prevalence of every drug except for inhalants which was not statistically significant. Males were

[9] In this study marriage/common-law categories are combined and therefore it will be assumed that the protective effect of marriage refers to both categories

consistently more likely than females to have used each of the eight drugs during their lifetime and this finding resembles previous research presented in the literature review. The greater likelihood of male drug use was especially true for steroid use (5.335 times more likely), use of inhalants (2.917 times more likely), and heroin (2.028 times more likely). Those residing in British Columbia were more likely than those residing in Nova Scotia to have used marijuana, cocaine/crack, amphetamines, ecstasy, hallucinogens, and heroin during their lifetimes. Inhalant use, however, was most prevalent in Nova Scotia. In addition, those residing in urban areas were more likely to have tried marijuana, ecstasy, and hallucinogens during their lifetime when compared to rural areas.

With regard to socio-economic predictors, those with incomes between $0-$9,999 were less likely to have tried marijuana, cocaine/crack, ecstasy, and hallucinogens, but more likely to have tried heroin in their lifetimes when compared to the highest income group. Those with more than a high school diploma were 9% more likely to have used marijuana, but 38% less likely to have used cocaine/crack, 18% less likely to have used amphetamines, 36.7% less likely to have used ecstasy, 29.9% less likely to have used heroin, and 35.2% less likely to have used steroids in their lifetimes when compared to those with a high school diploma or less.

In summary, multivariate analyses show that measures of prevalence of illicit drug use, when broken down by type of drug, produce a much more diverse set of results than when illicit drug use is treated as an aggregate category. Not only are the results of socio-demographic and socioeconomic predictors more in line with findings from previous studies, but network size and marital social capital also show a protective effect against the lifetime prevalence of certain types of drugs. These important findings would

otherwise be hidden if we were to treat illicit drug use as an aggregate category without analyzing specific types of drugs individually.

Prevalence within the Last 12 Months

The second series of multivariate analyses consisted of four logistic regressions to assess the relationship between social capital and use prevalence within the last 12 months. Analyses were only conducted for marijuana, cocaine/crack, amphetamines, and ecstasy due to low cell counts for the other four types of drugs. The results of the analyses are presented in Table 4.8 below.

Table 4.8: Unstandardized Logistic Regression Coefficients and Odds Ratios of Prevalence of Illicit Drug Use in the Last 12 Months (Marijuana, Cocaine/Crack, Amphetamines, Ecstasy) by Predictors, Weighted Sample

	Marijuana			Cocaine/Crack			Amphetamines			Ecstasy		
	B	Exp(B)	*p*	B	Exp(B)	*p*	B	Exp(B)	*p*	B	Exp(B)	*p*
(Constant)	.085	1.089	***	-2.262	.104	***	2.014	7.492		-1.180	.307	*
Age	-.060	.942	***	-.051	.950	***	-.110	.896	***	-.113	.893	***
Male[1]	.727	2.068	***	.810	2.247	***	-.037	.964		.391	1.479	**
New Brunswick[2]	-.446	.640	***	.501	1.650		1.751	5.763	*	-.305	.737	
Saskatchewan[2]	-.628	.533	***	.314	1.369		.035	1.035		-.288	.750	
British Columbia[2]	.245	1.277	***	.919	2.507	***	.405	1.499		.852	2.343	***
Urban[3]	.146	1.157	**	.415	1.514	**	-.190	.827		.350	1.419	*
Aboriginal[4]	.626	1.870	***	1.179	3.252	***	1.274	3.574	***	.556	1.744	**
Asian[4]	-2.074	.126	***	↓	↓	↓	↓	↓	↓	↓	↓	↓
Black[4]	-.643	.526	***	↓	↓	↓	↓	↓	↓	↓	↓	↓
Other[4]	-1.251	.286	***	-1.575	.207	***	.386	1.472		-.777	.460	***
Income ($0-$9,999)[5]	.058	1.059		-.082	.921		-.444	.641		-.616	.540	**
Income ($10,000-$29,999)[5]	.584	1.794	***	.250	1.284		-.431	.650		-.019	.981	
Income ($30,000-$59,999)[5]	.338	1.402	***	.239	1.270		-1.328	.265	*	-.341	.711	
Education (> Highschool Degree)[6]	-.227	.797	***	-.812	.444	***	-1.729	.177	***	-.548	.578	***
Network Size	.024	1.024	***	-.042	.959	**	-.047	.954		.030	1.030	
Separated[7]	.547	1.728	***	.749	2.115	**	1.815	6.142	***	1.042	2.834	***
Single[7]	.442	1.556	***	.789	2.201	***	.617	1.854		.815	2.260	***
Social Support	-.011	.989	***	-.020	.980	***	-.043	.958	***	-.017	.983	***
Nagelkerke R^2	.246			.176			.271			.230		
Cox/Snell R^2	.132			.023			.007			.025		
Sample n	31047			31047			31031			31041		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Notes: Due to limitations in sample size, Asian and Black race categories were merged into Other for Cocaine/Crack, Speed, and Ecstasy

Regressions controlled for year

The results show that network size was positively related with marijuana use and negatively related with cocaine/crack use within in the last 12 months. For every additional member in one's social network, the odds of prevalence of marijuana and cocaine/crack increased by 2.4% and decreased by 4.1% respectively. Network size did not significantly affect prevalence of amphetamines or ecstasy. Those who were single, separated, divorced, or widowed were more likely to have used each of the four illicit drugs in the last 12 months when compared to those who were married/common-law (all statistically significant except for use of amphetamines among those who were single). Those who were separated/divorced/widowed were 6.142 times more likely than those married/common-law to have used amphetamines in the last 12 months. Those with higher levels of social support were less likely to have used any of the four illicit drugs in the last 12 months.

Therefore, like the results of lifetime prevalence, the findings showed that higher network size can have a protective effect against drug use. However, it was also found that higher network size can also predict higher prevalence (as is the case with marijuana use) and reaffirms the value of analyzing drugs separately to observe the differences between them. The findings also demonstrated that marital social capital and social support were protective in the case of all four drugs and consistent with the hypothesis (H2) stating that social capital is inversely related to the prevalence of illicit drug use in the last *12 months*.

Other notable trends include wide disparities in use between ethno-racial categories which revealed that Aboriginal peoples were considerably more likely than Whites to use any of the four illicit drugs. However, Asians, Blacks, and individuals from

other ethno-racial origins were less likely to have used marijuana, cocaine/crack, and ecstasy within the last 12 months. With regard to geographic variation, those residing in British Columbia and in urban areas were more likely to have used marijuana, cocaine/crack, and ecstasy within the last 12 months. Finally, with regard to SES variables, it was revealed that those with higher education were less likely to have used all four drugs within the last 12 months and marijuana use was most common in the two middle-income groups of $10,000-$29,999 and $30,000-59,999.

Drug Dependence

While the analysis using measures of prevalence of illicit drug use may enable us to predict which factors increase the likelihood of illicit drug use, these measures give us little indication of whether respondents are dependent on drugs. Measuring drug dependence thus gives us some basis to assess severity of drug use in which high levels of drug dependence are likely to be associated with greater adverse physical and social consequences (SAMHSA, 2015).

To assess the relationship between social capital and dependence on illicit drugs, a 4-stage hierarchical multiple regression was conducted. For this model, a sub-sample of illicit drug users who reported dependence on illicit drugs (n=2,402) was analyzed. The regression statistics are presented in Table 4.9 below.

Table 4.9: Unstandardized and Standardized OLS Regression Coefficients of Drug Dependence in Last 12 Months, Weighted Sub-sample

	Model 1			Model 2			Model 3			Model 4		
	B	Beta	*p*	B	Beta	*p*	B	Beta	*p*	B	Beta	*p*
(Constant)	1.492		***	1.818		***	2.374		***	3.919		***
Age	-.011	-.113	***	-.013	-.131	***	-.018	-.185	***	-.019	-.203	***
Male[1]	-.121	-.036		-.003	-.001		.068	.014		.031	.003	
New Brunswick[2]	-.179	-.032		-.154	-.028		-.144			-.118	-.021	
Saskatchewan[2]	-.023	-.006		.033	.009		.062			.059	.015	
British Columbia[2]	-.172	-.051		-.086	-.026		-.050			-.074	-.022	
Urban[3]	.043	-.011		.102	.025		.063	.019		.061	.014	
Aboriginal[4]	.744	.095	***	.590	.076	***	.531	.086	***	.526	.068	***
Asian[4]	-.064	-.010		-.176	-.027		-.238	-.030		-.356	-.054	**
Black[4]	.584	.032		.506	.028		.450	.016		.508	.028	
Other[4]	.083	.011		-.026	-.004		-.087	-.014		-.112	-.015	
Income ($0-$9,999)[5]				.824	.167	***	.811	.155	***	.780	.158	***
Income ($10,000-$29,999)[5]				.238	.066	*	.176	.036		.148	.041	
Income ($30,000-$59,999)[5]				-.059	-.017		-.088	-.027		-.088	-.025	
Education (> Highschool Degree)[6]				-.651	-.131	***	-.598	-.122	***	-.595	-.120	***
Network Size							-.073	-.142	***	-.048	-.096	***
Separated[7]							.765	.148	***	.106	.109	***
Single[7]							.016	.009		.089	-.032	
Social Support										-.028	-.187	***
R^2	.031			.082			.123			.152		
R^2 Change				.051			.041			.029		
Adjusted R^2	.026			.076			.116			.145		
F	6.873***			14.127***			18.522***			22.481***		
Sample n	2402			2402			2402			2402		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Regressions controlled for year

The first stage of the regression involved an analysis of socio-demographic variables (age, sex, race, and community type). These variables contributed significantly to the model and accounted for 2.6% of the variance in drug dependence. However, among these variables, only age and Aboriginal origin showed significant effects for which the former was negative and the latter positive. The addition of socioeconomic variables of income and education in the second stage explained an additional 5% of the variance over and above the effects of the socio-demographic variables. Here, results showed that those in the two lowest income groups and those with lower education were significantly more likely to show drug dependence. In the third stage, the addition of social capital variables of network size and marital status explained an additional 4% of the variation in drug dependence bringing the model to a total adjusted R^2 of .116. In the fourth and final stage, social support was added to the model yielding a significant R^2 change and explained an additional 2.9% of the variation in drug dependence.

Thus the final model explained 14.5% of the variance in drug dependence. Social capital predictors explain nearly half of the variance (42.4%) within the fourth model with network size, marital status, and social support contributing 9.6%, 14.1%, and 18.7% of the variance respectively over and above the effects of SES and socio-demographic variables. To test possible interactions, eight protected block tests were conducted between the three measures of social capital and income and education. No significant interactions were found.

With regard to the influence of social capital predictors added in the third stage, network size was found to be inversely related to drug dependence. For example, for every additional member in the respondent's social network, there was -.073 unit

decrease in drug dependence. In the fourth stage, this unit change was reduced to -.048 when social support was added suggesting that social support diminished the negative effect of network size. In terms of marital status in the third stage, those who were separated/divorced/widowed had a drug dependence score of 0.765 units higher than those who were married/common-law. After the addition of social support in the fourth stage, those who were separated/divorced/widowed had a drug dependence score of 0.106 units higher than those who were married/common-law. The decrease in the effect of being separated/divorced/widowed on drug dependence from 0.765 (stage 3) to 0.106 (stage 4) suggests that some of the effect of being separated/divorced/widowed on drug dependence may be due to their lower social support when compared to married/common-law. Said in another way, the results show that some of effects of being separated/divorced/widowed on drug dependence are buffered by social support.

In assessing the influence of socio-demographic variables, the negative effect of age increased during each stage. The change in the B value of Aboriginal respondents from .744 to .590 after socioeconomic variables were added in stage 2 suggest that some of the differences in drug dependence scores between Aboriginal peoples and Whites were moderated by their low socioeconomic status. The change from significance to insignificance of the income group $10,000-$29,999 in the third stage may be due to the addition of social capital variables better explaining the variance in drug dependence. By including social support in the fourth stage, the negative tendency for drug dependence among Asians changed from a non-significant B value of -.238 to a significant B value of -.356. This may suggest a lower likelihood of drug dependence among Asians because of their inherently higher levels of social support. With regard to socioeconomic variables

and drug dependence, those in the lowest income category and those with lower education were more likely to score higher on the drug dependence index than those in the highest income group and those with higher education.

To summarize the effects of social capital variables on drug dependence, all social capital measures demonstrated an inverse relationship with drug dependence. These results support the hypothesis (H3) stating that social capital is inversely related to drug dependence on illicit drug use. That is, individuals who have smaller network sizes, lower marital social capital, and lower levels of social support are more likely to score higher on the drug dependence index. The results also showed that the effects of structural dimensions of social capital such as network size and marital status on drug dependence are partially mediated by social support[10].

In slight contrast to the findings of 12-month prevalence of illicit drug use which found a mixed effect of network size on prevalence of drug use, the findings of drug dependence found that higher network size has a protective effect on dependent use. It could very well be the case that social networks have differential effects depending on the type of drug use in question. That is, social networks may generally serve as a protective factor when drug use takes on a more problematic character, but may encourage drug use when it is not associated with negative social or health outcomes (e.g.,occasional use of marijuana). These empirical differences support the importance of analyses that are sensitive to different types of drug use (e.g.,dependent use vs. non-dependent use). In the case of the present study, we see that while measures of prevalence are broad in scope and capture a wide range of drug use behaviours, they may also potentially obscure

[10] An alternate regression with marital status as a socio-demographic variable yields the same support for the hypothesis (see Table 4.12 in Appendix B)

important differences between those who have tried an illicit drug once in their lifetime, those who engage in relatively benign forms of experimental use, and those whose drug use may have significant social and health implications. In the following set of analyses on drug interference, we find further evidence for the protective effect of network size on drug use that is associated with negative outcomes.

Drug Interference

The final series of analyses included four multiple linear regressions testing the relationship between social capital and interference of illicit drug use in particular aspects of the respondents' lives. The results are presented in Table 4.10 below.[11]

[11] For comparability across regressions, the sample (n=2,252) consisted of only those respondents who answered all four questions regarding interference. All other respondents were eliminated from analyses. For regression results without exclusions, see Appendix B.

Table 4.10: Unstandardized and Standardized Multiple OLS Regression Coefficients of Drug Interference in Last 12 Months, Weighted Sub-sample

	Home Responsibilities			Ability to Work at a Regular Job			Ability to Maintain Close Relationships			Social Life		
	B	**Beta**	***p***	**B**	**Beta**	***p***	**B**	**Beta**	***p***	**B**	**Beta**	***p***
(Constant)	3.554		***	1.855		***	4.027		***	2.668		***
Age	-.031	-.187	***	-.008	-.066	**	-.022	-.139	***	-.010	-.073	**
Male[1]	.066	.016		-.058	-.020		.134	.033		.073	.021	
New Brunswick[2]	.245	.034		.148	.029		-.192	-.027		.295	.049	
Saskatchewan[2]	.349	.072		.285	.084		.023	.005		.378	.094	
British Columbia[2]	.082	.021		.212	.076	*	.212	.055		.207	.063	*
Urban[3]	.134	.027		-.084	-.024		-.022	-.005		.088	.010	
Aboriginal[4]	.375	.063	**	.285	.062	**	.289	.050	*	.428	.087	***
Asian[4]	-.290	-.016		.482	.037		.949	.053	**	.842	.055	**
Black[4]	1.011	.053	**	-.550	-.041	*	1.370	.074	***	.486	.031	
Other[4]	.095	.008		.309	.038		.555	.049	*	-.195	-.020	
Income ($0-$9,999)[5]	.588	.094	***	.378	.086	***	.397	.065	*	.137	.112	***
Income ($10,000-$29,999)[5]	-.102	-.026		-.063	-.023		-.124	-.032		-.089	-.027	
Income ($30,000-$59,999)[5]	-.161	-.040		-.115	-.041		-.271	-.069	*	-.282	-.085	**
Education (> Highschool Degree)[6]	-.240	-.042	*	-.446	-.111	***	-.646	-.115	***	-.381	-.080	***
Network Size	-.036	-.063	**	-.040	-.098	***	-.066	-.117	***	-.045	-.095	***
Separated[7]	.776	.106	***	.281	.054	*	.551	.077	***	.378	.062	**
Single[7]	-.104	-.027		-.013	-.005		-.311	-.083	***	-.069	-.022	
Social Support	-.026	-.158	***	-.013	-.108	***	-.032	-.196	***	-.023	-.170	***
R^2	.109			.081			.140			.116		
Adjusted R^2	.102			.074			.132			.108		
Sample n	2252			2252			2252			2252		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Regressions controlled for year

Table 4.10 shows that those with lower social capital were more likely to experience interference from illicit drug use in the following aspects of their lives: 1) home responsibilities; 2) ability to work at a regular job; 3) ability to maintain close relationships; and 4) social life. These findings generally support the hypothesis (H4) stating that social capital is inversely related to interference from illicit drug use. Network size was inversely related to likelihood of interference in all four models. Being separated/divorced/widowed seemed most important in predicting interference in home responsibilities with a B value of .776, but was also a significant predictor for interference in the other three models as well. Being single did not behave in the anticipated direction with respect to the interference of drugs in the ability to maintain close relationships as it demonstrated a protective effect. Social support was a significant and important predictor demonstrating a protective effect in all four models.

The results also showed that when compared to the highest income group, those with incomes of $0-$9,999 were more likely to report interference of all types. Education was a significant predictor in the models and demonstrated that those with more education were less likely to report interference. Lastly, when compared to Whites, Aboriginal peoples were more likely to report interference in all models, Asians were more likely to report interference in the ability to maintain close relationships and in their social lives, Blacks were more likely to report interference in home responsibilities and in ability to maintain close relationships, but less likely to report interference in their ability to work at a regular job, and those categorized as “Other” were more likely to report interference in the ability to maintain close relationships.

Chapter 5: Discussion

The purpose of the present study was to examine the relationship between structural and relational dimensions of social capital and illicit drug use and dependence. This section summarizes the key findings of the study and discusses potential policy implications derived from these findings. Limitations, contributions, and areas for further research are also outlined.

Summary of Findings

The Influence of Social Capital on Lifetime Prevalence of Illicit Drug Use

The findings showed that combining a number of different drugs into an aggregate measure of illicit drug use obscured some important differences in how social capital affects lifetime prevalence of different types of drugs. For example, while network size was not found to significantly affect prevalence of aggregated drug use (as shown in Table 4.5), a larger network size did predict a lower likelihood of lifetime prevalence of inhalant, heroin, and steroid use (as shown in Table 4.7). Although the results for heroin are expected and conform to findings of previous studies (Bohnert, Bradshaw, & Latkin, 2009), they contradict the findings of Maycock and Howat's (2007) study of 147 male anabolic steroid users which found that social capital facilitated the distribution, entry into, and continuation of steroid use. The smaller sample size in Maycock and Howat's (2007) study may perhaps account for the differences in findings with the present study.

In terms of marital status, those who were separated/divorced/widowed were more likely than those who were married/common-law to have used each of the illicit drugs within their lifetime, except for inhalants. Being single predicted a greater likelihood of

ecstasy and heroin use, but predicted a lesser likelihood of marijuana, amphetamine, hallucinogen, and steroid use when compared to those who were married/common-law. These findings contradict those shown in Table 4.5 which found that being single predicted a lower likelihood of aggregated drug use, reaffirming the need to analyze drugs separately.

Furthermore, it is important to note that heroin use showed a particularly distinctive trend in which those who were single and those who were separated/divorced/widowed were approximately 1.8 times and 2.5 times more likely than those who were married/common-law to have used heroin within their lifetime respectively. The strength of the association confirms previous studies that have shown marriage to be particularly protective against the use of 'harder' drugs (Heinz et al., 2009; Merline et al., 2004).

One set of unexpected findings was that marijuana, amphetamine, hallucinogen, and steroid use were found to be more likely among individuals who were married/common-law compared to those who were single. A possible explanation for these unexpected results may be that some respondents' drug use patterns may have been initiated before marriage and as a result, marital status has little bearing on some respondents' drug use. Thus while the results may have interesting implications, some caution in interpreting the results is necessary and an analysis using a more recent outcome measure of drug use, such as prevalence of illicit drug use in the last *12 months* may help confirm or dispel the findings presented above (as shown in the next section).

Lastly, while structural forms of social capital were found to vary depending on the type of drug, social support showed a consistent inverse relationship for every type of

drug. This finding is consistent with research that has shown social support to be a protective factor against various types of substance use (Brown & Riley, 2005; El-Bassel et al., 1998).

In summary, the findings partially support the hypothesis (H1) stating that social capital is inversely related to lifetime prevalence of illicit drug use. It appears that network size and marital status as structural forms of social capital have diverse effects on different types of drugs, but social support as a relational form of social capital consistently demonstrates a protective effect regardless of drug type. The drug that demonstrated the greatest conformity to the hypothesis was heroin which revealed social capital to be inversely related on all dimensions.

The Influence of Social Capital on Prevalence of Illicit Drug Use in the Last 12 Months

The analysis of the relationship between social capital and a more recent outcome measure of illicit drug use in the last *12 months* demonstrated some similarities to the findings of *lifetime* use, but also yielded some important differences. For example, while previous results showed that larger network size predicted a lower likelihood of lifetime prevalence of inhalant, heroin, and steroid use (as shown in Table 4.7), the results shown in Table 4.8 demonstrated that a larger network size predicted both a greater likelihood of marijuana use and a lower likelihood of cocaine/crack use in the last 12 months. This suggests that social networks may have the potential to encourage the initiation and use of types of illicit drugs that rely more strongly on "friendly persuasion" (see Flores et al., 2013; Van Hout, 2010; Wister & Avison, 1982;). As a result of these diverse findings

network size did not conform to the expectations of an inverse relationship with prevalence of illicit drug use in the last 12 months as outlined in the hypothesis (H2).

On the other hand, marital status seemed to show strong support for the hypothesis (H2) as marriage and common-law arrangements predicted lower likelihoods of use within the last 12 months for all four drugs, except for amphetamine use where the effect of being single was not statistically significant. These findings are supported by studies that have found marriage to be a protective factor against drug use (Green et al., 2012; Heinz et al., 2009; Merline et al., 2004). In addition, these findings differ from the previous results for *lifetime* prevalence which demonstrated that being single predicted a greater likelihood of some forms of drug use and may suggest that prevalence in the last *12 months* provides a more accurate account of drug use based on the predictors used in this study and the consistency of the findings with previous literature.

One interesting aspect of these findings relates to the observation that larger networks have the ability to facilitate certain types of drug use (e.g., marijuana use in the last 12 months) while marriage generally serves as a protective factor for all types of drug use. The differences between these two types of structural social capital may speak to the possibility that social relations encompassed in general networks (typified in this study's measure of network size) versus intimate spousal relations (derived from marital and common-law arrangements) are quite distinct in regard to the types of relational resources they provide. For example, according to Gottlieb and Bergen (2010), close relationships (e.g.,spousal and intimate relations) and relations defined by normative role definitions (e.g.,marital, parental, or other familial relations) generally provide social support in greater variety and in more specialized forms including "the most intimate expressions of

support such as listening, caregiving, and affection" (p. 512). Although more focused research may be needed to assess which particular kinds of support best predict desistance from drugs, some studies have demonstrated that emotional forms of social support provided by family members are particularly salient when it comes to positive trajectories in drug treatment (Dobkin et al., 2002; Tracy et al., 2010). Other studies have shown that marital relations are characterized by much stronger informal social controls than those vested in relations of friends or acquaintances and, as a consequence, are more likely to promote desistance from illicit drug use (Duncan et al., 2006; Lee et al., 2010; Leonard & Eiden, 2007; Umberson, 1987). In contrast, social networks represented by measures of network size may include *both* friends and family. These mixed networks of social relations may be best characterized by their differential capacities to constrain drug use as well as exert peer pressure, serve as sources for procurement of drugs, transmit drug-use norms, or encourage drug-use behaviours by other means (see Flores et al., 2013; Kandel & Davies, 1991; Van Hout, 2010). Future research on the influence of social networks on drug use should be cognizant of these subtle, yet important differences.

Lastly, social support was found to be protective against prevalence of all four types of illicit drug use in the last 12 months. This finding is consistent with the previous analyses of lifetime prevalence and supports the hypothesis (H2) stating that social capital is inversely related to prevalence of illicit drug use within the last 12 months.

In summary, the hypothesis (H2) is only partially supported as marital status and social support were both found to be inversely related to prevalence of illicit drug use in

the last 12 months, while network size was found to be inversely related to prevalence of all illicit drugs except for marijuana which was positively related.

The Influence of Social Capital on Drug Dependence

In exploring the effects of social capital on drug dependence, it was found that all measures of social capital in this model operated in the anticipated directions outlined in hypothesis (H3) stating that social capital is inversely related to dependence on illicit drug use. The results showed that higher network size, being married or in a common-law relationship, and higher levels of social support predicted lower levels of drug dependence. The finding that network size was protective against drug dependence, but not against prevalence of other types of drug use (e.g., marijuana shown in Table 4.8) may be explained by the possibility that while large networks may facilitate and/or provide greater opportunities for *non-problematic* forms of drug use, they may also actively discourage *problematic* forms of drug use or provide necessary networks of support for individuals whose drug use patterns shows signs of dependence (see Maycock and Howat, 2007).

While there have been no studies that have examined the relationship between social capital and drug dependence, the findings of the present study are partially supported by several related studies that have shown social capital to be an important protective factor among drug treatment patients (Cheung & Cheung, 2003; Granfield & Cloud, 2001). However, many of these studies have demonstrated that social capital's protective effect is contingent on the types of networks in which social capital is accessed. For example, in a sample of 200 male patients in drug treatment, Cheung and

Cheung (2003) found that *positive* social capital measured by family support, participation in conventional social groups, and licit employment greatly enhanced patients' abilities to reduce risk of post-treatment drug use. Post-treatment outcomes were largely dependent on the types of social capital available to patients after completion of the treatment regimen; namely whether the patients' networks were characterized by *family support* or rekindled bonds with *drug-using peers*. Similarly, in analyzing the effects of social networks on abstinence outcomes of 128 drug treatment patients, Wasserman et al. (2001) found that both network size and social support predicted a greater likelihood of abstinence from cocaine use, but only if these networks were comprised of mainly *non-drug using* individuals. These studies seem to suggest that a generalized notion of social capital alone does not accurately predict abstinence and that the distinction between protective and facilitative (or positive and negative) forms of social capital is particularly important for individuals in drug treatment.

In contrast to the above-mentioned studies, the findings of the present study support the *overall* protective effects of social capital against drug dependence. The protective effect of social capital on drug dependence was not found to be contingent on positive forms of social capital such as those derived from family members or non-drug using individuals. This could be due to the possibility that clinical samples of drug-dependent individuals undergoing treatment represent a different population than the sample of the present study in terms of specialized needs, severity of drug problems, and characteristics of network structures.

Furthermore, the addition of social support to the hierarchical OLS model resulted in reductions of effect size attributed to both network size and marital status. This

demonstrates that while persons with small network sizes or with no marital social capital may be at a greater risk of drug dependence than those who have large network sizes and marital social capital, this risk may be moderated by levels of social support. Moreover, if we are to assume that the protective effects of social capital against drug dependence are solely a result of social support as some researchers have suggested (for example see Reynoso-Vallejo, 2011), then we would expect for the addition of social support to completely cancel out the effects of network size and marital status. Because the effect sizes of network size and marital status were only partially reduced by social support, this suggests that there are mechanisms inherent in structural forms of social capital that serve to protect individuals from drug dependence over and above social support. These could potentially include informal social control and/or information flows discussed earlier in the literature review. However further research would be needed to verify this assertion.

Lastly, the results showed that while some of the differences in drug dependence scores between Aboriginal peoples and Whites were moderated by their low socioeconomic statuses, these differences were also moderated by lower levels of structural social capital and social support. These findings are consistent with a large body of research that has examined the multiple sources of material and social deprivation that many Aboriginal populations collectively experience on a routine basis (see Mosher & Akins, 2007).

The Influence of Social Capital on Drug Interference

The findings for drug interference showed that a larger network size and higher levels of social support were related to lower levels of drug interference in home responsibilities, ability to work at a regular job, ability to maintain close relationships, and social life. Those who were separated/divorced/widowed were more likely than those who were married/common-law to experience interference in all four outcome measures. However, those who were single were found to be less likely to experience interference in the ability to maintain close relationships compared to those who were married/common-law, and therefore marriage does not appear to be fully protective of all forms of interference. This perhaps is due to the fact that those who are single may have fewer close or intimate relationships that are susceptible to interference by drug use. These results only partially satisfy the hypothesis (H4) stating that social capital is inversely related to drug interference. These findings are also novel in that no other studies that have examined the effects of social capital interference from illicit drug use.

The Influence of Socio-demographic and Socioeconomic Variables

The results of this research are generally consistent with previous literature in terms of the effects of sex (Becker & Hu, 2008; Cotto et al., 2010), community type (Gfroerer et al., 2007; Howard et al., 2011; Johnston et al., 1992; Medina-Mora & Real, 2008), race (Mitchell et al., 2003; SAMSHA, 2013), and SES (Grant, 1996; Stenbecka et al., 1993). Age, however, showed a linear relationship rather than the non-linear relationship that is suggested by previous studies (Mosher & Akins, 2007).

Looking at each predictor in more detail, the results demonstrated that older age was associated with lower likelihood of any illicit drug use within one's lifetime and within the last 12 months as well as lower levels of drug dependence and interference. These findings are not consistent with research showing that illicit drug use increases during adolescence, reaching an apex in early adulthood, and then steadily decreases throughout the remainder of an individual's life course (Mosher & Akins, 2007). The results were consistent with previous studies in terms of sex (Becker & Hu, 2008; Cotto et al., 2010) reporting that males are more likely than females to have used any illicit drugs. However, findings were not statistically significant for use of amphetamines in the last 12 months or for drug dependence and interference. Living in British Columbia appeared to predict higher prevalence of nearly all drugs, except for lifetime inhalant use which was more likely for those living in Nova Scotia. These findings correspond with other studies that have analyzed cross-provincial data on drug use (Canadian Alcohol and Drug Use Monitoring Survey, 2012). Furthermore, living in an urban area was predictive of having tried cocaine/crack, ecstasy, and hallucinogens within one's lifetime and cocaine/crack within the last 12 months. Living in a rural area was predictive of having tried marijuana and inhalants in one's lifetime; findings which are supported by existing literature (Gfroerer et al., 2007; Howard et al., 2011; Johnston et al., 1992; Medina-Mora & Real, 2008; Ompad & Fuller, 2005). With regard to racial differences, it was generally found that Asians, Blacks, and respondents categorized as 'Other' were less likely than whites to have tried illicit drugs within their lifetime and within the last 12 months. Aboriginal respondents, however, were more likely to have used illicit drugs in their lifetime and in the last 12 months as well as more likely to report drug dependence and

interference when compared to Whites. These findings confirm previous research demonstrating that Aboriginal peoples exhibit higher rates of illicit drug use and drug use problems than any other ethno-racial group (Mitchell et al., 2003; SAMSHA, 2013). Aboriginal peoples' collective susceptibility to adverse drug-related outcomes has been associated with a historical legacy of dispossession, colonization, social exclusion, and cultural genocide that has shaped the living environments around them (Dauvergne, 2009; Marshall, 2015). Interestingly, some of the effects on drug dependence for Aboriginal peoples were moderated by SES. This suggests that the lower overall socioeconomic status of Aboriginal peoples in this sample is a particularly influential factor in Aboriginal peoples' risk of developing drug dependence.

Findings related to SES showed diverse outcomes between different types of illicit drug use that are generally supported by previous studies. For example, lifetime prevalence of marijuana, cocaine/crack, ecstasy, and hallucinogen use was least common in the lowest income group ($0-$9,999), replicating findings of the study by Stenbacka et al. (1993) who found that lower SES was associated with lower likelihood of marijuana use and Grant's (1996) finding that lower income respondents (household income of less than $36,000) were less likely to use drugs at some time in their lives when compared to the highest income group ($72,000+). Grant's (1996) study, however, found that while those with low SES (education and income) were less likely to have used drugs than those with the highest levels of SES, respondents with lower income and respondents with the least education (less than 12 years) were more likely than the most affluent and the most educated to become *dependent* on drugs. This study similarly showed that while the lifetime prevalence of some drugs were more common among affluent respondents,

low education and low income were consistently associated with higher levels of drug dependence and interference.

These findings suggest that there is an important distinction between how those at the opposing ends of the socioeconomic gradient use illicit drugs and experience drug-related problems. By showing that those with higher levels of income and education are less likely to show indications of drug dependence, this study lends additional support to the assertion that those with higher SES appear to be afforded with a greater resilience to adverse consequences associated with drug use (Galea & Vlahov, 2002).

The Significance of State Withdrawal and Punitive Management of Poverty

Given the findings of the present study which have shown that lower levels of social capital are associated with a greater risk of drug dependence, there is reason to be cognizant of the broader economic forces that have been responsible for undermining the availability of social capital.

As a catalyst for deepening social and economic inequalities, the unravelling of the Keynesian compromise and the declining role of the state as a buffer against a vanishing labour market has had profound implications, especially for those residing in disadvantaged communities where social institutions crucial for the cultivation of social capital continue to be denigrated (Putnam, 2000; Wacquant, 1998). While this deterioration of once-vibrant sources of social capital can be understood in terms of diminishing community-based institutions such as public education, religious institutions, and voluntary associations (Putnam, 2000; Sampson et al., 1999; Wacquant, 1998), the corrosive effects of state withdrawal can also be observed on individual-level social

relations such as those embedded within the family institution (Ciscel & Heath, 2001; Wilson, 1987). That is, the stresses and time commitments associated with finding work and earning wages in a precarious labour market have impeded important parental obligations such as providing social capital to their offspring (Wright et al., 2001). In particular, increased labour demands have diminished the abilities of parents to act as conventional role models, communicators of rules and expectations, sources of social support and love, and buffers to economic strains that may contribute to substance use problems (Boyce et al., 2008; Curran, 2007; Maté, 2009; Mosher & Akins, 2007; Nakhaie & Arnold, 2010). The very same economic pressures that have been shown to weaken parental capacities have also had debilitating effects on rates of marriage, have fostered more favourable conditions for divorce and separation, and have increased the number of people living alone (Klinenberg, 2012; Putnam, 2000; Wilson, 1987). Given the findings from multiple studies that have shown the family to be the single most important source of social capital for mitigating drug use harms, it appears highly problematic that supportive functions of families are being continually diminished (Biko, 2000; Cheung & Cheung, 2003; Dufur et al., 2012; McPherson et al., 2013).

Furthermore, for many disadvantaged communities, family stability has been further weakened by stringent penal policies expedited by a War on Drugs that has produced dependent, single-headed family households in immense proportions (Alexander, 2010; Hart, 2013; Wilson, 1987). Some have pointed to the functional role of the penal state in managing poverty and containing the social disorders of crime and addiction that have emerged out of adaptations to the dim prospects of employment offered by the conventional labour market (Gilmore, 1998; Rusche & Kirchheimer, 1939;

Wacquant, 2009). Wacquant (2009), for example, explains that incarceration has been used as a "technique through which the nagging problem of persistent marginality rooted in unemployment, subemployment, and precarious work is made to shrink on – if not disappear from – the public scene" (p.60). In the United States, where the War on Drugs exists in one of its most resolute forms, entire communities have organized around incarceration as a mode of production (Christie, 1993; Simon, 1993) and calls to end the War on Drugs in its totality will likely be met with fierce resistance.

While the responses to poverty and some of its concomitant adaptations (e.g.,drug addiction, participation in the informal economy) have largely been punitive in nature, there is some reason to be optimistic about alternatives to the criminalization of drugs as an increasing number of countries have expressed interest in experimenting with different forms of drug liberalization. Although there is an argument to be made that the recent appeal of these initiatives in North America has largely been sparked by economic incentives (e.g.,realized tax income from the sale of marijuana, eliminating costs associated with incarceration), moves away from the institutional practices of criminal branding and the deprivation of life and liberty for non-violent drug offenses represent important steps to modelling a society around the production of life chances rather than their destruction.

Study Limitations

The first limitation of this study is the frame of analysis which, by the very nature of its exclusion criteria and sampling, is not wholly inclusive of all the segments of the Canadian population. Because not all provinces and territories included questions about social capital and illicit drug use in their questionnaires, the data cannot be said to be representative of the Canadian population. Regarding the four provinces that administered complete questionnaires, there remains a need to be cognizant of the additional limitations of sampling procedures employed during the administration of the survey. For example, it is often difficult to engage with those who suffer from severe forms of dislocation and/or substance addiction as their life circumstances do not easily permit their exposure to researchers (see Dahlberg & Anderberg, 2012). For reasons of fear of incrimination, general distrust, geographical isolation, or homelessness they often constitute a hidden population occasionally made visible only by ethnographic research or studies of clinical samples. Since the CCHS surveys were administered via telephone, those who did not reside in a conventional residence or did not have access to a telephone were not accounted for (see Adlaf, Begin, & Sawka, 2005). The exclusion of residents of Indian reserves and crown lands, members of the Canadian Armed Forces, and institutionalized persons of Canada during preliminary sampling procedures may also have discounted important segments of the population that may exhibit differential patterns of illicit drug use and dependence. For example, in a survey by Health Canada (2014), Aboriginal adults on reserve cited alcohol and drug as the primary challenge facing their communities followed by housing and jobs. Because a large proportion of Aboriginals residing in reserves have been excluded from analysis, effect sizes related to

Aboriginal ethno-racial predictors may be underestimated in the present sample. Despite these limitations to the sample, data from the four provinces represent a valuable pool of respondents from which to draw initial conclusions from. Further research that aims to integrate isolated and excluded populations into the sample may find a strengthened association between social capital and drug dependence.

The second limitation concerns the use of self-report data. The CCHS survey also relies heavily on self-report data of sensitive, stigmatized, and illegal behaviours. The reluctance of respondents to disclose drug use behaviours and the validity of self-reported drug use has been subject to substantial discussion (see Harrison & Hughes, 1997). Also, some components of the survey ask respondents to provide estimations of certain drug use behaviours and characteristics of their social network that are potentially prone to high variation. For example, since respondents were asked to subjectively estimate the number of close friends or relatives in their network, responses may have been affected by bias and/or memory-recall problems resulting in inaccurate estimates (Brewer, 2000; McCormick, Salganik, & Zheng, 2010). However, while respondents are unlikely to provide pin-point accuracy in their estimations, regressions are able to demonstrate general trends in the data in which small response variations do not significantly influence direction or significance of associations.

The third limitation of the study is the omission of social capital derived from informal intimate partnerships that do not qualify as marriage or common-law[12] relationships. Partner relationships not formally recognized by law have been argued to be equally important sources of social capital (Gillies, 2003). The inclusion of persons

[12] To qualify in Canada as a common-law relationship, individuals must have lived with a partner for at least 12 consecutive months (Government of Canada, 2015).

with these types of relations into the single category may under- or overestimate the effects on the outcome measure. Therefore results should be interpreted with caution.

The fourth limitation of the study is the possibility of specification problems that arise from the inability of available survey measures to adequately represent a particular underlying construct. Measures in this study that consist of indices (i.e., social support and drug dependence) are particularly vulnerable to this limitation as they may not explain all the variance in the observed variables. The use of factor analyses, however, ensured homogeneity of variables included in each index.

The fifth limitation of the study is the possibility of a reciprocal relationship between social capital and illicit drug use/dependence that was untested. The analyses of drug interference on one's social life and on one's ability to maintain relationships provided some preliminary evidence that illicit drug use may have an effect on the stability of social relations. Further tests could determine the causal nature of this relationship. Because of these limitations, caution must be exercised when interpreting the results of this study.

Policy Recommendations

While both illicit drug use and dependence were analyzed in this study, the following policy discussion is aimed at the latter on the basis that illicit drug use alone does not automatically indicate addictive or harmful patterns of use. In describing addiction, Maté (2009) suggests that the issue is not the quantity or frequency of use, but rather its impact whereby evidence strongly suggests the drug is doing significant harm.

Given the findings of the present study that suggest a protective effect of social capital against drug dependence, the most immediate policy implication would be aimed

at harbouring the potential of social capital to enhance treatment modalities. Previous studies have revealed the importance of social capital to patients in the recovery process and have suggested that more effective treatment outcomes can be achieved through group-oriented self-help programs in addition to therapy (Cloud & Granfield, 2008; Dobkin et al., 2002; Granfield & Cloud, 2001) and closer involvement of family in the healing process (Cheung & Cheung, 2003).

However, while supportive, non-judgemental, and compassionate treatment programs constitute an important *reactive* component to mitigating the harms of drug dependence, they are less able to address underlying social conditions that make individuals vulnerable to adverse drug outcomes. For this purpose, it may be informative to view addictions of all sorts as symptoms of a much larger social disease that has manifested itself under the conditions of structured market society (Alexander, 2010; Currie et al., 2013; Maté, 2009). Alexander (2001b) argues that addiction to drugs and other habits has become so prevalent since the industrial revolution as to constitute a "general condition in western society" (p.2); a trend that owes much to the dislocation, psychosocial disintegration, and immiseration produced by the free-market system (Alexander, 2008; Malott, Hill, & Banfield, 2013). For the most deprived populations who have been excluded from the labour market for much of their lives or who have been made redundant by technological advances and forces of globalization, addiction is a proximate reality in the absence of institutional supports previously maintained by the state (Bauman, 2004). The degree to which the state will engage in capacity building in neglected communities or revive elements of the Keynesian compact is tenuous given its continuing withdrawal from the social front and pursuit of governing strategies along

more neoliberal lines (Harvey, 2005; Wacquant, 2009). Economic shifts that have occurred as a result of the globalization of capital, the pursuit of cheap labour, and the movement of industry away from advanced capitalist economies has placed substantial fiscal pressures on the state to keep pace with growing social and economic inequalities (Harvey, 2005; Peck et al., 2009). In light of these obstacles to state intervention, perhaps the most convincing strategy would be to view drug-related problems (e.g.,drug dependence, overdose, and risky drug practices) and the poor social conditions in which they are reproduced as a public health issue in which some forms of substance use have serious health implications that are disproportionately distributed among those who reside at the lowest positions in the political, economic, and social order (Galea & Vlahov, 2002). Drug-related problems would only be considered to have a medical character insofar as the treatment of the most acute morbidities associated with problematic use are best addressed in a healthcare setting. The most crucial intervention points would be at a social level where the foundations of drug dependence, poor mental health, and many forms of chronic disease are linked by common social determinants (Spooner & Hetherington, 2004). A successful strategy would: a) hold the Canadian government to its commitment of reducing health disparities made in the 2003 Health Accord (see Public Health Agency of Canada, 2004); b) involve a collaboration of professionals from multiple disciplines and from a diverse range of ethno-racial and ethno-cultural groups; and c) would identify vulnerable communities and populations across Canada and pursue targeted interventions at the community and individual levels.

At the community level, proactive initiatives to rebuild institutions that enable vulnerable communities and populations to cultivate social capital are crucial. However,

policy-makers must avoid the trap of believing that internal development of social capital can be achieved by communities and families alone. Indeed, social capital theory has been heavily criticized on this basis, with critics arguing that mobilized in a particular way, social capital serves as a conservative construct that devolves responsibilities to communities and families (Baron et al., 2000). It is clear then that there is an important role for the state to play in cultivating formal social capital (see Wacquant, 1998) and reversing several decades of capital disinvestment in communities, which Hagan (1994) argues to be one of the greatest impediments to the formation of informal social capital. Some researchers have highlighted the need for the state to rebuild institutional supports at the community level in the form of affordable housing, access to employment, and opportunities for greater voluntary participation (Cheung & Cheung, 2003; Putnam, 2000). Warren et al. (2001) cite some examples of collaborative efforts between government agencies, non-governmental organizations, religious organizations, and community residents to "build affordable housing, foster micro-enterprise development, promote neighbourhood safety, improve schools, and more generally, take steps to reweave the social fabric of torn communities" (p. 4).

To attend to the needs of specific vulnerable and at-risk populations, initiatives must consider particular disadvantaged ethno-racial groups such as Aboriginal populations who, as a collective, have experienced several crises of substance dependence, chronic disease, mental health, and suicide that can largely be attributed to a legacy of colonial and state oppression (Adelson, 2005; Kirmayer et al., 2003; Marshall, 2015; Reading, 2009; Reading & Wien, 2009). For Aboriginal peoples who have migrated to urban centres, Hill and Cooke (2013) point to local institutions organized

around specific cultural values such as friendship centres and Aboriginal community centres that have successfully served as hubs for social network development. They are, however, cognizant of the challenges involved in promoting the development of social capital in Aboriginal communities as many "suffer from factionalism and low community bonding, linking, bridging capitals as a result of the imposition of colonial governance" (Hill & Cooke, 2013, p.424). Thus, they argue it is essential to approach such projects in a collaborative fashion with emphasis on trust-building and Aboriginal cultural values (Hill & Cooke, 2013).

Additionally, those who have lost a former spouse may also qualify as at-risk and in need of support. This study showed that deficits in marital social capital predicted higher prevalence of some types of illicit drug use and a greater likelihood of drug dependence. However, it was also demonstrated that social support can mitigate some of the effects of not having marital social capital on drug dependence. This finding is consistent with other studies that have shown social support to be an important element in coping with various adverse life events such as separation, divorce, death in the family, and other forms of marital and family dissolution (Cohen & Wills, 1985; Leslie & Grady, 1985). A practical policy implication then would be to enhance existing sources of social support, promote the development of new sources of social support through group therapy and organizational involvement, and provide institutional support (e.g., childcare to reduce overload of parenting, financial support) to individuals adapting to a loss of a former spouse who may exhibit several risk factors for substance use problems (Canadian Institute for Health Information, 2012; DeGarmo, Patras, & Eap, 2008).

Finally, and perhaps most importantly, there must be a rethinking of drug policy and the consideration of decriminalization and/or legal regulation of currently illicit drugs on the basis that criminal regulation of drug use has exacerbated social, legal, and health inequalities (Alexander, 2012; Oscapella, 2000; Provine, 2007; Sneddon, 2006). Recommendations made by the Global Commission on Drugs (2014) have suggested that moves to legalize illicit drugs must be accompanied by the reorientation of resources away from criminal justice initiatives and to the support of non-coercive forms of treatment, harm reduction initiatives, and social supports necessary for healthy development. Recent legislative moves to legalize marijuana in the United States and Canada appear to be a progressive step forward only insofar as they represent the first of many steps in a wholesale revision of drug policy. In other words, to liberalize some drugs but not others would only preserve highly politicized distinctions between illicit and licit drugs while perpetuating society's most injurious responses to the drug 'problem'.

Further Research

Because analysis was based on available measures in the dataset, other dimensions of social capital previously theorized were not directly measured. Additional avenues for research can strive to operationalize relational dimensions of social capital such as informal social control, information flow, trust, and norms of reciprocity and use these measures to predict drug-related outcomes. Analyses of this sort may yield more clear distinctions of which particular dimensions of social capital are most salient in predicting illicit drug use and dependence. Furthermore, it may be informative to conduct more comprehensive analyses on the relation between socioeconomic status and drug

dependence. Considering that adverse consequences of illicit drug use such as overdose, drug dependence, and other drug-related morbidities have been associated with economic deprivation in particular communities (Galea & Vlahov, 2002; Marzuk et al., 1997), it may be productive to determine whether absolute poverty or relative measures of inequality are more important in explaining this relationship (Marmot & Davey Smith, 1989). This could be approached using comparative multilevel analysis utilizing measures of inequality, social capital, and drug dependence at the census metropolitan area (CMA) level.

Chapter 6: Conclusion

The main objective of the present study was to enhance knowledge about the role of social capital in illicit drug use and dependence. The analyses revealed that structural dimensions of social capital (i.e., network size and marital status) do not influence illicit drug use in a uniform manner when taking into account different types of illicit drugs. In other words, these forms of social capital have the capacity to facilitate certain types of illicit drug use while constraining others. However, the relational dimension of social capital (i.e., social support) demonstrated a consistent protective effect across all types of illicit drugs. When measuring drug dependence, it was found that all three dimensions of social capital measured in this study showed unanimous protective effects. This study also found that those who identified as Aboriginal, reported low income, and reported low education were at an elevated risk for drug dependence. These findings lend support to the notion that drug use outcomes cannot be divorced from the social contexts in which individuals use and become dependent on drugs and that interventions must address the erosion of social capital at both the community and individual level.

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Table 4.11: Unstandardized and Standardized Multiple OLS Regression Coefficients of Drug Interference in Last 12 Months (No Exclusion), Weighted Sub-sample

	Home Responsibilities			Ability to Work at a Regular Job			Close Relationships			Ability to Maintain Social Life		
	B	**Beta**	***p***	**B**	**Beta**	***p***	**B**	**Beta**	***p***	**B**	**Beta**	***p***
(Constant)	3.327		***	1.867		***	3.830		***	2.506		***
Age	-.031	-.200	***	-.008	-.067	**	-.023	-.146	***	-.010	-.077	***
Male[1]	.148	.036		-.060	-.021		.170	.042	*	.119	.034	
New Brunswick[2]	.129	.018		.149	.029		-.230	-.032		.152	.024	
Saskatchewan[2]	.254	.052		.286	.084		-.066	-.013		.233	.055	
British Columbia[2]	.070	.018		.211	.076	*	.203	.052		.179	.052	
Urban[3]	.172	.035		-.083	-.024		-.010	-.002		.061	.014	
Aboriginal[4]	.385	.066	***	.262	.062	**	.334	.058	**	.479	.095	***
Asian[4]	-.301	-.017		.446	.035		.664	.037		.563	.036	
Black[4]	1.000	.050	**	-.548	-.041	*	1.349	.068	***	.444	.026	
Other[4]	.058	.005		.297	.036		.550	.046	*	-.208	-.020	
Income ($0-$9,999)[5]	.553	.094	***	.368	.083	**	.405	.070	**	.600	.119	***
Income ($10,000-$29,999)[5]	-.086	-.021		-.068	-.024		-.138	-.035		-.103	-.030	
Income ($30,000-$59,999)[5]	-.141	-.034		-.118	-.042		-.265	-.065	*	-.283	-.080	**
Education (> Highschool Degree)[6]	-.171	-.031		-.450	-.112	***	-.484	-.088	***	-.225	-.047	*
Network Size	-.037	-.065	**	-.040	-.099	***	-.069	-.121	***	-.048	-.097	***
Separated[7]	.825	.117	***	.281	.055	*	.616	.088	***	.471	.078	***
Single[7]	-.068	-.018		-.014	-.005		-.303	-.079	***	-.047	-.014	
Social Support	-.026	-.163	***	-.013	-.109	***	-.032	-.206	***	-.024	-.179	***
R^2	.117			.081			.144			.124		
Adjusted R^2	.110			.074			.137			.117		
Sample n	2435			2256			2433			2433		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Regressions controlled for year

Table 4.12: Unstandardized and Standardized Hierarchical OLS Regression Coefficients of Drug Dependence in Last 12 Months, Weighted Sub-sample (Marital Status as Socio-demographic Variable)

	Model 1			Model 2			Model 3			Model 4		
	B	Beta	*p*	B	Beta	*p*	B	Beta	*p*	B	Beta	*p*
(Constant)	1.496		***	1.872		***	2.374		***	3.919		***
Age	-.014	-.144	***	-.017	-.174	***	-.018	-.180	***	-.019	-.192	***
Male[1]	-.063	-.019		.062	.019		.063	.019		.031	.009	
Separated[7]	.776	.152	***	.780	.153	***	.765	.150	***	.554	.109	***
Single[7]	.136	.034		.011	.003		.016	.004		-.128	-.032	
New Brunswick[2]	-.165	-.030		-.143	-.026		-.144	-.026		-.118	-.021	
Saskatchewan[2]	.005	.001		.056	.014		.062	.016		.059	.015	
British Columbia[2]	-.160	-.048		-.078	-.023		-.050	-.015		-.074	-.022	
Urban[3]	.004	.001		.067	.017		.063	.016		.061	.015	
Aboriginal[4]	.705	.090	***	.559	.072	***	.531	.068	***	.526	.068	***
Asian[4]	-.050	-.007		-.158	-.024		-.238	-.036		-.356	-.054	**
Black[4]	.582	.032		.518	.029		.450	.025		.508	.028	
Other[4]	.097	.013		-.020	-.003		-.087	-.012		-.112	-.015	
Income ($0-$9,999)[5]				.861	.174	***	.811	.164	***	.780	.158	***
Income ($10,000-$29,999)[5]				.212	.058	*	.176	.048		.148	.041	
Income ($30,000-$59,999)[5]				-.070	-.020		-.088	-.025		-.088	-.025	
Education (> Highschool Degree)[6]				-.615	-.124	***	-.598	-.120	***	-.595	-.120	***
Network Size							-.073	-.146		-.048	-.096	***
Social Support										-.028	-.187	***
R^2	.051			.102			.123			.152		
R^2 Change				.051			.021			.029		
Adjusted R^2	.046			.096			.116			.145		
F	9.958***			15.922***			18.522***			22.481***		
Sample n	2402			2402			2402			2402		

*** p≤.001, ** p≤.01, * p≤.05

Reference Categories: [1]Female, [2]Nova Scotia, [3]Rural, [4]White [5]$60,000+, [6]Highschool Diploma or Less, [7]Married/Common-Law

Regressions controlled for year

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