

**UNVEILING A SOCIO-DEMOGRAPHIC PORTRAIT OF CANADIAN MEN'S
MENTAL HEALTH: EXPLORING THE INTERSECTIONAL IMPACT OF
SOCIAL HIERARCHIES ON DEPRESSION AND SUICIDAL IDEATION
AMONG CANADIAN MEN**

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A Thesis

Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfillment of the
Requirements for the Degree

DOCTOR OF PHILOSOPHY

Department of Sociology
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

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Dedication

For my family, who have supported me through my graduate studies and my convoluted professional journey.

For the men who struggle with depression, and for those that love and support them through this difficult journey.

Abstract

The intersectional impact of multiple social gradients on major depression (MD) and lifetime suicidal ideation (LSI) among Canadian men was explored through statistical analysis of four years of Canadian Community Health Survey data spanning 2009-2012 (n=124 000). 4.1% of Canadian men demonstrated MD, with significant variation across sub-groups of men. Significant predictors of MD included low self-esteem, current unemployment, low social support, being a sexual minority, and younger age. The effect of resource inequalities on MD were fully mediated by self-esteem, with the exception of social support, which exerted both a direct and indirect effect on depression predicted probability (DPP), while also moderating the effect of self-esteem on DPP. Significant predictors of LSI included low self-esteem, low social support, and visible minority status. Low standing on a single social gradient only predicted MD or LSI, in the presence of high covariance contribution related to poor standing on multiple gradients.

Preface

As a man who has struggled with depression throughout my life, the following dissertation represents both a personal and a professional passion of mine. This passion has its origins in my undergraduate nursing education, when I was first introduced to the profound disparities in men's health, and was further fueled by my exploration of Raewyn Connell's masculinities theory in the context of my Master of Nursing research. I have been intrigued by the role that masculinities and gender play in health ever since, and I have been particularly interested in the role that masculinities play in men's mental health. While the following study does not directly test the relationship of masculinity to major depression and suicidal ideation, gender clearly plays a significant role in the construction of social gradients, as a man's self-assessed position in hegemonic masculinity hierarchies, intersects with his position in all of the social gradients explored in this research study.

The choice to explore social gradients impact on mental health, was also profoundly influenced by my association with Dr. Susan McDaniel and Prentice Institute for Global Population and Economy, and my colleagues in the Faculty of Health Sciences. Being a part of these vibrant and multidisciplinary communities of scholars during my doctoral studies, has further reinforced the important role that social inequalities, and social structures play in shaping health and well-being. I am truly grateful for the opportunities I have been exposed to during this time, and for the transformative nature of the entire experience, in terms of my development as a scholar.



Peter Kellett

Acknowledgements

I have many people to thank for supporting me during the course of this doctoral research. First and foremost, I would like to thank my co-supervisors: Dr. Susan A, McDaniel, and Dr. Bradley Hagen; and my committee members: Dr. Olu Awosoga, and Dr. Cheryl Currie. I would also like to thank Dr. Christopher Hosgood and the entire Faculty of Health Sciences team at the University of Lethbridge, who have been supporters and cheerleaders for me throughout my studies. Thank you also to Statistics Canada, and the Prairie Research Data Centres in Calgary and Lethbridge for providing me access to the Canadian Community Health Study data, and technical support during the analysis and vetting process. In particular, I would like to thank Charlie Victorino, Rebecca Williams, Charmaine Bonifacio, and Dan Dutton for their guidance during my analysis.

I am also very grateful to my graduate student and Post-doctoral colleagues in the Faculty of Health Sciences and the Prentice Institute for Global Population and Economy, who have been my friends and support network throughout my studies including: Erin Mason, Marie Damgaard, Andrew Patterson, Dan Dutton, Jing Shen, Willa Liu, Germain Boko, Celeste Barnes, Jeff Bingley, Zehan Pan, and the rest of the Prentice grad student family. A big thanks to Nancy Metz and Leanne Little from the Prentice Institute for their support and always making me feel at home.

Thank you to my students, who are a never-ending source of inspiration to me, and who had to put up with me discussing my research and the importance of social gradients for health on a regular basis.

Last but not least, I would like to thank my wife Lynda, my son Christopher, my daughter Sophie, my parents Neil and Brigid, and my sister Anne. I could not do anything that I do without your love and support. Thank you for putting up with my long work hours, my never ending studies, and my constant preoccupation.

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List of Abbreviations

5HT	Blood Serotonin
B	Beta
BSE	Bootstrapped Standard Error
BSI-18	Brief Symptom Inventory 18
CCHS	Canadian Community Health Survey
CCHS-MH	Canadian Community Health Survey Mental Health
CI	Confidence Interval
CIDI	Composite International Diagnostic Interview
CIDI-SF-MD	Composite International Diagnostic Interview Short Form for Major Depression
CMNI	Conformity to Masculine Norms Inventory
DPP	Depression Predicted Probability
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders - Third Edition - Revised
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition
DSM V	Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition
FDA	Federal Drug Administration
GSMD	Gotland Scale of Male Depression
ICD-10	International Classification of Diseases Tenth Edition
L-HPA	Limbic Hypothalamic-Pituitary-Adrenal
LSI	Lifetime Suicidal Ideation

M	Mean
MD	Major Depression
MDD	Major Depressive Disorder
MDE	Major Depressive Episode
MOS	Medical Outcomes Study
MPC	Mechanistic Property Cluster
NCS	National Comorbidity Survey
NPHS	National Population Health Survey
OLS	Ordinary Least Squares
OR	Odds Ratio
OR _{adj}	Adjusted Odds Ratio
PHAC	Public Health Agency of Canada
RDC	Statistics Canada – Research Data Centre
RHP	Resource Holding Potential
SAM	Sympathetic Adrenal-Medullary
SD	Standard Deviation
SE	Standard Error
SSRI(s)	Selective Serotonin Reuptake Inhibitor(s)
U.S.	United States of America
VIBL	Visualization of Binary Logistic Regression Do File
WHO	World Health Organization
WMH	World Mental Health

WMH-CIDI	World Mental Health – Composite International Diagnostic Interview
WWI	World War I
WWII	World War II

Under the Iron Sea

*His frantic strokes propel him forward
Designed to minimize the disturbance of the iron sea's surface
Mimicking a shark in his affect, afraid to stop moving*

*Beneath the steely grey surface, lie unacknowledged threats
Lurking in the sub-surface shadows lie predatory suppressed fears, insecurity, pain, loneliness
Threatening to rise to the surface with devastating effect*

*Pulling him under, gasping for breath
Leaving nothing but the grey glassy surface
Forever hiding the source of his disappearance*

By Peter Kellett, August 2014
(Inspired by the song "Crystal Ball" by the U.K. band Keane and Robin Williams)

CHAPTER 1

Chapter 1

Introduction

Evidence is mounting to suggest that we may not possess a clear picture of the distribution and wider social symptoms of depression in Canadian men (Brownhill, Wilhelm, Barclay, & Schmied, 2005; Magovcevic & Addis, 2006; Oliffe, Galdas, Han, & Kelly, 2013; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008; Wide, Mok, McKenna, & Ogrodniczuk, 2011). Further, a well-established body of research is highlighting the profound impact of social gradients (e.g. income, status, education ...) and relative social inequality on the health and well-being of individuals and groups in society (Keating, 2009; Krieger, 2001; Bruce G. Link, 2008; Bruce G. Link & Phelan, 1995; Marmot & Theorell, 1988; McDaniel, 2013; Muntaner et al., 2011; Muntaner, Eaton, Miech, & O'Campo, 2004; Therborn, 2013; Wilkinson & Pickett, 2006, 2009). A perusal of the literature exploring depression and suicide in men causes many questions to arise. Do Canadian men actually experience depression at significantly lower rates than Canadian women, as published aggregate population-level statistics suggest? How does relative social inequality, established according to socio-demographic hierarchies, impact the development and clinical presentation of depression in Canadian men? Is there a potential for some men to be more significantly affected by the impact of social hierarchies because of the emphasis placed on status within many common hegemonic patterns of masculinity performance (Blincoe & Harris, 2011; Connell, 2005; Connell & Messerschmidt, 2005; Taylor, 2014)?

While aggregate depression statistics clearly serve an important role in understanding the distribution of depression among Canadian men, it is also essential to

acknowledge that men are not a homogenous group when interpreting these findings. Consequently, those studying the socio-epidemiological distribution of depression must consider approaches to analyzing population level data that acknowledge the complex social heterogeneity of men, and the intersectional impact of gender performance and multiple socio-demographic hierarchies on the development and presentation of depression among men (Hankivsky, 2012).

The following pages summarize the findings of a doctoral research study, which sought to take on this challenging task. Informed by multidisciplinary theoretical perspectives and incorporating a complex multi-layered approach to statistical analysis of Statistics Canada population survey data, this study significantly adds to the body of scholarship exploring depression in Canadian men. Pursuing this line of study is also timely because socio-demographic trends in the Canadian population paint a picture of an increasingly diversifying and aging society, with potentially more individuals occupying the lower rungs of established social hierarchies in the future (Statistics Canada, 2010). This changing socio-demographic picture is further set against a backdrop of rising income inequality, both globally and nationally (Corak, 2013; Fuentes-Nieva & Galasso, 2014; Piketty, 2013; Stiglitz, 2012; Therborn, 2013), increasing social precarity (Standing, 2011), and the pervasive influence of historically rooted existential inequalities such as racism, sexism, and classism (E. J. R. David, 2014; Therborn, 2013). As a result, these study findings also have significant potential to inform future health and social policy in Canada.

Dissertation Aims, Objectives, and Research Questions

Purpose

The primary aim of this dissertation was to determine the intersectional effect of multiple socio-demographic hierarchies on the development of depression and lifetime suicidal ideation in the 2009-2012 Canadian Community Health Survey [CCHS] data.

Research Objectives

In pursuit of the identified purpose of this study, the following research objectives were established:

1. To identify key socio-demographic hierarchies associated with the development of depression and lifetime suicidal ideation among Canadian men, and their relative contribution to the development of these conditions.
2. To identify and measure the degree of interaction between socio-demographic hierarchies in the development of depression and lifetime suicidal ideation.
3. To identify any variability in the interaction patterns between socio-demographic hierarchies and the development of depression among gay and bisexual Canadian men.

Research Hypotheses

One primary and three secondary research hypotheses will be explored including:

1. Occupying a low position on one or more socio-demographic hierarchies will contribute to higher risk of depression and lifetime suicidal ideation among Canadian men.
 - a. Occupying a low position in more than one socio-demographic hierarchy will interact to create enhanced risk of depression among Canadian men.
 - b. Occupying a low position in more than one socio-demographic hierarchy will interact to create enhanced risk of lifetime suicidal ideation among Canadian men.
 - c. Occupying a position of subordinated masculinity will intersect with other socio-demographic hierarchies to enhance the odds of major depression and suicidal ideation among gay and bisexual Canadian men.

Research Questions

The central research question posed in this dissertation is: How does a Canadian man's position in socio-demographic hierarchies influence the development of depression and suicidal ideation?

In pursuit of this primary research question, three additional sub-questions will also be explored:

1. What is the intersectional effect of occupying a low position in multiple socio-demographic hierarchies on the development of depression in Canadian men?

2. What is the intersectional effect of occupying a low position in multiple socio-demographic hierarchies on the development of lifetime suicidal ideation in Canadian men?
3. What social gradient variables, or other variables, serve as mediators or moderators of the effect on major depression or lifetime suicidal ideation?

Dissertation Organization

This dissertation is presented in a paper-based format to facilitate the rapid translation of these study findings into publishable papers. As is evident from chapter one so far, this chapter has presented an introduction to the research project, and articulated the purpose, research objectives, research hypotheses, and research questions on which serve as the foundation for the overall doctoral research study.

Chapter two provides a comprehensive review of the existing literature related to depression and suicide among Canadian men, and men at large, which serves as a backdrop to inform the current investigation. After, summarizing the epidemiology of Canadian men's depression, the role that masculinities play in the development and clinical presentation of depression is examined. The role of social structures and hierarchies in mental health is also examined, and how social inequalities can get “under the skin” and become biologically embedded is discussed.

Chapter three summarizes the theoretical frameworks that are being applied to the current investigation, including: existing medical/psychiatric theories about the origins of depression; psychosocial theories of illness; life course theory; intersectionality theory; and masculinities theory.

Chapter four is a theoretical paper that asks the question: What kind of thing is men's depression? Drawing on the paper by Kendler, Zachar, and Craver (2011) called "What kind of things are psychiatric disorders?", this paper proposes a novel and more complex way to understand men's depression syndrome during future research into men's depression, by conceptualizing men's unique presentation of the condition as a mechanistic property cluster.

Chapter five is a paper entitled: "Intersecting Social Gradients, Self-esteem, and Canadian Men's Mental Health in the 2009-2012 Canadian Community Health Survey (CCHS)". This paper presents the findings from analyses which explored the proportion of Canadian men, who met the criteria for major depression, or reported lifetime suicidal ideation. In recognition of the heterogeneity of Canadian men, the proportion of these conditions among sub-groups of Canadian men are also presented. In addition, the intersectional nature of social gradient predictors of major depression is explored through logistic regression and moderated mediation analyses, ultimately resulting in some interesting findings.

Chapter six is a paper entitled: "Depression and Suicidal Ideation among Gay and Bisexual Canadian Men: Exploring the Intersectional Impact of Sexual Orientation and Other Social Gradients in the 2009-2012 CCHS". Given the marginalized nature of gay and bisexual men's masculinity (Connell, 1995), and previously reported findings of high rates of depression and suicidal ideation among these men (Brennan, Ross, Dobinson, Veldhuizen, & Steele, 2010; Hottes, Bogaert, Rhodes, Brennan, & Gesink, 2016; Pakula & Shoveller, 2013), this paper not only examines the proportions of depression and lifetime suicidal ideation among these populations, but also how other social gradients are

intersecting with sexual orientation to influence these outcomes. The combination of four cycles of the CCHS during this study facilitated analyses that have not been possible previously due to inadequate sample size. Therefore, this paper presents the first separate estimates for major depression among these populations, and represents the largest Canadian population level analysis with gay and bisexual men that has been reported.

Chapter seven, presents a summary of the overall findings from this dissertation research, discusses the implications of this research, and presents recommendations for future research in this area of study. As with all studies, this research certainly adds to the body of knowledge related to men's depression and suicidal ideation, while also highlighting a number of areas which deserve further investigation and clarification in future research studies by myself, or other researcher in the area.

CHAPTER 2

Chapter 2

Study Background and Summary of the Literature

Why Study Canadian Men's Depression and Suicide?

Rates of depression are increasing worldwide, and the World Health Organization (2012a) identifies depression as “the leading cause of disability in the world”, and a “major contributor to the global burden of disease” (p.1). According to Health Canada (2009) approximately 11% of Canadian men can expect to experience major depression during their lives, although there are an unknown number of individuals that remain undiagnosed and untreated, so the actual number may be higher. Depressed men may slip through the diagnostic and treatment net for many reasons including: reluctance to self-identify due to the stigma associated with mental illness, or because admitting to depressive feelings is inconsistent with dominant social constructions of acceptable masculinity performance (Oliffe & Phillips, 2008).

Perhaps the most compelling argument for turning the spotlight on men's depression are suicide statistics, which consistently demonstrate a male-to-female ratio of completed suicide in Western societies of at least 2:1 (Payne, Swami, & Stanistreet, 2008). In Canada, the suicide rate for males (17.9 deaths per 100 000) is three times higher than the rate for females (5.3 deaths per 100 000), and intentional self-harm/suicide is consistently the seventh leading cause of death among Canadian men (Navaneelan, 2012; Statistics Canada, 2012c). While these higher suicide death rates have been linked to the frequent choice of more violent means of suicide by men (e.g. hanging and firearms) and may be further fueled by men's higher rates of addiction and associated intoxication, scholars studying masculinity and depression have posited that

these behaviours may actually represent forms of “compulsive” or “protest” masculinity performance in response to a pre-existing depression (Courtenay, 2000; Navaneelan, 2012; Oliffe & Phillips, 2008; Payne et al., 2008). While depression is not a required precursor to suicide, there is a strong link between severe depression and suicide (Oliffe & Phillips, 2008). About half as many men are diagnosed with depression in developed countries compared to women, yet men consistently die from suicide at least twice as often as women (Oliffe & Phillips, 2008). These contradictory findings are an enigma, which requires further exploration. “Are Canadian men experiencing depression more than current statistics would suggest?”, and if so, “why is this occurring?”, and “why are existing statistics not picking this up?” In the coming pages, these questions about men’s depression will be explored further by drawing on evidence that points to the significant contribution of hegemonic social constructions of masculinities, and their interaction with stress induced by social hierarchies (Courtenay, 2000; Keating, 2009; Payne et al., 2008; Walinder & Rutz, 2001).

Contemplating the Fuzzy Line between Sadness and Clinical Depression

Before going further, it is important to first clarify the concept of depression as it is used in this study. While the term “depression” is well established in the popular vernacular, within the psychiatric and mental health community it refers to a specific diagnosis, which requires the presence of certain diagnostic criteria as defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM). However, the often fuzzy line between normal sadness and clinical depression is still being vigorously debated, as are opinions surrounding the best approach for managing depression (Brent, 2009; Horwitz & Wakefield, 2007, 2008, 2009; Maj, 2010). At the root of this debate is the

recognition that the transition between “normal” and “abnormal” is socially constructed, and frequently informed by powerful socio-political forces that establish the boundaries of socially acceptable behaviour (Foucault, 1984; Rosenfeld & Faircloth, 2006). Adding to the debate, are feminist critiques of psychiatric diagnoses, which suggest that the historically predominantly male social context of psychiatry has contributed to the “othering” of women’s experience and the feminization of depression criteria (Caplan & Cosgrove, 2004; Riska, 2009; Wright & Owen, 2001).

Sadness can be considered a normal response to disappointment and losses experienced in the course of life (Horwitz & Wakefield, 2007). It has been hypothesized that the behaviours exhibited by individuals experiencing short-term sadness may even serve an adaptive evolutionary purpose by engendering social support from those surrounding the individual, or by protecting an individual from further aggression following defeat in status conflicts (Horwitz & Wakefield, 2007; J. S. Price, Sloman, Gardner, Gilbert, & Rohde, 1994; Sloman, Gilbert, & Hasey, 2003). Similarly, a case can be made for recognizing sadness as a normal response to challenges, that may actually serve a positive role by helping one recognize the need to make necessary life changes, or develop stronger social networks (Horwitz & Wakefield, 2007). However, debate continues to rage about the distinction made between a “normal” sadness response to loss and the threshold which signifies the transition to the mental disorder of depression (Brent, 2009; Horwitz & Wakefield, 2007, 2008, 2009; Maj, 2010). According to the DSM, a diagnosis of major depressive disorder is appropriate if an individual is experiencing at least five of the nine specified symptoms of depression, including depressed mood or an inability to derive pleasure from life, for at least two

weeks (Horwitz & Wakefield, 2008). The DSM indicates that the bereaved should not be diagnosed with Major Depressive Disorder (MDD) if they otherwise meet the criteria, unless their symptoms are unusually severe or last more than two months. However, Horwitz & Wakefield (2008) have questioned why other significant life losses (e.g. loss of a job, dissolution of a marriage, etc.) and social contexts are not considered as potential exceptions too. Adding to the lack of clarity is the common finding that receiving a diagnosis of MDD is not always considered a necessary precursor to pharmacotherapy with antidepressants, which in conjunction with need for subjective judgements about whether symptoms are “unusually severe” further muddies the distinction between sadness and MDD (Horwitz & Wakefield, 2008). Likewise, debate also surrounds the necessity of managing depression with pharmacotherapy over counselling and psychotherapy once a diagnosis of MDD has been made (Horwitz & Wakefield, 2007, 2008). Although the DSM seeks to make diagnoses more objective and comparable (Brent, 2009), it appears evident that consideration of social context and subjective judgements surrounding the severity of the presenting symptoms are inherently part of the diagnosis and management of depression by clinicians. Therefore, in exploring Canadian men depression this proposed study acknowledges the socially constructed and contextual nature of the diagnosis and management of depression, and recognizes depression as the indistinctly defined top end of the sadness gradient. It is this acknowledgement of the socially constructed and contextual nature of depression diagnostic criteria that underpins the following discussion, which asks whether current approaches to measuring depression are generating accurate estimates of depression among Canadian men.

Reported Rates of Depression in Canadian Men

Surveys and instruments used to classify major depression. Current population estimates for the incidence and prevalence of depression in Canadian men are based on the findings of two nationally representative, self-report, Statistics Canada surveys: The National Population Health Survey (NPHS); and the Canadian Community Health Survey (CCHS). The NPHS was a panel survey that collected data from a cohort of 17 276 Canadian household residents starting in 1994, and every two years thereafter until 2008 when this project ended after seven cycles (Simpson, Meadows, Frances, & Patten, 2012). Baseline data for the NPHS were predominantly collected during face-to-face interviews; however, follow-up data was primarily obtained through telephone survey (Simpson et al., 2012). The CCHS is a cross-sectional health survey of approximately 130 000 Canadian household residents, which has been conducted every two years since 2001, and has been carried out annually with approximately 65 000 Canadians since 2007 (Simpson et al., 2012; Statistics Canada, 2011). Both of these Statistics Canada surveys utilized trained interviewers and stratified cluster sampling to ensure that these data were of high quality and represented 98% of the Canadian population aged 12 years or older, who live in private dwellings in all provinces and territories (Statistics Canada, 2011). Excluded from the sample frame were individuals living on Indian Reserves, Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of some remote regions (Statistics Canada, 2011).

Major Depressive Episodes (MDE) in the previous 12 month period were identified among NPHS and CCHS participants, who met or exceeded a 90% predictive cut-point on the Composite International Diagnostic Interview Short-form for Major

Depression (CIDI-SF-MD), which was included in all cycles of the NPHS and the CCHS (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998; Patten et al., 2006; Simpson et al., 2012; J. L. Wang, Williams, et al., 2010). The CIDI-SF was originally developed by Kessler et al. (1994) as a short form version of the World Mental Health (WMH) Survey Initiative's version of the World Health Organization's (WHO) Composite International Diagnostic Interview (CIDI) for use in the United States National Comorbidity Survey (NCS) (Kessler et al., 1994; Kessler & Ustun, 2004; World Health Organization, 1990). The CIDI-SF-MD has since been revised to generate Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) diagnoses (American Psychiatric Association, 2000). A 90% cut-point on the CIDI-SF-MD corresponds with the fulfillment of five of nine symptoms in a list symptoms that approximates the A criterion of MDE in the DSM-III-R and DSM-IV (Kessler et al., 1998). The CIDI-SF-MD is reported to have a sensitivity of 89.6% (SE= 0.8), a specificity of 93.9% (SE=0.3), a positive predictive value of 75.7% (SE=1.0), a negative predictive value of 86.9% (SE= 0.4), and a total classification agreement with the WMH-CIDI of 93.2% (SE=0.3) (Kessler et al., 1998). No significant differences have been noted in the CIDI-SF-MD's ability to identify major depression between men and women (Kessler et al., 1998).

The full WMH-CIDI has not been incorporated into Canadian population health surveys on a regular basis because of the increased time required to administer this instrument; however, Statistics Canada did incorporate the WMH-CIDI into their 2002 CCHS: Mental Health and Well-Being (CCHS 1.2) and the 2012 CCHS – Mental Health (Patten et al., 2006; Statistics Canada, 2013a). Similar to other CCHS surveys, the CCHS 1.2 was drawn from a nationally representative sample (n=36 984) through stratified

cluster sampling, and data were collected by well-trained lay interviewers through a computer-assisted interview procedure (Patten et al., 2006). The computer-assisted version of the WMH-CIDI (Auto 2.1) was also used in a study to identify the prevalence of depression among first year university students in Nova Scotia (E. L. Price, McLeod, Gleich, & Hand, 2006) , and in a prospective Alberta study of the link between work environment and the incidence of major depression (J. L. Wang, Patten, Currie, Sareen, & Schmitz, 2012). The WMH-CIDI is a fully-structured diagnostic interview, which was developed at the request of the WHO to enable the mapping of symptoms to both the American Psychiatric Association`s (APA) DSM-IV and the WHO`s International Classification of Diseases (ICD 10) criteria (Andrews & Peters, 1998; Kessler & Ustun, 2004; Robins Ln & et al., 1988). The WMH-CIDI is currently used in a large number of countries worldwide, and psychometric studies have demonstrated that the inter-rater reliability is excellent, the test-retest reliability is good, and the validity is also considered to be good given the methodological challenges inherent in assessing the reliability of this instrument (Andrews & Peters, 1998; Wittchen, 1994).

Incidence of depression in Canadian men. The longitudinal design of the NPHS provided Wang et al. (2010) with an opportunity to estimate the incidence of major depression in Canada. Incidence rates quantify new cases of a condition, and previous occurrences of MDE are a strong indicator of future cases (J. L. Wang, Williams, et al., 2010). Individuals between 18 and 65 during the 2000/01 cycle of the NPHS were selected as the baseline for the study (n=7635), and cases experiencing MDE between 1994/95 and 2000/01 were excluded from the study cohort so as to start with group of previously mentally healthy individuals (J. L. Wang, Williams, et al., 2010).

Data were analyzed for the following three cycles of the NPHS (2002/03, 2004/05, and 2006/07) to identify new cases of MDE in the previous 12 month period utilizing the CIDI-SF-MD results (J. L. Wang, Williams, et al., 2010). The cumulative incidence of MDE among men was determined to be 2.4% (95% CI: 1.6 , 3.3) in 2002/03, 4.4% (95% CI: 3.5, 5.4) in 2004/05, and 5.5 % (95% CI: 4.4, 6.5) in 2006/07 (J. L. Wang, Williams, et al., 2010). Gender differences in MDE incidence rates were not significant in 2002/03 with women experiencing a cumulative incidence rate of 3.3% (95% CI: 2.6, 4.0); however, statistically significant differences ($p < 0.005$) were noted during the 2004/05 and 2005/06 cycles with women experiencing a cumulative incidence rate of 6.9% (95% CI: 5.8, 8.0) and 9.0% (95% CI: 7.8, 10.3) respectively (J. L. Wang, Williams, et al., 2010). Wang et al. also note that this six year cumulative incidence rate represents more than 50% of the previously reported lifetime prevalence in Canada, which suggests that these reported lifetime prevalence rates may underestimate the true lifetime prevalence of major depression (J. L. Wang, Williams, et al., 2010).

In a second study, Wang et al. (2012) followed a random sample of Alberta employees, ($n=2752$), who were between 25 and 64 years of age, for one year to assess the influence of work and environmental factors on the development of major depression. The one-year incidence rate of major depressive disorder as assessed by the WMH-CIDI among men in this study was 2.9% (95% CI: 1.9, 4.2) (J. L. Wang et al., 2012).

Prevalence of depression in Canadian men. Several studies have examined the prevalence of major depression in the Canadian population through analysis of the CIDI-SF-MD results in the CCHS and the NPHS data (Blackmore et al., 2007; Chen, Jiang, & Mao, 2009; Patten et al., 2006; Patten et al., 2015; Simpson et al., 2012). A summary of

these studies and their prevalence estimates for major depression among Canadian men is presented in Appendix A - Table 1. Estimates of annual prevalence among Canadian men ranged between 2.8% and 4%, with Patten et al. (2006) reporting point prevalence of Major Depressive Disorder (MDD) to be 1.2% (95% CI: 0.9, 1.4).

Very few studies reported the prevalence of major depression for different age groups or sub-groups of Canadian men (See Appendix A – Table 1). Patten et al. (2006) reported that the annual prevalence of major depression was higher among Canadian single men, who were older than 45 years (4.1%), when compared with single men who were 45 years-old or younger (3.7%). This pattern of prevalence in single men is the reverse of that demonstrated in single women, who exhibited lower prevalence of major depression in the corresponding older group (Patten et al., 2006). In a study that analysed fee-for-service physician billing data in Alberta between 2001 and 2004, Slomp et al. (2009) reported a three-year physician treated prevalence of depression of 10.2% among men between 18 and 44 years of age, 11.5% in those between 45 and 64 years of age, and 12.1% in men older than 65 years. Price et al. (2006) explored the prevalence of MDD among first year students in a small Nova Scotia university and reported the one-year prevalence of MDD to be 7% in male students as compared with 14% in female students. Since this prevalence is higher than the three to four percent prevalence reported in general population studies, this may indicate a potential for a higher prevalence of MDD among Canadian university students (Blackmore et al., 2007; Patten et al., 2006). Brennan et al. (2010) examined the health of Canadian men in the 2003 CCHS based on sexual orientation, and although they did not report the prevalence of major depression as a separate condition, their results were strongly suggestive of a potentially higher

prevalence of depression among gay and bisexual men. Heterosexual men displayed a 5.1% (95% CI: 4.8-5.5) unadjusted prevalence of mood or anxiety disorder, while homosexual and bisexual men demonstrated a unadjusted prevalence of 15.8% (95% CI: 12.0-19.6) and 13.8% (95% CI: 8.5-19.1) respectively for mood and anxiety disorders (Brennan et al., 2010).

Correlates of depression in Canadian men. Although there have been several published studies that report the correlates of depression in the Canadian population as a whole, relatively few studies report statistics for Canadian men as a separate population. A summary of the studies included in the current review is presented in Appendix A - Table 2. Canadian men, who are heavy drinkers, are at significantly higher odds (OR=3.9; 95% CI: 3.1, 4.9) of experiencing major depression (Lukassen & Beaudet, 2005). High job strain contributes to greater than twice the odds of men developing major depression (Blackmore et al., 2007; J. L. Wang et al., 2012), and lack of social support from supervisors or coworkers increases men's odds of developing major depression by between 1.2 and 2.7 times (Blackmore et al., 2007; J. L. Wang, Lesage, Schmitz, & Drapeau, 2008). Similarly, high work demands combined with low control over the work environment (OR= 1.74; 95% CI: 1.12, 2.69) and increased psychological demands related to work (OR=1.90; 95% CI: 1.06, 1.90) were significantly predictive of major depression (Blackmore et al., 2007; J. L. Wang et al., 2008). Three studies also report a significantly increased risk for the development of major depression among men experiencing job insecurity with reported odds ratios between 1.35 and 3.47 (Blackmore et al., 2007; J. L. Wang et al., 2008; J. L. Wang et al., 2012). Wang et al. (2010) also explored the relationship between socioeconomic status, work status, education, and the

incidence of MDE. Statistically higher incidence of MDE was noted among working men with lower levels of education (8.3%; 95% CI: 5.4, 11.1) and low income (12.9%; 95% CI: 4.7, 21.0) (J. L. Wang, Schmitz, & Dewa, 2010). Higher incidence of MDE was also present among men reporting financial strain (8.1%; 95% CI: 5.5, 10.7), and among unemployed highly educated men (4.5%; 95% CI: 1.6, 7.3) (J. L. Wang, Schmitz, et al., 2010).

The Intersection of Masculinities and Depression

Masculinities scholars have established a clear link between the adherence to gender performances aligned with hegemonic masculinities and men's poor health outcomes (Courtenay, 2000, 2011; Creighton & Oliffe, 2010; Evans, Frank, Oliffe, & Gregory, 2011; Robertson, 2007). As configurations of social practice, embedded within gender power relations, masculinities are multiple and contextual; therefore, caution is warranted in casting masculinities as inborn essential qualities, or inherently pathological (Connell, 1995; Robertson, Williams, & Oliffe, 2016). Indeed, many common elements of masculine practices are potential facilitators of health, such as: engaging in physical activity; maintaining health for the purposes of career success, sport, and fulfilling the responsibilities of fatherhood; and the emphasis on persistence and resilience (O'Brien, Hunt, & Hart, 2005; Robertson et al., 2016; Wassersug, Oliffe, & Han, 2014). However, some hegemonic patterns of masculine practice, are certainly linked with poor health outcomes, such as: refusal to admit vulnerability, risk taking, aggression, or reluctance to ask for help based on a skewed sense of independence or strength (Courtenay, 2000; Creighton & Oliffe, 2010; Evans et al., 2011; Robertson et al., 2016). Of particular interest to the current discussion is the growing body of scholarship that examines the

intersection between masculinities and depression, which collectively builds a convincing case for the profound impact of gender on the social performance of depression in men (Brownhill et al., 2005; Coen, Oliffe, Johnson, & Kelly, 2013; Conrad & White, 2010; Emslie, Ridge, Ziebland, & Hunt, 2006; Magovcevic & Addis, 2006; Mahalik & Rochlen, 2006; McCusker & Galupo, 2011; Ogrodniczuk & Oliffe, 2011; Oliffe, Bottorff, et al., 2010; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008; Oliffe, Rasmussen, et al., 2013; Spindel, 2015; Wide et al., 2011). Central to these accounts of masculinity and depression is a recognition that men are acutely aware of dominant societal constructions of masculinity that emphasize “strength”, “independence”, “success”, and “dominance”, which is consistent with Connell’s concept of hegemonic masculinities (Connell, 1995, 2000, 2005; Connell & Messerschmidt, 2005; Heifner, 1997; Oliffe & Phillips, 2008). Accounts by depressed men frequently position depression as a sign of personal weakness, vulnerability, or failure because they have been unable to overcome depression; therefore, they sometimes view depression as a failure of masculinity, and may demonstrate significant reluctance in admitting the symptoms of depression (Heifner, 1997; Oliffe & Phillips, 2008). Men’s attempts to hide traditionally feminized depression symptoms, such as crying or overt demonstration of sadness, tend to result in two constellations of presenting symptoms described by Brownhill et al. (2005) as: “acting in” and “acting out”. “Acting in” may present as social withdrawal, avoidance, or denial of problems, and can also include the performance of “compulsive masculinities” to numb emotional distress such as: use of drugs or alcohol, medicating with food, workaholism, sexual addiction/extra-relationship affairs, exercise/activity, or obsessive hobbies (Brownhill et al., 2005; Courtenay, 2000;

Majors & Billson, 1992; Oliffe & Phillips, 2008). Failing to deal with depression may contribute to a build-up of negative emotions, anxiety, or self-hatred, which can manifest as “acting out” in the form of risk-taking, violence, aggression, and sometimes crime (Bosson & Vandello, 2011; Brownhill et al., 2005; Oliffe & Phillips, 2008; Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008). The “acting out” constellation of symptoms resonates with Connell’s (1995) concept of “protest masculinities”, which are hypermasculine performances, generated to compensate for feelings of subordination and in order to demonstrate congruence with hegemonic masculinities. In some men, self-harm and suicide can be considered their final “acting out” performance, and their choice of more violent and dramatic means of committing suicide could be considered an act of “protest masculinity” (Brownhill et al., 2005; Connell, 1995, 2005).

Several Canadian qualitative studies have explored men’s experience of depression, and also provide some insight into how the often unique clinical presentation of depression among men is linked to the social performance of masculinities (Coen et al., 2013; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, et al., 2010). In a study of college men’s depression, Oliffe et al. (2010) interviewed 26 depressed male students and identified three interconnected themes: mind matters, stalled intimacy, and lethargic discontent. The theme “mind matters” revolved around the depression that these men felt when academic goals were not achieved, because this presented a potential threat to their future success (Oliffe, Kelly, et al., 2010). In addition to academic underperformance, concurrent issues that often contributed to their experience included their emerging student debt and poor career prospects (Oliffe, Kelly, et al., 2010). “Stalled intimacy” developed when depression exerted a negative impact on these men’s ability to initiate or

sustain intimate relationships (Olliffe, Kelly, et al., 2010). In some cases, these men socially withdrew themselves from the pursuit of a relationship at all because they did not want others to realize that they were experiencing depression, while in other cases the intimacy of the relationship was affected by these men's decreased libido, insecurities, or reluctance to disclose their condition to their current or potential partner (Olliffe, Kelly, et al., 2010). The theme "lethargic discontent" acknowledged the fact that the lethargy and fatigue experienced by these depressed men presented as a mind-body nexus, rather than a dualistic presentation where mental and physical symptoms are separate (Olliffe, Kelly, et al., 2010). Because the social performance of masculinity frequently requires the demonstration of physical strength and vitality, the impact of severe depression on their physical performance had a concurrent impact on their sense of masculine well-being (Olliffe, Kelly, et al., 2010).

In a second qualitative study of 25 college-aged men, who were classified as being depressed according to Beck's Depression Inventory, Olliffe et al. (2013) describe the performance of "faux masculinities" by these men. "Faux masculinities" were used to describe these depressed men's performance of idealized or hegemonic masculinities, which emerged from and in response to their experience of depression (Olliffe, Galdas, et al., 2013). There were three predominant masculine identities described within the concept of "faux masculinities": the "angry man"; "the solitary man", and the "risk reliant man" (Olliffe, Galdas, et al., 2013). The "angry man" used the expression of anger to mitigate the emotional pain and distress associated with depression (Olliffe, Galdas, et al., 2013). The "solitary man" chose to self-isolate himself from others for fear that others would recognize his depression and pass judgment on him (Olliffe, Galdas, et al.,

2013). Finally, the “risk reliant man” engaged in a hyper-masculine performance of alcohol and drug overuse to self-medicate his depression, rather than relinquish control by engaging with professional health care providers and services to manage his depression (Olliffe, Galdas, et al., 2013).

Coen et al. (2013) engaged in a qualitative study of men’s depression in a rural, northern, resource-based community in British Columbia. Data were collected through semi-structured interviews with nine heterosexual couples, and later subjected to thematic analysis (Coen et al., 2013). Participants in this study described depression as a private issue within the family, and stated that disclosure could have devastating consequences due to the widely held community perspective that depression is “a female disease” and that men suffering from this condition must be weak (Coen et al., 2013). In the highly physical context of a northern resource-based town, admitting to depression caused some to question the man’s ability to deliver on a range of masculine ideals such as: being a breadwinner, or being able to deliver a good work performance under adverse conditions (Coen et al., 2013). The participants described a monologic archetypal man in the community as being physically and mentally strong, indefatigable, and impenetrable in his conversion of natural resources into consumer products (Coen et al., 2013). The performance of this monologic masculinity extended beyond the workplace to include “manly” outdoor recreational pursuits such as: snowmobiling, hunting, and fishing (Coen et al., 2013). One partner stated that being a man in that community was based on how big your paycheck, house, or truck was (Coen et al., 2013). Men with depression and their partners enacted three main strategies to renegotiate their place in the community: legitimizing alternate masculine ideals, recalibrating gender relations, and selecting

healthful monologic traits (Coen et al., 2013). Legitimizing alternate masculine ideals was achieved by recognizing their masculine performance as a valid alternative to the monologic community ideal, by redefining success and pursuing balance in all aspects of their lives (Coen et al., 2013). Recalibrating gender relations referred to the renegotiating of traditional gender roles in their relationships (Coen et al., 2013). Selecting healthful monologic traits, referred to the increased emphasis put on positive and constructive performances of masculinity that fell inside the bounds of the common monologic understanding of masculinity, such as the ability to be a good mechanic, outdoorsman, or sexual partner (Coen et al., 2013).

Wide et al. (2011) engaged in a cross-sectional analysis to examine the degree to which men's conformity to masculine norms affected their presentation of depression. Male patients, who were 19 years or older, were recruited from a university family practice waiting room in British Columbia, and asked to complete three assessment forms while waiting to see their physician, including: the Brief Symptom Inventory (BSI-18) depression subscale; the Gotland Scale of Male Depression (GSMD) (Zierau, Bille, Rutz, & Bech, 2002); and the Conformity to Masculine Norms Inventory (CMNI) (Mahalik et al., 2003; Wide et al., 2011). A statistically significant difference was noted on the scores of the GSMD between the CMNI categories ($F_{3,93} = 2.89, p = .039$), with post hoc analysis demonstrating that men who scored in the "extreme conformity" to masculine norms group, scored higher on GSMD (measuring male-specific symptoms of depression) than men in the "moderate" or "non-conformity" groups ($p = .039$) (Wide et al., 2011). In other words, greater conformity to essentialized masculine norms was associated with a higher degree of male-specific depression symptoms (Wide et al., 2011). When scores on the

BSI-18 depression subscale were compared between CMNI categories, no statistically significant difference was noted ($F_{3, 93} = 2.45, p = .068$); therefore, the measurement of typical depression symptoms measured by the BSI-18 did not vary based on conformity to masculine norms (Wide et al., 2011). Wide et al. (2011) conclude that use of male depression screening tools may capture aspects of depression not captured by traditional measures of depression.

If many men are actively hiding their symptoms of depression, denying emotional distress, or channeling their depressive feelings into “acting in” or “acting out” performances, then the effectiveness of traditional screening tools (e.g. CIDI-SF-MD and WMH-CIDI) to identify depression in self-report national surveys may be significantly impeded due to reporting bias or a lack of sensitivity in identifying the symptoms of men’s depression. While tools based on the current DSM criteria may well identify depression in many male respondents, the findings of masculinity and depression researchers would suggest that these survey tools may not be capturing them all. Tools designed to identify the “acting in” and “acting out” symptoms of depression exhibited by men (e.g. the Gotland Scale of Male Depression, the Masculine Depression Scale, and the Male Depression Risk Scale) demonstrate promise in identifying depression in men with a strong affiliation to traditional essentialized ideas of masculinity (Magovcevic & Addis, 2006, 2008; Rice, Fallon, Aucote, & Möller-Leimkühler, 2013; Wide et al., 2011; Zierau et al., 2002). However, these masculine depression scales are not currently included in national population surveys such as the Canadian Community Health Survey and the National Population Health Survey, which means that it may be necessary to take a more creative approach to exploring the pervasiveness of depression in Canadian men.

Examining the Potential Impact of Social Structures and Socio-demographic Hierarchies on Men's Depression

How do social structures affect agency? Debates about social conditions and their role in the creation of health and illness have resulted in spirited exchanges about the relative influence of sociopolitical “structures” versus individual “agency”, with different theorists placing varying degrees of emphasis on each (Bertilsson, 1984; Bourdieu, 1977; Giddens, 1979; Labonte, Polanyi, Muhajarine, McIntosh, & Williams, 2005; McDaniel, 2013). In his theory of structuration, Antony Giddens presents social structures as virtual entities that exist as the rules and resources brought out by social actors (Bertilsson, 1984; Giddens, 1979). These contextual rules and resources are shaped by socio-political norms in society, and individuals act in a habitual way according to awareness of these social structures, which ultimately contributes to the maintenance of these structures through social reproduction and social regulation (Bertilsson, 1984; Giddens, 1979). These situated practices both constrain and enable agency by the actors (Bertilsson, 1984; Giddens, 1979). Agency may be enabled by structures because it establishes a pre-structured reality that guides action and establishes a path for action; however, this pre-structured social reality simultaneously limits agency by limiting options and possible pathways of action (Bertilsson, 1984; Giddens, 1979). While an individual is aware of and has the opportunity to act contrary to established social structures and practices, it is often easier to practically choose a way forward that acknowledges the limited options imposed by these established social practices (Bertilsson, 1984; Giddens, 1979). Consequently, individual agency is constrained by experience and socialization and by the variable availability of social, cultural, and

symbolic capital (Bourdieu, 1977, 1990; McDaniel, 2013). Bourdieu (1977) labelled this tendency to act in accordance with an acquired set of dispositions “habitus” in his cultural theory of action, and Giddens’ and Bourdieu’s structural theories still provide potentially useful frameworks to understand how social context may undermine and shape individual agency (McDaniel, 2013). Although Giddens and other structural theorists have been criticized for not placing enough emphasis on the inherent power and agency of social actors to overthrow these established structures (Bertilsson, 1984), evidence is mounting to support the profound influence of social structures, including the political economy and social gradients, on the health and well-being of populations (Green & Benzeval, 2011; Helliwell, 2002; Keating, 2009; Krieger, 2001; Bruce G. Link, 2008; Bruce G. Link & Phelan, 1995; Marmot & Theorell, 1988; McDaniel, 2013; Muntaner et al., 2011; Muntaner et al., 2004; Quesnel-Vallée & Taylor, 2012; Therborn, 2013; Wilkinson & Pickett, 2006, 2009).

Social inequalities are frequently established along socio-demographic lines.

It is important to establish that the current usage of the concept social inequality does not merely refer to differences between individuals and groups (Therborn, 2013).

Differences between individuals is inevitable, and even sometimes highly desirable; however, when these differences are socially constructed and assigned value in response to socio-political context, or fundamentally limit an individual’s ability to achieve success, health, and well-being, then this crosses into the undesirable realm of social inequality (Therborn, 2013). Drawing on the work of the Nobel Prize winning economist Amartya Sen (1992), inequality can be very broadly defined as unequal capability to function fully as a human being. In other words, social inequalities establish a situation

where individuals do not possess the resources or social standing necessary to achieve their full holistic human potential in all spheres of their lives.

Therborn (2013) outlines three kinds of inequality including: vital inequality, existential inequality, and resource inequality. Vital inequality refers to “socially constructed unequal life-chances of human organisms”, which may be indicated by measures such as life expectancy and health expectancy (p.49). Existential inequality refers to the “unequal allocation of personhood, i.e., of autonomy, dignity, degrees of freedom, and of rights to respect and self-development” (Therborn, 2013, p. 49). All forms of discrimination and unequal social standing would fall under this category. Resource inequality refers to situations where individuals have unequal access to the resources needed to function fully as a holistically healthy human being, and are certainly the category of inequalities that are considered most frequently in terms of health determinants (Therborn, 2013). While socio-economic resources are likely what is considered most often, resources for health may include: your parents, your social support network, availability of knowledge and education, or access to health services or a healthy environment, among many others (Therborn, 2013). These labels of inequality provide a useful way to organize and understand the potential mechanisms of inequalities that impact health and well-being; however, they should not be considered mutually exclusive categories (Therborn, 2013). Each type of inequality is intertwined, intersectional, and interdependent with at least one of the other articulated kinds of inequality (Therborn, 2013). For example, the resource availability of education may influence economic resource availability, and ultimately where one ends up on the vital inequality gradient; however, access to quality education may depend on your address,

your parent's education, or existential factors such as your gender or ethnicity in some cases. The potential interactions between inequalities are extremely complex, underlining the need for statistical models that recognize the potential intersectional/interactional effect of social inequalities on health outcomes like depression.

Socio-demographic categories (e.g. income, education level, ethnicity/racialization, employment status, marital status, birthplace, address ...) interact with socially constructed notions of value and importance to establish social gradients in society. Therefore, examining the impact of social inequalities on the development of depression in Canadian men requires the inclusion of socio-demographic variables, which represent relevant social hierarchies associated with depression in men. These socio-demographic categories can then be used as potential indicators of standing in social gradients, and the interactions between these variables can be examined to determine the social factors that exert the greatest influence on the development of depression in Canadian men.

Socio-demographic hierarchies and their influence on health. Recognition of the importance of social gradients for the health of individuals and populations is substantially acknowledged by the Public Health Agency of Canada [PHAC] (2014) in their list of health determinants (See Table 1), since the majority of these health determinants represent potential existential and resource inequalities that impact health. Similarly, the list of social determinants of health generated by the 2002 York University Social determinants of health across the lifespan conference (See Table 1) also primarily

identify areas of potential social inequality that may impact the health of populations (Raphael, 2004)

There is an extensive body of scholarship that demonstrates the profound link between socio-economic standing and the health of individuals, with those in lower socio-economic strata demonstrating poorer health outcomes than those occupying higher socioeconomic strata (Hertzman & Siddiqi, 2009; Keating, 2009; Krieger, 2001; Bruce G. Link & Phelan, 1995). Similarly, the extensive work of Wilkinson and Pickett (2009), and the United Kingdom's Black Report provide convincing evidence about the negative impact of income inequality on all aspects of society, including health (McDaniel, 2013; Townsend & Davidson, 1982). Muntaner et al. (2011) have also illustrated that societies with economic redistributive policies possess better health outcomes. Considering the impact of socio-economic standing on depression, a meta-analysis of 51 cross-sectional prevalence studies published since 1979 by Lorant et al. (2003) reported that persons occupying lower socio-economic position were at significantly higher odds of being depressed (OR=1.81, $p<0.001$) than those occupying high socio-economic position. In addition, the odds of a new episode of depression (OR=1.24, $p=0.004$) were lower than the odds of persisting depression (OR=2.06, $p<0.001$) (Lorant et al., 2003). While it can be argued that cross-sectional research cannot clearly identify the direction of the effect between socio-economic standing and depression, a number of longitudinal studies reaffirm support for socio-economic status as a potential causative mechanism of depression (J. G. Johnson, Cohen, Dohrenwend, Link, & Brook, 1999; Miech, Caspi, Moffitt, Wright, & Silva, 1999; Muntaner et al., 2004; Power, Stansfeld, Matthews,

Manor, & Hope, 2002; Quesnel-Vallée & Taylor, 2012; Ritsher, Warner, Johnson, & Dohrenwend, 2001)

Table 1.
Official Canadian List of Health Determinants and the Social Determinants of Health

Health Determinants ¹	Social Determinants of Health ²
Income and social status	Aboriginal status
Social support networks	Early life
Education	Education
Employment and working conditions	Employment and working conditions
Social environments	Food security
Physical environments	Health care services
Personal Health practices and coping skills	Housing
Healthy Child development	Income and its distribution
Culture	Social safety net
Gender	Social exclusion
Health Services	Employment and employment security
Biology and Genetic endowment	

Note. ¹ Public Health Agency of Canada [PHAC] (2014); ² Raphael (2004)

Numerous other social gradients have been documented to influence health outcomes including age, education/occupation, racialization/ethnicity, marital status, gender, social class/caste, physical environment, social environments, and particularly the richness of childhood environments to support healthy growth and development, to name but a few (Keating, 2009; Krieger, 2001, 2008; Therborn, 2013). For example, in a

longitudinal study of three cohorts in the West of Scotland spanning 20 years, Green and Benzeval (2011) identified an intersectional effect of two social gradients on the prevalence of depression. An increasing prevalence of depression was noted with increasing age; however, the rate of depression prevalence increased more quickly for those from the manual working classes compared to the non-manual working classes (Green & Benzeval, 2011). In another study, Gilman, Kawachi, Fitzmaurice, and Buka (2003) identified another interactional effect between two social hierarchies, with the presence of family disruption (e.g. divorce and conflict) and low socio-economic status in early childhood increasing the long term risk for major depression in adulthood. Those living in a high conflict home with a mother, who had divorced and remarried at age seven, were at significantly higher odds of initial onset of major depression in adulthood ($OR_{adj} = 3.45$; CI: 1.90, 6.27) (Gilman et al., 2003).

The relative effect of social inequalities on health. One well-known seminal study related to social gradients is the landmark Whitehall study, which was a two decade longitudinal study of 10 000 British civil servants (Marmot & Theorell, 1988; McDaniel, 2013). What made the findings of the Whitehall study particularly poignant was that it not only provided evidence of a clear social gradient effect on mortality from the top of the civil service hierarchy to the bottom, but also provided evidence that relative social inequality is a significant player in health outcomes (Marmot & Theorell, 1988).

Although there was certainly a well-established and rigid social hierarchy present among the British civil service, none of the participants could be considered resource impoverished, yet mortality consistently worsened in accordance with each decreasing rung on the social status ladder (Marmot & Theorell, 1988).

Further support for the effects of relative social inequality on men is provided by Eibner and Evans (2005), who analysed individual-level U.S. data on males from the 1988-91 National Health Interview Survey Multiple Cause of Death Files. In their study, Eibner and Evans determined that high relative deprivation was associated with higher probability of death, worse self-reported health, higher self-reported limitations, higher body mass index, and an increased chance of taking health risks (Eibner & Evans, 2005). These findings are particularly interesting when considered through a masculinities and health lens, since higher body mass index and increased chance of taking health risks could be examples of compulsive and protest masculinities in response to subordinated status (Courtenay, 2000; Eibner & Evans, 2005).

To illustrate the truly relative nature of the effect of status on health, we only have to consider the findings of two studies that looked at the mortality of actors and actresses, who had ever been nominated for an academy award (Redelmeier & Singh, 2001), and the mortality of Nobel Prize nominated scientists in the first half of the 20th century (Rablen & Oswald, 2008). Among Academy Award nominees, life expectancy was found to be 3.9 years longer for winners of the Academy Award (79.7 years) compared to nominated actors and actresses that did not win the award (75.8 years; $p=0.003$) (Redelmeier & Singh, 2001). In addition, additional wins were associated with a 22% relative reduction in death rates (CI: 5%, 35%) (Redelmeier & Singh, 2001). Similarly, Rablen and Oswald (2008) reported that winning the Nobel Prize was associated with one to two years of extra longevity compared to merely being nominated. Clearly, relative status affects health and well-being, even when all individuals occupy a relatively high status in society.

Biological embedding: How relative social inequality “gets under the skin” to impact biological and psychological health. Social inequalities/hierarchies appear to exert their effect on health through the varied availability of resources and opportunities, and through the psychological and biological effects of social subordination (Keating, 2009). It is theorized that the psychological stress of subordination and decreased agency activates biological systems that are designed to help people cope with short-term stress (i.e. “fight or flight”), but when faced with chronic stress, the increased “allostatic load” results in cumulative “wear and tear” on the health of individuals (Keating, 2009; Krieger, 2001; McDaniel, 2013; McEwen, 1998, 2003, 2005). Under chronic stress, the body will experience the negative health effects of sustained higher levels of epinephrine and norepinephrine through activation of the sympathetic-adrenal-medullary (SAM) axis; higher neuroimmune system functioning (possibly linked to autoimmune conditions); increased epinephrine and cortisol production related to the limbic hypothalamic-pituitary-adrenal (L-HPA) axis (linked to organ damage, high blood glucose, metabolic syndrome, cardiovascular disease), and potentially lower levels of serotonin and oxytocin (linked to mental illness and decreased attachment respectively)(Horwitz & Wakefield, 2007; Keating, 2009; Krieger, 2001; J. S. Price et al., 1994; Raleigh, McGuire, Brammer, & Yuwiler, 1984; Sloman et al., 2003).

In considering a potential link between social hierarchies and the development of depression, hypotheses related to social competition, attachment theory, and social rank are particularly interesting candidates (J. S. Price et al., 1994; Sloman et al., 2003). Price et al. (1994) presented the social competition hypothesis of depression, which suggested that depressive states may represent an inherited psycho-biological response to threat and

domination. Their hypothesis suggested that depression may represent an involuntary subordination response to competition loss (J. S. Price et al., 1994). Such an involuntary subordination strategy would prevent the individual from attempting to make a comeback by inhibiting aggressive behavior to rivals or superiors (but not dependents), would create a subjective sense of incapacity, and would communicate to others that they do not represent a threat (J. S. Price et al., 1994). While in our evolutionary past, humans may have regularly engaged in ritual agonistic behavior for the purposes of establishing dominance through physical combat, it is suggested that it is far more common to see social intimidation used in displays of dominance in the current day (J. S. Price et al., 1994). Price et al. suggest that willingness to engage in agonistic behavior can be described in terms of a self-concept called resource-holding potential [RHP]. Resource-holding potential is assessed relative to others, and is a self-determined estimate of strength and ability to dominate in actual or symbolic status competitions (J. S. Price et al., 1994).

Social hierarchies are well-established in society along multiple social gradients including: socioeconomic status, race/ethnicity, education/occupation, gender performance, age, marital status, and many more (Keating, 2009; Krieger, 2001). Each individual assesses their resource-holding potential in relation to others, essentially assigning him/herself a position in the social hierarchy, and their perceived position in the hierarchy may in turn be reinforced by more dominant members of the social hierarchy, or wider social structures/processes (Giddens, 1979; J. S. Price et al., 1994). Social hierarchies ultimately make it harder to compete in social arenas, access resources, or acquire the social support of others, which may initiate an involuntary subordination

response and contribute to the development of depressive symptoms (J. S. Price et al., 1994).

Sloman et al. (2003) expanded on Price et al.'s (1998) social competition hypothesis of depression by suggesting that social rank is not necessarily focused on physically dominating others (although this may happen), rather it is about exerting social control over resources in contexts where others are also competing for these same resources. In addition, Sloman et al. argue that this response may also be enacted in response to any major loss of resources, including the loss of social support associated with relationships. These authors suggest that depression is heterogeneous, and that it is unlikely that all depression can be explained by evolutionary mechanisms (Sloman et al., 2003). They further suggest that stress linked major depression is perhaps most sensitive to this evolutionary mechanism, and that some cases of depression could be viewed as a maladaptive effect of prolonged activation of short-term adaptive stress defenses (Sloman et al., 2003). In the short term, the endocrine system helps the human body cope with stress (threats) when the pituitary gland mobilizes the body for action through the "fight or flight" response (Keating, 2009; Sloman et al., 2003). The sympathetic-adrenal-medullary (SAM) axis causes the release of epinephrine and norepinephrine to prepare the cardiovascular system, muscles, and brain for action, while activation of the limbic hypothalamic-pituitary-adrenal (L-HPA) axis causes increases in blood Cortisol and blood glucose (Keating, 2009; Sloman et al., 2003). However, if stress activation persists long-term, the body may experience detrimental effects to overall physical and mental health, and immune system functioning (Keating, 2009; Sloman et al., 2003).

Hyperactivity of the L-HPA axis in low ranking primates has been noted to be highly congruent with findings in major depression (Sloman et al., 2003). In addition, prolonged stress and feelings of subordination may also contribute to disruption of neurotransmitters (Keating, 2009; Sloman et al., 2003), and primate studies have demonstrated a link between blood serotonin (5HT) levels and dominance status (Raleigh et al., 1984; Sloman et al., 2003). Dominant Vervet monkeys exhibited higher blood serotonin levels than their submissive counterparts, and when the dominant Vervet was isolated from his social group his 5HT level fell, while the 5HT level in the interim dominant Vervet increased (Raleigh et al., 1984; Sloman et al., 2003). When returned to the group, the previously dominant Vervet monkey re-established himself as the dominant male, with his 5HT levels returning to previous levels while the interim Vervet's 5HT levels returned to a lower level (Raleigh et al., 1984).

While the role of neurotransmitters in the development of depression is still unclear, if neurotransmitters, such as serotonin, are linked to the development of depression, and long-term stress can contribute to biochemical stress on the body and alterations in hormone and neurotransmitter levels, it is possible that social rank in response to social conditions and hierarchies could be one of the potential links between social adversity, biological imbalance, and depression. The inherent difficulty in determining the origins of depression and sadness is disentangling the web of causation to determine which factor(s) contributes the most to the development of depression, and which comes first? Social hierarchies have certainly been convincingly linked to poor health in relation to other types of illness, and it is highly plausible that they play a

significant role in the development and trajectory of depression (Keating, 2009; Bruce G. Link, 2008; Bruce G. Link & Phelan, 1995; Marmot & Theorell, 1988; McDaniel, 2013).

Could the effect of social status hierarchies on health be stronger in men?

There is mounting evidence to suggest that social inequalities exert a more pronounced effect on the health and longevity of men, and this disparity in outcomes can at least partially be explained by the intersectional influence of masculinity hierarchies with other social hierarchies (Connell, 1995; Connell & Messerschmidt, 2005; Courtenay, 2000; Therborn, 2013). Traditional essentialized conceptualizations of masculinity have placed huge emphasis on status and “being a big wheel” (D. S. David & Brannon, 1976; Kimmel, 2010). Therefore, social status and success in competition may be particularly important to men’s self-assessment of their masculinity, self-concept, or resource holding potential (Connell, 1995; J. S. Price et al., 1994; Sloman et al., 2003). While it must be acknowledged that men often collectively benefit from the existential and resource inequalities associated with patriarchy and sexist social practices, not all men share equally in the patriarchal dividend, and the qualities of masculinity reified within common patterns of hegemonic masculinities may ultimately serve as counterproductive to men’s health in many cases (Connell, 1995; Courtenay, 2000; Evans et al., 2011). The unattainable and mythopoetic nature of socially constructed hegemonic masculinities ensures that the vast majority of men would self-assess their masculinity status as subordinate; therefore, symbolic, or actual, loss of resources and status may only serve to potentiate this effect (Connell, 1995; Connell & Messerschmidt, 2005; J. S. Price et al., 1994; Sloman et al., 2003). While this situation has the potential to affect most men, the impact may be particularly intense for men performing socially marginalized

masculinities, such as homosexuality, bisexuality, or trans-masculinities (Connell, 1995; Connell & Messerschmidt, 2005). Similarly, men occupying low status on multiple socio-demographic hierarchies associated with masculinity performance (e.g. single, low-income, unemployed, and low education) will likely experience an intersectional and potentiated sense of social subordination.

The significance of masculinity performance in the presence of other men is illustrated by a study of physiological stress response related to loss of social influence and threats to masculinity (Taylor, 2014). Taylor (2014) noted that young men exhibited an elevated Cortisol level in response to loss of social influence, while working with other young men. A similar elevation in Cortisol was not noted in women, or in men working with women (Taylor, 2014). The importance of respect and social standing to men was also noted in a U.S. study of gendered emotional responses to perceived disrespect (Blincoe & Harris, 2011). Men demonstrated more concern with respect and were more likely to respond to disrespect with anger, while women were more likely to respond to disrespect with sadness (Blincoe & Harris, 2011).

While both men and women will likely experience psychological and biological effects associated with social subordination, is it possible that men may experience a greater effect because of the emphasis placed on social status within the performance of masculinity? If men's relative perception of subordination and its importance is heightened, then could the resulting psychological and biological impact of social subordination also be heightened?

The potential impact of internalized oppression on mental health. Another potential mechanism of translating existential social position into illnesses is internalized oppression (E. J. R. David, 2014). When individuals are subjected to long-standing discrimination and oppression at the hands of a dominant social group that has constructed itself as superior, or possesses significant socio-political influence over them, the oppressed individuals may start to internalize the message that they are inferior (E. J. R. David, 2014). In some cases oppression is overt and institutionalized in social structures and processes, while at other times discrimination and prejudice may be communicated through more subtle “microaggressions” (E. J. R. David, 2014). Materializing in forms such as offhand comments, assumptions, expressions, or body language, these microaggressions sometimes even occur outside of the conscious awareness of the victims (E. J. R. David, 2014). Therefore, victims may experience “attributional ambiguity” because they may not be able to identify a clear source of the oppression, and may even blame themselves for being “overly sensitive” or dismiss the behaviour as a result (E. J. R. David, 2014). Whether due to overt oppression or microaggression, psychological distress is the consequence, and may even be amplified in the case of microaggressions, because when there is no opportunity to deal with the resulting anger by confronting the source of the oppression, the anger may be directed inwardly at those who remind the oppressed individual of themselves (E. J. R. David, 2014; Friere, 1970).

Consequently, individuals subjected to existential inequality over time, such as racism or heterosexism, start to internalize the social structures and processes that perpetuate their own oppression, which may in turn exert a significant influence on their

perceived sense of agency to change their situation (Bertilsson, 1984; Bourdieu, 1977; Giddens, 1979). Similarly, the internalized negative feelings about themselves, or their social group, can harm an individual's self-concept and assessment of their relative social status, ultimately translating into psychological or biological alterations that may contribute to depression (Keating, 2009; J. S. Price et al., 1994; Sloman et al., 2003).

Social Structures and Context Change over Time

While constantly influenced by the long shadow of the past, social structures and context are under constant renovation; therefore, it is helpful to consider that the potential effect of social structures on the development of depression in Canadian men may vary between different generations (Elder & Giele, 2009; McDaniel & Bernard, 2011).

Individuals born at a similar time, and in a similar social context, journey through life as a cohort, and will be subject to some of the same social realities as a result (Elder & Giele, 2009). Some cohorts may experience more positive social conditions, such as good economic times or strong redistributive government policy that contributes to a positive healthy life course trajectory (Elder & Giele, 2009; McDaniel & Bernard, 2011). Other cohorts may experience less favorable social and economic conditions, or may experience “shocks” (e.g. an economic downturn or policy change), which act like “gravity” on their life course trajectory and health (Elder & Giele, 2009; McDaniel & Bernard, 2011). Negative life experiences and contexts contribute to an accumulation of risks as life progresses for a cohort and “chains of risk” may contribute to the development of illness, especially when high risk individuals in a cohort are exposed to a particular trigger event that tips the scales (Ben-Shlomo & Kuh, 2002). Exposure to one area of risk may expose members of the cohort to other risks as well, contributing to “risk

clustering” and increased chances of developing illness and depression (Ben-Shlomo & Kuh, 2002).

While the micro social contexts of individuals clearly play a significant role in individual life course trajectories and pathways to illness, the current study focus on the meso and macro levels of society to elicit more general patterns of interaction between socio-demographic hierarchies and the development of depression in populations of Canadian men. However, since social structures such as masculinities have undergone significant renovation over the past century, the current study also calculated rates of depression and suicide according to the generational cohorts established by Statistics Canada , to consider the influence of changing social norms on socially constructed concepts such as gender and the stigma associated with mental illness (Statistics Canada, 2012b).

Of particular interest are the patterns of depression and suicidal ideation in the “baby boom” cohort of men, since they represent the largest birth cohort of Canadian men, and constitute a significant part of the rapidly growing group of older Canadians (Statistics Canada, 2012b). This “baby boom” cohort of men includes higher numbers of individuals, who are divorced, separated, or living alone than ever before, which may be a significant factor in the mental health of these men as they age (Demey, Berrington, Evandrou, & Falkingham, 2013; Jamieson & Simpson, 2013; Milan, 2013). Studies suggest that men’s social capital is much weaker than women’s, and that men depend heavily on their female partners and family members for emotional support (Conrad, 2010; De Silva, McKenzie, Harpham, & Huttly, 2005; Locher et al., 2005; Muckenhuber, Stronegger, & Freidl, 2013; Robertson, 2007; Sixsmith & Boneham, 2003; Tilvis et al.,

2012). If more men are entering their senior years without sufficient social capital and emotional support, there may be a consequence in terms of the rates of depression that manifests in this cohort. One study even suggests that the effect of low social capital may affect the health of older men to a greater extent than younger men (Muckenhuber et al., 2013). Finally, acquiring a more complex understanding of depression among male “baby boomers” may inform mental health policy and programming as these men enter age groups which have traditionally demonstrated some of the highest rates of suicide in men (Oliffe, Ogrodniczuk, & Han, 2010; Payne et al., 2008; Statistics Canada, 2012e; Walinder & Rutz, 2001).

CHAPTER 3

Chapter 3

Theoretical Frameworks Informing the Current Dissertation Studies

Several theoretical frameworks inform the design of this doctoral study and serve as theoretical lenses through which to interpret study findings. Drawing on multi-disciplinary perspectives from psychiatric medicine, psychology, sociology, social epidemiology, and gender/masculinities studies, each of these theoretical frameworks are briefly outlined below.

Medical/Psychiatric Theories for the Origins of Depression

Is there a genetic link? While discussion of a genetic link to depression and other mental disorders is quite pervasive in biomedical circles, very little conclusive evidence has emerged to support the hypothesis that depression is due to heredity or an aberration in genetics (Colbert, 2001; Whitfield, 2003). The evidence that has been presented to support a genetic hypothesis of depression draws on inheritance, family, and twin studies, which are vulnerable to methodological issues and the potential confounding effects of shared social context and experience (Colbert, 2001; Whitfield, 2003). While one previous study suggested that there was a link between the *s/s* allele of the 5HTTLPR gene and depression in the presence of stressful events, a follow-up meta-analysis of 14 studies found no evidence to support this claim (Coleman & Ataullahjan, 2010). While current evidence for a genetic link to depression is inconclusive, genetics cannot be ruled out completely, and it is possible that advances in genetics and epigenetics may shed new light on the subject in the future.

Is depression the result of a biochemical imbalance? The predominant biomedical theory of depression suggests that depression results from insufficient levels of brain neurotransmitters such as: norepinephrine, serotonin, and dopamine (Kirsch, 2010; Whitfield, 2003). This theory originated in the 1950s, when depressed patients demonstrated improvement in symptoms in response to medications that increased levels of norepinephrine and serotonin (Kirsch, 2010). However, although this theory dominates until the current day, and antidepressants, such as the selective serotonin reuptake inhibitors (SSRIs), rank as among the most heavily used medications in society, the evidence to support this theory is surprisingly inconsistent (Horder, Matthews, & Waldmann, 2011; Kirsch, 2010; Kirsch et al., 2008; Moncrieff, Wessely, & Hardy, 2012; E. H. Turner, Matthews, Linardatos, Tell, & Rosenthal, 2008; Vohringer & Ghaemi, 2011; Whitfield, 2003). For example, studies have demonstrated that depletion of neurotransmitters does not induce depression, except in individuals, who are currently taking antidepressants to increase neurotransmitter levels (Kirsch, 2010). A series of meta-analyses examining 35 anti-depressant trials submitted to the Food and Drug Administration of the United States did demonstrate statistically significant difference between anti-depressants and placebos; however, there were inconsistent findings about the effect size of this difference, and questions raised about the actual clinical significance of the differences in symptoms noted (Horder et al., 2011; Kirsch et al., 2008; Vohringer & Ghaemi, 2011). Moncrieff, Wessely, and Hardy (2012) published a Cochrane review of nine studies (n=751), which compared active placebos to antidepressants in the management of depression. Although this review reported a pooled estimate of effect of 0.39 standard deviations (CI: 0.24, 0.54) in favor of the anti-

depressants, as measured by an improvement of mood, it also reports a second more conservative estimate of pooled effect of 0.17 (CI: 0.00, 0.34), which was calculated after eliminating one extremely positive trial (Moncrieff et al., 2012). These authors go on to conclude that the differences in mood noted between the anti-depressants and active placebos were small, and that unblinding effects may have further inflated the efficacy of antidepressants using inert placebos (Moncrieff et al., 2012).

The quality of published evidence to support the efficacy of anti-depressants was further called into question by a review of 74 FDA registered studies by Turner et al. (2008). Turner et al. reported that 31% of these studies were not published (n=3449). In addition, of the 38 studies that had positive results, 37 were published, while of the studies that the FDA viewed as having negative results, only 3 were published, 22 were not published, and 11 were published in a way that conveyed a positive outcome (E. H. Turner et al., 2008). These findings point to the effect of publication bias on the availability of unbiased published evidence to support clinical decision making by mental health practitioners. Whether the authors of the unpublished studies chose not to submit these study findings for publication, or whether they were turned down for publication by journal editors, the end result was that these findings were not accessible in the professional literature.

While increasing the availability of neurotransmitters, such as norepinephrine and serotonin, appears to provide a positive effect for some sufferers of depression, research findings in support of the efficacy of anti-depressants over placebo remain unclear, which calls into question the primacy of this potential biological mechanism of depression. One of the primary criticisms of an exclusively genetic and biochemical explanation for

depression is that it fails to consider the potential contribution of psychological distress related to challenging social situations in the development of depression (Horwitz & Wakefield, 2007; Whitfield, 2003). However, the social competition hypothesis of depression presents one possible connection between the social and biological contributors to depression, by suggesting that social losses and feelings of subordination/defeat may actually induce an involuntary subordinated response, hyperactivity of the L-HPA axis, and lower serotonin levels (Hagen, 2011; J. S. Price et al., 1994; Raleigh et al., 1984; Sloman et al., 2003). Therefore, the development of depression does not necessarily have to be due to one mechanism, but may actually involve a combination of many different potential paths in the web of causation.

Psychosocial Theory of Illness

Keating's conceptual model. Psychosocial theories of illness development acknowledge the complex interaction of social and developmental conditions with neurological and biological influences (neural/ neuroendocrine/neuroimmune development and function), and the regulation of emotion, attention and behaviour (Keating, 2009; Krieger, 2001). Keating's (2009) Conceptual Model of the Social and Developmental Mediators of the Social Gradient in Developmental Health (Appendix B – Figure 1) provides an excellent framework to explore the interaction of social disparities, social hierarchies, social support networks, and biological/developmental mediators in the creation of mental health outcomes. Social disparity does not always translate into illness, and social privilege does not always translate into health. However, individuals experiencing social disparities are more likely to experience greater risk of illness depending on the availability of beneficial social mediators to mitigate the effects of

socio-biological and developmental stress, such as positive early childhood experiences, equitable social environments, and social capital (networks/support/community identity) (Keating, 2009). Each individual's pathway to health or illness is unique and related to their own combined accumulation of positive or negative social and developmental factors, although individuals experiencing similar social conditions may exhibit common patterns of experience (Keating, 2009). Chronic social and biological stress, also known as increased allostatic load, may translate into activation of the sympathetic-adrenal-medullary (SAM) axis and the Limbic hypothalamic-pituitary-adrenal (L-HPA) axis, which results in increased production of norepinephrine, epinephrine, and cortisol (Keating, 2009; McEwen, 1998, 2005; Sloman et al., 2003). In addition, chronic stress may also contribute to the potential disruption of serotonin and oxytocin levels, and the neuroimmune system (Keating, 2009; Raleigh et al., 1984; Sloman et al., 2003). These biological imbalances can potentially contribute to increased health risks in multiple areas including organ damage, cardiovascular disease, metabolic syndrome (high blood glucose, obesity, and hypertension), problems with attachment and social bonding, and potentially mental illness (Keating, 2009; McEwen, 1998, 2005).

Ecosocial theory. Nancy Krieger's Ecosocial Theory (See Appendix B – Figure 2) also acknowledges the psychosocial impacts of social inequality in the production of disease, while incorporating elements of life course theory, political economy, and ecological theory (Krieger, 2001, 2008). Ecosocial theory emphasizes the nested levels of organization in society and the ecosystem ranging from an individual level to a global level, while acknowledging the role of history, the wider political economy, and the ecological context on the health of individuals and populations. Relevant ecosocial

constructs include: embodiment; pathways of embodiment; the cumulative interplay between exposure, susceptibility and resistance; and accountability and agency (Krieger, 2001). Embodiment is the concept that individuals literally incorporate their social context into their biological make-up, and that biology cannot be understood without considering the individual's history and social reality (Krieger, 2001). Pathways to embodiment recognizes that our biological and social trajectories are shaped by social and power structures, and the constraints and possibilities of our biology, as defined by our evolutionary history, individual history, and ecological context (Krieger, 2001). The cumulative interplay between exposure, susceptibility, and resistance is expressed as pathways of embodiment with each factor and its distribution conceptualized at multiple levels (individual, neighborhood, regional, national) and in multiple domains (home, work, school) (Krieger, 2001). Accountability and agency are expressed through pathways of embodiment and knowledge of embodiment in relation to institutions, households, and individuals (Krieger, 2001). This concept also refers to the accountability and agency of researchers in articulating the theories they have used chosen to ignore in exploring social inequalities in health (Krieger, 2001).

Both Keating's (2009) conceptual model and Krieger's (2001, 2008) Ecosocial Model demonstrate the complexity of the mechanisms through which social conditions contribute to health, and help to identify relevant socio-demographic hierarchies and potential mediators or moderators of depression in the forthcoming analysis.

Life Course Theory

The life course of individuals may unfold in a multitude of ways depending on historical, geographical, and cultural contexts, social ties and relationships, opportunities for agency and personal control, and the timing of key life events (See Appendix B - Figure 3) (Elder & Giele, 2009; McDaniel & Bernard, 2011). Individuals live in specific communities and historical times, and those born at the same time may experience similar historical events and be exposed to similar social conditions as a cohort (Elder & Giele, 2009). People's lives are inextricably linked and intertwined with the lives of those around them, and social ties and relationships with family members, friends, acquaintances, or groups can potentially alter our life course trajectory in positive or negative ways (Elder & Giele, 2009). As individuals journey through life they exercise agency in contributing to the construction of their life course, by self-selecting themselves into roles and situations, and making choices related to the social ties that they make (e.g. selection of a life partner) (Elder & Giele, 2009; McDaniel & Bernard, 2011). However, it must also be acknowledged that larger socio-political structures may put constraints on individual agency, as is seen in the effect of social gradients on well-being (Bertilsson, 1984; Elder & Giele, 2009; Giddens's, 1979; Keating, 2009). Finally, the timing of key life events (e.g. leaving home, starting work getting married, having children, loss of parents/family members, major illnesses, or retirement) may exert a significant influence on the life course trajectory of individuals (Elder & Giele, 2009; McDaniel & Bernard, 2011).

The influences on life course trajectory are complex and multiple; therefore, there are multiple pathways that may contribute to the development of depression. Individuals

may experience “shocks”, or negative events, such as, a severe illness, death of a loved one, exposure to physical or sexual abuse, or a traumatic event, that derails their life course and puts them on a pathway to depression (Elder & Giele, 2009; McDaniel & Bernard, 2011). Similarly, low socioeconomic status, socially impoverished and abusive environments, or environments rife with stress and trauma may act like “gravity” on the life course trajectory – effectively putting a person on a pathway to sadness or depression (Elder & Giele, 2009; Gilman et al., 2003; Green & Benzeval, 2011; McDaniel & Bernard, 2011; Muntaner et al., 2004; Quesnel-Vallée & Taylor, 2012). The timing of major life events may also be significant in terms of creating stress, which may in turn contribute to the eventual development of depression. Normative life scripts in society establish the expected timing of key life events, and when life scripts do not play out as we hoped, such as parenthood early in life or remaining single longer than we expected, then increased social pressures, emotional distress, or disappointment may result (McDaniel & Bernard, 2011).

Experiencing a “shock” or an unfavorable context during a critical or sensitive period in development may be enough to put a person on a path to depression; however, in most cases it is likely that poor mental health is the result of accumulated risk over the life course, which may be exacerbated or “triggered” by particular events like a loss or trauma (Ben-Shlomo & Kuh, 2002). In this manner, the accumulation of risk factors, and exposures to negative experiences, creates a “chain of risk” (Ben-Shlomo & Kuh, 2002). Because individuals experience “linked lives” with those in the same birth cohort or those experiencing similar social contexts, it is also common to see those experiencing similar social conditions, experiencing similar risk for alterations in mental health (Elder &

Giele, 2009; Keating, 2009; McDaniel & Bernard, 2011; Muntaner et al., 2004). In addition, deprivation or marginalization in one area, may increase the risk of negative experiences in another area, which contributes to “risk clustering” and a potential additive effect of multiple negative events on the development of depression (Ben-Shlomo & Kuh, 2002).

Life course theory is increasingly being applied to the study of depression, and Coleman and Ataullahjan (2011) have identified several factors that may contribute to the development of depression throughout the life course. Identified risk factors for depression include: low educational attainment, financial strain, low income, and exposure to stressful life events such as: loss related events, unemployment, abuse, traumatic events, or chronic stress (Coleman & Ataullahjan, 2010). Co-morbidity with anxiety disorders, substance abuse, and antisocial behavior may also contribute to the development of depression (Coleman & Ataullahjan, 2010). Protective factors that may mitigate the development of depression are social support, physical health, active coping, self-esteem, mastery, self-efficacy, psychotherapy, and possibly pharmaceutical treatments (Coleman & Ataullahjan, 2010).

Because life course theory examines the development of life circumstances based on the sum of life conditions and experiences, it presents an excellent theoretical perspective for the consideration of the factors that contribute to depression, while also complementing the other theoretical frameworks used to inform the proposed study.

Intersectionality Theory

Since this proposed study seeks to examine the impact of multiple socio-demographic hierarchies on the development of depression in Canadian men, intersectionality demonstrates promise as a theoretical perspective to inform this complex population level analysis (Bauer, 2014; Hankivsky & Christoffersen, 2008). Originating in the work of African American feminist scholars such as Crenshaw, Collins, and Hooks, intersectionality seeks to expose the problematic nature of considering categories of social difference and identity (e.g. gender, race/ethnicity, sexual orientation, etc...) as separate and merely additive in the course of analysis and interpretation of research data (Bauer, 2014; Hankivsky, 2012). Hankivsky (2012) identifies the central theoretical tenets of intersectionality including

the idea that human lives cannot be reduced to single characteristics; human experiences cannot be accurately understood by prioritizing any one single factor or constellation of factors; social categories such as race/ethnicity, gender, class, sexuality, and ability are socially constructed, fluid and flexible; and social locations are inseparable and shaped by the interacting and mutually constituting social processes and structures that are influenced by both time and space (p.1713)

Intersectionality theory suggests that it is inappropriate to consider marginalizations as distinct subjects of enquiry, because “an individual’s experience, and their health are not simply a sum of their parts” (Bauer, 2014, p. 11). While the combined effect of some marginalizations on an outcome of interest may approximate addition of the individual effects, it is far more likely that the interaction between categories will be multiplicative in some manner (Bauer, 2014).

Incorporating an intersectionality perspective into population health research is still relatively new, and it certainly promises to add to the methodological complexity of the study (Bauer, 2014). However, considering the intersectional nature the multiple socio-demographic hierarchies, when permitted by the available data, would also be a novel approach that may advance our understanding of the social contributors to men's depression. By engaging in a careful analysis of the mediating and moderating interactions between the socio-demographic hierarchies of interest in this study, the resultant findings ultimately provide a more precise prediction of the relative contribution of each of the independent variables to the development of depression among men.

Masculinities Theory

In exploring the impact of social hierarchies on the development of depression in men, perhaps the most unique and significant social hierarchy to consider is the hierarchical organization of masculinities, and the potential intersectional impact that the socially-constructed performance of masculinity has on the development of depression, and the expressed symptoms of depression in men. Masculinities and men's health scholars have clearly demonstrated that men's social interactions and health behaviors are profoundly shaped by the social pressure to adhere to dominant or hegemonic masculinities in society. (Connell, 2005; Connell & Messerschmidt, 2005; Conrad & Warwick-Booth, 2010; Courtenay, 2000; Creighton & Oliffe, 2010; Evans et al., 2011; Kimmel, 2010; Messerschmidt, 2000; Oliffe & Phillips, 2008) The use of the plural term masculinities acknowledges the multiple socially-constructed performances of masculinity that may exist in response to changing social contexts. (Connell, 2000, 2005; Connell & Messerschmidt, 2005) While multiple masculinities exist, they are not all

allocated the same status in social power relations, and certain dominant or hegemonic performances of masculinity will be valued above all other forms. (Connell, 2005; Connell & Messerschmidt, 2005) Hegemonic masculinities tend to support the perpetuation of patriarchal power through the performance of traditional masculinities associated with: heterosexuality, independence, strength, large physical size, power, emotional stoicism (alexithymia), success, dominance, the subjugation of femininities and subordinate, or marginalized, masculinities. (Connell, 2005; Connell & Messerschmidt, 2005; Kimmel, 2010; Levant, 2005; Messerschmidt, 2000) As such, hegemonic masculinities are constructed in opposition to common essentialized constructions of femininity (Connell, 2005). While they are constructed relative to a given social context, subordinate or marginalized performances of masculinity are those which deviate from commonly accepted hegemonic masculinities and social norms (Connell, 2005; Connell & Messerschmidt, 2005).

Messerschmidt (2005) presents men's constant, yet often ambivalent, quest to conform to hegemonic masculine norms as a virtual running tally of masculine resources versus challenges to masculinity. Masculine resources can be considered contextually available social practices that support men's congruence with hegemonic masculinities (Messerschmidt, 2000). Masculine resources may include: the use of violence as doing masculinity (bullying, fighting); emphasizing heterosexuality (engaging in sex, talking about sex, watching pornography); dressing in a socially acceptable masculine way; exerting power over others (dominating) or engaging in activities that subordinate others (women, homosexuals, "wimps", "geeks"); pursuit of achievement or winning as dominance; or engaging in risk-taking behaviors to demonstrate toughness

(Messerschmidt, 2000). Challenges to masculinity may occur on any occasion where a man's masculinity risks being called into question (Messerschmidt, 2000). Since men's claim to masculinity is tenuous and constantly in question, men must demonstrate an acceptable performance of masculinity in virtually all social interactions, especially in interactions with other men (Connell & Messerschmidt, 2005; Kimmel, 2010; Vandello et al., 2008). Challenges to masculinity may arise if a man is physically small, if he shies away from confrontation or a fight, is not good at sports, is viewed as unintelligent, or is viewed as a failure (Messerschmidt, 2000). Men, who feel that their masculinity is challenged, or who are experiencing oppression, will often respond by engaging in "hyper-masculine" performances of masculinity in an attempt to reclaim their masculine status, or to present their performance of masculinity as the "true masculinity" (Bosson & Vandello, 2011; Courtenay, 2000; Vandello et al., 2008). These "hyper-masculine" performances are referred to by several names including oppositional (Messerschmidt, 2000), compulsive (Majors & Billson, 1992), or protest masculinities (Connell, 1995).

Other social hierarchies also intersect with masculinity performance to shape masculinity status such as men's: choice of occupation, employment status, socioeconomic status, relationship status, and educational level. Therefore, men's standing in social hierarchies associated with heteronormativity, strength, power, importance, and success may also serve as a masculine resource, or a challenge to masculinity status, depending on their relative position in each of these social gradients (Connell & Messerschmidt, 2005; Messerschmidt, 2000).

Post-structuralist perspectives on gender consider gender to be performative, constituted in discourse and social interaction, tentative and fluid, and recognize that

gender performance is even partially invisible to the individual themselves, because the social structures which contribute to its performance have already become part of us in ways that we cannot fully recognize (Berggren, 2014; Butler, 1990). Macro-level social structures such as patriarchal perspectives, and collective hegemonic understandings of masculinity at a societal level, impact men's health and well-being through their institutionalization in meso-level social structures such as: religious institutions; workplaces; the law; government policy; education; scientific knowledge; and family roles and expectations, to name but a few (Robertson et al., 2016). Therefore, while individual men may possess diverse perspectives on what constitutes masculinity, which may run contrary to hegemonic forms, their individual agency to enact a different configuration of masculine practice may be constrained by these embedded institutionalized masculinities (Bertilsson, 1984; Bourdieu, 1990; Giddens, 1979; Robertson et al., 2016). Furthermore, men's location in other social structures and gradients, may further intersect with the institutionalized configurations of masculine practice to further constrain men's agency in terms of their social practices (Bauer, 2014; Hankivsky, 2012). Engaging in social practices that are inconsistent with embedded social structures can be extremely difficult to enact, and psychological dissonance and social marginalization may also result from acting counter to social expectations; therefore, men may find themselves engaging in configurations of social practice that may impact their health in negative ways, despite awareness that these aspects of masculine practice may be negative (Robertson et al., 2016).

Canadian population health surveys do not contain any variables or scales that directly measure male participant's affinity with traditional essentialized understandings

of masculinity, so direct consideration of masculinity hierarchies is not possible in the current study. However, variables like sexual orientation, marital status, income level, employment status, education level, and occupational group may serve as potential proxy measures of men's standing in the masculinity hierarchy. By selecting only male participants for analysis, and using masculinities theory as a theoretical lens in the design, analysis, and interpretational phases of the research, it is hoped that the influence of gender performance on men's depression can be illuminated.

While it is important to recognize the inherent complexity and contextual nature of each gender performance, the goal of the current investigation is to unveil the influence of collective patterns of masculinity performance that may be impacting depression at the population level. What is considered an acceptable performance of masculinity is highly contextual, and will change throughout the life course; however, collective patterns of masculinity may be present in society, which are shaped by the pervasive influence of underlying patriarchal power structures (Connell, 1995, 2005; Connell & Messerschmidt, 2005). Even when men do not feel aligned with patriarchal perspectives, they may still engage in complicit masculinities by not directly challenging or resisting hegemonic constructions of masculinity for fear of social marginalization (Connell, 1995). Therefore, although we cannot discount the fluid nature of individual masculinity performances, collective patterns of masculinity will likely be evident in any population of men (Connell, 1995).

CHAPTER 4

Chapter 4

What Kind of Thing is Men's Depression?:

Conceptualizing Men's Depression Syndrome as a Mechanistic Property Cluster

Qualitative research and clinical accounts of depression in men, have presented a significant body of evidence to suggest that men's symptoms of depression are profoundly influenced by their aspirational pursuit of social performances that align with hegemonic masculine norms (Addis, 2008; Brownhill et al., 2005; Cochran & Rabinowitz, 2000; Coen et al., 2013; Emslie et al., 2006; Levant, 2005; Levant & Pollack, 1995; Mahalik & Cournoyer, 2000; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008; Real, 1998; Spindel, 2015). Current annual prevalence statistics for major depression also suggest that Canadian men (2.8%, CI: 2.3, 3.2) suffer from major depression at approximately half the rate of Canadian women (4.9%, CI: 4.3, 5.5) (Patten et al., 2015; Simpson et al., 2012). However, those studying depression in men have repeatedly proposed that these depression statistics may underestimate the true prevalence of depression in men, because the generic diagnostic criteria used in population-level surveys may not be sensitive to identifying all men's depression (Blair-West & Mellsop, 2001; Brownhill et al., 2005; Kilmartin, 2005; Magovcevic & Addis, 2006; Oliffe & Phillips, 2008; Rutz, Wålinder, Von Knorring, Rihmer, & Pihlgren, 1997; Wide et al., 2011; Winkler, Pjrek, & Kasper, 2006). Lending weight to this assertion are disproportionally high suicide rates in men worldwide, and suicide rates in Canadian men that are approximately three times higher than those seen in women (Statistics Canada, 2012d; World Health Organization, 2012b, 2014). These findings are at odds with the lower rates of major depression consistently reported by epidemiological

studies (Blair-West & Mellsop, 2001; Oliffe & Phillips, 2008; Winkler et al., 2006). While not all suicides are due to affective disorders, such as depression, it has been estimated that up to 40 to 70 percent of suicides are the culmination of a struggle with these conditions (Arsenault-Lapierre, Kim, & Turecki, 2004; Blair-West & Mellsop, 2001; Rutz et al., 1997; Winkler et al., 2006). Since the male depressive syndrome, documented by men's depression researchers, also identifies addictions and violent behaviours as potential symptoms of depression in men, it is also possible that some suicides attributed to addictive disorders and anti-social personality disorders may owe their origins to a "masked" form of depression not captured by generic diagnostic criteria (Oliffe & Phillips, 2008; Rutz et al., 1997; Winkler et al., 2006).

Underpinning these paradoxical findings are differences of opinion as to the origins of depression, and the differential criteria that separate a diagnosis of depression from other related conditions or diagnoses. Where does depression end, and other conditions begin, and just what kind of thing is men's depression anyway? How should it be defined? Is it different than depression experienced by other gender identities? How can it be identified? How important is it to assign a syndrome like masculine depression to a mutually exclusive diagnostic category? The following pages are devoted to the pursuit of answers to these questions. While it cannot be claimed that a conclusive solution to these questions is immediately forthcoming, the following discussion proposes an unconventional marriage between the idea of depression as a mechanistic property cluster (de Jonge, Wardenaar, & Wichers, 2015; Kendler et al., 2011), biopsychosocial theories of mental illness (Keating, 2009; McEwen, 2003; J. S. Price et al., 1994; Raleigh et al., 1984; Sloman et al., 2003), existing depression criteria

(American Psychiatric Association, 2000, 2013; World Health Organization, 2016), and social constructivist perspectives on men's depression articulated by men's health theorists (Brownhill et al., 2005; Evans et al., 2011; Oliffe & Phillips, 2008). The resulting relationship may present a useful way to conceptualize men's depression and facilitate more complex ways of considering this condition in future research.

Background

Clear etiological factors and diagnostic criteria for depression remain elusive and a source of ongoing controversy (de Jonge et al., 2015; Patten, 2015b). The potential causes of depression are undoubtedly complex and multifactorial, with major depression representing an inherently heterogeneous syndrome with a broad range of presentations and prognoses (de Jonge et al., 2015; Kendler et al., 2011; Lorenzo-Luaces, 2015; Maj, 2010; Patten, 2015b). Multiple etiological models and metaphors for depression have been discussed in the literature, including: chemical imbalances of neurotransmitters or hormones; deficiencies; degenerative brain processes; exposure to a toxic social environment; genetics; and embedded evolutionary processes (Coleman & Atallahjan, 2010; Colman et al., 2014; de Jonge et al., 2015; Hagen, 2011; Horwitz & Wakefield, 2007; McEwen, 2003; Patten, 2015b; J. S. Price et al., 1994; Sloman et al., 2003). As a definitive source of depression remains unclear, attempts to identify and classify depression are inherently fraught with difficulties that open the various classifications to dispute (de Jonge et al., 2015; Kendler et al., 2011). Some have even suggested that depression may be a flawed and obsolete diagnostic term that should be eliminated to make way for new ways of classifying the condition in more useful ways (Patten, 2015b).

What Kinds of Things are Psychiatric Disorders?

Kendler et al. (2011) state that psychiatric disorders, such as depression, tend to be classified as either essentialist kinds, socially constructed kinds, or practical kinds. When considered an essentialist kind of condition, the etiology of depression is assumed to be clearly delineated, with consistent qualities that can be discerned regardless of social context (de Jonge et al., 2015; Kendler et al., 2011). Essentialism assumes there is a true universal and underlying essence of depression, which may be discovered, described, and deemed applicable to all cases of the condition. However, essentialist approaches to biological phenomena are inherently fraught with difficulty, since living beings and biological systems are constantly evolving and changing in response to interaction with their physical and social environments; therefore, the expectation that there are universal essential traits in the biological realm is an idealized perspective that is unlikely to exist in reality (Boyd, 1991; Kendler et al., 2011; Wilson, Barker, & Brigandt, 2007)

Alternately, when considered a socially constructed kind of condition, the classification criteria for depression and other psychiatric disorders are assumed to be constructed within the context of cultures and societies, and represent collective agreements surrounding what constitutes a particular condition or a disorder in that context (de Jonge et al., 2015; Foucault, 1965; Kendler et al., 2011). These socially constructed kinds of conditions are not only shaped by the dominant beliefs and norms in society, but once established they also effectively function as a means to police beliefs and behaviors by establishing the boundaries that separate the normal from the abnormal (Foucault, 1965). When considering the impact of masculinities on mental health, the

classification of depression is generally considered to be a socially constructed kind, since gender performativity evolves within a social context (Butler, 1990; Connell, 1995; Kendler et al., 2011).

From a practical point of view, neither the essentialist nor the socially constructed conceptualizations of depression represent a completely acceptable solution to identifying depression or determining treatment need (Maj, 2010; Patten, 2008). Rather, viewing depression as a practical kind takes a middle of the road instrumentalist approach (Kendler et al., 2011). Using the best evidence available, cases would be assigned to an appropriate category that facilitates the achievement of the most effective scientific, professional, and treatment outcomes (Zachar & Kendler, 2007). The diagnostic criteria for depression presented in the Diagnostic and Statistical Manual for Mental Disorders (DSM), or the International Classification of Diseases (ICD-10), represent but two attempts to conceptualize depression in a practical descriptive way to develop a consistent taxonomy and guide treatment decisions (American Psychiatric Association, 2013; Kendler et al., 2011; World Health Organization, 2016; Zachar & Kendler, 2007). However, problems may arise when these practical attempts to create consistency in classification are understood and operationalized in an essentialized manner by their users (Zachar & Kendler, 2007). Therefore, in order to address professional and practical goals such as diagnosis, prognosis, and treatment decisions, mental health practitioners ultimately recognize that treatment choices cannot be made based on diagnostic criteria alone (Patten, 2008, 2015a). Some individuals may require treatment without meeting the official diagnostic criteria for major depressive disorder (MDD), while others will meet the criteria for MDD, but may not require significant professional intervention (Patten,

2008, 2015a). In other cases, diagnostic criteria may assign an individual to more than one diagnosis (i.e. concurrent disorders), yet the practitioner may acknowledge the intertwined and reinforcing nature of diagnoses such as depression and addictions when developing, and enacting, a treatment plan.

In recognition of the multifactorial and intersectional nature of potential causes of psychiatric disorders, and the inevitable heterogeneous clinical presentations associated with these disorders, Kendler et al. (2011) have proposed that these conditions be considered mechanistic property cluster (MPC) kinds. If depression is considered to be an MPC kind of condition, a diverse combination of causes may induce depression, and the clinical presentation of the condition may generate a variety of symptoms, which may also interact as causes of depression (Kendler et al., 2011). By conceptualizing depression as an MPC kind of condition, it establishes the possibility of recognizing additional sub-types of depression, which may be shaped by pervasive social conditions and forces, such as gender. Masculinities have been linked to men's health outcomes in numerous areas (Courtenay, 2000; Creighton & Oliffe, 2010; Evans et al., 2011; Gough, 2013); therefore, it is highly plausible that MPC kinds of masculine depressive syndromes exists , as proposed by clinicians and researchers that have studied the intersection of masculinities and depression (Addis, 2008; Brownhill et al., 2005; Coen et al., 2013; Courtenay, 2000; Levant, 2005; Levant & Pollack, 1995; Magovcevic & Addis, 2006, 2008; Ogrodniczuk & Oliffe, 2011; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008; Rutz et al., 1997; Winkler et al., 2006).

How do Masculinities Influence Depression in Men?

Qualitative descriptions of men's depression have coalesced around similar collections of symptoms. Spendelow (2015) performed a systematic review of qualitative studies (n=14) that explored men's self-reported coping strategies in response to depression. Five meta-thematic categories were identified including: *promote traditional masculinity*; *promote flexible masculinity*; *social concealment and minimization*; *seek support*; and *seek new perspectives* (Spendelow, 2015). Table 2 summarizes men's reported responses to depression from the qualitative literature, organized according to Spendelow's meta-thematic categories. Presenting a performance of masculinity that was consistent with hegemonic norms was central to the three most common meta-themes of *promote traditional masculinity*, *promote flexible masculinity*, and *social concealment and minimization* (Spendelow, 2015). These dominant meta-themes represented men's attempts to manage their depression while concurrently counterbalancing the perceived threat that depression posed to their masculine capital by exhibiting traditional masculinities as part of their coping strategy (Spendelow, 2015).

Table 2. Men's Self-reported Strategies for Managing Depression in the Qualitative Literature

Spendelow's Meta-themes ¹	Clinical Presentation/ Symptom
Promote traditional masculinity	<ul style="list-style-type: none"> ● Self-reliance/autonomy^{1, 2, 3, 4, 5} ● Concealing and/or ignoring negative emotions^{1, 6} ● Alexithymia - inability or unwillingness to express emotions⁷ ● Not seeking formal help or medication^{1, 6, 8} ● Self-management <ul style="list-style-type: none"> ○ Problem-solving¹ ○ "Escaping it"⁹ <ul style="list-style-type: none"> ▪ Physical exercise¹ ▪ Listening to music¹ ▪ Meditating¹

		<ul style="list-style-type: none"> ▪ Increased focus on work^{1, 10} ▪ Extramarital affairs⁹ ▪ Regression to adolescent behavior³ ○ Engaging in risky behaviors^{1, 7, 9, 10,} ○ Substance Use/Self-medication – “Numbing it”^{1, 4, 9, 10} <ul style="list-style-type: none"> ▪ Alcohol/Drugs/Eating ○ Externalizing - “Acting Out”⁹ <ul style="list-style-type: none"> ▪ Irritability, low impulse control, & violence – “hurting me hurting you”^{1, 9} ▪ Self-harm/suicide – “stepping over the line”⁹
Promote flexible masculinity	Strategic interpretation of traditional traits	<ul style="list-style-type: none"> ● Emphasize existing masculine traits and positive characteristics to preserve masculinity^{1, 11} ● Using health behaviors to leverage masculine capital – positioning help-seeking as proactive and responsible^{1, 6} ● Positioning men as a “hero” or in a “battle” with depression^{1, 6, 12}
	Broadening traditional traits	<ul style="list-style-type: none"> ● Attempting to alter the dominant masculine stereotype^{1, 2, 8, 11} ● Aligning with alternate masculine identities^{1, 2, 11} ● Normalization of altered gender roles in couples to accommodate alternate masculine behaviors^{1, 11}
Social Concealment and minimization		<ul style="list-style-type: none"> ● Internalizing - “Avoiding it”^{6, 9} ● Concealing, distracting, or downplaying depressive symptoms^{1, 8} ● Deliberate social withdrawal or isolation^{1, 6} ● Active avoidance of other people or romantic relationships^{1, 6} ● Positioning silence as protecting others (e.g. family)¹ ● Self-masking – not admitting the existence of depression – “Alexithymia”^{1, 7, 10, 14}
Seek support		<ul style="list-style-type: none"> ● Less common strategy¹ ● Seeking social support (friends, family, church)^{1, 3, 12, 13} ● Seeking mental health treatment^{1, 13}

- Seek new perspectives
- Making lifestyle changes to manage mood in the long-term^{1,3}
 - Recalibrating one's approach to life^{1,3}
-

Note. ¹ Spendelov's (2015) meta-themes are used to organize the presentation of male depressive syndrome; ² Sierra Hernandez, Oliffe, Joyce, Söchting, and Ogrodniczuk (2014); ³ Skärsäter, Dencker, Häggström, and Fridlund (2003); ⁴ J. L. Johnson, Oliffe, Kelly, Galdas, and Ogrodniczuk (2012); ⁵ Emslie et al. (2006); ⁶ Oliffe et al. (2010); ⁷ Levant and Pollack (1995); ⁸ Tang, Oliffe, Galdas, Phinney, and Han (2014); ⁹ Brownhill et al. (2005); ¹⁰ Oliffe and Phillips (2008); ¹¹ Coen et al. (2013); ¹² Oliffe, Ogrodniczuk, Bottorff, Johnson, and Hoyak (2012); ¹³ Chuick et al. (2009); ¹⁴ Rochlen et al. (2010);

Why Does it Matter?

When practical conceptualizations of depression, such as the DSM and ICD-10 criteria, are applied in an essentialized way to identify depression in population-level surveys, the incidence and prevalence rates that are calculated in the course of psychiatric epidemiology studies certainly remain useful; however, these established criteria may not be as sensitive to identifying men's depression as tools that have been specifically developed to be sensitive to masculine depression (Magovcevic & Addis, 2006, 2008; Rice et al., 2013; Wide et al., 2011; Zierau et al., 2002). The primary problem associated with relying on depression statistics that may not accurately identify the "masked" forms of masculine depression, is the potential for underestimation of the true burden of depression among men. This under-identification can have significant consequences, since governments and mental health organizations may under-invest in services to meet the needs of depressed men, and these statistics ultimately create an inaccurate risk profile, which positions depression as a condition that primarily affects women. As a result, men may be reluctant to self-identify as depressed, and some health professionals may be less likely to investigate the possibility of depression among their male clientele.

Is Consideration of a Single Pathway to Depression Realistic?

What is apparent from a review of the depression literature, and the literature exploring men's depression in particular, is the inherent complexity associated with the numerous potentially intersecting pathways to depression. Each theory of mental illness' origins has merit and evidence to support it, yet neither has garnered conclusive proof that their singular perspective articulates a definitive universal explanation for the origins of depression.

The depletion of neurotransmitters such as norepinephrine, serotonin, and dopamine is arguably the predominant biomedical theory of depression (Kirsch, 2010; Whitfield, 2003). However, despite its dominance and the undisputable popularity of antidepressant medications such as Selective Serotonin Reuptake Inhibitors (SSRIs), the evidence to support this theory is inconsistent and has been influenced by publication bias (Horder et al., 2011; Kirsch, 2010; Kirsch et al., 2008; Moncrieff et al., 2012; E. H. Turner et al., 2008; Vohringer & Ghaemi, 2011; Whitfield, 2003). However, if depleted neurotransmitters are to blame, then what is causing this depletion to occur? While genetics been implicated as a potential source of vulnerability to depression, the evidence to support the idea that flawed genes are responsible is currently inconclusive and circumstantial, although it is possible that epigenetic research may yield new discoveries (Colbert, 2001; Coleman & Atallahjan, 2010; Whitfield, 2003) There is evidence to suggest that social conditions, such as social competition and the stress associated with occupying a low position in established socio-demographic gradients, may contribute to the development of depression through reduced neurotransmitter (serotonin) levels (Keating, 2009; Raleigh et al., 1984), and neuroplastic structural changes to the amygdala

and hippocampus related to elevated cortisol levels (McEwen, 1998, 2003, 2005).

Therefore, even when depression originates within the social realm, it is likely that this effect is still enacted through biochemical processes in the body (Hagen, 2011). Indeed, these social/biological mechanisms of depression may be one means by which masculinities may influence the development of depression in men, as masculinities are inherently linked with status, social hierarchies, and power relations (Connell, 1995; Connell & Messerschmidt, 2005).

While researchers exploring depression in men have gathered substantial evidence to support the assertion that the social performance of masculinity shapes the presentation of this condition in men (Brownhill et al., 2005; Courtenay, 2000; Ogrodniczuk & Oliffe, 2011; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008; Oliffe, Rasmussen, et al., 2013), many men will still be diagnosed using generic criteria that do not take gender into account. However, in men with a strong affiliation to hegemonic masculinities, it is possible that tools designed to identify the gendered presentation of “masked depression” may be more effective in identifying depression in these men (Magovcevic & Addis, 2008; Mahalik & Rochlen, 2006; Rice et al., 2013; Wide et al., 2011; Zierau et al., 2002).

The pursuit of a clear cause for depression and universal depression criteria is an ideal, but perhaps unrealistic, goal considering the variety of potential pathways to the development of depression, and the heterogeneous nature of its clinical presentation. This quest is built on the shaky assumption that mental illness follows an essentialized predictable course, with a clearly delineated etiology, and a predictable and relatively universal symptomology (Kendler, 2005; Kendler et al., 2011). It assumes that mental

illness is comparable to infectious disease and medical illnesses with a well-defined cause, that results in predictable biological sequelae (Kendler, 2005; Kendler et al., 2011). Therefore, in recognition of the complexity of mental illnesses, considering men's depression as an MPC holds great promise as a theoretical structure for the future exploration of depression in men, and also depression in the wider context.

Conceptualizing Masculine Depression as an MPC

By considering men's depression as an MPC, theorists, researchers, and mental health practitioners may simultaneously consider how gender, social status, and biology may interact to cause depression, but also how these factors may influence the presentation of symptoms that are used to establish the diagnosis of depression. Using an MPC framework also provides a useful means to consider the interaction of concurrent disorders as interrelated conditions, and a means to examine how clinical features like social withdrawal, or self-medication with alcohol or drugs, may ultimately interact with other contributing factors to further entrench depression. In exploring the effect of gender and other interacting social gradients, considering depression as an MPC is also an ideal way to theoretically incorporate intersectionality perspectives into investigations of men's depression (Hancock, 2007; Hankivsky, 2012; Hankivsky & Christoffersen, 2008).

In order to demonstrate the potential application of the MPC concept to the examination of men's depression, Figure 1 illustrates the potential interactions that may exist between a selected sample of potential causes, and clinical features, in the development and replication of masculine depression syndrome. Low social standing related to the performance of masculinity may interact with other indicators of social status such as income, education, employment status, etc.. These interacting social

gradients may in turn influence the availability of social support, and a man's perceived social status. Chronic stress related to low social standing, may activate the limbic, hypothalamic, pituitary, adrenal (L-HPA) axis causing increased levels of cortisol and resultant neuroplasticity of brain structures (McEwen, 2003), and possibly reduced serotonin levels (Keating, 2009; Raleigh et al., 1984). Masculine depression syndrome

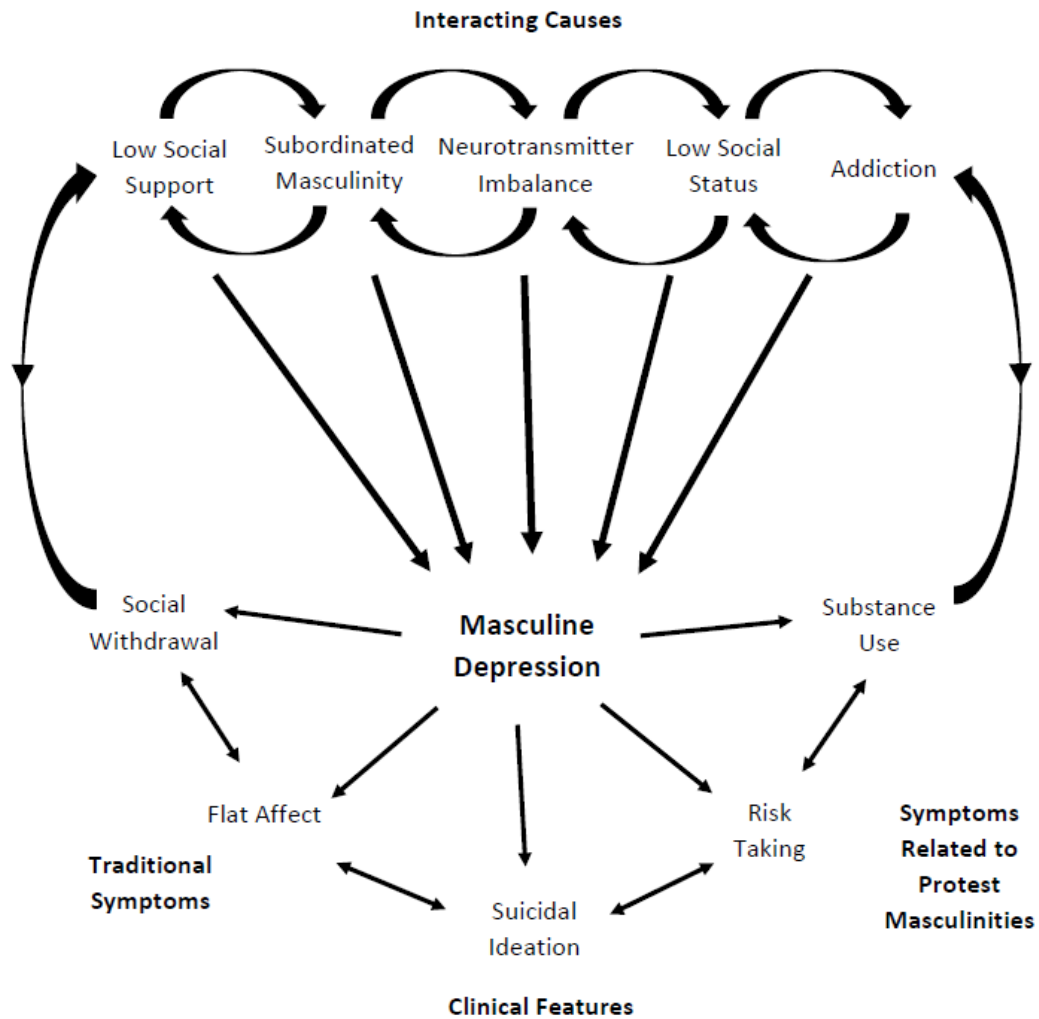


Figure 1. Masculine Depression Syndrome as a Mechanistic Property Cluster (MPC) Developed based on (Kendler et al., 2011).

may manifest in numerous clinical features, including more traditional symptoms, such as social withdrawal and flat affect, but these clinical presentations may in turn lead to deterioration of social support and worsening of depression symptoms or duration. Many of the symptoms associated with “masked depression” in men are tied to a form of protest hypermasculinity performance, which is enacted to counteract the feelings of insecurity and subordinated masculinity that these men may feel in the presence of depression (Brownhill et al., 2005; Connell, 1995; Courtenay, 2000; Oliffe & Phillips, 2008). This hypermasculine performance may manifest as risk taking, violence, aggression, anger, crime, or addictions (Brownhill et al., 2005; Courtenay, 2000; Oliffe & Phillips, 2008). Addiction serves as an ideal example of how a concurrent mental disorder could be considered as part of the MPC of masculine depression. Addictions could serve as a precipitating concurrent disorder, or could be the end result of excessive substance use related to self-medication and emotional numbing in the presence of depression. It is also possible that numerous other chronic medical conditions could be considered as possible concurrent disorders, since chronic illness is often linked to depression (Patten & Juby, 2008). While suicidal ideation is part of the traditional DSM and ICD-10 criteria for depression, it may also be considered to be part of the spectrum of protest masculinities, since a suicide attempt may serve as a form of externalizing emotional distress and feelings of social subordination through an act of violence turned inwards (Payne et al., 2008). The chosen method of suicide, and ultimately higher death rates among men, are also highly influenced by hegemonic masculinities, which may cause a man to choose a more violent means of attempting suicide (Brownhill et al., 2005; Oliffe et al., 2012; Oliffe & Phillips, 2008; Payne et al., 2008). This example represents only one possible

combination of factors that could be considered as part of the MPC of masculine depression, but the structure of the MPC allows for inclusion of greater complexity in the development of holistic and comprehensive models of men's depression.

Conclusion

While existing approaches to classifying and considering depression and other mental illnesses have served their purpose, perhaps it is time to move beyond models of depression that consider it as belonging to either an essentialized, socially constructed, or practical kind alone. There is mounting evidence that depression is likely the result of a complex interaction between human biology, numerous other social factors, including gender, and that many interactions in the web of causation may be bi-directional. Therefore, the heterogeneous nature of men's depression is unsurprising, and calls for a more complex theoretical approach moving forward. Considering masculine depression syndrome to be a mechanistic property cluster, presents an ideal theoretical framework from which to advance the study and treatment of depression in men, without dogmatically clinging to a single perspective as to the origins or nature of this common condition.

CHAPTER 5

Chapter 5

Intersecting Social Gradients, Self-esteem, and Canadian Men's Mental Health in the 2009-2012 Canadian Community Health Survey (CCHS)

Tis very certain that each man carries in his eye the exact indicator of his rank in the immense scale of men, and we are always learning to read it – Emerson (1860) in “The Conduct of Life”

Poor mental health is significantly associated with social inequalities (Allen, Balfour, Bell, & Marmot, 2014; Manseau, 2014; Shim et al., 2014; World Health Organization and Calouste Gulbenkian Foundation, 2014), and low standing on multiple social gradients may intersect to potentiate this risk as an individual's life course unfolds (Hankivsky, 2012; Hankivsky & Christoffersen, 2008; McDaniel & Bernard, 2011). Furthermore, a man's standing in hegemonic masculine hierarchies may be profoundly affected by his standing in other social gradients, such as: income, employment status, sexual orientation, education, and many others (Connell, 1995; Connell & Messerschmidt, 2005). Therefore, the intersectional effect of prominent social gradients on the mental health of men may ultimately take on a unique gendered presentation that is shaped by men's aspirational pursuit of social performances that align with collective patterns of hegemonic masculinities in the Canadian context (Connell, 1995; Connell & Messerschmidt, 2005). Even when men aspire to social performances that run counter to hegemonic masculinities, their agency to do so may be limited by the fact that hegemonic masculinities may be institutionally embedded in workplaces and social processes (Robertson et al., 2016). While aspects of hegemonic configurations of masculine practice may occasionally serve as protective, it is often difficult for men to escape the

negative effects that some aspects of hegemonic masculinities may exert on their mental health and self-esteem (Robertson et al., 2016).

Research into the effect of social inequalities on health has also demonstrated that the effect of inequality is not necessarily linked to one's absolute standing on a given socio-demographic gradient; rather, this effect may be due to an individual's perception of their relative standing compared to others in their social context (Keating, 2009; Marmot & Theorell, 1988; McDaniel, 2013). Therefore, it is unsurprising that self-esteem and social support, which can serve as measures of an individual's self-assessment of their social standing, have been shown to be important protective factors in maintaining mental health (Bhar, Ghahramanlou-Holloway, Brown, & Beck, 2008; Bovier, Chamot, & Perneger, 2004; De Silva et al., 2005; Hakulinen et al., 2016; Kleiman, Riskind, Kleiman, & Riskind, 2013; Orth, Robins, & Roberts, 2008; Sowislo & Orth, 2013).

The following study explores the entangled, intersectional effect of multiple social gradients, social support and self-esteem on the mental health of Canadian men through the statistical analysis of four years of Canadian Community Health Survey (CCHS) data collected between 2009 and 2012. The resulting findings illuminate the complexity of the potential social contributors to mental illness in men, while lending some additional support to theories that propose a significant social evaluative mechanism in the development of depression and suicidal ideation (Hagen, 2011; J. S. Price, Gardner, & Erickson, 2004; J. S. Price et al., 2007; Sloman et al., 2003).

Study Aims

The central aim of the current study was to investigate the intersectional influence of multiple social gradients and self-esteem on the risk of major depression (MD) and lifetime suicidal ideation (LSI) among Canadian men. In pursuit of this goal, three research questions were explored: 1) What is the intersectional effect of occupying low position in multiple sociodemographic hierarchies on the development of depression and lifetime suicidal ideation in Canadian men?; 2) What sociodemographic gradients are associated with depression and lifetime suicidal ideation in Canadian men?; 3) Does self-esteem and/or social support act as a mediator and/or moderator of the intersectional effect of social gradients on mental health outcomes in Canadian men?

Background

The health of men is profoundly influenced by the social performance of masculinity, as men's pursuit of mythopoetic, unattainable, aspects of hegemonic masculinities frequently leads men to neglect their well-being, and take risks, in order to appear independent, strong, fearless, and ultimately dominant (Connell & Messerschmidt, 2005; Courtenay, 2000, 2011; Creighton & Oliffe, 2010; Evans et al., 2011). However, masculine hierarchies cannot be considered in isolation from other social gradients that are used to denote social status, because Western hegemonic masculinities are intimately enmeshed with other indicators of social standing and patriarchal power, such as: economic and employment success, educational attainment, relationship success, and the performance of heterosexuality (Connell, 1995; Connell & Messerschmidt, 2005). This pattern has also been noted in studies that have explored depression and suicide in men,

and there is growing awareness that men's presentation of depression and suicidality are profoundly impacted by their desire to maintain the appearance of hegemonic masculinities (Branney & White, 2008; Brownhill et al., 2005; Emslie et al., 2006; Mac an Ghail & Haywood, 2012; Mahalik & Rochlen, 2006; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, et al., 2010; Oliffe et al., 2012; Oliffe & Phillips, 2008; Oliffe, Rasmussen, et al., 2013; Payne et al., 2008; Rutz et al., 1997; Spendelow, 2015), especially in men who are strongly aligned with traditional masculinities (Levant & Wimer, 2014; Wide et al., 2011).

Over the past few decades, past-year prevalence of major depressive disorder (MDD) among Canadian men has ranged between 2.8 and 4 percent (Blackmore et al., 2007; Patten et al., 2006; Patten et al., 2015; Simpson et al., 2012). Patten et al. (2015) analyzed the 2012 CCHS and reported a twelve month MDD prevalence of 2.8% (95% CI: 2.3, 3.2), and a trend of decreasing MD prevalence with increasing age. While rates of MDD among Canadian men have been consistently reported to be about half the rate experienced by women, men's suicide rate (17.9 per 100 000) is paradoxically three times higher than the rate reported for women (5.3 per 100 000), and suicide has consistently remained the seventh leading cause of death among Canadian men (Bilsker, 2011; Statistics Canada, 2012c, 2012d). In general, rates of completed suicide increase with age in Canada with peaks seen in men during middle age and again after 80 years-old (Bilsker, 2011; Statistics Canada, 2015). The highest suicide rate is noted among men aged 40 to 59 at 32.5 per 100 000; however, suicide deaths are significantly more common across all age groups of Canadian men (Statistics Canada, 2012d).

The social correlates of depression and suicide have been extensively examined in previous studies. Social support can serve as a resource that supports health and may also contribute to an existential sense of well-being; therefore, it is unsurprising that numerous studies have documented the positive effect that social support and social capital have on mental health (Bovier et al., 2004; De Silva et al., 2005; Grav, Hellzèn, Romild, & Stordal, 2012; Hakulinen et al., 2016; Milner, Krnjacki, Butterworth, & LaMontagne, 2016). Of particular relevance to the study at hand, is the tendency for men to report lower levels of social support and weaker social capital than women (Burda & Vaux, 1987; Conrad, 2010; R. J. Turner & Marino, 1994). In addition, it has been reported that men with a stronger alignment to traditional “hegemonic” masculinities are less likely to report strong social support (Burda & Vaux, 1987; Conrad, 2010), which may be associated with lower quality and/or less frequent social contact among men invested in this style of gender performance (Conrad, 2010; R. J. Turner & Marino, 1994). Indeed, it may be the effect of higher levels of social support among married individuals (R. J. Turner & Marino, 1994) that contributes to the generally reduced risk of depression among married Canadians, with the preventative link between marital status and depression stronger in men (Patten & Juby, 2008; Patten et al., 2015).

Previous Canadian studies suggest that socioeconomic standing, employment status, work stress, and education level may interact to influence the risk of major depression (Blackmore et al., 2007; J. L. Wang et al., 2008; J. L. Wang et al., 2012; J. L. Wang, Schmitz, et al., 2010). Among working Canadians, those with lower educational levels have demonstrated higher rates of MD than those with higher education (J. L. Wang, Schmitz, et al., 2010). However, unemployed Canadians with higher education

levels exhibited a higher incidence proportion of MD than those with lower education (J. L. Wang, Schmitz, et al., 2010). Household income levels were also related to MD among men, who worked in the past 12 months, while those who were unemployed and at the lowest level of personal income were more likely to have developed MD than others (J. L. Wang, Schmitz, et al., 2010). Work stress also appears to be a significant factor in the development of MD in men, since high job strain and job insecurity have been shown to be predictive of greater odds of depression in men (Blackmore et al., 2007; J. L. Wang et al., 2008; J. L. Wang et al., 2012).

Visible minority status and recent immigration has been consistently shown to be linked to lower rates of depression in national level Canadian studies (Ali, 2002; Hansson, Tuck, Lurie, & McKenzie, 2012; Patten & Juby, 2008; Smith, Matheson, Moineddin, & Glazier, 2007). The reasons for this pattern appear to be complex, and may be affected by issues of reporting bias, or culturally biased diagnostic tools (Hansson et al., 2012). This speaks to the need for more comprehensive research in this area, which attends to these complexities and acknowledges the heterogeneity of visible minority and immigrant populations (Hansson et al., 2012). In a review of 17 papers that examined the rates of mental illness and suicidality among immigrant, refugee, ethno-cultural, and racialized groups in Canada, Hansson et al. (2012) report that there was no clear pattern related to depression across these diverse groups. While suicide rates also tended to be low among these ethnically diverse groups, it was also noted that different national origin groups exhibited different trajectories in suicide rates across the generations, suggesting that there are some cultural retained of patterns of suicidality from the country of origin, even after migration to Canada (Hansson et al., 2012).

Sexual orientation plays a significant role in establishing men's place in masculinity hierarchies (Connell, 1995; Connell & Messerschmidt, 2005). Western hegemonic masculinities emphasize the performance of heterosexuality, thereby constructing all other sexualities as subordinate masculinities (Connell, 1995; Connell & Messerschmidt, 2005). Previous Canadian studies of depression and suicidal ideation among gay and bisexual men suggest that these men have a prevalence of mood or anxiety disorders that is two to three times higher than the rate experienced by heterosexual men, and an odds of lifetime suicidality that is around four times higher for gay men and up to six times higher among bisexual men (Brennan et al., 2010; Pakula & Shoveller, 2013).

While the link between social status and health outcomes is well established, the mechanism by which these gradients contribute to mental illness is undoubtedly complex, and remains an area of vigorous debate (Horwitz & Wakefield, 2007; Keating, 2009; McEwen, 2003; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003; Therborn, 2013; Wilkinson & Pickett, 2009). Bio-psychosocial theories of mental illness posit that the chronic stress associated with occupying a lower rung in a social hierarchy may activate the limbic hypothalamic-pituitary-adrenal (L-HPA) axis, which leads to elevated levels of the stress hormone cortisol (Keating, 2009; McEwen, 2003, 2005). While high cortisol levels have been linked to depression, it is further hypothesized that elevated cortisol levels may exert this effect by contributing to structural neuroplastic changes such as: hyperactivity of the amygdala; and delayed atrophy of the hippocampus and the prefrontal cortex (Keating, 2009; McEwen, 2003). There is also some evidence from primate models to suggest that occupying a lower social position may lead to lower

levels of the neurotransmitter serotonin, which has been implicated in depression and other mental illnesses (J. S. Price et al., 1994; Raleigh et al., 1984).

Evolutionary theories of mental illness also provide a possible explanation for the link between social status and depression (Hagen, 2011; Horwitz & Wakefield, 2007; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003). Essentially, these theories hypothesize that depression may represent the consequences of an involuntary subordination response that would have originally served an evolutionary protective purpose by causing an individual to withdraw themselves from danger following a agonistic status defeat, and potentially draw social support to the individual that suffered the defeat (J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003). While agonistic displays are no longer a daily part of life in most modern human societies, these theories propose that individuals may still assess their relative resource holding potential to that of others, which may in turn cause the involuntary manifestation of depression, if they perceive their social resources to be less than others (J. S. Price et al., 1994).

Theoretical Frameworks

Study design, variable selection, and interpretation of findings were informed by several theoretical frameworks including bio-psychosocial theories of mental illness (Horwitz & Wakefield, 2007; Keating, 2009; Krieger, 2001; McDaniel, 2013; McEwen, 2003; Therborn, 2013), masculinities theory (Connell, 1995; Connell & Messerschmidt, 2005; Courtenay, 2000; Creighton & Oliffe, 2010; Gough, 2013), intersectionality theory (Griffith, 2012; Hankivsky, 2012; Hankivsky & Christoffersen, 2008), and evolutionary

social competition theories of depression (Hagen, 2011; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003).

Method

Statistics Canada granted the research team permission to access the Canadian Community Health Survey (CCHS) master files through the Research Data Centre (RDC) at the University of Lethbridge, and the University of Lethbridge's Human Subjects Research Committee was consulted prior to beginning research analyses.

Dataset and Sampling

The Canadian Community Health Survey (CCHS) is a cross-sectional population health survey administered by Statistics Canada to approximately 65 000 Canadians annually (Statistics Canada, 2013b). The CCHS uses three sampling frames, including: the area frame from the Canadian Labour Force Survey, which engages a multi-stage stratified cluster design, with the household as the final sampling unit (generating approximately 40.5% of the sample); a list frame of telephone numbers (approximately 58.5% of the sample); and the final one-percent of the sample is collected using a random digit dialing sampling frame (Statistics Canada, 2013b). While Statistics Canada states the CCHS is representative of about 98% of the Canadian population aged 12 or over, who live in private dwellings in all provinces and territories, it is important to acknowledge that individuals living on Indian Reserves or Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of some remote regions are excluded from the sampling frame (Statistics Canada, 2013b). The CCHS household-level response rate was 78.4% in 2009-2010 and 81.0% in 2011-2012, while

the person-level response rate was 89.3% in 2009-2010 and 87.3% in 2011-2012 (Statistics Canada, 2011, 2013b). About 40% of CCHS interviews were completed using computer-assisted personal interviewing, while the remaining 60% were completed using computer assisted telephone interviewing (Statistics Canada, 2013b). The 2009-10 and 2011-12 two-year master files were combined into a single dataset using Statistics Canada recommended procedures (Thomas & Wannell, 2009), resulting in an accessible overall sample of approximately 124 000 Canadian men, spanning the years 2009 to 2012. However, it should be noted that CCHS respondents were not asked to respond to all survey modules, based on variations in provincial data collection requirements, or answers to initial screening questions. (Statistics Canada, 2011, 2013b). Therefore, the end sample size for each analysis varies, and is substantially lower than the total sample size. In addition, it is also important to acknowledge that estimates calculated in the course of these analyses do not represent point estimates for the Canadian population in a given survey cycle, but rather period estimates for the population during period between 2009 and 2012 (Thomas & Wannell, 2009).

Study Variables

Dependent variables. Depression predicted probability (dpsdpp) is a derived variable in the CCHS based on responses to the Composite International Diagnostic Interview Short Form for Major Depression (CIDI-SF-MD) (Kessler et al., 1998; Statistics Canada, 2011, 2013b). Since a predicted probability of .90 or greater is considered diagnostic of MD, the depression predicted probability variable was also recoded into a dummy variable with cases of major depression coded as one, and those with a depression predicted probability of less than .90 coded as zero (not depressed).

Lifetime suicidal ideation (LSI) was also a dummy coded variable with one indicating the presence of LSI and zero indicating a report of no lifetime suicidal ideation. It was these dummy coded versions of the MD and LSI variables that were used to calculate population proportions for these conditions and as the dependent variables in logistic regression models.

Independent variables. “Self-esteem” was a derived variable in the CCHS, based on a subset of six items from the Rosenberg Self-esteem scale (Rosenberg, 1965), which Pearlin and Schooler (1978) have previously factored into a single dimension representing self-esteem, with higher scores representing greater self-esteem (Statistics Canada, 2012a). Social support was measured by the 19 item Medical Outcomes Study (MOS) Social Support Scale (Cronbach’s alpha= 0.97, which was reported in the CCHS according to its four subscales: emotional/informational support (alpha=0.96); tangible social support (alpha=0.92); positive interaction (alpha=0.94); and affection (alpha=0.91) (Sherbourne & Stewart, 1991). For the purposes of regression analyses, a standardized “total social support” variable was generated, by adding these four MOS sub-scale scores together and dividing the total by the total number of scale items. The sexual minority variable was derived by recoding gay and bisexual respondents to the sexual orientation variable (sdc_7aa) into a dummy variable with one indicating those who had self-identified as gay or bisexual, and those identifying as heterosexual coded to zero. The variable “Visible Minority” was another derived dummy variable, with Caucasian respondents to the racial or cultural group variable (sdc_dcg) coded as zero, and visible minority respondents coded to one. “Income” represented the survey respondent’s self-reported household income according to the 13 income categories, with higher numbers

representing higher household income. “Education” captured the respondent’s self-reported level of education, with higher numbers representing higher reported levels of education. “Partnered” was a dummy variable derived by recoding the marital status variable as one if the respondent was married or in a common-law relationship, and zero if the respondent was single, separated, divorced, or widowed. “Work Last Week” was generated by dummy coding the working status variable (*lbs_01*) to one if the respondent worked in the past week, and zero, if the respondent was unemployed or permanently unable to work. Age was a continuous variable that captured the respondent’s self-reported age. All continuous variables were mean-centred in order to generate regression models that represented the average Canadian man’s situation. A grouping variable indicating rural versus urban geographical location was generated by recoding the Urban and Rural Areas variable (*geodur*) into a dummy variable with rural areas coded zero, and other areas coded one to indicate largely urban status. A generational cohort variable was also generated for grouping purposes by recoding cases according to year of birth (*dhh_yob*), into eight generational cohorts that corresponded with those outlined by Statistics Canada (2012b). These generational cohorts were labelled: Turn of the Century (1800-1919); Veterans (1920-1940); WWII Cohort (1941-1945); Early Boomers (1946-1951); Late Boomers (1952-1965); Baby Bust-Generation X (1966-1971); Generation Y (1972-1992); and Generation Z (1993-2012).

Statistical Analysis

Statistical analyses were performed using STATA 12.1™ within the RDC at the University of Lethbridge. All survey weights were scaled and normalized according to Statistics Canada recommendations, and where possible, survey bootstrap weights (500

replications) were applied in all analyses to generate more accurate statistical estimates (Thomas & Wannell, 2009). Assumptions were met for all tests, no multivariate outliers were identified, and no missing data were replaced (Billor, Hadi, & Velleman, 2000; Tabachnick & Fidell, 2013). Population proportions for major depression (MD) and lifetime suicidal ideation (LSI) were calculated, and stratified by sex, rural/urban status, generational cohort (Statistics Canada, 2012b), sexual orientation, partner status, and employment status. Tests of difference in population proportions were performed using Chi Square tests. Exploration of the predictors of MD and LSI was done utilizing logistic regression analyses, with mean-centered continuous predictors, and calculation of adjusted odds ratios for each predictor in terms of the outcome of interest (Tabachnick & Fidell, 2013). Significant effects identified during logistic regression analyses were further explored utilizing the Visualization of Binary Logistic Regression (VIBL) do file. Multiple ordinary least-squares (OLS) regression was applied in the consideration of self-esteem as an outcome of social gradient variables. Exploration of the potential role of self-esteem as a mediator of the relationship between intersecting social gradients and depression predicted probability, and total social support as a moderator of the relationship between self-esteem and depression was performed utilizing structural equation modeling informed by the work of Preacher, Rucker, and Hayes (2007), Hayes (2013), and the Institute for Digital Research and Education (2016).

Findings

The calculated population proportions for the annual prevalence of MD and LSI for selected groups of Canadian men during the period from 2009 to 2012 are presented in Table 3. A significantly higher proportion ($p < 0.001$) of Canadian women (6.7%,

SE=0.17) demonstrated MD according to the CIDI-SF-MD criteria when compared with Canadian men (4.1%, SE=0.20). Likewise, a significantly higher proportion of Canadian women reported LSI (10.7%, SE=0.32) when compared with Canadian men (8.1%, SE=0.36).

Table 3. Proportion of Canadian Men Experiencing Major Depression (MD)^a and Lifetime Suicidal Ideation (LSI) during the Period 2009-2012

Group	Major Depression			Lifetime Suicidal Ideation		
	Proportion with MD (BSE)	Sample Size (n)	Test Statistic (X ²) d	Proportion with LSI (BSE)	Sample Size (n)	Test Statistic (X ²)
Overall						
Men	4.1% (.17)	37932	279.47***	8.1% (.32)	22771	94.5***
Women	6.7% (.20)	45682	d=14.01	10.7% (.36)	27015	d=7.63
Geographical Location		37932	19.21***		22771	1.73
Urban Men	4.3% (.21)		d=4.76	8.0% (.35)		d=1.16
Rural Men	3.2% (.25)			8.7% (.78)		
Generational Cohort		37868	254.75***		22771	103.1***
Veterans (1920-40)	1.0% (.18)			3.4% (.47)		
WWII (1941-45)	1.8% (.37)			5.6% (.80)		
Early Boom (1946-51)	3.1% (.40)			7.6% (.84)		
Late Boom (1952-65)	4.4% (.35)			8.9% (.68)		
Bust-Gen X (1966-71)	5.6% (.59)			10.2% (1.21)		
Gen Y (1972-92)	5.5% (.36)			8.8% (.54)		
Gen Z (1993-2012)	1.7% (.26)			5.1% (.90)		
Sexual Orientation		25290	44.29***		16876	75.9***
Heterosexual ^b	5.1% (.25)			8.8% (.41)		
Gay	12.5% (2.36)		d=4.41	25.1% (4.76)		d=4.82
Bisexual	10.2% (2.80)		d=2.57	23.8% (6.06)		d=3.49
Partnered		37896	212.12***			222.2***
Yes	2.9% (.19)		d=11.67	6.0% (.34)		d=11.99
No	5.9% (.31)			11.7% (.58)		
Employed Last Week		33731	78.42***		21701	42.66***
Yes	3.7% (.21)		d=7.47	7.6% (.36)		d=5.09
No	5.9% (.36)			10.4% (.69)		

Note. MD= Major Depression; ^a Major Depression corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; ^b Prevalence rate exceeds overall rate for men because only a subsample of the total sample were asked their sexual orientation; ^c d calculated with heterosexual as the reference category; BSE= Bootstrapped Standard Error; X²=Chi Squared; d= Cohen's d effect size; n=weighted sample size; ***p<0.001

Differences in the proportion of MD were noted based on geographical location, with significantly more urban men (4.3%, SE=0.21) exhibiting MD ($p<0.001$) than rural men (3.2%, SE=0.25). However, although not statistically significant, more rural men reported LSI (8.7%, SE=0.78) than urban men (8.0%, SE=0.35).

When annual prevalence of MD was calculated by generational cohort, a pattern of increasing prevalence is noted for each subsequent generation with the highest prevalence noted among Canadian men in Generation X at 5.6% (0.59), with only slightly lower prevalence in Generation Y at 5.5% (0.36), and a significant drop in prevalence for Generation Z at 1.7% (0.26). A similar pattern was also noted when the population proportion of LSI was calculated for each generational cohort. Prevalence of LSI increased with each subsequent generational cohort, with the highest proportion noted among Generation X at 10.2% (1.21). The proportion of LSI for Generation Y was lower at 8.8% (0.54), and Generation Z at 5.1% (0.90); however, it should be noted that these rates are based on a shorter elapsed lifespan, so it remains possible that rates of LSI may exceed those experienced by previous generations by the time they achieve a similar age.

Significant differences in the annual prevalence of MD were noted based on Canadian men's sexual orientation ($p<0.001$). Gay (12.5%, SE=2.36) and bisexual men (10.2%, SE=2.80) experienced MD at approximately twice the rate of heterosexual men (5.1%, SE=0.25). An even more striking pattern was noted in LSI based on sexual orientation with Gay and Bisexual men exhibiting rates of 25.1% (4.76) and 23.8% (6.06) respectively compared with 8.8% (0.41) among heterosexual men.

Partnered men exhibited significantly lower annual prevalence rates of MD ($p < 0.001$) at 2.9% (0.19) compared to men without a partner at 5.9% (0.36). Men with partners also experienced significantly lower rates of LSI ($p < 0.001$) at 6.0% (0.34) compared to 11.7% (0.58) among those without partners.

Canadian men, who were employed in the previous week, also demonstrated a significantly lower prevalence of MD ($p < 0.001$) at 3.7% (0.21), compared to men not working in the previous week at 5.9% (0.36). Similarly, men who were working in the past week had a significantly lower prevalence of LSI ($p < 0.001$) at 7.6% (0.36) compared to those not working at 10.4% (0.69).

Predictors of Major Depression.

The results of a logistic regression to explore the intersecting social gradient predictors of MD are presented in Table 4. While not a social gradient, the covariate self-esteem was the strongest predictor of major depression ($p < 0.001$), with men with average self-esteem exhibiting an almost 25% reduction in risk ($OR_{adj} = 0.758$ [95% CI: 0.720, 0.797]). Whether a man was working in the previous week was the second strongest predictor ($p < 0.001$) of MD in Canadian men, with current employment reducing the odds of MD by almost 50% ($OR_{adj} = 0.535$ [95% CI: 0.387, 0.740]). Overall level of social support was the next most significant predictor ($p < 0.001$) of MD with an almost 75% reduction in the odds of MD among Canadian men possessing mean levels of social support ($OR_{adj} = 0.268$ [95% CI: 0.132, 0.540]). Identifying as a gay or bisexual man more than doubled the odds of MD ($p < 0.01$) with a calculated adjusted odds ratio of 2.18 [95% CI: 1.40, 3.41]. Increasing age was also associated with a significant decrease in the risk

Table 4. Bootstrapped Logistic Regression exploring the social gradient predictors of Major Depression^a

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem -C ^b	-.277 (.026)	-10.63***	0.758 [.720, .797]
Worked Last Week	-.625(.17)	-3.79***	0.535 [.387, .740]
Total Social Support-C ^b	-1.32 (.36)	-3.68***	0.268 [.132, .540]
Sexual Minority	.780 (.23)	3.43**	2.181 [1.40, 3.41]
Age-C ^b	-.047 (.02)	-2.73**	0.954 [.922, .987]
Age X Total Social Support	.020 (.01)	2.54*	1.020 [1.005, 1.04]
Partnered	-.380 (.19)	-2.00*	0.683 [.471, .991]
Visible Minority	-.47 (.26)	-1.80	0.628 [.378, 1.04]
Education-C ^b	.054 (.03)	1.58	0.1.05 [.987, 1.13]
Income-C ^b	-.001 (.03)	-0.05	0.998 [.944, 1.06]
Constant	-4.45 (.72)***		

Note. $X^2(10, n=9667)=243.66, p<.001$; ^a Major Depression corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; ^b All Continuous variables were mean centred; Pseudo $R^2=0.163$ ***; * $P<0.05$; ** $p<0.01$; *** $p<0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

of MD ($p<0.01$). There was also a significant interaction between age and social support at the less stringent 0.05 alpha level, with social support declining more rapidly with age among men with MD.

Post hoc exploration of significant effects were explored using the visualization for binary logistic regression (VIBL) do file, and these analyses illustrated the intersectional nature of these selected social gradients' association with MD. While each of the significant predictors appear to exert an influence on the development of MD, these significant effects on the probability of MD were only present in the presence of high

covariance contribution from the other predictor social gradients. Therefore, it appears that it is unlikely that a single predictor variable would influence the development of MD independently. Rather, the effect of low status in one social gradient is likely potentiated by the collective impact of an individual case's intersectional low standing on multiple social gradients, combined with very low self-esteem. It is also important to note that the pseudo R^2 for this logistic regression model is 0.163, suggesting that approximately 16% of the variance in the classification of cases to a diagnosis of MD may be attributed to the model as presented, and that there are clearly other significant factors not accounted for in the present model.

Is Self-esteem a Mediating Variable?

Since self-esteem was identified as the strongest predictor of MD in the previous logistic regression, a multiple regression was performed to determine if self-esteem could be predicted by the other social gradient variables, because it seemed to make intuitive sense that one's location in a social hierarchy may influence one's ultimate self-esteem. The results of this multiple regression ($n=8318$) confirmed a significant regression model, $F=385.8$, $p<0.001$, $R^2= 0.107$, making self-esteem a strong candidate as a mediating variable in the ultimate effect on the development of MD. Adding to this case was the fact that all social gradient predictors of self-esteem were statistically significant at the 0.05 (most at the 0.01 level), except for sexual minority status ($p=0.059$) and age ($p=0.054$), which approached significance.

Drawing on the work of Preacher et al. (2007) and Hayes (2013), and suggested Stata code from the Institute for Digital Research and Education (2016), Stata 12's

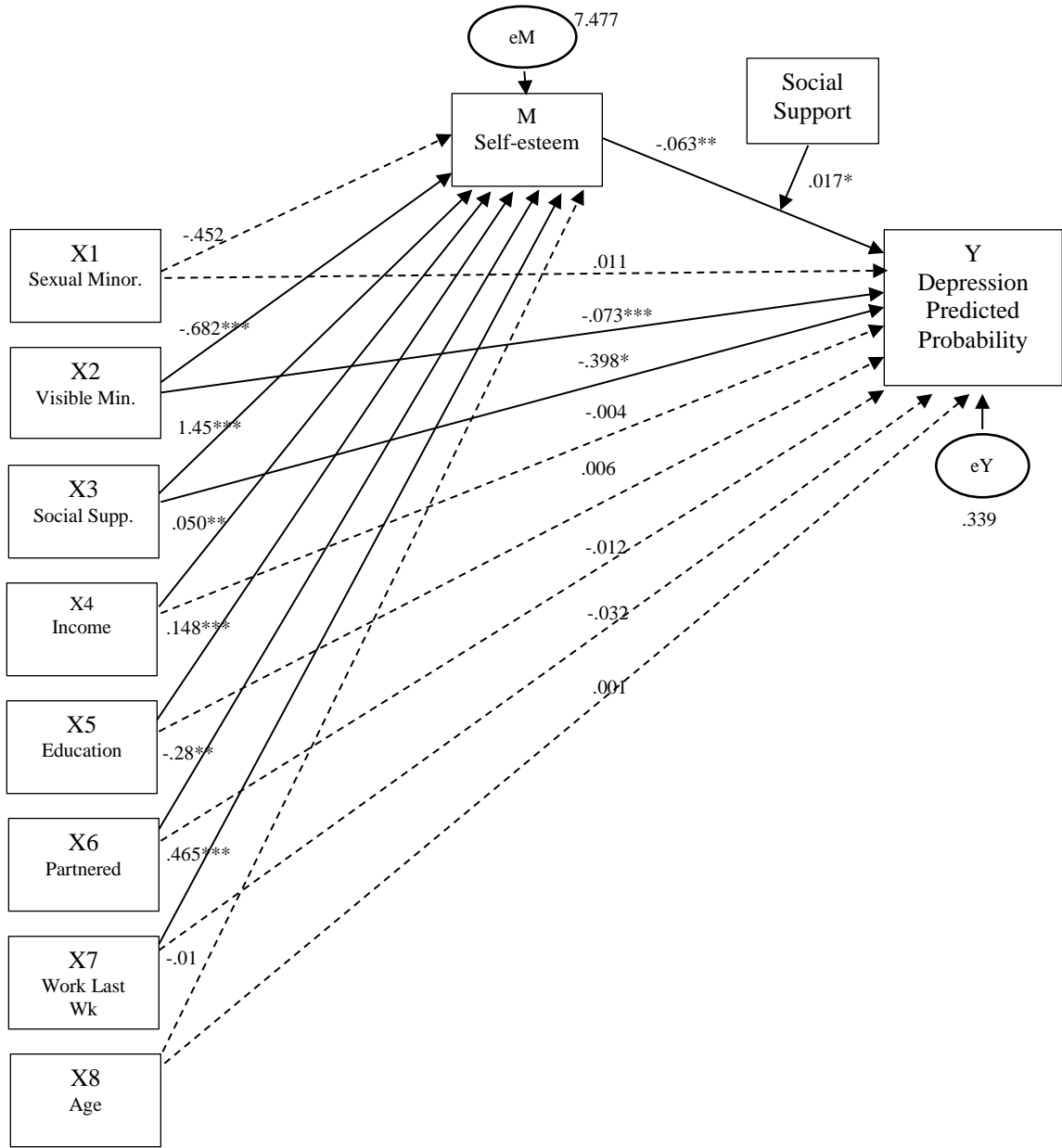


Figure 2. Intersecting Social Gradient Predictors (Moderated Mediation) of Depression Predicted Probability in Canadian Men in the 2009-2012 Canadian Community Health Survey (CCHS). *Note.* Solid lines between variable boxes indicate significant relationships, with dashed lines indicating non-significant relationships. Lines are also labeled with calculated beta values and statistical significance is indicated by asterisks: * $P < 0.05$; ** $p < 0.01$; *** $p < 0.001$. The terms eM and eY are the error terms associated with self-esteem and depression predicted probability respectively.

structural equation modeling capabilities were utilized to explore self-esteem's role as a mediator of the previously explored social gradient's effect on depression predicted probability. Additionally, total social support was explored as a potential moderator of the effect of self-esteem on depression predicted probability. The results of this analysis are displayed in Figure 2. The effect of the majority of the social gradients included in this moderated mediation model appears to be mediated through the variable self-esteem. Household income, education level, being partnered, and working last week do not exert a significant direct effect on depression predicted probability (DPP); however, each of these social gradients exerts a significant effect on self-esteem, which in turn exerts a significant effect on DPP. When controlling for all other social gradients, and the mediating effect of self-esteem, being a sexual minority and age do not demonstrate a significant effect on DPP directly, nor through the mediator self-esteem. Visible minority status exerts a significant negative effect on both DPP and self-esteem, which ultimately means that these two effects are contradicting one another. The reduction in self-esteem associated with visible minority status may be decreasing the effect of reduced DPP associated with visible minority status. Social support also moderates the significant negative effect of self-esteem on DPP. When this moderating effect was probed, social support was noted to significantly moderate the effect of self-esteem on DPP throughout the range of social support from minus one standard deviations ($p < 0.001$) through plus one standard deviations ($p < 0.01$) of mean social support.

Social Gradient Predictors of Lifetime Suicidal Ideation

The results of a logistic regression analysis exploring the social gradient predictors of LSI are presented in Table 5. Increasing self-esteem was negatively

associated with LSI in Canadian men ($p < 0.001$), with average self-esteem associated with an approximately 34 percent reduction in the odds of LSI ($OR_{adj} = 0.655$ [95% CI: 0.529, 0.810]). Total social support level was also a significant negative predictor of LSI ($p < 0.01$), with average social support levels being associated with a staggering 90 percent reduction in the odds of LSI ($OR_{adj} = 0.092$ [95% CI: 0.016, 0.526]). The interaction term between self-esteem and total social support was positively associated with LSI ($p = 0.016$), while being a visible minority was associated with an approximately 60 percent reduction in the odds of LSI ($OR_{adj} = 0.386$ [95% CI: 0.158, 0.940], $p = 0.036$); however, these two effects are evident only at the less stringent alpha level of 0.05.

Post hoc exploration of these significant effects with the Visualization of Binary Logistic Regression (VIBL) do file, further supports the intersectional effect of social gradients on LSI, as the significant effect of self-esteem was only evident at very low level of reported self-esteem and high levels of covariance contribution from intersectional low standing on other social gradients. An increase in the probability of LSI was not evident across the whole range of the total social support variable during VIBL analysis, yet the overall effect was statistically significant. It is possible that the effect of social support is partially operating through the self-esteem variable as in the case with MD; however, a similar moderated mediation analysis was not possible, since the dummy coded LSI variable does not meet the assumptions for SEM. The positive association between the Self-Esteem X Social Support interaction term and LSI is somewhat unexpected given the negative associations between the individual variables and LSI. Graphical exploration of this interaction illustrated a possible reason for this pattern, as those reporting LSI surprisingly demonstrated more rapid increases in reported

Table 5. Bootstrapped Logistic Regression of Lifetime Suicidal Ideation

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem –C ^a	-.424 (.11)	-3.89***	0.655 [.529, .810]
Total Social Support-C ^a	-2.39 (.89)	-2.68**	0.092 [.016, .526]
Self-Esteem X Total Social Support	.122 (.05)	2.41*	1.130 [1.02, 1.24]
Visible Minority	-.952 (.45)	-2.10*	0.386 [.158, .940]
Sexual Minority	.546 (.34)	1.62	1.727 [.892, 3.34]
Income-C ^a	-.037 (.03)	-1.25	0.963 [.908, 1.02]
Worked Last Week	-.254(.23)	-1.05	0.782 [.495, 1.24]
Education-C ^a	-.019 (.04)	-0.44	0.981 [.898, 1.07]
Age-C ^a	-.003 (.01)	-0.32	0.997 [.982, .1.01]
Partnered	-.027 (.21)	-0.13	0.974 [.639, 1.48]
Constant	-7.84 (2.42)**		

Note. $X^2(10, n=3413) = 82.04, p < .001$; ^a All Continuous variables were mean centred; Pseudo $R^2 = 0.086$; * $P < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

self-esteem with increasing levels of social support (See Figure 3), and higher reported levels of self-esteem at all levels of social support. Therefore, those with LSI would have a larger calculated interaction term than those not reporting LSI.

Discussion

Prevalence of Depression

Previous Canadian studies have estimated the annual prevalence of MD in men to range between 2.8 and 4% (Blackmore et al., 2007; Patten & Juby, 2008; Patten et al., 2006; Patten et al., 2015; Simpson et al., 2012), with Simpson et al. (2012) reporting that the 12-month prevalence of MD in the CCHS data during the period 2001 to 2007 was four

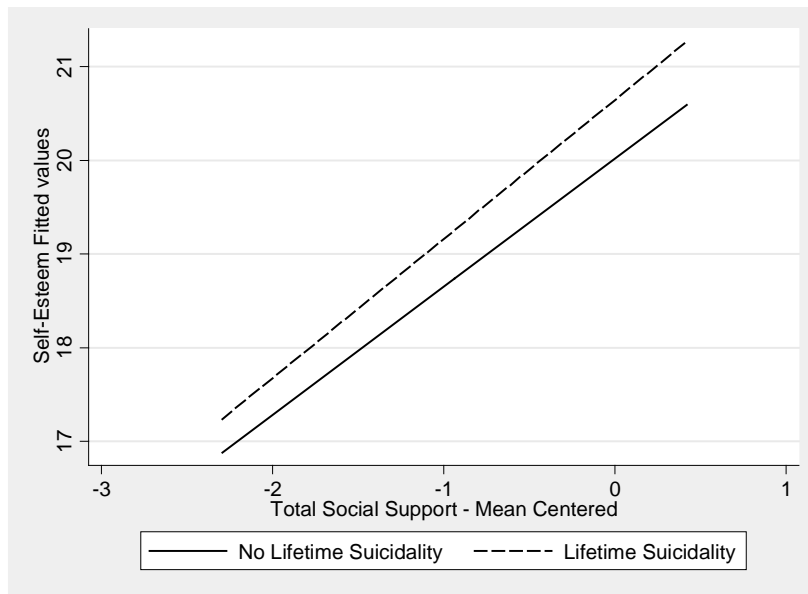


Figure 3. Graphical representation of the fitted linear relationship between self-esteem and total social support based on Lifetime Suicidality

percent for men, and seven percent in women over time. These findings are consistent with the annual prevalence estimates in the current study of 4.1 percent in men and 6.7 percent in women during the period between 2009 and 2012, which suggests that the proportion of Canadians with a diagnosis of depression is remaining relatively stable over time (Simpson et al., 2012). The sensitivity of instruments such as the CIDI-SF-MD to masculine presentations of depression remains an area of ongoing controversy, since men tend to mask their presentation of depression as part of the social performance of masculinities (Magovcevic & Addis, 2008; Oliffe & Phillips, 2008; Rutz et al., 1997; Wide et al., 2011; Zierau et al., 2002). Therefore, when combined with the enhanced stigma associated with depression among men (Oliffe et al., 2016), the risk of reporting bias among male respondents to national self-report surveys may be high. It is possible that the gender disparity in depression rates between men and women would be less apparent if survey depression screening utilized instruments that are more sensitive to

men's masked presentation of this condition (Magovcevic & Addis, 2008; Wide et al., 2011; Zierau et al., 2002).

No previous Canadian studies were located that reported the annual prevalence of MD for rural versus urban men separately. However, the current period estimate of 3.2% for rural men, versus 4.3% for urban men, is relatively consistent with previous Canadian estimates of MD among rural and urban residents overall (Patten et al., 2006). Typically rural residents report lower levels of MD (Patten et al., 2006; J. L. Wang, 2004), with Patten et al. (2006) reporting an overall annual prevalence of 3.3 percent (95%CI: 2.7, 4.0) among rural residents and 4.1 percent (95%CI: 3.8, 4.4) among urban dwellers.

The tendency for the prevalence of MD to decrease with age is well documented in the Canadian population (Patten & Juby, 2008; Patten et al., 2006; Patten et al., 2015); therefore, the general trend of increasing MD prevalence with each subsequent generation is not particularly surprising. While this may be documenting a valid trend, it is also possible that this pattern may be a function of reporting bias. Patten et al. (2012) have identified that the reporting of depressive episodes decreases with time, so retrospective assessment of depressive episodes could contribute to inaccuracy. In addition, since older generations may be more strongly aligned with traditional hegemonic constructions of masculinity, it is plausible that older men may have a greater tendency to deny depression because of its association with vulnerability, or because of the greater stigma associated with mental illness among older cohorts (Ogrodniczuk & Oliffe, 2011; Oliffe et al., 2016; Oliffe & Phillips, 2008). However, if the higher prevalence of MD that is currently noted in the Late Baby Boom, Generation X, and Generation Y cohorts persists as they age, this

pattern could also foreshadow a future where greater numbers of Canadian men will present with MD in their older years,

The current estimates of depression prevalence based on sexual orientation, are consistent with previously reported unadjusted prevalence rates of mood and anxiety disorders in the 2003 CCHS (Brennan et al., 2010) and reports of increased odds of mood and anxiety disorders among gay and bisexual Canadian men (Brennan et al., 2010; Pakula & Shoveller, 2013). The fact that gay and bisexual Canadian men are presenting with an annual prevalence of MD that is at least twice that of heterosexual men has significant implications for those working with these men, or planning programming for sexual minority men. For a more extensive discussion of depression and suicide among gay and bisexual Canadian men, please refer to the following paper in this dissertation (See Chapter 5).

The finding that partnered men experience a prevalence of MD that is half that of men without partners is consistent with previous findings in the Canadian population, which have consistently found marital status to be protective against the development of depression in men (Patten & Juby, 2008; Patten et al., 2006; Patten et al., 2015). It is possible that the origins of this disparity lie with the tendency for men's social support to be weaker than that experienced by women, and the fact that previous studies have found that men depend heavily on their partners for emotional support in particular (Conrad, 2010; Robertson, 2007; R. J. Turner & Marino, 1994).

Previous Canadian studies have also consistently demonstrated a positive relationship between employment, job security, and men's mental health (J. L. Wang et

al., 2008; J. L. Wang et al., 2012; J. L. Wang, Schmitz, et al., 2010); therefore, the current finding that employed men have a lower prevalence of MD is not unexpected. This relationship may be a function of the numerous possible social advantages associated with employment for men, including increased income, potentially greater availability of social support and self-esteem associated with employment, and the well-established link between employment and the performance of hegemonic masculinities (Connell, 1995; Connell & Messerschmidt, 2005; Oliffe, Han, Ogrodniczuk, Phillips, & Roy, 2011).

Prevalence of Lifetime Suicidal Ideation

Research into suicide and suicidal ideation is inherently fraught with numerous complexities because of the potential for underreporting related to social stigma (Oliffe et al., 2016), death misclassification bias (Patten, 2016), and recall bias with the passage of time (Patten et al., 2012). In the CCHS only 12-month and lifetime suicidal ideation are explored because of the self-report nature of this population level survey; however, because of the relatively rare reporting of suicidal ideation, this study has examined LSI to ensure an adequate sample size for regression analyses that include sub-components of the Canadian population. Unfortunately, very few studies were located that report LSI according to strata of the social gradients explored in the current study (Findlay, 2017), making it difficult to directly compare these findings to those of previous research in this area. However, these findings are consistent with Canadian patterns noted in completed suicide based on sex, age, and generational cohort (Findlay, 2017; Statistics Canada, 2012d; Thibodeau, 2015).

The finding that a greater proportion of women are experiencing LSI than men is consistent with the long-standing Canadian pattern that more women are reported to attempt suicide than men, even though the suicide death rate is consistently higher among men (Statistics Canada, 2012d). Although the proportion of Canadian rural men reporting LSI is not significantly higher than the proportion of urban man reporting LSI, the higher proportion among rural residents is consistent with previously reported statistics that demonstrate higher rates of completed suicide among rural men (DesMeules et al., 2006). The lower rates of LSI among partnered and employed individuals is also consistent with previously observed suicide patterns in Canada (Statistics Canada, 2012d).

The current pattern of LSI by generational cohort aligns with the well documented pattern of greater suicide deaths among middle-aged Canadian men (Statistics Canada, 2012d, 2015; Thibodeau, 2015). In her age-period cohort analysis of suicide mortality in Canada between 1926 and 2008, Thibodeau (2015) reported that a significant portion of the net age effect on suicide deaths corresponds with the Baby Boom cohort, and that the cohort analysis indicated a strong net effect for male Baby-boomers, and Generation Xers; therefore, the high proportions of LSI noted among the Baby Boom and Generation X demographic cohorts are consistent with these findings. Given that LSI captures reported suicidal ideation for an individual's life at the time of completing the survey, the relatively high proportions of LSI in the younger Generation Y (8.8%) and Generation Z (5.1%) cohorts are troubling, and warrants further investigation and monitoring in the future. This pattern is further supported by Findlay (2017), who reported that 10.2% of Canadian males aged 15-24 years reported LSI, based on her analysis of the 2012 CCHS-Mental Health survey.

The proportion of gay and bisexual men reporting LSI is also troubling at 25.1% and 23.8% respectively, and these findings are remarkably consistent with the 25.2% of gay men and 34.8% of bisexual men, who reported LSI in the 2003 CCHS (Brennan et al., 2010). While on the surface it appears that there may have been a reduction of LSI among bisexual men, caution would be warranted in making this conclusion since Brennan et al. (2010) made their estimate based on only one cycle of the CCHS, and small sample size of men reporting bisexuality likely influenced the precision of this estimate. These findings are also consistent with previous studies that have reported greater depression and suicidality among sexual minority men (Hottes et al., 2016; Pakula & Shoveller, 2013).

Social Gradient Predictors of Major Depression & Lifetime Suicidal Ideation

The logistic regression analyses exploring MD and LSI illustrate the intersectional nature of social gradients in their influence on these mental health outcomes, as many previously identified predictors of MD and LSI are not statistically significant predictors when considered in conjunction with other social gradients (Hancock, 2007; Hankivsky, 2012). When controlling for other social gradients, several gradients that have previously been linked to MD were not significant predictors of this condition, including: visible minority status, income, and education (Caron & Liu, 2010; Gamarel, Reisner, Parsons, & Golub, 2012; Patten & Juby, 2008; J. L. Wang, Schmitz, et al., 2010). Similarly, being partnered, income, education level, age, employment status, and sexual minority status were not significant predictors of LSI, when controlling for self-esteem, social support, visible minority status, and the interaction between social support and self-esteem, despite previous studies that have implicated many of these gradients in suicidality

(Brennan et al., 2010; Hottes et al., 2016; Pakula & Shoveller, 2013; Pompili et al., 2013; Statistics Canada, 2012d, 2015). It should be acknowledged that this interpretation of these findings assumes that the hypothesized predictors are exerting an effect on MD and LSI, but given the cross-sectional nature of these data, it is theoretically possible that the reverse could be true, as the temporal sequence is unknown.

The most significant predictor of MD and LSI was self-esteem. While self-esteem is not a social gradient per se, it was included in these analyses because it has been strongly linked to both depression and suicide in numerous studies (Bhar et al., 2008; Kleiman et al., 2013; Lakey, Hirsch, Nelson, & Nsamenang, 2014; Orth et al., 2008; Phillips & Hine, 2016; Sowislo & Orth, 2013; Thompson, 2010). It is also plausible that one's self-esteem may be influenced by both intrinsic and extrinsic factors related to self-perceived status on a number of other social gradients; therefore, self-esteem could serve as an indicator of these men's self-perceived resource holding potential (Hagen, 2011; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003). Since an OLS multiple regression indicated that a number of the social gradients were significant predictors of self-esteem, and there is evidence that self-esteem predicts depression (Orth et al., 2008), the finding that self-esteem mediates the effect of visible minority status, social support, income, education, partner status, and employment on the development of MD is not unsurprising (Kleiman et al., 2013). In addition, this finding may lend some support to the psychosocial and social competition hypotheses surrounding depression, in that it is not necessarily one's absolute standing on an individual social gradient that is associated with the development of MD, rather it is one's perception of their overall standing in relation to multiple social gradients that may be

contributing to MD (Hagen, 2011; Keating, 2009; McDaniel, 2013; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003).

Consistent with previous Canadian studies which have explored the link between employment, job security, and depression (Blackmore et al., 2007; J. L. Wang et al., 2008; J. L. Wang et al., 2012), working in the previous week was the second strongest predictor of MD among Canadian men. However, the moderated mediation model (See Figure 2) suggests that the effect of this resource inequality is completely mediated by the effect current employment exerts on self-esteem. Employment may influence self-esteem by elevating general social standing and masculinity status, while also being strongly linked to other gradients such as education, income, and potentially social support.

Low social support appears to be a very significant predictor of both MD and LSI in Canadian men, which has been previously noted in numerous studies (De Silva et al., 2005; Grav et al., 2012; Hakulinen et al., 2016; Milner et al., 2016; X. Wang, 2014). After self-esteem, social support was the strongest predictor of LSI, and it was the third strongest predictor of MD after working in the previous week. Social support may contribute to mental well-being by serving as a social resource, or as a marker of existential social standing (Therborn, 2013). Indeed, the powerful influence of social support is evident in the moderated mediation analysis of DPP, since social support exerted a direct negative effect on DPP, even when controlling for all other social gradients, while also exerting an indirect negative effect on DPP through its positive effect on the mediating variable, self-esteem. In addition, social support also served as a moderator of the relationship between self-esteem and DPP, with the interaction between self-esteem and social support surprisingly increasing DPP. The interaction term between

self-esteem and total social support was also the third strongest predictor of LSI in the logistic regression model. The positive relationship between this interaction term and the outcomes of LSI and DPP seems counterintuitive given the negative relationship between these outcomes, and these variables when considered separately. This surprising pattern is also evident in Figure 3, which illustrates the trend of higher self-esteem levels, with increasing social support among those reporting LSI, when compared to those reporting no LSI. Fragile, or contingent, self-esteem, depends on external validation by others for its existence, and Lakey et al. (2014) noted that college students with this type of self-esteem reported greater depressive symptoms and suicidal behavior. Perhaps many Canadian men are experiencing self-esteem which is contingent on social validation or support, and this may be contributing to the significant positive effect of this interaction term on DPP and LSI? It is also possible that these men's contingent self-esteem is tied to the acceptable performance of hegemonic masculinities, which requires social validation by those surrounding them (Connell & Messerschmidt, 2005). Social support may represent a significant intervention lever to improve men's mental health, since men tend to possess lower levels of social support than women, and adherence to traditional masculinities has been documented to be negatively associated with acquiring social support (Burda & Vaux, 1987; Conrad, 2010; R. J. Turner & Marino, 1994).

Being a sexual minority more than doubled the odds of MD in the logistic regression model, which is consistent with previous Canadian and international study findings (Brennan et al., 2010; Hottes et al., 2016; Pakula & Shoveller, 2013). However, when sexual minority status was considered in the moderated mediation model of DPP, this variable did not exert a significant direct effect on DPP or the mediating self-esteem

variable. Although logistic regression analyses suggested that there were elevated odds of LSI among sexual minority men, this predictor gradient did not reach statistical significance, which is an interesting finding given the high proportion of LSI noted among gay and bisexual Canadian men, and previous reports of significantly higher unadjusted odds of LSI among gay and bisexual men (Brennan et al., 2010; Pakula & Shoveller, 2013). Perhaps sexual orientation does not directly contribute to LSI and DPP among these sexual minority men. Maybe this effect is a result of the influence that sexual orientation may have on other social gradients or factors, such as social support and self-esteem (Eldahan et al., 2016; Morrison, 2011; Nadal & Mendoza, 2014).

Previous Canadian studies have consistently shown a general trend of decreasing prevalence of MD with increasing age, so the finding that age is a significant negative predictor of MD is expected (Patten & Juby, 2008; Patten et al., 2006; Patten et al., 2015). However, increasing age does not necessarily correlate with decreased risk of MD among all Canadian men, since the interaction term between age and social support was a significant predictor of increased odds of MD. This effect is likely due to the tendency for social support to drop off more rapidly with age among men with MD.

Visible minority status was associated with less LSI, which is consistent with previous Canadian studies, which have noted lower rates of depression and suicidal ideation among many racialized groups in Canada (Ali, 2002; Hansson et al., 2012; Patten & Juby, 2008; Zheng, Noh, Kaspar, & Schimmele, 2003). Since many visible minorities in Canada, are also recent immigrants to the country, it is possible that this finding is influenced by the tendency for the rates of suicide and suicidal ideation to be

low among immigrants, who often retain the patterns of suicidality from their country of origin (Ali, 2002; Hansson et al., 2012; Malenfant, 2004; Zheng et al., 2003)

Strengths and Limitations

A significant strength of the current analysis is that four years of reliable and representative national-level CCHS survey data have been combined to generate a substantial sample, which enabled the exploration of complex regression models, and calculation of robust population proportion estimates. However, the cross-sectional nature of these survey data means that we are unable to imply any cause and effect relationships between the statistically significant predictor variables and the outcomes of MD and LSI. It is also important to acknowledge that the calculated pseudo R^2 values for these regression analyses indicate that there are a significant number of predictors of MD and LSI that are not accounted for in these models. The self-report nature of these data in the CCHS also represent a potential limitation, since any self-report survey data may be affected by recall and social desirability biases (Patten et al., 2012), especially when examining mental health topics that may be subject to significant social stigma (Olfiffe et al., 2016). Another aspect of CCHS data to consider is that many survey modules, including the depression module, are only asked of participants in certain provinces and jurisdictions; therefore, it is possible that these findings may not represent the situation in all geographic areas of Canada. The use of a single variable, with limited response options, to capture the sexual orientation of survey respondents is also a potential limitation, since it does not capture the full spectrum of sexual orientation presentations (Dharma & Bauer, 2017; Sell, 1997). In addition, those identifying as gay and bisexual are likely highly underestimated, since previous international studies have noted that

there are often much higher proportions of individuals with same-sex attraction, or same-sex sexual behavior, than will actually self-identify as gay or bisexual (Dharma & Bauer, 2017; Herbenick et al., 2010; Sell, Wells, & Wypij, 1995). Finally, there may also be under-representation of gay and bisexual men in the sample, because the question was only asked of respondents between 18 and 59 years of age, and this question was coded as a non-response during proxy interviews (Statistics Canada, 2016) .

Study Implications

Many of the current study findings add to the existing body of literature that assists those working with depressed and suicidal men to identify those at highest risk, and to target programming for groups of Canadian men at risk for these conditions. Of particular note are the high rates of MD and LSI in younger cohorts of Canadian men, which bear watching carefully as these men progress through their life course. While this pattern of higher rates of MD and LSI in the Generation X and Y cohorts compared to older cohorts may be an artifact of recall bias as people age (Patten et al., 2012), or greater stigma associated with mental illness in older cohorts (Oliffe et al., 2016), if these patterns persist into later life, they may foreshadow a future of significant mental health challenges. The confirmation of high rates of depression and suicidality among gay and bisexual men is also another notable finding, and illustrates the urgent need to explore interventions to address the over-representation of depression and suicidality among sexual minority populations (Brennan et al., 2010; Hottes et al., 2016; Pakula & Shoveller, 2013).

This study presents several findings that suggest some possible sites of intervention to reduce the incidence of depression and suicidal ideation in Canadian men.

Social support clearly plays a significant role in the development of self-esteem and in promoting men's mental health; therefore, pursuing interventions that seek to strengthen men's social support networks, may exert a protective effect against both depression and suicidal ideation. Given the role of self-esteem in mental health, interventions that encourage men to reframe their assessment of their perceived social status, may also prove promising in improving mental health status over time.

The complex and intersectional interactions between multiple social gradients, which were evident in the regression analyses of MD and LSI, also suggest that we should be very cautious of etiological models of mental illness that allocate blame to standing on a single, or a small number of social gradients. While these less complex analyses are certainly useful, and informative, they may miss the inherently complex and intersectional nature of social gradient effects. This is further illustrated by the post hoc analyses of these significant effects, which have demonstrated that even with very poor standing on a single social gradient, the effect on MD and LSI is usually only significant when accompanied by high levels of covariance contribution associated with poor standing on multiple gradients.

In short, the contributors to MD and LSI are far more complex than they may initially appear, social factors play only a partial role in the development of these conditions, social relationships and social support influence mental health a great deal, and it is highly probable that hegemonic masculinities are playing a role in men's assessment of their social standing (Connell, 1995; Connell & Messerschmidt, 2005) and their ultimate feelings of self-esteem. The impact of multiple social gradients such as income, education, employment status, marital status, and sexual orientation may all be

influenced by hegemonic masculinities, men's social context, and the degree to which individual men are aligned with traditional hegemonic masculinities.

Opportunities for Future Research

These findings support the need for complex statistical models to explore the origins of conditions like MD and LSI; therefore, future explorations of mental illness would benefit from analyses that attend to this complexity. Pursuing population-level research that also asks respondents to complete a masculine depression scale (Magovcevic & Addis, 2008; Rice et al., 2013; Wide et al., 2011; Zierau et al., 2002), or tools such as the Conformity to Masculine Norms Inventory (CMNI) (Mahalik et al., 2003), may help to determine more accurate estimates of depression prevalence in men, and would certainly facilitate the exploration of the role that masculinities play in men's mental health.

Conclusion

While the prevalence of MD and LSI is lower among men than women in Canada, there is significant variation in the patterns of prevalence among sub-groups of Canadian men. Urban men, men from younger generational cohorts, gay and bisexual men, men without a partner, and unemployed men all demonstrate higher prevalence of depression. A similar pattern is noted for LSI, with the exception of slightly higher rates of LSI among rural men. Self-esteem, current employment, social support, sexual minority status, and increasing age are all significant predictors of MD, with the majority of these resource predictor gradients acting through the mediating variable of self-esteem. Similarly, self-esteem, social support, and visible minority status were all significant

predictors of LSI. These analyses further confirm the complex and intersectional nature of social gradients and their impact on the mental health of Canadian men; they also highlight the potential benefit of developing interventions that seek to strengthen men's social support, or provide them with tools to reframe their assessment of their standing in these social hierarchies.

CHAPTER 6

Chapter 6

Depression and Suicidal Ideation among Gay and Bisexual Canadian Men: Exploring the Intersectional Impact of Sexual Orientation and other Social Gradients in the 2009-2012 CCHS

Numerous studies indicate that gay and bisexual men are at significantly higher risk of mood disorders, anxiety disorders, and suicidal ideation than their heterosexual counterparts (Brennan et al., 2010; Engler et al., 2011; Fredriksen-Goldsen, Hyun-Jun, Barkan, Muraco, & Hoy-Ellis, 2013; Hirshfield et al., 2008; Pakula & Shoveller, 2013). When the intersectional effect of other social gradients is considered, the risk of mental health problems is often further magnified for these men, who may concurrently experience both marginalized masculinity and other social marginalization due to their sexual orientation within heteronormative society (Gamarel et al., 2012; Lyons & Hosking, 2014; Lyons, Hosking, & Rozbroj, 2015; Lyons, Pitts, & Grierson, 2013; Mao et al., 2009; Nyamathi et al., 2012; O'Donnell, Meyer, & Schwartz, 2011). In recognition of this complex intertwined social reality, the impact of sexual orientation on the mental health of Canadian men was explored, while controlling for the intersecting influence of other significant social gradients such as: income, employment status, education, visible minority status, age, partner status, and social support availability. The results of this study illustrate the problematic nature of reducing individuals to a single category when considering the origins of mental illness, while also demonstrating a clear pattern of disturbingly high rates of depression and lifetime suicidal ideation among gay and bisexual Canadian men.

Only a small number of studies have examined the prevalence and odds of mood disorders and suicidal ideation among Canadian gay and bisexual men, and no population-level estimates for major depression (MD) have been reported separately for these populations (Brennan et al., 2010; Engler et al., 2011; Pakula & Shoveller, 2013). Accurate estimates for MD in these populations have likely been thwarted by sample size limitations, due to the relatively small number of respondents identifying as gay or bisexual in Statistics Canada self-report surveys (Brennan et al., 2010; Engler et al., 2011; Pakula & Shoveller, 2013). Therefore, in an effort to overcome the sample size limitations associated with statistical analysis of a single cycle of the Canadian Community Health Survey [CCHS], data from four cycles of the CCHS (2009-2012) were combined during the current study (Statistics Canada, 2013b; Thomas & Wannell, 2009). By starting with a much larger representative population sample, it was possible to generate better estimates of MD and lifetime suicidal ideation (LSI) among gay and bisexual Canadian men, while concurrently adjusting for social gradients that may intersect with sexual orientation to impact mental health (Hankivsky, 2012; Hankivsky & Christoffersen, 2008).

Study Aims

The primary aim of the current study was to derive a clearer picture of the prevalence and odds of major depression and suicidal ideation in gay and bisexual Canadian men, while considering the intersectional impact of other relevant social hierarchies on mental health. In pursuit of this goal, the following research questions were explored: 1) What is the annual prevalence of MD among gay and bisexual Canadian men?; 2) How does sexual orientation intersect with other social gradients in

the development of major depression and suicidal ideation in Canadian men?; and 3) To what degree is sexual orientation an independent predictor of depression and suicidal ideation in Canadian men?

Background

Studies examining the mental health of gay and bisexual men in Canada suggest that these populations are potentially more vulnerable to mental illness than the wider heterosexual population (Brennan et al., 2010; Engler et al., 2011; Pakula & Shoveller, 2013; Tjepkema, 2008). Tjepkema (2008) performed statistical analysis on a combined sample of the 2003 (cycle 2.1) and 2005 (cycle 3.1) CCHS, and reported that gay and bisexual Canadians were more likely to consult mental health providers, or report a diagnosis of a mood or anxiety disorder, than their heterosexual counterparts. Brennan et al. (2010) explored the impact of men's sexual orientation on health through logistic regression of data from the 2003 cycle 2.1 of the CCHS. Gay and bisexual men were reported to be at significantly higher odds ($p < 0.01$) of experiencing a mood or anxiety disorder with adjusted odds ratios (OR_{adj}) of 3.06 (95% CI: 2.20, 4.25) and 2.38 (95% CI: 1.45, 3.90) respectively (Brennan et al., 2010). Likewise, gay and bisexual men were also reported to be at significantly higher odds of lifetime suicidality ($p < 0.01$) with reported odds ratios of 4.13 (95% CI: 2.13, 8.01) and 6.32 (95% CI: 2.08, 19.15) respectively (Brennan et al., 2010). Compared to an annual prevalence of 5.1% (95% CI: 4.8, 5.5) among heterosexual men, 15.8% (95% CI: 12.0, 19.6) of gay men, and 13.8% (95% CI: 8.5, 19.1) of bisexual men experienced a mood or anxiety disorder (Brennan et al., 2010). In a more recent logistic regression analyses of the 2007-2008 combined file of the CCHS, Pakula and Shoveller (2013) similarly report that gay and bisexual men are

at significantly increased odds of mood disorder ($OR_{adj}=3.48$; 95% CI: 2.81, 4.31) when compared to heterosexual men, and that the adjusted odds of mood disorder remained significantly elevated, but gradually declined, as gay and bisexual men aged.

In an online Internet-based survey of gay and bisexual Canadian men ($n=1673$), Engler et al. (2011) reported that 36.3% of gay men and 27.3% of bisexual men stated they had depression, with bisexual men experiencing significantly lower adjusted odds ($OR_{adj}=0.68$; 95% CI: 0.52-0.90) of reporting this condition compared to gay men. Bisexual men (10.2%) were also at significantly lower adjusted odds of suicidal ideation or attempt ($OR_{adj}=0.65$; 95% CI: 0.44, 0.95) than gay men (14.5%) (Engler et al., 2011).

Multiple potential mechanisms may account for the higher rates of mental illness and suicidal ideation/attempts among gay and bisexual men including: interpersonal/relationship problems (J. Wang, Häusermann, & Weiss, 2014; J. Wang, Plöderl, Häusermann, & Weiss, 2015); low social support (Hirshfield et al., 2008; Lyons et al., 2013; Mao et al., 2009; McLaren, Jude, & McLachlan, 2008); discrimination related to sexual orientation or race (Hirshfield et al., 2008; Lyons et al., 2013; Mays & Cochran, 2001; Morrison, 2011; O'Donnell et al., 2011; J. Wang et al., 2014); internalized homophobia/biphobia (Morrison, 2011; Ross, Dobinson, & Eady, 2010; J. Wang et al., 2014; J. Wang et al., 2015); minority stress/stigma (Eldahan et al., 2016; Körner et al., 2008; Lewis, 2014; Wight, LeBlanc, de Vries, & Detels, 2012); gender role conflict (Blashill & Vander Wal, 2010); low socioeconomic position (Gamarel et al., 2012; Lyons et al., 2013; Mao et al., 2009); lower educational level (Hirshfield et al., 2008); rural geographic context (Lyons et al., 2015); and concurrent HIV infection (Hirshfield et al., 2008; Körner et al., 2008; Parsons, Grov, & Golub, 2012).

Theoretical Perspectives on the Potential Social Mechanisms of Mental Illness

A significant body of literature documents the profound effect that perceived social position and social marginalization have on the development of illness (Krieger, 2001; McDaniel, 2013; Therborn, 2013). Social gradients may be established along many lines including: resource inequalities in areas such as socioeconomic status, education level, employment status, and availability of social support; and existential inequalities in areas like gender, skin color, and sexual orientation (Therborn, 2013). Being a gay or bisexual man in heteronormative society, impacts a man's existential social position in multiple intersecting ways. Gay and bisexual men are not only assigned to a lower social position in the sexual orientation hierarchy, they are also likely to occupy a position of subordinated or marginalized masculinity, since hegemonic masculinities consistently emphasize heterosexuality as a key element in acceptable performances of masculinity in Western society (Connell, 1995; Connell & Messerschmidt, 2005). Indeed, subordinated and marginalized masculinity has been linked to increased incidence of poor health in men, including increased risk of mental illnesses such as: depression; anxiety; and suicidal ideation (Courtenay, 2000, 2011; Evans et al., 2011; Oliffe & Phillips, 2008). Even if marginalization of gay and bisexual men is not overt in nature, implicit messages of social marginalization may contribute to internalized homophobia and biphobia that causes individuals to perceive their social status as lower (Nadal & Mendoza, 2014). Marginalization of gay and bisexual men may be further potentiated by the intersectional impact of occupying low social position on multiple social gradients, either due to the influence of being a sexual minority, or due to the impact of low social status in areas independent of the influence of sexual orientation (Bauer, 2014; Griffith, 2012; Hancock,

2007; Hankivsky, 2012; Hankivsky & Christoffersen, 2008). Discrimination experienced by gay and bisexual men may also impact other resource related social gradients such as employment, education, social support, and access to health care services. Ultimately, the cumulative effect associated with the intersection of low position on multiple social gradients has the potential to magnify adversity and the risk of mental illness to a greater extent than the sum of the individual gradient contributions (Hancock, 2007).

Evolutionary and psychosocial theories have both been posited as potential explanations for how low social position contributes to mental illness (Hagen, 2011; Horwitz & Wakefield, 2007; Keating, 2009; Krieger, 2001; McEwen, 2003; J. S. Price et al., 1994; Raleigh et al., 1984; Sloman et al., 2003). Some evolutionary theories of depression, suggest that depression may be the result of maladaptive chronic activation of neuro-endocrine responses that were originally designed to enable our ancestors to cope with short-term threats such as subordinated rank, and status defeat due to agonistic conflict (J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003). It is hypothesized that appeasement displays associated with status defeat may have served an adaptive role by not only causing the defeated person to remove themselves from immediate conflicts that they were unlikely to win, but these displays may have also drawn social support to these individuals from the wider social group (J. S. Price et al., 2004; J. S. Price et al., 1994). While overt agonistic displays are no longer a daily part of life for most modern human beings, social gradients continue to be established, which influence an individual's self-perceived social status (J. S. Price et al., 2004; J. S. Price et al., 1994). The resulting ongoing self-assessment of resource holding potential (self-esteem related to status), may contribute to a chronic dysfunctional

involuntary subordination response - resulting in neuro-hormonal and behavioural changes consistent with depression (J. S. Price et al., 2004; J. S. Price et al., 1994).

While activation of the Sympathetic Adrenal Medullary (SAM) and Limbic Hypothalamic Pituitary Adrenal (L-HPA) hormonal systems in the face of short-term threats (“fight or flight”) serves a vital role in managing immediate crisis, chronic activation of these axes in response to a perception of low resource-holding potential may translate into poor health and depressive symptoms in a number of ways (Keating, 2009; McEwen, 1998, 2003, 2005). Chronic hyper-activation of these axes is referred to as “increased allostatic load”, and the effect on anxiety and depression appears to be influenced by elevation of the glucocorticoid hormone cortisol in the L-HPA axis in particular (McEwen, 2003). The amygdala and hippocampus are brain structures that are involved in contextual fear conditioning and passive avoidance learning, with the amygdala modulating reactions that are key to dealing with immediate threats, and the hippocampus playing a role in the storage and retrieval of memories and the contextualization of fear (McEwen, 2003). Increased levels of glucocorticoids enhance learned fear, while chronic stress related glucocorticoid exposure can suppress neurogenesis and may contribute to hypertrophy of the amygdala, delayed atrophy of the hippocampus and prefrontal cortex, cognitive impairment, and increased fear conditioning (McEwen, 2003). These changes correlate with increased anxiety, fear, and aggressiveness in animal models, and symptoms consistent with depressive illness (McEwen, 2003). In addition, a meta-analysis (n=208) of laboratory research related to acute stressors and cortisol responses, suggests that tasks that have an uncontrollable or social-evaluative element were more likely to elicit cortisol responses (Dickerson &

Kemeny, 2004). Therefore, social standing in gradients that are outside the influence of individuals, may particularly contribute to some of these structural changes in the brain over time.

Additional hormonal and neurotransmitter changes have also been linked to chronic stress related to social position, Increased allostatic load is associated with decreased levels of the hormone oxytocin, which can result in impaired attachment (Keating, 2009). Primate models have also suggested that subordinate position in a dominance hierarchy is also associated with lower levels of the neurotransmitter serotonin, which has also been linked with depression, anxiety, and other mental illnesses (Horwitz & Wakefield, 2007; Keating, 2009; Raleigh et al., 1984).

Method

Permission to access the CCHS Microdata through the University of Lethbridge's Research Data Centre was obtained from Statistics Canada, and the University of Lethbridge's Human Subjects Research Committee was consulted prior to embarking on this research project.

Datasets & Sampling

The CCHS is an annual, cross-sectional, Statistics Canada health survey of approximately 60 000 Canadians, who live in private dwellings in the ten provinces and three territories (Statistics Canada, 2013b). Statistics Canada utilizes three sampling frames to select the sample of households surveyed, and states that the CCHS sample covers 98% of the Canadian population aged 12 and over (Statistics Canada, 2013b). Excluded from the sample are persons living on Indian Reserves or Crown lands, those residing in institutions, full-time members of the Canadian Forces and residents of certain

remote regions (Statistics Canada, 2013b). The CCHS household-level response rate was 78.4% in 2009-2010 and 81.0% in 2011-2012, while the person-level response rate was 89.3% in 2009-2010 and 87.3% in 2011-2012 (Statistics Canada, 2011, 2013b). Self-report data were collected during computer assisted interviews by trained interviewers, either in-person, or via telephone interviews (Statistics Canada, 2013b). Not all survey modules were completed by all respondents annually, due to specific jurisdictional information requirements. For example, the depression module was only administered in seven provinces and territories in 2012 (Statistics Canada, 2013b). Therefore, in order to ensure adequate sample size for multivariate statistical analyses that draw on variables from multiple modules, CCHS data from the years 2009 to 2012 were combined to create a dataset representing a sample of approximately 124 000 men. These datasets were combined according to procedures recommended by Statistics Canada, only variables covered by each cycle of the CCHS were retained, and survey weights were scaled to ensure that weighted statistical analyses would generate population level predictions (Thomas & Wannell, 2009). It should be noted that although survey weights were adjusted to ensure accurate predictions, these predictions do not represent point estimates for the Canadian population during a specific survey cycle, but rather represent period estimates for a hypothetical average population during the 2009-2012 survey period (Thomas & Wannell, 2009).

Study Variables

Dependent variables. Depression predicted probability (dpsdpp) was a derived variable based on the responses to the Composite International Diagnostic Interview Short Form for Major Depression (CIDI-SF-MD) in the CCHS (Kessler et al., 1998;

Statistics Canada, 2013b). A dichotomous dummy variable for major depression was generated by recoding the depression predicted probability variable, with score of .90 or greater coded one (diagnosis of major depression) and scores less than .90 coded to zero (no diagnosis of major depression). This dummy coded major depression variable was subsequently used as the dependent variable to calculate the population proportions for MD, and as the outcome variable in logistic regression models. Lifetime suicidal ideation (LSI) was also a generated dummy coded dependent variable, with one indicating lifetime suicidal ideation, and zero indicating no suicidal ideation reported during the respondent's lifetime.

Independent variables. "Self-esteem" was a derived variable based on a subset of six items from the Rosenberg Self-esteem Scale (Rosenberg, 1965), which have previously been factored into one dimension in the factor analysis by Pearlin and Schooler (1978), with higher scores indicating greater self-esteem (Statistics Canada, 2012a). Social support was measured in the CCHS by the 19 item Medical Outcomes Study (MOS) Social Support Scale (Cronbach's alpha of 0.97), which consists of four subscales: emotional/informational support (alpha=0.96); tangible social support (alpha=0.92); positive interaction (alpha=0.94); and affection (alpha=0.91) (Sherbourne & Stewart, 1991). Emotional (expression of positive affect, empathetic understanding, and the encouragement of expressions of feelings) and informational (the offering of advice, information, guidance or feedback) support involves the availability of empathetic support that encourages the expression of feelings, and offers advice, information or guidance as needed (Sherbourne & Stewart, 1991). Tangible social support refers to the availability of material or behavioural assistance (Sherbourne & Stewart, 1991). Positive

interaction refers to the availability of social contacts to engage in enjoyable activities (Sherbourne & Stewart, 1991). Finally, affectionate support refers to the availability of love and affection (Sherbourne & Stewart, 1991). A standardized “total social support” variable was also generated for use in the regression analyses, by adding the MOS subscale scores, and dividing by the total number of scale items. The “gay” and “bisexual” variables were derived by recoding the sexual orientation (sdc_7aa) variable into two dummy variables, with a score of one indicating that the respondent was either homosexual or bisexual, and a score of zero indicating the respondent was heterosexual. “Visible Minority” was another dummy variable derived by coding Caucasian respondents to zero, and visible minority respondents to one based on the racial or cultural group (sdcdcgt) variable responses. “Income” captured the respondent’s self-reported household income according to 13 income categories, with increasing numbers indicating increasing income. “Education” captured the respondents self-reported level of education with higher numbers representing higher levels of education. “Partnered” was a dummy variable derived by recoding the marital status variable to one if the respondent was in a marital or a common law relationship, and zero if the respondent was widowed, separated, divorced, or single. “Work Last Wk” was generated by dummy coding the working status variable (lbs_01) to one if the respondent was working last week, and zero if the respondent was not working or permanently unable to work. Age was a continuous variable capturing the respondent’s self-reported age. All continuous variables were mean-centred prior to analysis to generate regression models that represented the average Canadian man’s situation.

Statistical Analysis

All statistical analyses were performed utilizing Stata 12.1™ statistical software within the Statistics Canada Research Data Centre. Normalized weights and bootstrap weighting were applied to each analysis in accordance with Statistics Canada recommendations (Statistics Canada, 2011, 2013b; Thomas & Wannell, 2009). All statistical test assumptions were explored prior to each analysis, no missing data were replaced, no univariate or multivariate outliers were identified; therefore, all available data were retained in each analysis (Billor et al., 2000; Tabachnick & Fidell, 2013; Weber, 2010).

Population proportions of men with MD and LSI were calculated based on reported sexual orientation, and were subsequently stratified according to social support level. Statistically significant differences in population proportions were tested by Chi Square statistics. Logistic regression analyses were performed to determine the relative contribution of the numerous social gradient predictor variables and relevant statistically significant interaction terms to the outcomes of MD and LSI. Separate models were generated for gay and bisexual men to determine the adjusted odds of MD and LSI among men identifying as gay or bisexual, while controlling for the influence of other social gradients and interaction terms. Differences in self-esteem, and social support based on sexual orientation, work status, and partner status were tested using factorial Analysis of Variance (ANOVA), and post hoc Scheffe pairwise comparisons.

Findings

Major Depression

The annual prevalence of a major depressive episode (MDE) by sexual orientation is presented in Table 6. Bisexual male respondents to the CCHS exhibited an annual prevalence of MD (10.2%) that was twice the rate experienced by heterosexual men (5.1%), while gay men exhibited an even higher prevalence of MD at 12.5% annually during the 2009-2012 period.

Table 6. Proportion of Canadian Men Experiencing Major Depression (MD)^a by Sexual Orientation

Sexual Orientation	Proportion with MD (BSE)	Proportion without MD (BSE)	Sample Size (n)	Chi Squared Test Statistic (X ²) d
Heterosexual	5.1% (.25)	94.9% (.25)	25290	X ² =44.3***
Gay	12.5% (2.36)	87.5% (2.36)		d= 4.41
Bisexual	10.2% (2.80)	89.8% (2.80)		d= 2.57

Note. MD= Major Depression; ^a Major Depression corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; BSE= Bootstrapped Standard Error; d = Cohen's d effect size compared to heterosexual; n=weighted sample size; ***p<0.001

Table 7 presents the results of a logistic regression analysis that explored the impact of several social gradients on the finding of MD. Increasing self-esteem was associated with decreased risk of MD ($p < 0.001$), and men with average self-esteem exhibited approximately a 25% reduction in the odds of MD. Working in the past week was also a significant negative predictor of MD ($p < 0.001$), with a 47% reduction in the odds of MD. As men's total social support increased, their chance of a diagnosis of MD decreased ($p < 0.001$), with a 74% reduction in the odds of MD among men with mean levels of social support. Being gay significantly increased the chances of MD ($p < 0.01$), with gay men experiencing approximately 2.25 [95% CI: 1.35, 3.75] times the odds of

MD compared with heterosexual men. Older men were less likely to be assigned a diagnosis of major depression ($p < 0.01$), and the interaction term between age and total social support was a significant positive predictor of MD ($p < 0.01$), with depressed men experiencing a more rapid decline in social support with age than men without a diagnosis of MD.

Table 7. Bootstrapped Logistic Regression of Major Depression^a in Gay Canadian Men 2009-12

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem -C ^b	-.275 (.026)	-10.39***	0.759 [.721, .800]
Worked Last Week	-.639(.17)	-3.82***	0.527 [.380, .732]
Total Social Support-C ^b	-1.36 (.36)	-3.76***	0.258 [.127, .522]
Gay	.812 (.26)	3.12**	2.252 [1.35, 3.75]
Age-C ^b	-.049 (.02)	-2.81**	0.952 [.920, .985]
Age X Total Social Support	.020 (.01)	2.61**	1.021 [1.005, 1.04]
Partnered	-.364 (.19)	-1.89	0.695 [.476, 1.01]]
Visible Minority	-.450 (.26)	-1.73	0.640 [.386, 1.06]
Education-C ^b	.055 (.03)	1.61	1.06 [.988, 1.13]
Income-C ^b	-.003 (.03)	-0.11	0.997 [.942, 1.06]
Constant	-4.51 (.73)***		

Note. $X^2(10, n=8257)=243.66, p<.001$; ^a Major Depression corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; ^b All continuous variables were mean centred; * $P<0.05$; ** $p<0.01$; *** $p<0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

The logistic regression model was repeated with the “bisexual” variable entered as a predictor instead of the “gay” variable, and the results can be seen in Table 8. Once

again, increasing self-esteem was negatively associated with MD ($p < 0.001$) with an almost 24% reduction in the odds of MD among men with mean self-esteem. Working in the past week was negatively associated with a diagnosis of MD ($p < 0.001$), with an almost 48% reduction in the odds of MD among employed men. Increasing social support reduced the chance of MD ($p < 0.01$), and average social support reduced a man's risk of MD by approximately 70%. Age and the interaction between age and social support remained statistically significant predictors, but at the less stringent alpha level of 0.05.

Table 8. Bootstrapped Logistic Regression of Major Depression^a in Bisexual Canadian Men 2009-12

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem -C ^b	-.272 (.03)	-10.08***	0.762 [.723, .803]
Worked Last Week	-.650 (.17)	-3.73***	0.522 [.371, .735]
Total Social Support-C ^b	-1.23 (.36)	-3.44**	0.293 [.145, .590]
Age-C ^b	-.044 (.02)	-2.51*	0.957 [.925, .990]
Age X Total Social Support	.018 (.01)	2.28*	1.018 [1.002, 1.03]
Partnered	-.372 (.20)	-1.89	0.689 [.467, 1.01]]
Visible Minority	-.416 (.26)	-1.60	0.659 [.395, 1.10]
Bisexual	.658 (.48)	1.38	1.930 [.759, 4.91]
Education-C ^b	.043 (.03)	1.25	1.04 [.976, 1.12]
Income-C ^b	-.001 (.03)	-0.02	1.000 [.944, 1.06]
Constant	-4.24 (.72)***		

Note. $X^2(10, n=8109) = 218.34, p < .001$; ^a Major Depression corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; ^b All continuous variables were mean centred; * $P < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

Increasing age reduced the odds of a diagnosis of MD ($p < 0.05$), and depressed men experienced a more rapid decline in social support than those without a diagnosis of MD ($p < 0.05$). Men identifying as bisexual did demonstrate a 1.93 times higher odds of MD [95% CI: .759, 4.91]; however, this did not reach statistical significance.

Post-hoc exploration of the logistic regression results using the visualization of binary logistic regression (VIBL) do file illustrated the intersectional nature of the effect exerted by the predictors, because each predictor only demonstrated a significant effect on the probability of a major depression diagnosis at very high levels of covariance contribution from the other predictor variables. In other words, it is unlikely that low position in a single predictor gradient can be deemed the sole contributor to the diagnosis of MD, rather, MD appears to be more likely in the case of low standing on multiple social gradients. In addition, the Pseudo R^2 for the logistic regression model suggested that this combination of predictors accounts for approximately 16% of the variance in MD, so there are clearly other contributing factors to the development of MD that are not accounted for in these analyses.

Lifetime Suicidal Ideation

As displayed in Table 9, significant differences in the proportion of men experiencing LSI were noted based on sexual orientation. While 8.8% (0.41) of heterosexual men reported LSI, this annual population prevalence jumped drastically to 25.1% (4.8) in gay men, and 23.8% (6.2) among bisexual men.

The unadjusted odds ratio of LSI was calculated to be 3.45 [1.06, 5.79], $p < 0.001$, among gay men, and 3.23 [1.67, 6.25], $p < 0.001$, among bisexual men; however, the

picture changed significantly when these odds ratios were adjusted for other predictors through logistic regression modeling. The odds of LSI were 2.35 times higher among gay men [95% CI: 1.20, 4.61], $p < 0.05$, when compared to heterosexual men, after adjusting for all statistically significant predictor variables including: self-esteem, total social support, visible minority status, and the interaction between self-esteem and total social support. However, as can be seen in Table 10, once all social gradient predictors are included in the analysis, the odds of LSI among gay men ceases to be significant ($OR_{adj} =$

Table 9. Proportion of Canadian Men Experiencing Suicidal Ideation during their Lifetime (LSI)

Sexual Orientation	Proportion with LSI (BSE)	Proportion Without LSI (BSE)	Sample Size (n)	Chi Squared Test Statistic (X^2) d
Heterosexual	8.8% (.41)	91.2% (.41)	16876	$X^2 = 75.9^{***}$
Gay	25.1% (4.8)	74.9% (4.8)		d = 4.79
Bisexual	23.8% (6.2)	76.2% (6.2)		d = 3.41

Note. LSI= Lifetime Suicidal Ideation; BSE= Bootstrapped Standard Error; d = Cohen's d effect size compared to heterosexual; n=weighted sample size; *** $p < 0.001$

2.21 [.988, 4.98], $p = 0.053$). Once adjusted for self-esteem and total social support, the odds ratio of LSI among bisexual men compared to heterosexual men is no longer statistically significant ($OR_{adj} = 1.45$ [.470, 4.49]). As can be seen in Table 11, by the time the odds of LSI among bisexual men is adjusted for all the social gradient predictor variables, the adjusted OR is not statistically significant 0.789 [.252, 2.47].

Tables 10 and 11 present the results of logistic regression models that explore the influence of intersecting social gradients on the development of LSI for gay and bisexual men respectively. In both cases, the main negative predictors of LSI were self-esteem ($p < 0.001$) and total social support ($p < 0.01$), with the interaction term between self-esteem

and total social support exhibiting a significant positive association at the less stringent alpha of 0.05. This positive association is surprising, since both total social support ($r = -0.12, p < 0.001$) and self-esteem ($r = -0.15, p < 0.001$) are negatively associated with LSI among Canadian men, and positively associated with each other ($r = 0.31, p < 0.001$). When regression lines were fitted for the relationship between social support and self-esteem based on LSI, self-esteem rises more quickly in relation to social support among men who report LSI. Among bisexual men, being a visible minority decreased the chance of LSI ($p < 0.05$). Gay and bisexual men with average self-esteem had an approximately

Table 10. Bootstrapped Logistic Regression of Lifetime Suicidal Ideation among Canadian Gay Men 2009-12

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem -C ^a	-.421 (.11)	-3.79***	0.656 [.528, .815]
Total Social Support-C ^a	-2.38 (.91)	-2.63**	0.092 [.016, .547]
Self-esteem X Total Social Support	.122 (.05)	2.36*	1.12 [1.02, 1.25]
Visible Minority gay	-.941 (.45)	-2.08*	0.390 [.160, .949]
Income-C ^a	.797 (.41)	1.93	2.21 [.988, 4.98]
Worked Last Week	.032 (.03)	-1.26	0.963 [.907, 1.02]
Education-C ^a	-.260 (.24)	-1.10	0.771 [.485, 1.23]
Age-C ^a	-.026 (.05)	-0.58	0.974 [.892, 1.06]
Partnered	-.004 (.01)	-0.46	0.996 [.980, 1.01]
Constant	-.011 (.21)	-0.05	0.989 [.649, 1.51]
	-7.83 (2.46)**		

Note. $X^2(10, n=2810)=72.4, p<.001$; ^a All continuous variables were mean centred; Pseudo $R^2=$ ***; * $P<0.05$; ** $p<0.01$; *** $p<0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

34% ($OR_{adj} = 0.656$ [.528, .815]) and 35% ($OR_{adj} = 0.651$ [.519, .816]) reduction in the risk of LSI respectively, while possessing average social support reduced the risk of LSI by 91% for both gay and bisexual men ($OR_{adj} = 0.092$ [0.16, .547] and $OR_{adj} = 0.085$ [.013, .543] respectively).

Table 11. Bootstrapped Logistic Regression of Lifetime Suicidal Ideation among Canadian Bisexual Men 2009-12

Variable	Regression Coefficients (B) (Bootstrap SE)	Wald Statistics	Odds Ratios [95% CI]
Self-Esteem -C ^a	-.429 (.12)	-3.72***	0.651 [.519, .816]
Total Social Support-C ^a	-2.47 (.95)	-2.60**	0.085 [.013, .543]
Self-esteem X Total Social Support	.124 (.05)	2.31*	1.018 [1.02, 1.26]
Visible Minority	-.962 (.48)	-2.02*	0.382 [.150, .971]
Income-C ^a	-.032 (.03)	-1.03	0.968 [.911, 1.03]
Worked Last Week	-.205 (.25)	-0.83	0.814 [.502, 1.32]
Education-C ^a	-.029 (.05)	-0.63	0.971 [.887, 1.06]
Age-C ^a	-.004 (.01)	-0.61	0.995 [.979, 1.01]
Bisexual	-.237 (.58)	-0.41	0.789 [.252, 2.47]
Partnered	-.014 (.22)	-0.07	0.986 [.643, 1.51]
Constant	-7.98 (2.57)**		

Note. $X^2(10, n=2810)=72.4, p<.001$; ^a All continuous variables were mean centred; * $P<0.05$; ** $p<0.01$; *** $p<0.001$; Bootstrap SE = Bootstrapped Standard Error; CI = Confidence Interval

Post-hoc exploration of the significant predictors of LSI was carried out using the VIBL do file. While social support was a significant predictor of LSI, the chance of reporting LSI only increased at very low levels of social support combined with very low standing on the remaining social gradients (high covariance contribution). Likewise,

visible minority status only increased the chance of LSI by 1% at maximum covariance contribution from the other predictor variables. As self-esteem declined, and covariance contribution from low standing on all other social gradients increased, the chance of reporting LSI increased. At minimum self-esteem, and maximum covariance contribution, the risk of LSI increased by 33%. Similar to the picture with MD, LSI was rarely the result of low standing on a single social gradient, but rather the result of the intersectional effects from low position on multiple social gradients. The pseudo R^2 was approximately 8.6% for these logistic regression models, also suggesting that these models are failing to account for a sizable portion of the variance that contributes to LSI - providing further evidence of the complex etiology of suicidal ideation.

Exploring the Influence of Self-esteem and Social Support

No significant differences were evident in mean self-esteem levels based on sexual orientation ($F(2, 17217) = 3.84, p=0.147$), with mean self-esteem calculated to be 20.75 ($SE = 0.04$) for heterosexual men, 20.37 ($SE = 0.22$) for gay men, and 20.41 ($SE = 0.46$) in bisexual men.

Table 12 displays the population proportions of MD and LSI, stratified by sexual orientation and social support. Results for bisexual men are not reported because of sample size limitations; however, differences in MD and LSI proportions are clearly evident based on social support level between gay and heterosexual men. Among men with less than mean levels of social support, heterosexual men exhibit a population proportion of MD of 11% ($SE = 1.1$), while 18.8% ($SE = 8.0$) of gay men with low social

Table 12. Proportion of Canadian Men Experiencing Major Depression (MD) and Suicidal Ideation during their Lifetime (LSI) Stratified by Sexual Orientation and Social Support

Sexual Orientation ^a	Social Support Level ^b	Major Depression (MD) ^c		Lifetime Suicidal Ideation ^d	
		Proportion with MD (BSE)	Proportion Without MD (BSE)	Proportion with LSI (BSE)	Proportion Without LSI (BSE)
Heterosexual	Low	11.0% (1.1)	89.0% (1.1)	11.3% (1.0)	88.7% (1.0)
	High	2.8% (0.2)	97.2% (0.2)	8.5% (0.4)	91.5% (0.4)
Gay	Low	18.8% (8.0)	81.2% (8.0)	19.6% (6.3)	80.4% (6.3)
	High	8.2% (3.1)	91.8% (3.1)	27.5% (6.2)	72.5% (6.2)

Note. ^a Bisexual not reported due to small sample size following stratification; ^b Low social support = less than mean social support, high social support = greater or equal to mean social support; ^c weighted sample size (n)= 16538; ^d weighted sample size (n)= 16876; MD= Major Depression – corresponds with a CIDI-SF-MD predicted probability of $\geq .90$; LSI= Lifetime Suicidal Ideation; BSE= Bootstrapped Standard Error

support could be diagnosed with MD. Lower population proportions of MD were calculated for men possessing mean levels of social support or higher, but significantly higher rates of MD remained for gay men 8.2% (SE = 3.1) compared with heterosexual men 2.8% (SE = 0.2). When examining population proportions of LSI, gay men with less than mean social support likewise demonstrated a higher rate of LSI at 19.6% (SE = 6.3) compared to 11.3% (SE = 1.0) among heterosexual men. However, while the proportion of LSI among gay men with high social support 27.5% (SE = 6.2) is much higher than the 8.5% (SE = 0.4) calculated for heterosexual men with high social support, it is also surprisingly even higher than the rate calculated for gay men with low social support.

Mean levels of social support by sexual orientation are reported in Table 13, and differences were tested using one-way ANOVA and post-hoc Scheffe pairwise comparisons. Gay and bisexual men had significantly lower total social support than

heterosexual men ($p < 0.05$). When examining the MOS sub-scale scores, gay men exhibited significantly lower tangible social support than heterosexual men ($p < 0.01$); gay and bisexual men had significantly lower affection social support than heterosexual men ($p < 0.01$); gay and bisexual men also demonstrated significantly lower positive social interaction scores than heterosexual men ($p < 0.05$); and bisexual men exhibited significantly lower emotional and informational support than heterosexual men ($p < 0.05$). When total social support was stratified by sexual orientation, partner status, and employment status in the past week, and differences were tested using three-way ANOVA and post hoc Scheffe pairwise comparisons, no significant differences were noted based on sexual orientation in similar strata. These findings suggest that although gay and bisexual men demonstrate lower total social support, and MOS subscale scores in

Table 13. Total Social Support and MOS ^a Sub-scale Scores by Sexual Orientation

Sexual Orientation	Total Social Support ^b	Tangible Social Support	Affection Social Support	Positive Social Interaction	Emotional & Informational Support
	M(BSE)	M(BSE)	M(BSE)	M(BSE)	M(BSE)
Heterosexual	2.34 (.01)	13.53 (.05)	10.60 (.03)	13.93 (.04)	27.22 (.09)
Gay	2.22 (.04)*	12.58 (.30)**	9.95 (.20)**	13.25 (.25)*	26.27 (.49)
Bisexual	2.13 (.07)*	12.45 (.45)	9.25 (.36)**	12.50 (.47)*	24.98 (.85)*

Note. ^a MOS- Medical Outcomes Study Social Support Scale (Sherbourne & Stewart, 1991); ^b Total Social Support (standardized total of MOS subscale scores); weighted $n=13718$; BSE= Bootstrapped Standard Error; n =weighted sample size; Scheffe pairwise comparisons reported with heterosexual as the reference category; * $P<0.05$; ** $p<0.01$.

several areas, these differences social support may depend more on other factors such as relationship status and employment status, rather than on sexual orientation independently.

Discussion

The results of the current study report specific annual estimates of major depression, as defined by the CIDI-SF-MD, in gay and bisexual Canadian men during the period from 2009 to 2012, thereby providing a glimpse into the actual burden of depression in this population without having to estimate this burden based on results that report mood disorders as an aggregated category. These current findings are relatively consistent with the previously reported unadjusted prevalence rates of mood and anxiety disorder among gay and bisexual men in the 2003 CCHS (Brennan et al., 2010), and the increased odds of mood disorders reported for these groups by both Brennan et al. (2010) and Pakula and Shoveller (2013). However, the calculated annual prevalence rates of MD are certainly lower than those reported by Engler et al.'s (2011) Internet-based survey. These differences may be accounted for by the greater specificity of the CIDI-SF-MD in categorizing responses according to DSM and ICD 10 depression criteria in these CCHS data (Kessler et al., 1998). Alternately, it is possible that these differences may also be related to reported problems in CIDI-SF-MD sensitivity to masked presentations of masculine depression (Magovcevic & Addis, 2008; Martin, Neighbors, & Griffith, 2013; Oliffe & Phillips, 2008; Rutz et al., 1997; Wide et al., 2011; Zierau et al., 2002). What is evident from these results is that gay and bisexual men are disproportionately experiencing MD at about twice the rate experienced by heterosexual men, and that these

findings provide further support for previous calls to address the issue of MD among these men.

The proportion of gay and bisexual men reporting LSI is significantly higher than the proportion of heterosexual men reporting LSI. The finding that one in four gay men report LSI is extremely concerning, but it is also remarkably consistent with the findings for gay men of 25.2% reported by Brennan et al. (2010) in their analysis of the 2003 CCHS. The proportion of bisexual men reporting LSI is also very high at 23.8%; although, this finding is substantially lower than the 34.8% reported by Brennan et al. (2010). However, caution would be advised before concluding that LSI has improved among bisexual men between 2003 and 2009 - 2012. The current finding likely represents a more precise estimate of the true proportion of LSI in bisexual Canadian men, since combining four cycles of the CCHS provided larger available sample of bisexual men, and the resulting improvement in the precision of the estimate is evidenced by the smaller confidence interval in the current study. The adjusted odds of LSI calculated in the current study also illustrate the role that other predictor variables play in terms of determining the risk of LSI in gay and bisexual Canadian men. While the unadjusted odds of LSI based on sexual orientation are quite large (over three) and highly significant, once adjusted for all statistically significant predictor gradients, the adjusted odds of LSI drop to 2.35 in gay men and a statistically insignificant 1.45 in bisexual men. Once all predictor gradients are added to the model, the adjusted odds of LSI becomes non-significant for both gay and bisexual men, suggesting that the effect of sexual orientation on LSI is likely manifested through other social gradients, which may be highly affected by their sexual minority status through mechanisms such as: the effect that

marginalization and discrimination may have on self-esteem; and social gradients such as: social support; the ability to find a partner; employment; and income insecurity (Morrison, 2011; Nadal & Mendoza, 2014).

Predictors of MD and LSI

The findings of the logistic regression analyses, which explored the effect of multiple social gradients on the presence of MD and LSI, illustrate the complex intersection of numerous socio-demographic factors that may influence the development of these conditions in gay and bisexual men (Hankivsky, 2012; Hankivsky & Christoffersen, 2008). The following discussion assumes that the independent variables are exerting an effect on the outcomes of MD and LSI; however, given the cross-sectional nature of these data, it is also theoretically possible that these outcomes could be influencing independent variable values. When controlling for other social gradients, many previously discussed determinants of men's mental-health were not identified as significant predictors of MD, such as: partner status; racialized status; education level; and income (Caron & Liu, 2010; Gamarel et al., 2012; Hirshfield et al., 2008; Lyons et al., 2013; Mao et al., 2009; O'Donnell et al., 2011; J. L. Wang, Schmitz, et al., 2010; Zheng et al., 2003). Likewise, the logistic regressions exploring the significant predictors of LSI did not identify income, work status, education, age, or partner status as significant predictors, when all available social gradients were entered into the model. In addition, it must also be noted that the post hoc analyses examining the influence of each predictor on the development of MD or LSI illustrated that low standing on a single social gradient rarely contributed to these conditions alone, rather the probability of

assignment to MD or LSI increased as low standing on other predictor variables (covariance contribution) increased.

The predictor that contributed the most to these logistic regression models for MD and LSI was self-esteem. While not a social gradient per se, self-esteem was included in these models because low self-esteem has been consistently linked to greater incidence of depression and suicidal thoughts in numerous studies (Bhar et al., 2008; Kleiman et al., 2013; Lakey et al., 2014; Orth et al., 2008; Phillips & Hine, 2016; Sowislo & Orth, 2013; Thompson, 2010). There is also evidence to suggest that self-esteem predicts depression, rather than the reverse (Orth et al., 2008). In addition, self-esteem is the measure in the CCHS which is most likely to capture the concept of “resource holding potential” as articulated by proponents of evolutionary theories of depression (Hagen, 2011; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003). As a measure of perceived self-worth, it is plausible that self-esteem may be influenced by intrinsic and extrinsic assessments of status on numerous social gradients. Furthermore, exposure to discrimination, minority stress, and subsequent internalization of homophobia/biphobia (Eldahan et al., 2016; Morrison, 2011; Nadal & Mendoza, 2014; Pachankis et al., 2015) combined with the stigma associated with mental illness (Bos, Kanner, Muris, Janssen, & Mayer, 2009; B. G. Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001; Lundberg, Hansson, Wentz, & Björkman, 2009; Verhaeghe, Bracke, & Bruynooghe, 2008) also has the potential to exert a negative effect on self-esteem and ultimately mental health.

The reduced odds of MD and LSI in the presence of higher social support is also consistent with the well-documented link between greater social support and better

mental health (De Silva et al., 2005; Grav et al., 2012; Hakulinen et al., 2016; Milner et al., 2016; Xingmin Wang, Cai, Qian, & Peng, 2014). Likewise, previous studies investigating the mental health of gay and bisexual men also report a protective effect of social support for mental health (Lyons & Hosking, 2014; Lyons et al., 2013; Mao et al., 2009; Nyamathi et al., 2012). Overall, men tend to possess lower levels of social support than women (Conrad, 2010; R. J. Turner & Marino, 1994), and adherence to traditional gender roles is negatively associated with the acquisition of social support (Burda & Vaux, 1987; Conrad, 2010). While many gay and bisexual men may not be as strongly aligned with hegemonic masculinities as many heterosexual men, the dominant social constructions of masculinity undoubtedly still exert some influence on the social interactions of these men (Blashill & Vander Wal, 2010; Connell, 1995; Connell & Messerschmidt, 2005), and may influence the resultant availability of social support. While social support clearly influences mental health, it is possible that the effect of social support on outcomes such as suicidal ideation is at least partially mediated or moderated by other variables such as self-esteem (Kleiman et al., 2013). For example, Kleiman et al. (2013) reported that the effect of perceived social support to decrease suicidal ideation is individually moderated by both utilization of social support and increasing self-esteem.

The significant interaction term between social support and self-esteem in the regression analyses for LSI is an interesting finding, although it only exhibited significance at the 0.05 alpha level. Post hoc analyses demonstrated that self-esteem increased at a greater rate in response to increasing levels of social support among men with LSI compared to men not reporting LSI. Lakey et al. (2014) have previously

reported that college students with fragile or contingent self-esteem, which depends on external validation for its existence, reported greater depressive symptoms and suicidal behaviour. Perhaps this interaction term is significant because it is indicating the effect exerted by those men whose self-esteem is more contingent on social validation and support?

Working in the previous week was the second-strongest predictor of a diagnosis of major depression, which is consistent with previous findings that employment, job security, and workplace environment influence the development of depression in Canadian men (Blackmore et al., 2007; J. L. Wang et al., 2008; J. L. Wang et al., 2012; J. L. Wang, Schmitz, et al., 2010). However, working in the previous week was not identified as a significant predictor in the logistic regression of LSI for gay and bisexual men, suggesting that this social gradient plays a less important role in the development of suicidal thoughts.

The finding that MD tended to decrease gradually with age is consistent with previous Canadian studies that have examined the age distribution of MD prevalence (Patten et al., 2006; Patten et al., 2015), although it has been noted that the prevalence of MD may actually increase in older single Canadian men as they age (Patten et al., 2006). There was also a significant interaction term between age and social support which increased the chances of being classified with MD. In general, social support declined with age; however, those men diagnosed with MD, experienced a more rapid decline in social support as they aged.

Being gay significantly increased the odds of MD, and the calculated adjusted odds ratio was slightly lower than the odds of mood or anxiety disorder, reported by Brennan et al. (2010), and the odds of mood disorders reported by Pakula and Shoveller (2013). However, unlike these previously reported findings from analyses of single CCHS cycles, being bisexual was not a statistically significant predictor of MD. This variation in findings is likely due to the greater precision of estimates that was possible in the current analysis because of the significantly larger sample size. Perhaps these higher odds of MD are due to the social marginalization and discrimination experienced by many gay men, and the internalization of homophobic perspectives, which may contribute to impaired self-esteem and emotional distress (Nadal & Mendoza, 2014; Wight, Harig, Aneshensel, & Detels, 2016). It is also possible that the marginalized nature of gay men's masculinities may also be influencing these men's perceived social status (Connell, 1995; Connell & Messerschmidt, 2005). Standing on other social gradients such as social status, employment, income, and partner status may also be affected by environments or policies that are unsupportive of gay men, which may further influence these men's self-esteem and mental health.

Visible minority status was also a significant predictor of LSI at the 0.05 alpha level, with visible minority men demonstrating less LSI. Although being a visible minority frequently assigns a person to a position of lower social status within a racialized society, and may exert an intersectional effect on health in conjunction with other social gradients, previous Canadian studies have often found lower rates of depression and suicidal ideation among many racialized groups (Ali, 2002; Hansson et al., 2012; Zheng et al., 2003). These findings may ultimately be an artifact related to the

reality that so many visible minority Canadians are recent immigrants to the country.

Rates of suicide and suicidal ideation have been low among many immigrant groups (Ali, 2002; Hansson et al., 2012; Malenfant, 2004), which often retain a pattern of suicide similar to their country of origin (Malenfant, 2004).

Variations in Social Support

Given the established link between social support and mental health, the lower levels of overall social support experienced by gay and bisexual men may be playing a significant role in creating the higher rates of MD and LSI evident in these groups. In particular, these men appear to have particularly lower social support in the affection and tangible social support sub-scores, with slightly smaller differences noted in the area of positive social interaction. Perhaps some of this variation in social support is related to homophobia and biphobia affecting the availability of social supports, or impacting these men's opportunity to openly seek a partner. Interestingly, bisexual men also appear to have significantly lower levels of emotional and informational support, which may be a function of monosexism, the structural invisibility of bisexuality, and the difficulties associated with accessing information and emotional support when many people assume that bisexuals are just confused about whether they are straight or gay (Ross et al., 2010).

Gay men with low social support exhibited higher prevalence of MD than heterosexual men or gay men with higher levels of social support, providing further evidence that social support interacts with sexual orientation in the development of MD. However, counterintuitively, a higher proportion of gay men with greater than mean levels of social support reported LSI, compared to gay men reporting lower levels of social support. The reason for this discrepancy is unclear, but since there is generally

more stigma associated with reporting suicidal ideation compared to depression, perhaps the higher level of social support created the conditions where these gay men were more likely to disclose suicidal ideation?

Study Implications

The high rates of MD and LSI exhibited by both gay and bisexual Canadian men provide further evidence that there is a need to allocate greater resources to the screening and treatment of mental health conditions among members of these groups. In addition, the prominent role of social support and self-esteem in the development of MD and LSI in these men, also provides a potential mechanism for population-level interventions that may help to reduce the incidence and prevalence of these conditions. Creating a safer and more supportive social environment for members of the lesbian, gay, bisexual, transgender, and queer plus (LGBTQ+) communities demonstrates promise as a key mechanism for improving the holistic health of these groups. Examples of such structural interventions may include: public education; human rights legislation; inclusive LGBTQ+ positive public policy in schools, public institutions, and private businesses.

Strengths and Limitations

A central strength of the current analysis is the use of large population level survey data gathered using a robust sampling design, and the combination of four cycles of the annual household CCHS to acquire a large enough sample size to enable the exploration of complex logistic regression models and the calculation of robust population proportions. Therefore, this approach has generated more accurate estimates of the prevalence of MD and LSI in gay and bisexual men than previously reported.

Although these analyses of cross-sectional population level data have identified some interesting and statistically significant correlational regression findings, it is important to acknowledge that they cannot imply a cause and effect relationship. In addition, calculated pseudo R-squared values suggest that there are many factors contributing to depression and suicidal ideation that are not captured in the reported regression models. The self-report nature of these CCHS data also represents a significant limitation, since responses may be subject to social desirability and recall biases (Patten et al., 2012), especially in the case of lifetime suicidal ideation. The use of a single variable to capture respondents identified sexual orientation in the CCHS is also a potential limitation, since it does not address the inherent complexity associated with the potential spectrum of sexual orientation presentations (Sell, 1997). Therefore, the number of respondents identifying as gay and bisexual likely underestimates the true size of the population of men on the LGBTQ+ spectrum, because previous international studies have identified much higher proportions of individuals with same sex attraction, and same-sex sexual behaviour, than actually identify as gay or bisexual when surveyed (Herbenick et al., 2010; Sell et al., 1995). Finally, it is also important to consider that many CCHS modules are only asked in certain provinces and jurisdictions; therefore, the reported findings may not always be representative of all geographic areas in Canada.

Conclusion

Canadian men, who identify as gay and bisexual, demonstrate a significantly greater annual prevalence of MD and LSI, and are at significantly higher odds of depression and suicidal ideation than their heterosexual counterparts. Being a gay man remains an independent predictor of MD, when controlling for numerous social gradients;

however, this is not the case for in bisexual men. Despite high prevalence and unadjusted odds of LSI in both gay and bisexual men, it appears that the effect of sexual orientation ceases to be a significant predictor of LSI once numerous other social gradients are entered into the model, suggesting that suicidal ideation among these men is likely primarily the result of these individual's collective standing in other social hierarchies. In addition, these analyses further suggest that neither MD nor LSI are likely to result from sexual orientation, or poor standing in any other social gradient alone, but rather are more likely the result of an intersectional effect due to low standing on multiple social gradients. As two of the most significant predictors of mental health in these analyses, social support, and self-esteem represent ideal candidates for population level interventions to improve the mental health of gay and bisexual men, with LGBTQ+ positive education, legislation, and public policy representing promising options.

CHAPTER 7

Chapter 7

Summary of Findings, Implications, and Recommendations for Future Research

Conceptualizing Masculine Depression Syndrome as a Mechanistic Property Cluster

The unexpected incongruence between depression rates and completed suicide rates among Canadian men suggests that something unique and gendered is happening in the expression of men's mental health. Clues as to the source of this disparity have been provided by qualitative researchers of depression and suicide in men, who have clearly linked the performance of masculinities to the clinical presentation of symptoms in men (Addis, 2008; Brownhill et al., 2005; Coen et al., 2013; Emslie et al., 2006; J. L. Johnson et al., 2012; Oliffe, Galdas, et al., 2013; Oliffe, Kelly, Bottorff, Johnson, & Wong, 2011; Oliffe, Kelly, et al., 2010; Oliffe & Phillips, 2008). As many men's symptoms of depression and suicidal ideation are frequently different from those seen in women, it is hypothesized that this could lead to an under-identification of these conditions (Oliffe & Phillips, 2008), since traditional screening tools may not identify all men with depression and suicidal ideation (Magovcevic & Addis, 2008; Martin et al., 2013; Wide et al., 2011; Zierau et al., 2002).

In response to these previous qualitative findings among men, this theoretical paper proposes a mechanistic property cluster model of masculine depression (See Figure 1 on p.74), which acknowledges the complex, intersecting, and gendered pathways to depression and concurrent disorders, such as: suicidal ideation, antisocial personality disorder, and addictions. Drawing on the work of Kendler et al. (2011), and informed by the research related to masculinities and depression, and bio-psychosocial theories of

illness (Hagen, 2011; Keating, 2009; McEwen, 2003; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003), this theoretical model presents a novel way to conceptualize masculine depression syndrome in future studies exploring depression and suicide in men.

While this proposed model has not yet been validated by any empirical research studies, it could serve as a catalyst to expand on traditional epidemiological models of depression in future research, and represents one plausible way to facilitate the incorporation of masculinities into a mechanistic property cluster conceptualization of depression. At the very least, this discussion may cause some depression researchers and mental health practitioners to question the application of established depression criteria in an essentialized manner that treats depression as mutually exclusive from other related concurrent disorders.

Intersecting Social Gradients, Self-Esteem, and Canadian Men's Mental Health

Informed by bio-psychosocial theories of mental illness (Keating, 2009; McEwen, 2003), intersectionality theory (Hankivsky, 2012; Hankivsky & Christoffersen, 2008), masculinities theory (Connell, 1995; Connell & Messerschmidt, 2005), and social competition theories of depression (Hagen, 2011; J. S. Price et al., 2004; J. S. Price et al., 2007; J. S. Price et al., 1994; Sloman et al., 2003), the intersectional impact of multiple social gradients on the outcomes of major depression (MD) and Lifetime Suicidal Ideation (LSI) was explored through statistical analysis of Canadian Community Health Survey (CCHS) data between 2009 and 2012.

Calculated population proportions for the period 2009-2012, suggest that Canadian men exhibited an annual prevalence of MD of 4.1% compared to 6.7% among Canadian women. Similarly, 8.1% of men reported LSI as compared to 10.7% of women. However, prevalence rates were not homogenous throughout the male population, as significant differences were noted based on a number of socio-demographic characteristics.

Urban men demonstrated a significantly higher prevalence of MD (4.3%), when compared to men located in rural settings (3.2%); however, although not statistically significant, rural men had a higher prevalence of LSI (8.7%) compared to urban men (8.0%).

Increasingly higher proportions of MD and LSI were noted in younger generational cohorts, with the highest prevalence noted in "Generation X" (MD=5.6%; LSI=10.2%), with "Late Baby Boomers" (MD= 4.4%; LSI= 8.9%) and "Generation Y" (MD=5.5%; LSI=8.8%) also demonstrating high prevalence of these conditions.

Gay (12.5%) and bisexual (10.2%) men demonstrated a prevalence of MD that was approximately twice that seen among heterosexual men (5.1%). However, the prevalence of LSI was particularly shocking among sexual minority men, with 25.1% of gay men and 23.8% of bisexual men reporting LSI compared to 8.8% of heterosexual men.

Men with partners demonstrated about half the prevalence of MD and LSI (MD=2.9%; LSI=6.0%) compared to men without partners (MD=5.9%; LSI=11.7%).

Current employment also resulted in significantly lower prevalence of MD and LSI (MD=3.7%; LSI=7.6%) compared with current unemployment (MD=5.9%; LSI=10.4%).

The social gradient variables entered into the logistic regression and moderated mediation models included: Working Last Week (yes/no); Total Social Support; Sexual Minority (yes/no); Visible Minority (yes/no); Education Level; Household Income; Age; and Partnered (yes/no). All continuous variables were mean-centred. Self-esteem was entered as a covariate and a measure of self-assessed status.

Logistic regression analyses indicated that the significant predictors of MD included: self-esteem ($OR_{adj}=0.758$); working in the past week ($OR_{adj}=0.535$); total social support ($OR_{adj}=-0.268$); sexual minority status ($OR_{adj}=2.181$); age ($OR_{adj}=0.954$); and the interaction term between age and total social support ($OR_{adj}=1.020$). Moderated mediation analyses of depression predicted probability (DPP), using structural equation modeling, indicated that the effect of all the resource hierarchies (income; education; being partnered; and working in the past week) was completely mediated through the variable self-esteem. The exception was total social support, which exerted both a significant direct effect on DPP and an indirect effect through self-esteem, while also moderating the effect of self-esteem on DPP. Visible minority status also exerted a significant direct effect on DPP and self-esteem. Interestingly, sexual minority status and age did not exert a significant effect on DPP directly, or on self-esteem, despite the significant findings for both these variables during the logistic regression of MD.

Logistic regression analyses indicated that the significant social gradient predictors of LSI included: self-esteem ($OR_{adj}=0.655$); total social support ($OR_{adj}=0.092$); the interaction term between self-esteem and total social support ($OR_{adj}=1.130$); and visible minority status ($OR_{adj}=0.386$). While sexual minority status did suggest some elevated odds of LSI ($OR_{adj}=1.727$), this did not reach statistical significance. Interestingly, those reporting LSI also demonstrated higher self-esteem scores as their social support increased, which may suggest that those reporting LSI may also possess more fragile or contingent self-esteem that depends on the validation of others (Lakey et al., 2014).

Post-hoc analyses of both the MD and LSI regression analyses, utilizing the visualization of binary logistic regression (VIBL) do file, illustrated the intersectional nature of the effects of these social gradients. Most social gradients were only predictors of MD or LSI at very low levels, and only in the presence of high covariance contribution related to low standing on multiple social gradients. These findings suggest that it is rarely one social condition contributing to these mental health outcomes, rather MD and LSI are more likely the outcome of low status on multiple social hierarchies working together.

Depression and Suicidal Ideation among Gay and Bisexual Canadian Men

The prevalence and intersecting social gradient predictors of MD and LSI among gay and bisexual Canadian men were explored through statistical analyses of data spanning the 2009 to 2012 CCHS. The prevalence of MD has never been reported for gay and bisexual Canadian men previously because of inadequate sample size; however, the

combination of four cycles of CCHS data not only enabled the calculation of the annual prevalence of MD for the period 2009-2012, but also allowed the calculation of more precise estimates of the prevalence of LSI in these men. In addition, logistic regression analyses were carried out to explore the intersecting effect of several social gradients on the outcomes of MD and LSI, and enabled the calculation of the odds of these conditions among gay and bisexual men, while controlling for the effects of other social gradients and self-esteem.

Gay men exhibited the highest prevalence of MD at 12.5%, closely followed by bisexual men at 10.2%, and heterosexual men at 5.1%. Similarly, gay men demonstrated the highest prevalence of LSI at 25.1%, followed by bisexual men at 23.8%, and heterosexual men at 8.8%.

The social gradient variables entered into the logistic regression models for MD and LSI were: Working Last Week (yes/no); Total Social Support; Sexual Minority (yes/no); Visible Minority (yes/no); Education Level; Household Income; Age; and Partnered (yes/no). All continuous variables were mean-centred. Self-esteem was entered as a covariate and a measure of self-assessed status.

Statistically significant social gradient predictors of MD for gay men included: self-esteem ($OR_{adj}=0.759$); working in the past week ($OR_{adj}=0.527$); total social support ($OR_{adj}=0.258$); being gay ($OR_{adj}=2.252$); age ($OR_{adj}=0.952$); and the interaction term between age and total social support ($OR_{adj}=1.021$), with those with MD experiencing a more rapid decline of social support with age.

Statistically significant social gradient predictors of MD for bisexual men included: self-esteem ($OR_{adj}=0.762$); working in the past week ($OR_{adj}=0.527$); total social support ($OR_{adj}=0.293$); age ($OR_{adj}=0.957$); and the interaction term between age and total social support ($OR_{adj}=1.018$), with those with MD experiencing a more rapid decline of social support with age. While bisexual men did demonstrate an elevated odds of MD at 1.93, this did not reach statistical significance when controlling for all other social gradients and self-esteem.

Logistic regression analyses exploring LSI among gay men, identified several social gradient predictors of this condition including: self-esteem ($OR_{adj}=0.656$); total social support ($OR_{adj}=0.092$); the interaction term between self-esteem and total social support ($OR_{adj}=1.12$); and visible minority status ($OR_{adj}=0.390$).

A similar logistic regression analysis controlling for the variable bisexual identified the same predictors of LSI including: self-esteem ($OR_{adj}=0.651$); total social support ($OR_{adj}=0.085$); the interaction term between self-esteem and total social support ($OR_{adj}=1.018$); and visible minority status ($OR_{adj}=0.382$). The unadjusted odds of LSI was calculated to be statistically significant ($p < 0.001$) at 3.45 for gay men, and 3.23 for bisexual men; however, the fact that sexual orientation ceases to be a significant predictor of LSI when controlling for other social gradients may suggest that the high rates of suicidality noted among these populations may be due to marginalization on other social gradients like social support or self-esteem. This may be a consequence of discrimination (homophobia/biphobia) or minority stress/internalized oppression (Eldahan et al., 2016; Mays & Cochran, 2001; Nadal & Mendoza, 2014; Pachankis et al., 2015). Similar to the analyses for the general population of Canadian men, self-esteem was noted to increase

more in relation to social support among men with LSI compared to men without LSI, which may suggest that these men may have more fragile self-esteem that is contingent on the support and approval of others (Lakey et al., 2014).

Post hoc analyses with the visualization of binary logistic regression (VIBL) do file suggests that the effect of a single social gradient on the outcomes of MD and LSI is largely due to the intersectional contribution of multiple social gradients. Even among statistically significant social gradient predictors of MD and LSI, the effect was only significant with very low standing on that social gradient in combination with high covariance contribution, due to low standing on multiple other social gradient variables.

In ANOVA analyses to examine social support differences based on sexual orientation, gay and bisexual men demonstrated significantly lower total social support than heterosexual men. Gay men demonstrated significantly lower tangible support than heterosexual men. Both gay and bisexual men had significantly lower affection support than heterosexual men, and significantly lower positive social interaction scores than heterosexual men. Bisexual men exhibited significantly lower emotional and informational support than heterosexual men.

Study Implications

These findings add to the already substantial body of literature that informs ongoing efforts to support depressed and suicidal men, and may further assist mental health practitioners to readily identify those men, who are at highest risk for these conditions. This information can also be used to focus screening efforts for these

conditions, and to inform the planning of population-level interventions and programming at the primary, secondary, and tertiary level.

Of particular note are the high rates of MD and LSI among the Generation X and Y cohorts, compared to older cohorts. While these findings may be an artifact of recall bias as people age (Patten et al., 2012), or the potential for greater stigma associated with these conditions among older men (Oliffe et al., 2016), these high rates could foreshadow problems as these cohorts age. The high rates of LSI reported by these relatively young cohorts is particularly concerning, since they are already reporting greater occurrence of suicidal ideation than older cohorts, who have lived considerably longer. Rates of depression and suicidal ideation bear watching closely among these cohorts, and considerable benefit may be reaped by investing in more primary and secondary prevention programs targeted towards men in these age groups.

While previous studies and suicide rates have already identified gay and bisexual men as groups that are at significant risk for MD and LSI (Brennan et al., 2010; Hottes et al., 2016; Pakula & Shoveller, 2013), these current study findings provide even more precise evidence of this pattern in the Canadian population. With gay and bisexual men experiencing approximately double the odds and prevalence of MD, and calculated prevalence rates that suggest one in four sexual minority men will experience suicidal ideation in their lifetime, the need for programming and population level interventions targeted toward these populations is clear. In particular, structural policy level interventions that prevent discrimination and marginalization of LGBTQ+ persons, may contribute to a feeling of greater social support, and a decrease in internalized homophobia/biphobia that may harm self-esteem and mental health. The moderated

mediation analysis of DPP also provides some evidence to suggest that sexual minority status is not a direct predictor of depression probability, when other social gradients are controlled for. Therefore, policies that protect LGBTQ+ persons from discrimination in the areas of employment, education, marriage, and access to opportunities of all kinds, will likely have positive consequences for their mental health.

Social support clearly plays a vital role in the mental health of Canadian men, yet we also know that men's social capital is often weaker than women's because hegemonic masculinities emphasize independence and devalue help-seeking (Conrad, 2010; O'Brien et al., 2005). Social support exerts both a direct effect on MD and LSI, and an indirect effect through its role in the construction of self-esteem; therefore, pursuing interventions that strengthen men's social support networks and willingness to seek emotional support from others, may have a protective effect against the development of depression, suicidal ideation, and perhaps mental illness in general. In addition, since self-esteem appears to play the largest role in mediating the effect of social gradients on depression, interventions that encourage men to reframe their self-assessment of their social status may also prove promising in inoculating men against mental illness. For example, this could be achieved through programs with young men that ask them to confront the role that social constructions, like masculinities, play in their self-assessment, or alternately by teaching practices like mindfulness, which encourage practitioners to reframe their interpretation of events and feelings.

Employment also plays a significant role in self-esteem, social support, resource availability, and ultimately men's mental health. These findings suggest that current unemployment may double the risk of depression. Therefore, interventions that seek to

mitigate the effects of unemployment on men's mental health may serve as primary or secondary prevention of depression.

The complex and intersectional nature of social gradients' effect on the mental health of Canadian men has been illustrated by these study findings, thereby further supporting the case for complex statistical modelling in social epidemiological explorations of mental illness. These findings have illustrated that the effect on MD and LSI is rarely exerted by a single social gradient alone, rather it is frequently the result of a combined effect of multiple variables acting together, sometimes through a mediating variable like self-esteem. While less complex models may still have value, their findings may over-simplify the complex web of causation that may be at play. Indeed, even with the large number of variables included in the current analyses, over 80% of the variance in the logistic regression models was still unaccounted for. Perhaps deviating from more traditional epidemiological conceptualizations of mental illness, and considering depression as a mechanistic property cluster (Kendler, 2005) may be a useful avenue to pursue in future research.

Recommendations for Future Research

As with all research endeavors, the possibilities for future research are almost limitless; however, several key areas of future research will be emphasized in the coming paragraphs.

Embracing the idea of men's depression syndrome as a mechanistic property cluster, future studies could explore even more complex models of men's depression by incorporating variables that attend to other potential contributing factors, such as: family

history of depression, recent losses (deaths, relationships, jobs, financial ...), support network membership, life course events, and others as deemed appropriate. In order to construct these statistical models, other national and international datasets may need to be explored, as the CCHS does not capture many of these factors currently, and has not consistently asked for the same modules in each cycle of the survey. In fact, it may not be possible to acquire the necessary data for such a study using existing datasets, or through the linking of multiple existing datasets. Therefore, there may be value in joining forces with other depression researchers in the world to create a new panel survey that captures comprehensive longitudinal data to explore some of these questions. Such an endeavor would be extremely ambitious, very time consuming, and very expensive, but could reap huge rewards in terms of disentangling the complexity of depression epidemiology in the long run.

A significant limitation in the current exploration of Canadian men's depression was the lack of any variables to directly assess the impact of masculinity on the development of MD and LSI, and on the clinical presentation of depression. While the qualitative literature in this area is remarkably consistent, it would be useful to document this at a population level quantitatively. Therefore, in future explorations of men's depression, it would be useful to incorporate tools such as the "Conformity to Masculine Norms Inventory" (Mahalik et al., 2003), and men's depression scales such as: the "Gotland Scale Male Depression Scale" (Zierau et al., 2002); the "Masculine Depression Scale" (Magovcevic & Addis, 2008); or the "Male Depression Risk Scale" (Rice et al., 2013). Inclusion of such tools would enable a consideration of men's alignment with

traditional hegemonic masculinities, and may also help to explore the paradoxical inconsistency between men's depression and suicide rates.

While there may be some significant challenges with respect to sample size, it may also be beneficial to repeat these analyses from this study after partitioning by generational cohort, to explore whether there are any differences in how the social gradients affect MD and LSI in different generational cohorts. There are clearly different levels of MD and LSI reported based on generation membership; however, it would be interesting to explore whether social change over time, and experiencing a different life course, results in different findings. For example, does sexual minority membership mean something different in younger cohorts as compared to older cohorts? Are generation Y and Z less affected by employment than the career oriented baby boomers?

Given the high rates of depression and suicidal ideation in members of the LGBTQ+ community, there is also an urgent need to continue to explore pathways to depression among these populations. It is also important to further explore the role that discrimination, and internalized oppression are playing in these conditions among sexual minorities, so that more robust evidence can support calls for LGBTQ+ positive public and organizational policies. How do discrimination and minority stress influence social support and self-esteem, and how much of a role do these factors play in the development of depression and suicidal ideation?

What is clear from this study, and those that have come before, is that we have only begun to scratch the surface of revealing the true complexity of mental illnesses like depression and suicidal ideation. Unlike infectious disease, there is no clear causative

agent to target in mental illness; no possible magic bullet to solve the problem. These are conditions which appear to be the result of a complex interaction between genetics, social conditions, and biological systems. It will take innovative and creative research to reveal their mysteries, and both effective population-level and individual level interventions to mitigate their effects. What is also clear, is that these conditions appear to be taking a larger toll on society, as humans live longer lives in a connected globalized world with social gradients established along many lines (World Health Organization, 2012a). Therefore, it would serve us well to unravel the mysteries of depression as soon as possible, and I hope that I can play a small part in that endeavor.

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Appendix A

Tables Summarizing the Prevalence and Correlates of Canadian Men's Depression

Table 1. Studies Calculating the Prevalence of Major Depression among Canadian Men

Authors & Study Title	Study Design	Time Period	Population Studied (Sample)	Instrument(s) to Identify Depression	Type of Prevalence Reported	Prevalence (95% CI)
Patten et al. (2015)	Cross-sectional Survey	2012	CCHS-MH (Mental Health & Well-being) Nationally Representative Sample n=25 113 (>15 years-old) Multi-stage Stratified Cluster Design	WMH – CIDI MDD present if one or more MDE without signs of BD (manic episodes)	12 month (Annual) Prevalence MDD	2.8% (2.3, 3.2)
Patten et al. (2006) Descriptive epidemiology of major depression in Canada.	Cross-sectional Survey	2002	CCHS 1.2 (Mental Health & Well-being) Nationally Representative Sample n=36 984 (>15 years-old) Multi-stage Stratified Cluster Design	WMH – CIDI MDD present if one or more MDE without signs of BD (manic episodes)	12 month (Annual) Prevalence MDD Point Prevalence of MDD 12 month (Annual) Prevalence among Single Men	2.9% (2.6, 3.3) 1.2% (0.9, 1.4) ≤ 45 years = 3.7% ≥ 46 years = 4.1%
Blackmore et al. (2007) Major depressive episodes and work stress: Results from a national population survey.	Cross-sectional Survey	2002	CCHS 1.2 (Mental Health & Well-being) Nationally Representative Sample n= 24 324 (15 - 75 years-old and employed selected) Multi-stage Stratified Cluster Design	WMH – CIDI	12 month (Annual) Prevalence of MDE	3.4%
Simpson et al. (2012) Is mental health in the Canadian population changing over time?	Cross-sectional Survey	2001 – 2007	CCHS (1.1 – 4.1) 1.1 (2001), 2.1 (2003), 3.1 (2005), 4.1 (2007) n~130 000 Representative Sample	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A	12 month (Annual) Prevalence of MDE Population weighted and directly standardized	4%

			Multi-stage Stratified Cluster Design	criterion for MDE in DSM-IV		
	Longitudinal Survey	1994 - 2008	NPHS Nationally Representative Sample of Household Residents n= 17 276 Every 2 Years (7 Cycles)	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A criterion for MDE in DSM-IV	12 month (Annual) Prevalence of MDE Population weighted and directly standardized	3%
Chen et al. (2009) The association between obesity and depression in Canadians	Cross Sectional Survey	2005	CCHS (3.1) (n=59 652) Representative Sample Multi-stage Stratified Cluster Design Five provinces: Nova Scotia, Quebec, Saskatchewan, Alberta, and British Columbia	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A criterion for MDE in DSM-IV	12 month (Annual) Prevalence of MDE	3.9%
E. L. Price et al. (2006) One-year prevalence rates of major depressive disorder in first year university students	Cross-sectional survey	2004-2005	309 First-year university students in a Nova Scotia university were screened using the CES-D (Phase 1) and invited to participate in Phase 2 of the study using stratified proportional sampling according to CES-D scores (n=147: 36 men and 111 women)	Phase 1 CES-D Score Categorized as: Low (<16) Medium (16-21) High (≥ 22) Phase 2 Computerized Structured Diagnostic Interview with CIDI-Auto 2.1	12 month (Annual) Prevalence of MDD	6.7% Among First Year University Students
Slomp, Bland, Patterson, and Whittaker (2009) Three-year physician treated prevalence rate of mental disorders in Canada	Analysis of fee-for-service claims from Alberta physicians over a three year period	2001-2004	Examined Fee-for-service claim records for Alberta patients, 18 years or older, to identify those treated for a mental disorder (ICD-9 diagnosis codes 290 & 319) during the fiscal years 2001/02 to 2003/04	Treatment for MDD was identified by ICD-9 diagnosis codes submitted as part of Alberta Physician fee-for-service billing	Three-year Physician Treated Prevalence of Depression	18-44 years = 10.2% 45-64 years = 11.5% 65 years + = 12.1%

Brennan et al. (2010) (Brennan et al., 2010)	Cross-sectional survey	2003	CCHS (2.1) (n~135 000) Representative Sample Multi-stage Stratified Cluster Design	CIDI-SF Short-form Version of CIDI	Unadjusted Prevalence Rates of Mood and Anxiety Disorders (combined)	Heterosexual men 5.1% (4.8 , 5.5) Homosexual men 15.8% (12.0 , 19.6) Bisexual men 13.8% (8.5, 19.1)
Men's sexual orientation and health in Canada						

Note. CI = Confidence Interval; CCHS = Canadian Community Health Survey; WMH = World Mental Health 2000 Project; CIDI = Composite International Diagnostic Interview; SF = Short Form; MDD= Major Depressive Disorder; MDE= Major Depressive Episode; BD= Bipolar Disorder; NPHS = National Population Health Survey; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV; CES-D = Centre for Epidemiological Studies – Depression Scale; ICD-9 = International Classification of Diseases 9th Edition

Table 2. Studies Reporting Correlates of Major Depression among Canadian Men

Correlate	Authors and Study Title	Study Design	Time Period	Population Studied (Sample)	Instrument(s) Used	Reported Statistics (95% CI)
Alcohol Consumption	Lukassen et al. (2005) (Lukassen & Beaudet, 2005) Alcohol Dependence and depression among heavy drinkers in Canada	Cross-sectional Survey Analysis	2000-2001	CCHS (1.1) (n=19 228) >18 years-old Classified as a regular or heavy drinker Representative Sample Multi-stage Stratified Cluster Design	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A criterion for MDE in DSM-IV Individuals who indicated that they consumed 5 or more alcoholic drinks on one occasion monthly or more frequently were classified as heavy drinkers	Significantly more male heavy drinkers (36.8%***) experienced a MDE in the previous 12 months compared to those who did not experience an MDE (28.5%) Male heavy drinkers had significantly higher odds of experiencing a MDE in the previous year OR= 3.9*** (3.1, 4.9)
Body Weight	Chen et al. (2009) (Chen et al., 2009) The association between obesity and depression in Canadians	Cross Sectional Survey	2005	CCHS (3.1) (n=59 652) Representative Sample Multi-stage Stratified Cluster Design Five provinces: Nova Scotia, Quebec, Saskatchewan, Alberta, and British Columbia	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A criterion for MDE in DSM-IV BMI calculated based on reported height and weight and classified as: Underweight <18.5 kg/m ² Normal 18.5 – 24.9 kg/m ² Overweight 25.0-29.9 kg/m ² Obese ≥ 30.0 kg/m ²	There was no significant increase in the odds of annual MDE for all BMI classifications in men except a slightly increased odds in the overweight category OR _{adj} - adjusted for age, marital status, income adequacy, educational level, race, marital status, smoking status, alcohol use, physical activity, and chronic condition. Underweight: OR _{adj} = 1.27* (0.70, 2.31) Normal: OR _{adj} = 1.00 Overweight: OR _{adj} = 1.26 (1.06, 1.49) Obese: OR _{adj} = 1.19* (0.95, 1.48)

Work Environment and Employment	Blackmore et al. (2007) (Blackmore et al., 2007) Major depressive episodes and work stress: results from a national population survey	Cross-sectional Survey	2002	CCHS 1.2 (Mental Health & Well-being) Nationally Representative Sample n= 24 324 (15 - 75 years-old and employed selected) Multi-stage Stratified Cluster Design	WMH – CIDI Karasek and Theorell's Job Strain Model – Six sub-scales: decision authority, skill discretion, psychological demands, work social support, job insecurity, & physical exertion. Two key dimensions: psychological job demands & decision latitude	Increased levels of job strain were significantly associated with an increased odds of MDE OR=2.38* (1.29, 4.37) Lack of social support at work was significantly related to MDE OR=2.70* (1.55, 4.71) Low levels of job security were associated with increased risk of 12 month MDE . OR= 2.66* (1.56, 2.66) Increased psychological demands were associated with 12 month MDE OR=1.90* (1.06, 1.90)
	Wang et al. (2012) (J. L. Wang et al., 2012) A population-based longitudinal study on work environmental factors and the risk of major depressive disorder	Longitudinal Study	2008 - 2011	Random sample of employees in Alberta. Participants without a current or lifetime diagnosis of MDD were followed for one-year (n=2 752)	WMH – CIDI (Auto 2.1) Work stress assessed by the Job Content Questionnaire (JCQ) Job Strain Ratio (JSR) & Effort Reward Balance (ERB) calculated Work-to-family Conflict Questionnaire	Significantly increased odds of MDD was seen in each of the following: Falling in the 4 th quartile of the job strain ratio (high job strain) OR= 2.97* (1.22, 7.23) Job Insecurity OR=3.47* (1.46, 8.25) Family-to work conflict OR=2.31* (1.04, 5.15)
	Wang et al. (2008) (J. L. Wang et al., 2008) The relationship between work stress and mental disorders in men and women: findings from a population-based survey	Cross-sectional Survey	2002	CCHS 1.2 (Mental Health & Well-being) Nationally Representative Sample n=24 277 (>15 years-old and employed selected) Multi-stage Stratified Cluster Design	WMH – CIDI Brief Version of the Job Content Questionnaire (JCQ)	Increased odds of MDD was associated with: High demand and low control in the workplace OR _{adj} =1.74* (1.12, 2.69) Job Insecurity OR _{adj} =1.35* (1.19, 1.54)

						High stress in social support from supervisor/coworkers OR _{adj} = 1.15* (1.07, 1.25)
						Being Single OR _{adj} = 2.06* (1.46, 2.91)
						Work/family life imbalance OR _{adj} = 5.26* (3.79, 7.30)
Economic Level & Income	Wang et al. (2010) (J. L. Wang, Schmitz, et al., 2010)	Longitudinal Survey	1994 - 2008	NPHS Nationally Representative Sample of Household Residents n= 17 276 Every 2 Years (7 Cycles)	CIDI –SF –MD Short-form Version of CIDI 90% predictive cut point used to determine A criterion for MDE in DSM-IV	Weighted incidence proportions of MDE were significantly higher among: Working men with lower levels of education 8.3% (5.4, 11.1)* Low income working men 12.9% (4.7, 21.0)* Men reporting financial strain 8.1% (5.5, 10.7)* Higher educated men, who were not working 4.5% (1.6, 7.3)*
	Socioeconomic status and the risk of depression: The Canadian National Population Survey				Indicators of SES Objective (education, household income, and personal annual income) Subjective (financial strain)	

Note. * p<.05; **p< 0.001, *** p<0.0001; CI = Confidence Interval; CCHS = Canadian Community Health Survey; ; CIDI = Composite International Diagnostic Interview; SF = Short Form; MDD= Major Depressive Disorder; MDE= Major Depressive Episode; BMI = Body Mass Index; OR = Odds Ratio WMH = World Mental Health 2000; NPHS = National Population Health Survey; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV; SES= socioeconomic status

Appendix B

Theoretical Framework Figures

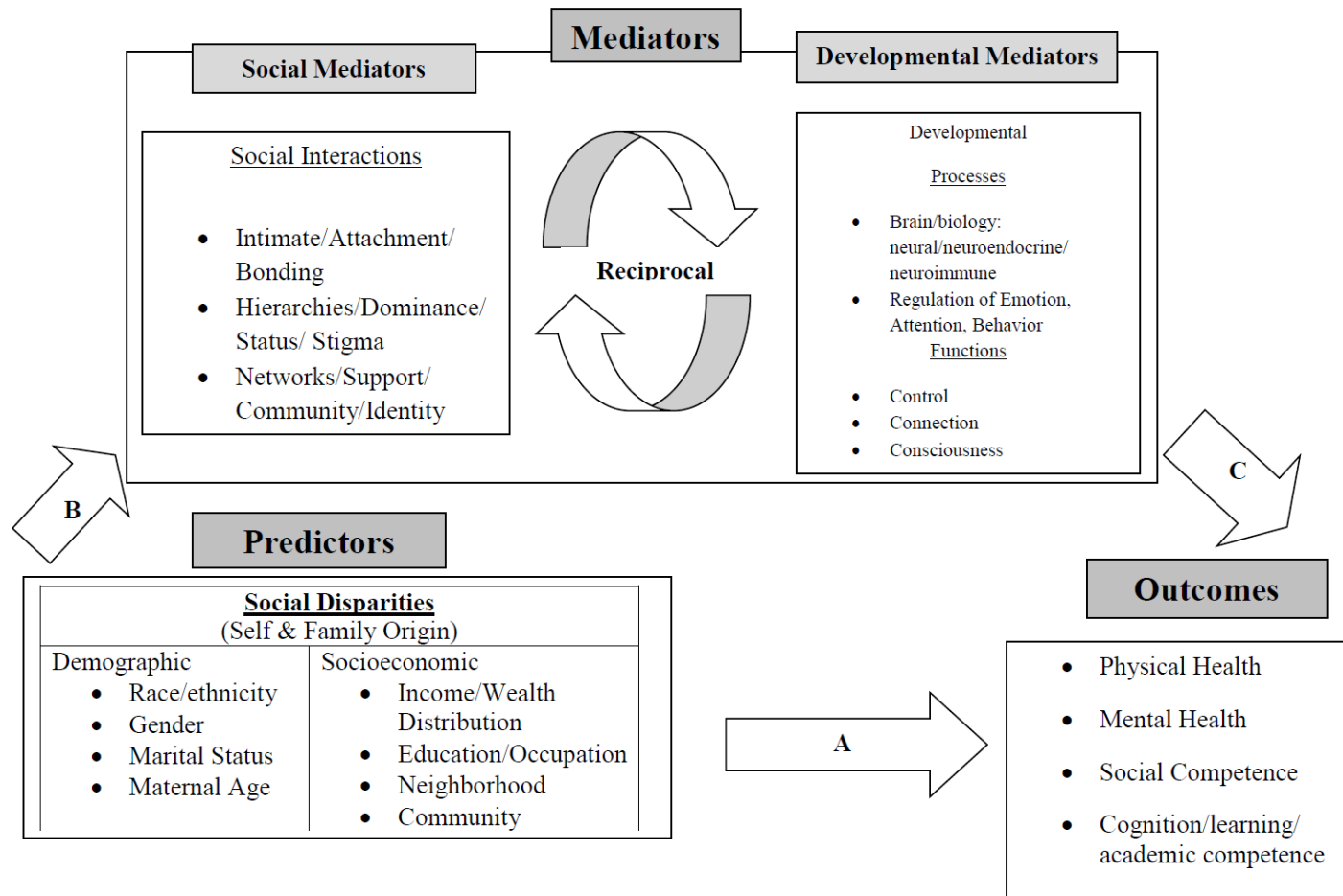
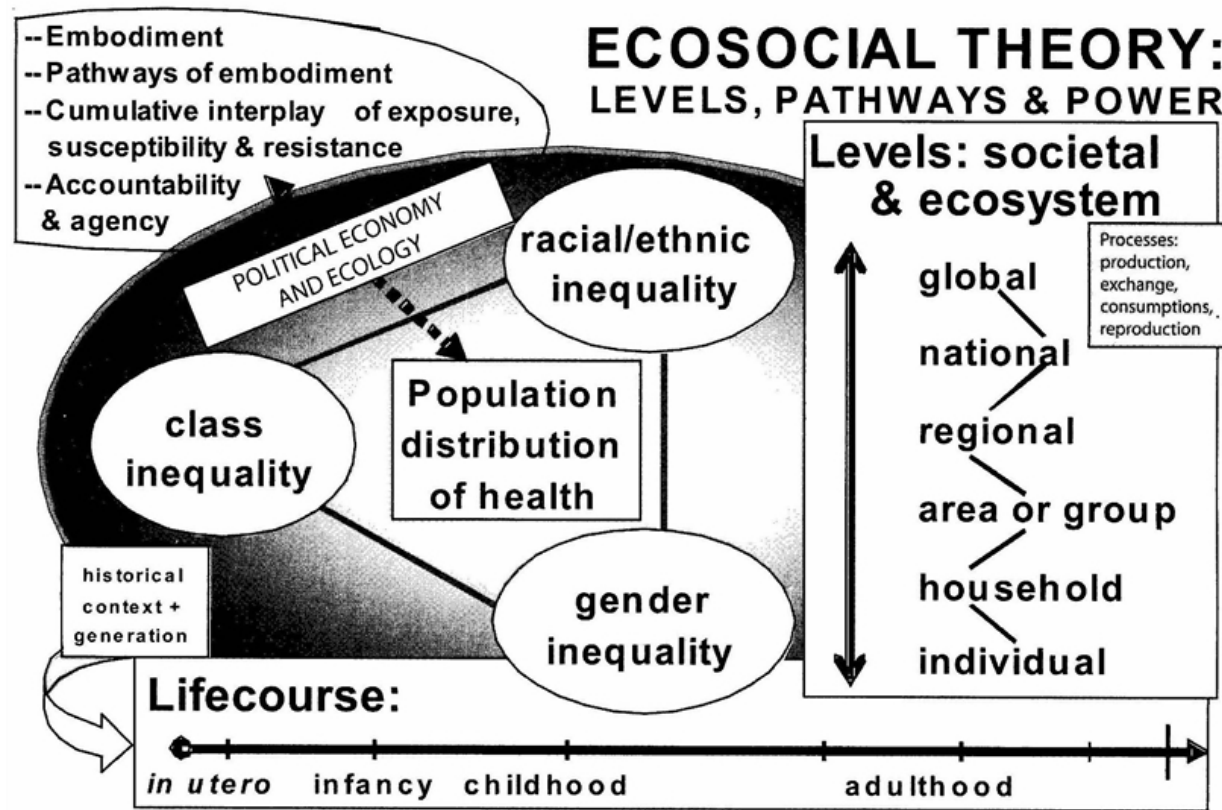


Figure 1. Conceptual Model of the Social & Developmental Mediators of the Social Gradient in Developmental Health
Note: Model copied directly from Keating (2009), p.67



Note. To explain current and changing population distributions of disease, including health inequities, and who and what is accountable for the societal patterning of health, it is necessary to consider causal pathways operating at multiple levels and spatiotemporal scales, in historical context and as shaped by the societal power relations, material conditions, and social and biological processes inherent in the political economy and ecology of the populations being analyzed. The embodied consequences of societal and ecologic context are what manifest as population distributions of and inequities in health, disease, and well-being.
Source. See references 1,17-21.

Figure 2. Ecosocial Theory: Levels, Pathways, & Power

Note. Copied directly from Krieger (2008), p.224

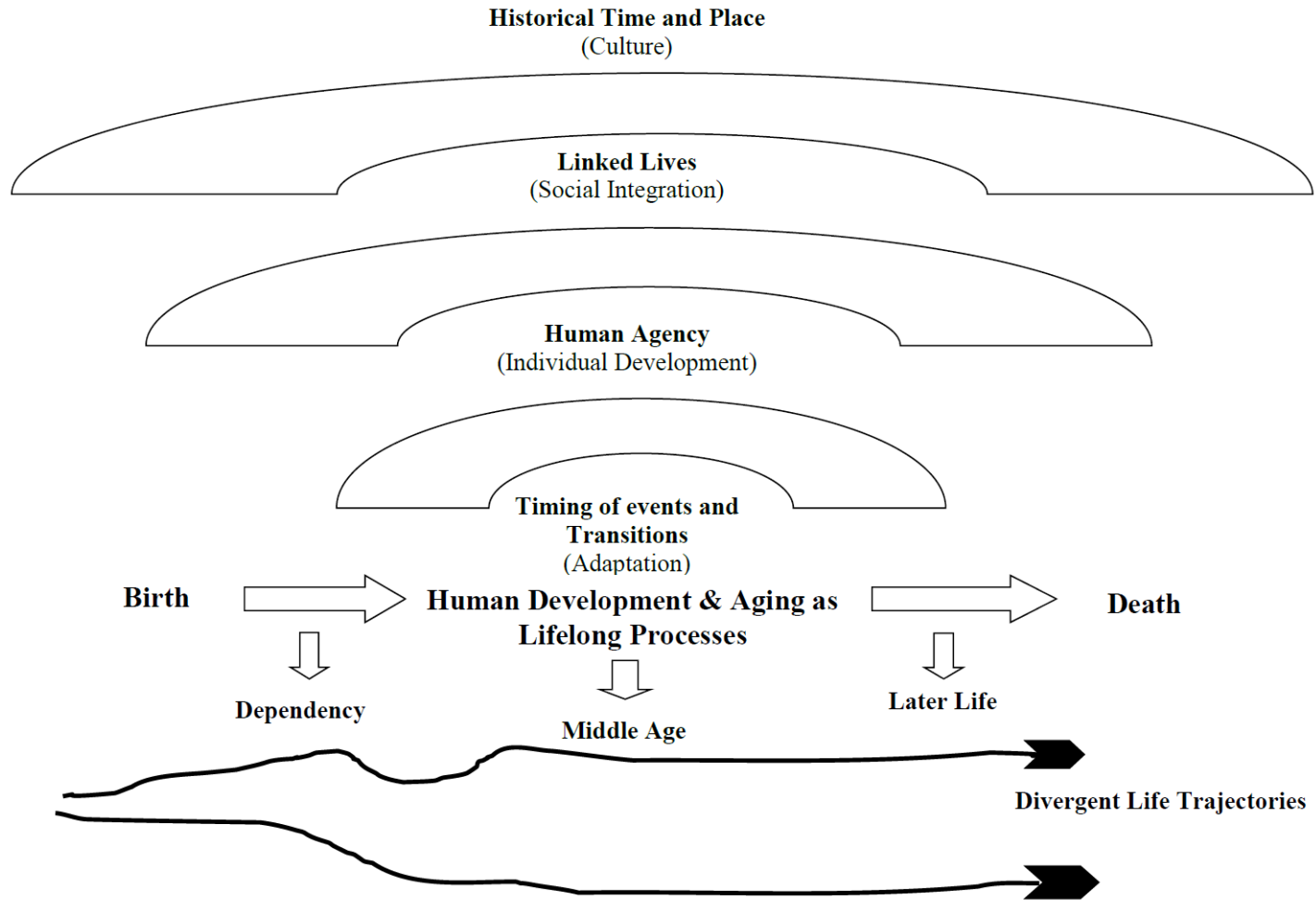


Figure 3. Elements of the Life Course Paradigm
Note. Adapted from Elder & Giele, 2009, p.11

