

SOCIAL CONTEXTS IN POSTSECONDARY
PATHOPHYSIOLOGY TEXTBOOKS:
HOW TYPE 2 DIABETES IS UNDERSTOOD

by

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Graduate Department of Leadership, Higher and Adult Education
Ontario Institute for Studies in Education
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Abstract

Type 2 diabetes mellitus is a disease that has trebled in incidence over the last 25 years, affecting both adults and increasingly children. The rapid increase of the disease mirrors the gradients of social position and income distribution, and parallels the accelerated environmental changes witnessed with the rise of neoliberal capitalism. This research situates neoliberal capitalism as a collection of political and economic policies that form an ideology suited to protect discrete elite interests. The current ideology has permeated all social aspects of society, including education and healthcare. Therefore, it is argued that the practice of healthcare and the education of healthcare students are shaped by the sociopolitical environment in which they exist.

Ten best-selling postsecondary textbooks in pathology, pathophysiology, and disease processes were selected for content analysis to determine if the interpretation of type 2 diabetes in pathophysiology textbooks reflects neoliberal thinking. The data were interpreted within the tradition of critical discourse analysis and theoretically enriched using Foucault's descriptions of governmentality, biopolitics, and discursive formations.

The results indicate that notions consistent with neoliberal capitalism permeate pathology textbooks in the understandings of type 2 diabetes. Consistent with how neoliberal thought embodies and explicates social conditions, type 2 diabetes is described in a way that stresses

self-responsibility and culpability for falling ill. The texts also impart the importance of biomedical industry interventions for the treatment of the sick and the surveillance of the healthy. Finally, in a way that substantiates the degradation of the environment and retrenchment of social welfare policies, the textbooks fail to make any reference to the ecological factors that contribute to type 2 diabetes, including urbanisation and the propagation of food deserts, environmental toxins, income inequality, the steepening of the social gradient, and the deleterious effects of globalisation on human nutrition.

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Chapter 1

Introduction

Background

Chronic, noncommunicable diseases are the leading causes of morbidity and mortality in Canada (Schell, 2004). Globally—while infectious disease is still prominent in *very* low-income countries—non-infectious (or man-made illness) has become ubiquitous in low, middle, and high-income countries (Alwan et al., 2010). What is therefore emerging is that these chronic diseases (overwhelmingly represented by cancer, cardiovascular disease, and type 2 diabetes) are no longer conditions of the wealthy or conditions of rich nations; they are globally apportioned inordinately among the lower and middle income countries (World Health Organisation [WHO], 2005), and among populations of lower socioeconomic status within the West. Type 2 diabetes (T2D) is a chronic, debilitating disorder of particular concern. Over the last 20 years there has been a rapid increase in the incidence of T2D, making it one of the major threats to global health (Zimmet, Alberti, & Shaw, 2001). While typically associated with adulthood, the increase of T2D among children has proliferated since the 1990s and now parallels type 1 diabetes in new-onset cases (Pinhas-Hamel & Zeitler, 2005). Affecting multiple organ systems, T2D aggressively impacts those living with the illness and their families, overall population morbidity and mortality rates, and consumes a considerable amount of healthcare resources. Chronic disease is a symptom of the current politicoeconomic environment. The prevalence of illness mirrors the gradients of social position, income distribution, and correlates with urbanisation and environmental decay (Browning, Bjornstrom, & Cagney, 2011). The incidence and prevalence of T2D replicates these trends, enforcing the notion that chronic disease is shaped by, and responds to, a

broader ecological paradigm. Additionally, the way in which chronic disease is situated, understood, researched and interpreted within the biomedical field is also mediated by external influences. The trends in incidence, distribution patterns, risk factors, and disease management, as provocative as they are, are often discussed in current studies as discrete entities avulsed from the critical awareness of the social, political and economic reality in which they prevail. Empirical research and the measurement of epidemiological trends can therefore be limited and ideological because they treat such trends as being uprooted from sociopolitical realities and therefore abstract. The result is that chronic disease in general and T2D in particular become researched and realised in a context that is reductionist, decontextualised, and one that legitimates protected interests.

Neoliberal capitalism as a collection of political and economic policies has grown to become a robust phenomenon influencing and shaping all aspects of social institutions over the past 20 to 30 years. Neoliberalism does not exert clear-cut paths across demographic and sociopolitical arenas; instead it is a system that manifests, shapes and directs social, political, economic, and historical contextual spaces. Articulated as an ideology (Giroux, 2005; Harvey, 2009; Navarro, 2007b), neoliberalism is the current powerful historical context in which human health and illness are not only patterned by, but also understood, interpreted, managed, and treated. The representation of chronic illness within the research setting, the clinic, public health campaigns, and mass media reflects the influence of neoliberalism. From this conceptualization, the thesis will unfold.

Rationale

This thesis argues that the understanding of risk factors and treatment for T2D is situated within a neoliberal ideology and is therefore exposed to the biases and constraints of the paradigm in which it exists—and of equal importance—replicates them. Within mass media and public health campaigns, T2D is overrepresented by a self-responsibility and self-regulatory trope, consistent with the value of individualism characteristic of neoliberalism. What has not been investigated is whether this representation of T2D predominates within postsecondary textbooks used by students in medicine, nursing, and other allied healthcare professions.

The reasons for this investigation are multiple and of significance. Historically embedded ideologies have impacted the medical profession, the delivery of healthcare, and the scientific understanding of the patient throughout the evolution of modern medicine. Science, medicine and technology have existed in synchrony and discord, all collectively reflecting and impacting social relations (Pickstone, 1993). Healthcare is considered a pillar of social policy, in concert with education and income security (McGregor, 2001). Medicine and the overall paradigm of healthcare therefore have a significant presence within the public realm; an ongoing critical surveillance of medical education becomes a valid exercise to fully understand what is translated from the research to the classroom to the clinic and public health realms.

Neoliberalism has shaped the understanding of illness and the practice of medicine in the broader landscape in many ways. One facet of the neoliberal ideology is the promotion of self-autonomy and the virtue of self-discipline, self-regulation and independence. The value

of independence and importance placed on self-direction is described as being ‘subject to ourselves’, but the value is a *veiled* freedom; more appropriately it is a regulated operation of political power (Lupton, 1999). Individualism and the virtue of disciplined lifestyle choices benefit the neoliberal agenda in many ways: the neoliberal subject is a producer of health by the self-regulation of behaviour, therefore alleviating the state of having to address the complexities of income inequalities, social stratification, loss of social cohesion (Coburn, 2004), and environmental decay as key contributors to chronic disease. By instilling self-governance, the protection of a welfare state becomes legitimised as a lesser priority. The hands off approach to the health of a population has catalysed the evolution of the patient–consumer; an enabled, active, self-reliant seeker of health information (Briggs & Hallin, 2007), which—conveniently—not only places the burden of responsibility entirely on the afflicted patient but also the onus of opting for pharmaceutical consumption as a cure (Fisher & Ronald, 2008). What develops is an advantageous symbiotic reciprocation: individualism reduces the burden of maintaining a welfare state whilst simultaneously generating a space for the growth of clinical trials, biomedical technologies, the pharmaceutical industry, and the expanding power of evidence-based medicine (Mykhalovskiy & Weir, 2004). The politicisation of medicine mobilised by the overarching interests of pharmaceutical and biotechnology industries shift clinical impartiality, and the cost cutting agenda of the neoliberal trajectory shape how medicine is delivered. The ‘marketisation of society’ has propelled the patient–consumer to become self-empowered whilst simultaneously disempowering medical autonomy and the medical voice that espoused medicine for the greater good (Brown, 2008).

While research has identified neoliberal influence in health messages seen in mass media and public health campaigns, *the presence (or absence) of a similar undercurrent has not been established in postsecondary pathology-related textbooks*. Textbooks (particularly within the sciences) have traditionally been the foremost source for detailed information, facts and figures (Lord, 2007). Texts influence the organisation of curricula (Bandiera, 2002) and the way in which biomedical information is assimilated and interpreted. More importantly, the framing of textual material inevitably infuses current social, political, and economic values in current medical knowledge, understanding and practice. Neoliberalism has impacted the organisation and regulation of educational systems (Olssen & Peters, 2005), subdued the professional decision making of faculty (Giroux, 2002; Hursh, 2001; Lipman, 2006), shaped student experiences (Saunders, 2007), and the kind of knowledges that are disseminated in the classroom (Hill, 2004). What becomes emphasised in the classroom—and ultimately shapes the education of healthcare professionals—is political.

Overview of the Study

Within this conceptual framework, the research will attempt to answer the following question: Does the interpretation of T2D in pathophysiology textbooks reflect neoliberal thinking? This question will be reflected upon by undertaking a content analysis of popular pathology and pathophysiology textbooks currently in use by postsecondary students enrolled in healthcare programmes. Content analysis was used to organise words, phrases and conceptual understandings within the textual matter, to relay the intent of the material and produce inferences about the historical setting in which the content was produced.

Definition of Terms and Conceptual Framework

Diabetes mellitus is a condition of persistent hyperglycaemia. Glucose remains in blood serum, generally as a result of insulin resistance by tissue cells or by insufficient insulin production by the endocrine pancreas. T1D is an autoimmune disorder whereby the insulin producing β -cells of the pancreas are destroyed. Insulin is required to stimulate receptors on insulin sensitive tissue cells, thereby generating the intracellular migration of Glut-4 transporters to cell membranes. The result is an influx of glucose and subsequent glycogenesis, thereby reducing serum glucose levels.

In type 2 diabetes (T2D), hyperglycaemia is a result of cellular insulin resistance, usually seen in tandem with concurrent β -cell insufficiency. As the pancreas is unable to compensate in this situation, there is a *relative* degree of insulin insufficiency.

Of the two forms of diabetes, T2D demonstrates a higher global incidence and prevalence (Zimmet, 2000). The physiological mechanism by which insulin resistance ensues remains somewhat elusive, but glucose intolerance and overt T2D are associated with multiple defects of the signalling cascade and impaired intracellular enzymatic activity (Sesti, 2006). Over time, insulin secretion also becomes impaired, as β -cells undergo apoptosis and deteriorate, thereby making T2D a progressive condition (Mudaliar & Henry, 2009). Additionally, persistent and uncontrolled hyperglycaemia exerts negative effects on multiple organ systems, resulting in cardiovascular complications, renal and neural damage, eye disorders, impaired immunity, and premature mortality (Inzucchi et al., 2012).

Diabetes rates are increasing globally, and the disease is emerging as one of the most costly chronic diseases of our time (Lipscombe & Hux, 2007; Shaw, Sicree, & Zimmet,

2010). More specifically, there has been a particular increase in the prevalence of T2D in the last two decades (Lipscombe & Hux, 2007). In Canada, trends are similar. According to Health Canada, the age-standardised prevalence has demonstrated a 70% increase from 1998/99 to 2008/09, and 5.6% of Canadians are now diabetic (Public Health Agency of Canada [PHAC], 2011, p. 17). Epidemiological trends are also changing among youth: 20 years ago, new-onset diabetes among children was almost exclusively T1D. Today, up to 45% of children with new-onset disease will be diagnosed with T2D (Aye & Levitsky, 2003). In Canada, the increase in incidence rates over the last decade have been strongly encouraged by new diagnoses in those from age 1 to 19 (PHAC, 2011).

T2D has rapidly increased alongside the rise and growth of neoliberal governance. Neoliberalism has evolved as a hybrid hegemony blending deregulatory systems with state interventionism (Navarro, 2007b). As a natural complement to the unrelenting need for the production of capital and wealth, market constraints such as government regulations have declined, and neoliberal capitalism has become the means of freeing market constraints for such production. The neoliberal agenda has exponentially permeated global economics in the last 20 to 30 years as a revival of 19th-century laissez-faire economics; neoliberalism has hastened deregulatory processes, shifted manufacturing from richer to poorer countries, reduced the social wage, extolled privatisation and has enforced global free trade. Modern liberalism is a modified resurrection of the economic liberalism envisioned by Adam Smith in the late 18th century (McGregor, 2001). Developing in the last 20 to 30 years, this new liberalism emerged as a post-Keynesian movement and has formed the ideology for globalization (Conway & Heynen, 2006).

The definition, or more appropriately *conceptualisation*, of neoliberalism varies according to the disciplinary lens through which it is viewed. Neoliberalism is described as a political discourse that is diametric and multivocal, while concurrently acting as a mechanism by which to govern individuals at arm's length (Larner, 2000). Although its complex manifestations impair the ability to consolidate a finite definition, the neoliberal discourse is broadly one of deregulation, competition, free market, and neglect of the welfare state (Hursh & Henderson, 2011). Systems imposed by the state that enforce privatisation and the freedom of trade collectively adhere to the neoliberal ethos (Harvey, 2005). The result is an ideology that—through the veil of liberalism—has permeated and controlled not only economic, but also broader political and social processes. In other words, the freedom of market and trade has increasingly permeated into *all* aspects of human consciousness as a pervasive neoliberal ideology (Allman, 2007). In this respect, it is argued that neoliberal capitalism is different from the liberal market envisioned by Adam Smith; the *new* liberalism is not simply a political entity, but an entity penetrating all spaces of existence and embedding all social spaces within a marketised understanding (Read, 2009).

A welfare-based society is inconsistent with the neoliberal agenda, so regulatory policies that have the potential to reduce the generation of profit are therefore minimalised. Such policies vulnerable to neoliberalism include those protecting human rights, labour rights, and environmental protection policies (McGregor, 2001). Within the guise of deregulation, economic autonomy, and personal freedom, there exists a most subtle and supremely powerful presence of control. Purcell defines this apparent dichotomy as an “*aidez-faire*” logistic (Purcell, 2008, p. 15). The *aidez-faire* (or interventionary) facet of the neoliberal zeitgeist is not without strategic benefits: political intervention, as a way that

promotes market sustainability, is not only acceptable to the neoliberal trajectory but also sanctioned. For the sustained power of the market economy, policies to control inflation, public intervention to nurture streamlined and efficient infrastructures, cooperative public–private partnerships, and disciplined approaches to employment/reemployment are valid devices (Purcell, 2009). The somewhat contradictory mechanisms that sometimes occur within the neoliberal environment are therefore reconciled; state intervention (in the form of bailouts or regulations that curb specific, unwanted competition) is appropriate when it is done to serve the best interests of the elite.

Consistent with Harvey’s commentary (2005), neoliberalism is a system in which the state creates the environment in which ruling or elite market interests flourish. Neoliberalism is made appealing to the populace by insisting the freedom of market and trade is a means by which to advance individual freedom. However, individualism is a regulated, or interventional freedom, that is in place to ensure the operation of political power. How one is *directed* to exert self-reliance and self-regulation is in alliance with governmental objectives (Lupton, 1999). As neoliberal ideology permeates all aspects of social, political, and economic existences, it emerges that the penetration is not one of political economy, but one of class; neoliberalism is a system of class protectionism. Therefore, for the sake of this thesis, neoliberalism is not recognised as a discrete theoretical form of political economy, but a means—somewhat contrapositive at times—to reinforce the self-interests of the elite.

As implied, neoliberalism will frequently be discussed as an *ideology*. The term carries with it any number of understandings, meanings, or conceptualisations. In this thesis, ideology refers to a system of symbolic forms used to propagate a hegemonic discourse and subsequent maintenance of unequal power relations. The system used is a means by which to

legitimise distorted representations of reality (McGuigan, 2011), or, perhaps more eloquently, “a closed system, self-fulfillingly accurate within its own parameters” (Naidoo, 1986, p. 82). Neoliberal capitalism, while claimed and fortified as the means to propagate global well-being, has catalysed social inequality (Navarro, 2007a) and destabilised many of the social structures it claims to strengthen.

Another term referenced throughout the thesis is the *ecological* settings or domains of health. The *ecological model* of childhood development was the result of Bronfenbrenner’s (1979) experimental work and has since become a significant theoretical model on which broader human health trends and health promotion initiatives have been built. The ecological model places human development within the influences of a layered, multifaceted environment consisting of micro-, meso-, exo-, and macrosystems. Although variations exist according to context, the spheres of influence broadly represent the individual (the child), his/her family, the community, and lastly the societal and political environment. With this perspective, the ecological model specifically aims to deviate from individual and interpersonal interactions as primary agents for human development and well-being. Instead, the model places equal importance on the broader, multilayered environmental influences and the nonsocial aspects of these interactive relationships (Bronfenbrenner, 1979). It is a model used in a variety of adaptations that lends itself to understanding the multifactorial aspects of health and disease in general (Ahem & Hendryx, 2005; Grzywacz & Fuqua, 2000; Karpati, Gakea, Awerbuch, & Levins, 2002), and the broader social framing of health promotion programmes (Green, Richard, & Potvin, 1996; McLeroy, 1988; Stokols, 1996). Therefore T2D, as a disease shaped and modified by forces external to the individual, serves to be recognised and discussed in relation to social ecological systems.

Situating Myself

During my career I've worked as a medical technician, an osteopathic practitioner, and most recently as a college professor teaching anatomy, physiology, pathophysiology, and health promotion. When I was studying osteopathic medicine, T2D was described as a disease resulting from overeating and not exercising. It was a disease I saw with increasing regularity while in clinical practice, but it was when I began to teach about the disease myself that I started to view the epidemiology of T2D with particular interest. First, I noticed that over time I was required to teach more about the condition, incorporating it somehow in all terms of anatomy, physiology, and pathophysiology. Second, my students over the years seemed to be working more frequently with diabetic patients, and these patients were presenting with increasingly complex illness. I found it difficult to rationalise that individuals were simply caring less about themselves, which in the extreme resulted in amputations, renal failure, and blindness. How could the disease become so apparent on a global scale, and how did our approach to care evolve the way it did? These were questions unanswered in my diabetes lectures and in the pathophysiology textbooks I was familiar with. Was what I was teaching in the classroom therefore a valid representation of T2D?

There are other aspects of healthcare that I have been compelled to reflect upon. During my hospital work and osteopathic medical studies in the United Kingdom, I navigated within a two-tiered healthcare system. The National Health Service was in place to provide healthcare to all, but the predilection for 'Harley Street' (or private) care was a pernicious undercurrent in British culture. Receiving care from the National Health Service was adequate; however, to visit the private physician on London's Harley Street projected the clear appearance that one was *particularly* important, and probably affluent. It therefore

became apparent to me, having grown up in Ontario, where there has been some obligation to preserve medical care in the public system, that the British environment was one that catalysed social stratification and elitism. This was unsettling for me, and it motivated me to discover what inequities exist in our own healthcare, how the social distribution of disease is being perpetuated, and if the social relations that shape health and the expression of disease are being replicated in the classroom. T2D became the avenue in which to explore the social climate of disease causation, and perhaps the broader forces of power differentials that affect the framing of health and illness in society. T2D seemed particularly appropriate for this type of study, as the overwhelming evidence suggests that the sharp increase in the prevalence of this disease was due to social determinants.

Outline of Thesis

Following the introduction, chapter 2 presents an in-depth reflection upon the social determinants of health and how T2D is understood as a socially mediated disease. Chapter 3 provides an overview on how neoliberal policies affect population health. It concludes with a review of the literature that investigates how, and to what extent, chronic diseases are situated and presented within neoliberal understandings. Chapter 4 introduces the theoretical framework of the research. Critical discourse analysis and Michel Foucault's observations on power relations within a neoliberal society are discussed. The chapter also outlines how the two theoretical premises integrate and complement one another for the purpose of this research. Chapter 5 presents the methodology of the research and describes in detail the content analysis procedure used in this research. Chapter 6 presents the findings of the research initiative, and chapter 7 discusses and reflects upon the data. Chapter 8 consists of a

conclusion, limitations of the study, implications for education, and recommendations for future research.

Chapter 2

The Social Determinants of Health

To appreciate how chronic disease is intrinsically linked with social ecology, several items will be examined. Health is in part the result of behavioral choices, but these choices are situated, and therefore transmuted, by a wide variety of external influences. Ultimately, the determinants that influence the physiological and psychological being are broad reaching, and include social, political, and economic variables. Together they collectively create environments that shape not only a particular health ecology, but also the ways in which diseases are understood and treated.

In this thesis, T2D is presented as a disease that is socially produced. Furthermore, it is also argued that within certain situations it is conceptualised and discussed in a framework consistent with neoliberal ideology. The chapter therefore begins with an explanation of the social determinants of health and an overview of how health and illness rest within a broader ecology. Because T2D is the representative disease for this undertaking, the chapter will conclude with a reflection upon the ways in which T2D is formed by the current social, political and economic paradigm.

Components of the Social Determinants of Health

The social determinants of health span the factors that influence health and well-being external to biomedical risks. They include a variety of factors that extend beyond the intrapersonal to include both social and economic situations in which individuals exist. In spite of the current trend that witnesses an epidemiological emphasis on individual risk factors, the broader socioeconomic context in which individuals live—embracing such

elements as social support, the physical environment, occupation, and access to education—have a profound impact on health directly and strongly mediate health-related behaviours.

Early observations of how socioeconomic factors contribute to health were by Friedrich Engels after observing the working conditions of labourers in England in 1844 (Engels, 1845/1987), and Rudolf Carl Virchow who made significant contributions to social medicine (Brown & Fee, 2006). By the early 20th century North America, there was a significant increase in longevity. While it is postulated that momentum in stemming early mortality was the result of the genesis of modern biomedicine and the advancement of medical technology, this premise has been countered by numerous alternative explanations. McKinlay and McKinlay (1977) highlight that, since 1900, chemotherapeutic and prophylactic medical measures were for the most part introduced well after marked declines in mortality caused by infectious diseases took place. More plausibly it was improvements in social conditions including housing, nutrition, sanitation and clothing (Preston, 1977) that catalysed improvements in population health (Evans, 1994; House, 2002).

Even after improving the risk factors associated with disadvantage, however, there still exist health disparities both nationally and internationally (Wilson, 2009). Today, communicable diseases continue to prevail in populations identified as disadvantaged, both in economic terms and in social terms where policies mediate health inequities (Labonté & Schrecker, 2006). Additionally, chronic diseases are represented in an unequal distribution throughout the population; they are today disproportionately prevalent in lower socioeconomic populations as tuberculosis and smallpox were at the beginning of the last century.

When considering the health of a population, it is therefore necessary to recognise that societies, cultures, and political structures combine to form a complex matrix of variables that mediate the shape of health at any given time. These variables—that influence risk, morbidity, and the management of disease—also influence one another in an organic, interrelated relationship. Therefore, not only are social determinants of health difficult to conceptualise as discrete entities, they are inherently fluid with time. An adjuvant consideration is how exhaustive the list of social determinants might conceivably be. For example, safety in the workplace and clean drinking water are arguable determinants of health—and although not entirely ubiquitous throughout Canada—are relatively assured and secure through policies and regulations.

To generate a foundational realisation of the social determinants of health in which to locate this study, the Key Determinants of Health section, as identified in *Toward a Healthy Future: Second Report on the Health of Canadians* (1999), is of importance. This public policy report was produced by an advisory committee representing federal, provincial and territorial interests. In collaboration with Statistics Canada, Health Canada, the Centre for Health Promotion at University of Toronto and the Canadian Institute for Health Information, the report summarises the health of the nation. Moreover, it was produced to serve as a means to advise the Conference of Deputy Ministers of Health on how to improve the health of Canadians through a more integrated approach to healthcare (Federal, Provincial and Territorial Advisory Committee on Population [FPRACP], 1999).

This segment of the literature review will explore and describe the individual components that collectively generate what is understood to be the social determinants of

health, after which T2D will be situated and elucidated within an understanding of social determinants.

The Socioeconomic Environment

The socioeconomic environment incorporates a range of factors impacting population health, generally understood to include income, occupation, and education. Collectively they are a robust predictor of health, although the ways in which they interact—and what discrete factor has the most profound effect—is less clear (FPRACP, 1999; Raphael, 2006).

Irrespective of the ways in which socioeconomic factors intermingle and influence one another, what *is* known is that health responds to social factors. Globally, including the wealthiest nations of the world, individuals who are more socioeconomically compromised have higher mortality rates (World Health Organization [WHO], 2003). This phenomenon is apparent irrespective of the variations in which socioeconomic position was measured and from what disease (infectious or noninfectious) the morbidity and mortality is caused (Kaplan, Haan, Syme, Minkler, & Winkleby, 1987). The link between socioeconomic status and health is not simply a reflection of have or have not but also to what degree socioeconomic level exists; the distribution of health is such that with each incremental increase in socioeconomic status, there is an incremental decrease in rates of illness. Furthermore, morbidity and mortality as it relates to social gradients is a reality that affects the lives of children as well as adults (Marmot, 2005). Below is an elucidation of the components that collectively comprise socioeconomic status, and their correlation with population health outcomes.

Income

Income serves as a means of determining health in a number of ways. Absolute poverty results in absolute material deprivation and therefore increased mortality. However, some countries where income is low have healthy populations (Marmot, 2005). Conversely, within the world's richest countries where a standard of health is perhaps assumed or expected, there exists wide discrepancies in health status; those with higher incomes have better health than those with low incomes (Karlsson, Nilsson, Lyttkens, & Leeson, 2010; Kondo et al., 2009). As an example, in Canada, men in the highest income bracket will live 6.3 years longer than men in the lowest income level, and live over 14 more years free of disability (Robine & Ritchie, 1991). Therefore, absolute income, while noteworthy, is not wholly responsible for health: if this were the case, the economic prosperity of developed nations would thwart health inequalities among the population (Wilkinson, 1997).

Instead, there exists a *relative deprivation* of health, which not only serves to express a broader understanding of social functioning (Marmot, 2005), but also creates a clear means by which to gauge the distribution of health among a population. Within wealthy nations at least, the stratified distribution of health may be explained by the *income inequality hypothesis*; an idea that has evolved from Wilkinson's foundational paper, "Income Distribution and Life Expectancy" (Wilkinson, 1992). This hypothesis predicts that health integrity is influenced by not simply wealth or lack thereof, but by an equal distribution of incomes (Kawachi & Kennedy, 1999) within a country.

There are many explanations put forward for the correlation between health and income inequality. Supportive social institutions such as civic participation, interpersonal

cooperation, social cohesion, reciprocity, and trust are components of social capital (Franke, 2005), which erodes under the influence of income stratification and inequality. Adverse health outcomes are impelled and perpetuated when any of these factors of social capital are compromised (d'Hombres, Rocco, Suhrcke, & McKee, 2010; Holtgrave & Crosby, 2003; Kawachi et al., 1997; Subramanian & Kawachi, 2004). An increase in mortality is associated with deficient social cohesion (Kawachi & Kennedy 1997), and it is suggested a strong sense of coherence among individuals equates with a 20% reduced risk of all-cause mortality (Wainwright et al., 2007).

Residential concentrations of income can additionally propagate an increase in local crime and violence (Daly, Wilson, & Vasdev, 2001; Elgar & Aitken, 2011; Kennedy et al., 1998), likely attributable and catalysed by the inherent coexistence of psychosocial distressors, sense of trust and social cohesion (Wilkinson, Kawachi, & Kennedy, 1998). Physical harm is not limited to interpersonal conflict, however. Raphael et al., (2005) supports this argument by impressing poverty not only limits people from achieving the relational prerequisites for health but also generates personal anxiety and stress. The psychophysiological impact of social situation is not exclusively limited to absolute poverty; neuroendocrine function is moderated by income *inequality* and the inherent emotional burden that accompanies it (Fitzpatrick & LaGory, 2000). The negative psychosocial manifestations of invidious social comparison (Kawachi & Kennedy, 1999; Zimmerman & Bell 2006; Wilkinson, 1996) have been offered as hypotheses to explain income inequality and health outcomes. General levels of psychosocial stress and depression are associated with income inequality, and they combine to create a complexity of psychological burdens—particularly in those stratified in lower income levels (Kahn, Wise, Kennedy, & Kawachi

2000; Muramatsu, 2003; Wilkinson, 1992). For example, from the Whitehall II cohort it was found that office staff moving from public to private sector employment developed more heart disease, hypertension, weight gain, and psychological distress than those remaining in the public sector (Virtanen et al., 2010).

The unequal distribution of income affects not only adults physically and psychologically, but children as well. Childhood well-being is vulnerable to income maldistribution (Emerson, 2009; Pickett & Wilkinson, 2007) in ways that affect both psychosocial (Elgar, Craig, Boyce, Morgan, & Vella-Zarb, 2009; Levin et al., 2011), and physical (Nkansah-Amankra, Dhawain, Hussey, & Luchok, 2009; Olson, Diekema, Elliot, & Reiner, 2010) aspects of the child. Inequality asserts its compromising effects at the onset of life, generating low birth weights (Davey Smith, 1996) and increased mortality rates (Davey Smith, 1996; Waldman, 1992) in infants where income inequality is most profound.

Unfortunately, consistencies across research initiatives within the field of income maldistribution have been elusive, calling into debate the significance and legitimacy of the income inequality hypothesis. These inconsistencies are contested, however: when critically analysed, findings that do not support the income inequality hypothesis are based on measurements taken from small regional or geographic areas (Kondo, 2011; Subramanian, Blakely, & Kawachi, 2003; Wilkinson & Pickett, 2006), and discard control factors that are not necessarily confounders but mediators between inequalities and health (Subramanian, Blakely, & Kawachi, 2003; Wilkinson & Pickett, 2006). Overall, the vast body of literature that suggests a correlative effect (Wilkinson & Pickett, 2006) warrants consideration. In an effort to homogenise and link the connection between income inequality and health there are alternative explanations: a thoughtful hypothesis by Lynch, Davey Smith, Kaplan, and House

(2000) explores the notion that the political and economic forces generating income inequality are the same forces that engender compromised social welfare policies, substandard working conditions, and deficient public resources. Understanding deficits in social cohesion as instigators for poor health misses the point when broader social injustices (be it class, gender, or racial tensions) continue unchecked (Muntaner & Lynch, 1999). Coburn's contribution (2004) complements Lynch et al. (2000), in that his premise insists critical attention needs to be paid to the social conditions in which income inequality evolves. Income inequality is a symptom of misaligned political and economic strategies, alongside poor health.

With these insights in mind, it behoves attention that income inequality aggravates a deflection from the democratic process, whereby political policies favour the selected interests of the elite to the detriment of the disadvantaged (Kawachi & Kennedy, 1999; Lawson & Wilson, 1995; Davey Smith, 1996; Veenstra, 2002). There appears to be a self-perpetuating momentum towards health inequality; socioeconomic policy nurtures inequality, and the outcome preserves the decisions and policy implementations consistent with health disparity. A holistic and ecological approach offers a rich and inherently solid basis upon which to build an understanding of epidemiological trends in chronic disease and to the fundamental roots of health gradients within affluent countries.

Occupation

Employment status and income are related to personal assets. There are ample findings in how the experience of employment (as well as underemployment and unemployment) shapes the health of individuals.

As discussed, income inequality influences the representation of chronic disease in populations. Within the workplace however, it appears other forces are engaged. In the Whitehall and Whitehall II studies, it was observed that the health effects of income distribution were trumped by the effects of employment hierarchy. Looking at employment grades within the British civil service, the Whitehall studies were therefore based upon a population in which the very rich and very poor were eliminated. Within this cohort, a clear inverse relationship was identified between health and employment status; a subordinate British civil servant was more prone than his colleagues slightly higher on the social gradient to both chronic and acute illness, including increased mortality. As employment status incrementally increased, the chance of suffering ill health declined (Marmot et al., 1991). The Whitehall studies collectively formed the cornerstone for other international research initiatives on the social *gradient* and health, and the phenomenon (with few exceptions) is international (Borg & Kristensen, 2000).

These core findings indicate how stratification, particularly within the workplace, generates implications for health. Borg and Kristensen (2000) reported low influence at work and high job insecurity as strong predictors of self-rated health, particularly among those in low working classes. An important study by Karasek, Baker, Marxer, Ahlbom, and Theorell (1981) demonstrated that demands on the job in conjunction with low decision latitude generated psychological strain and stress-related illness, including cardiovascular disease. Later research separated decision latitude from job control, established a consistent measure of job demand, and replicated the findings (Wall, Jackson, Mullarkey, & Parker, 1996). Unfairness in the workplace (defined as treating someone in a way that is unreasonable or not right) is associated with elevated biomarkers for coronary events and impaired health

functioning (De Vogli, Ferrie, Chandola, Kivimäki, & Marmot, 2007). Workplace stress is responsible for absenteeism and premature death, and general health is compromised when individuals are unable to use their skills or exercise decision making on the job (WHO, 2003). After correcting for preexisting risk factors, justice in the workplace (which includes not only the ability to contribute to decision making but understands decision making as fair, consistent, and respectful) independently affects physical and mental health (Kivimäki, Elovainio, Vahtera, & Ferrie, 2003; Kivimäki et al., 2005).

Structural relations within the workplace impacts health, as does the degree to which individuals are employed and the type of work engaged in. In Canada, unemployment and underemployment have a particularly negative effect on those with low education, youth and Aboriginals (FPRACP, 1999). Temporary employment coexists with higher rates of mortality among men and women, similar to unemployment (Kivimäki, et al., 2003). This risk is reduced when full time employment is secured. In general, low-paying and lower class work tends to involve more repetitive work with greater ergonomic, physical, chemical and climatic exposures (Borg & Kristensen, 2000).

Education

A third component of the socioeconomic paradigm is education. The interplay between education, income, employment, and health is again complex and difficult to consider through a reductionist lens. While education serves as a catalyst to securing income it also mediates health in its own right through securing literacies, self-empowerment, and decision-making skills (Mirowsky & Ross, 2003). For example, women having attained little formal education were not only suspicious about the benefits of eating a healthy diet, but also

were limited in controlling family eating patterns, less likely to seek support for eating well, and perceived greater constraints to seeking healthy food choices for themselves and their families (Lawrence et al., 2009). Mortality rates among cancer patients are inversely related to education achieved (Cokkinides, Geller, & Jemal, 2012), likely influenced by decision making regarding early screening and receiving more aggressive treatment (Kinsey, Jemal, Liff, Ward, & Thun, 2008). Literacies, including reading (DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004), numeric (Montori & Rothman, 2005), scientific and civic (Zarcadolas, Pleasant, & Greer, 2005), all mediate health outcomes. Education therefore is a congruous factor when considering trends in morbidity, mortality, and the shaping of health behaviours.

The Physical Environment

One's surroundings have a profound effect on health. Surroundings such as local housing conditions, community-level physical features, or broader environmental trends all act as determinants of health status.

Housing conditions mediate the health of dwellers, and children are particularly prone to the effects (FPRACP, 1999). Inadequate ventilation, mold, lead paint, and cockroach droppings within the home (particularly low-income housing complexes) generate poor health and population health disparities (Hood, 2005; Krieger & Higgins, 2002; Rauh, Landrigan, & Claudio, 2008). Illnesses such as lead poisoning (Leighton, Klitzman, Sedlar, Matte, & Cohen 2003), asthma (Shaw, 2004), and mental health challenges (Evans, Wells, Chan, & Saltzman, 2000) are also associated with poor physical housing quality.

Community-level conditions generate environments that also affect physical and psychological health, particularly in urban surroundings. The effects of heat islands in built

environments increases the risk of respiratory distress, renal failure, cardiovascular incidents and heat stroke mortality, particularly in the elderly and socioeconomically disadvantaged (Kovats & Hat, 2008; Patz, Campbell-Lendrum, Holloway, & Foley, 2005). Access to green space is associated with improved self-reported health (Maas, Verheij, Groenewegen, de Vries, & Spreeuwenberg, 2006) and facilitates physical activity (Lee & Maheswaran, 2010). A sense of social interaction and support in neighbourhoods that are safe and resource rich promotes mental health (Evans, 2003), while sidewalks, and access to adequate public transportation have a positive influence on reducing unintentional injury and death (Pucher & Dijkstra, 2003).

Currently, the driving agenda for the international production of goods and transglobal trade has spurred environmental degradation to an alarming extent. Environmental factors such as hygiene and exposure to infectious illness, food additives and soil quality, presence of industrial chemicals, pesticides, and pollution are estimated to be responsible for one quarter to one third of ill health globally (Smith, Corvalan, & Kjellstrom, 1999). Perhaps not surprisingly, the burden of disease due to environmental factors is heaviest among the poorest nations of the world (Smith et al., 1999), and among the poorest segment of the population within countries (Elliott, Wang, Lowe, & Kleindorfer, 2004; Evans & Kantrowitz, 2002; Morello-Frosch & Shenassa, 2006). Depletion of the ozone layer and subsequent risk for skin cancer is one memorable example. The unfettered ubiquity of petroleum product use generates detrimental health effects to multiple systems (Kampa & Castanas, 2008) whether through the indirect effects of climate change (Hill et al., 2009) or direct exposures through industrial (Grandjean & Landrigan, 2006) and consumer use (Scélo et al., 2009). Growing interest in such ubiquitous components of our environment such as

bisphenol-a, arsenic, parabens, and a range of persistent organic pollutants (POPs) is also producing significant gains in the understanding of how they are detrimental to health. As research moves from animal to human observation, so too are ideas regarding the damaging effects of environmental toxins in both adults (Duty, Manori, Barr, Brock, Ryan, & Chen, 2003; Evans & Kantrowitz, 2002) and children (Grigg, 2004; Morello-Frosch & Shenassa, 2006).

The effects of environmental pollutants and chemical toxins on health are multiple, and exposures to such chemicals occur in a wide variety of settings. The effects of urban air pollution on cardiovascular (Pope et al., 2004) and respiratory disease (Ling & Eeden, 2009) are well reported and predictably, those living in the most compromised urban situations are much more likely to succumb to pollution-related health events (Arden Pope, Ezzati, & Dockery, 2009). In fact, what is overwhelmingly obvious is that while all are affected by environmental place, the socioeconomically disadvantaged bear a significant burden of environmental related illness, whether through exposure to air pollution, hazardous wastes, occupational exposure, overcrowding, and substandard housing (Evans & Kantrowitz, 2002). Pesticide exposure (whether within the agricultural industry, the home, or ingested in the diet) creates significant positive associations with several cancers, neurological, mental, and endocrine diseases (Cohen, 2007).

More research is required in the understanding of persistent, low-grade exposures to environmental toxins. While exposure to single toxins and subsequent health effects are theoretically easy to elucidate, the more likely effects of multiple interactions raise methodological challenges (Cohen, 2007). Until large amounts of data are pooled, measured and assayed, there will be gaps in the understanding of how multiple exposures to toxins

impact health (Hunter, 2005). Meanwhile, existing evidence does identify the negative synergistic effects of tobacco smoke and asbestos exposure (Vainio & Boffetta, 1994) on health, and such combinations as heat and air pollution (Rainham & Smoyer-Tomic, 2003). It is therefore reasonable to assume more symbiotic relationships exist among environmental toxins that will become noteworthy as more systematic and controlled research initiatives are undertaken.

Healthcare Services

Healthcare services as a social determinant broadly encompasses utilization patterns, quality of delivery, financing, and allocation of resources (Braveman, 2003). The presence, effectiveness, and accessibility of certain healthcare services within a country have an influence on health outcomes. However, viewing health services as a broad panorama results in abstractions, oversimplifications and oversights; deconstructing the facets of healthcare provision highlights specific areas of efficiency, shortcomings, and dichotomies.

There is a degree of contention regarding the sole significance of modern medicine on epidemiological trends in public health. According to Poland (1998), it is somewhat ambiguous whether healthcare—viewed in its broadest sense—has had a *significant* impact on overall morbidity and mortality. Healthcare has summoned technologies that augment the management of many diseases and conditions, but social, environmental and dietary changes (health determinants) ushered noteworthy reductions in mortality (McMichael & Beaglehole, 2000).

Legislative actions are another way of ensuring public health. Broad sweeping public health policies help to ensure the safety of a population. In Canada, health protection policies

impact population health, and include such directives as legislations enforcing seatbelt use and wearing of bike helmets, (FPRACP, 1999) or immunization initiatives. Overall, while there is contention regarding the way and the degree to which medical interventions have improved population health, it has provided encouraging gains in many ways. Medical intervention has reduced case fatality rates, has played a significant role in improving quality of life, has improved palliative care, and has assisted with the management of chronic disease (Poland, Coburn, Robertson, & Eakin, 1998).

In Canada, as in many developed nations, there is universal healthcare for medical conditions. Access to care is not limited by income, and universal care has assisted in moderating the impact of the income barrier (Poland et al., 1998). While the public health agency impresses that accessibility to healthcare services is universal irrespective of income, this theoretical trope is qualified. Access disparities in Canada exist, particularly on the basis of race, immigrant status, education, and indeed income (Lasser, Himmelstein, & Woolhandler, 2006), with the most extreme example being the difference in morbidity and mortality between Aboriginals and the rest of the Canadian population (Frohlich, Ross, & Richmond, 2006; Health Disparities Task Group, 2004). Disparities in Canada are much less pronounced than in the United States, however, largely due to universal coverage (Lasser et al., 2006). Overall, in most Western countries there is a noteworthy fall in mortality rates. In tandem with increasing healthcare spending, however, there is an increase in social differences and health; explainable more by *inequalities* in health rather than the deteriorating health of the lower social class (Borg & Kristensen, 2000). Health is therefore dependent upon SES, and access to healthcare reduces mortality, disability, pain, and distress (Health Disparities Task Group, 2004). But the broader policies that affect the social

conditions shape the experience of the disease (Willson, 2009). In other words, methods that seek to reduce the impact of economic difference modify health outcomes, above and beyond access disparities.

Early Childhood Development

Ecological influences impart consequences on the health of the newborn and child. Childhood circumstances—including socioeconomic status—have a direct influence on adult health through the accumulation of advantage or disadvantage (Raphael, 2010). However, childhood disadvantage is also able to impart adult adverse health outcomes, irrespective of later life circumstance (Poulton et al., 2002).

The socioeconomic status of parents and children alike influences health outcomes. Neonatal motor and cognitive development is vulnerable to maternal stress via modifications in neonatal adrenal function (Davis & Sandman, 2010), as is maladaptive infant temperament (Davis et al., 2007). Adult offspring exposed to prenatal stress are more at risk for depressive disorders (Tamura, Sajo, Kakita, Matsuki, & Koyama, 2011). Maternal nutrition, whether overnutrition (Rooney & Ozanne, 2011) or undernutrition (Black et al., 2008) affects birthweight, subsequent growth patterns and metabolic integrity in the child. Furthermore, maternal exposure to teratogens (often mediated by social circumstances) generates a multitude of negative health outcomes in the child, both physical and psychological (Bradley & Corwyn, 2002; Vrijheid et al., 2000).

Another aspect of childhood development is childcare and early childhood education. Particularly among children of lower income families, quality childcare improves scholastic achievement in middle childhood (Dearing, McCartney, & Taylor, 2009), and overall

cognitive and language performance (Sylva et al., 2011). Since the 1970s, the growth of income for those under 45 years of age has stagnated or declined. Additionally, over half of women with young children are employed outside of the home, and shift work is increasing (McCain & Mustard, 1999). In Canada, only Quebec has a universally accessible public system for childcare. Less expenditure is dedicated to childcare in Canada than most other OECD nations (Bryant, Raphael, Schrecker, & Labonté 2011). This is unfortunate in light of the evidence that national social policies that provide and support access to regulated, high-quality day care centres and early childhood education are beneficial. For children of lower income families, the positive impact is particularly strong (Bryant et al., 2011). Universal access to day care is said to narrow the achievement gap in education between the children of low-income and higher-income families (Boocock, 1995). The benefits of universally accessible childcare are said to extend into adulthood, contributing to lower attrition rates in higher education, greater labour market attachment, and lower rates of welfare dependency (Havnes & Mogstad, 2009).

Biology and Genetic Endowment

Familial genetic patterning can drive biologic functioning and gene expression, and certain inherited genetic patterns leave offspring both susceptible to and resistant to certain diseases (Mucci, Wedren, Tamimi, Trichopoulos, & Adami, 2001). However, the environment in which one exists also radically influences genetic expression and ultimate behaviour. Environmental factors have not only immediate effects on gene expression, but are also able to influence gene morphology in ways that are inheritable in subsequent generations. Familial or inherent genetic endowment is therefore of note, but ecological processes and how they impact physiologic behaviours cannot be disregarded.

Biological and genetic manifestations are readily apparent when looking at early nutritional status, including growth patterns in children (Evans, 1994) and metabolic patency in offspring (Bruce & Hanson, 2010; Criscuolo, Monaghan, Nasir, & Metcalfe, 2008). They are also evident in many environment–gene interactions resulting in higher incidences of certain cancers (Fraumeni, 2002.), heart disease (Ordovás & Smith, 2010), and autoimmune diseases (Costenbader, Gay, Alarcón-Riqueime, Laccarino, & Doria, 2012). Social isolation and psychological environments are predicted in maladaptive gene function for both cancer (McClintock, Conzen, Gehlert, Masi, & Olopade, 2005) and behavioural challenges (Cacioppo, Berntson, Sheridan & McClintock, 2000; Fox et al., 2005). The biological or genetic influences on health require careful consideration. What is embedded in foundational DNA sequencing and carried from one generation to the next is much different from the modulation of genetic behaviour that occurs as a result of environmental interactions. Disregarding this point nullifies the necessity for securing a social ecology that accords a healthy population.

Personal Health Practices and Coping Skills

Individual resources are multiple, and are loosely categorised as social, economic, or biological. Several of these variables have been linked to improved health status, at least at the aggregate level (Blakely, Kennedy, & Kawachi, 2001; Kawachi et al., 1997). Examples of individual resources include measures of social cohesion, such as the propensity of individuals to join voluntary organizations.

Psychosocial characteristics are also important in health outcomes, and include interpersonal trust, one's sense of control, and overall satisfaction with life. Each of these

variables has been found to be associated with individual health in various studies (Bosma, Schrijvers, & Mackenbach, 1999; Marmot & Wilkinson, 2006). Complementary to these findings are data supporting a relationship between lack of social trust and increased mortality rates (Kawachi et al., 1997). Social isolation is also inversely and significantly related to health (d'Hombres, Rocco, Suhrcke, & McKee, 2010).

Volitional choices about health and related behaviours influence personal health outcomes. Choices about physical activity, dietary practices, smoking, and alcohol consumption correlate closely with the major chronic diseases (Li, Daling, Porter, Tang, & Malone, 2009; Maahs, Snell-Bergeon, Ogden, Kinney, & Rewers, 2009; Mokdad et al., 2003). However, when behaviour is reduced to simple voluntary actions deconstructed from the ecological environment in which it exists, the true understanding of how it manifests as a social determinant is lost. Smoking is one example of a behaviour detrimental to health that is also consistently linked to low educational levels (Wetter et al., 2005), income (Haustein, 2006), and working class (Barbeau, Kreiger, & Soobader, 2004). Alcohol consumption mirrors this epidemiological trend. Dietary habits (Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005) and inclination to physical activity are other examples (Cerin & Leslie, 2008). Further, those having survived acute myocardial infarction—if of a lower socioeconomic status—were still reluctant to adopt behavioural changes post-infarction (Chan, Gordon, Chong, & Alter, 2008). Indeed, as socioeconomic status (determined by education attained, income level *or* wealth) declines, risky health behaviours increase (Lowry, Kann, Collins, & Kolbe, 1996; Wray, Alwin, & McCammon 2005). It is posited that unhealthy behaviours and attitudes are an expression of maladaptive coping mechanisms in response to social and material deprivation (Raphael, 2010).

It is necessary then, to locate behaviour within an influential social ecology. Understanding behaviour and coping only within a broader ecological paradigm will solidify an understanding of why behaviour change is not only difficult to provoke but equally difficult to sustain. Furthermore, social determinants in themselves, independent of how they influence behaviour, require attention if there is to be significant impact on public health.

The Ecological Risk Factors for Type 2 Diabetes

The impact of T2D healthcare costs, quality of life, and productivity is enormous. In Canada, more than 50% of those affected with diabetes are working age (Public Health Agency of Canada [PHAC], 2011). Performance quality, safety, income, and rate of absenteeism in the workforce are all impacted by the presence of diabetes in those employed (Kraut, Walld, Tate, & Mustard, 2001). Individuals with diabetes self-report poorer health than healthy individuals of the same age (Glasgow, Ruggiero, Eakin, Dryfoos, & Chobanian, 1997; Maddigan, Feeny, & Johnson, 2005; PHAC, 2011). Additionally, diabetic patients access medical care roughly twice as often as those without diabetes (PHAC, 2011), and when hospitalised, spend between 1.5 and 6 times more days in-patient than non-diabetics (PHAC, 2011). The consistent access to care and regular monitoring required for stabilising the condition requires a strategic multidisciplinary medical infrastructure. In the United States, in spite of more than a doubling of healthcare expenditures within 5 years, the average American with diabetes received only half the recommended processes (glycosylated haemoglobin, serum glucose, and blood pressure monitoring) needed for adequate management of the disease (McGlynn et al., 2003). It is an unfortunate situation, particularly since the incidence of T2D has trebled in the US over the last 25 years (Centers for Disease Control and Prevention [CDCP], 2011).

Social Determinants of Health and Diabetes

With rapid changes in socioeconomic developments over the last several decades, T2D is now thought to be one of the most common causes of death in most countries (Zimmet, 2000). Like other communicable and noncommunicable diseases, the epidemiology of T2D arguably reflects the social, political and economic environment in which it rests.

A meta-analysis by Agardh et al. (2011) investigating research on social determinants and incidence of diabetes solidifies an inverse association between socioeconomic position and T2D in all countries. Socioeconomic status (framed in terms of annual income and attained education combined) clearly correlates with raised biomarkers consistent with T2D in an inverse relationship, irrespective of lifestyle behaviours (Kavanagh et al., 2010). Research investigating self-reported quality of life as it applies to health mirrors this same inverse relationship (Maddigan, Feeny, & Johnson, 2005). The level of occupational class and wealth (Demakakos, Nazroo, Breeze, & Marmot, 2008) generate similar results. Those presenting with T2D are predominantly of low educational level (Kavanagh et al., 2010; Paile-Hyyärinen et al., 2009), of lower income (Dinca-Panaitescu et al., 2011; Kavanagh et al., 2010), or lower occupational class (Hayashino, Yamazaki, Nakayama, Sokejima, & Fukuhara, 2010; Kumari et al., 2008). Moreover, as income inequality grows, T2D is increasing. Within developed countries in which there exists a steep income hierarchy, there is a greater incidence of obesity and diabetes mortality (Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005).

As previously introduced, personal health practises and coping mechanisms are socially located and exist within an ecologic continuum. With this in mind, it warrants

reflection that the behavioural mechanisms supportive of T2D are similarly located. We see this phenomenon as it applies to diabetes manifest in multiple ways; psychological stress and coping behaviours participate in the expression of T2D, likely through the neurohypophysis—or *hypothalamic-pituitary-adrenal axis* (Mooy, De Vries, Grootenhuis, Bouter, & Heine, 2000; Rosmond & Björntorp, 2000). Emerging evidence points to higher rates of T2D among those suffering PTSD (Trief, Ouimette, Wade Shanaham, & Weinstock, 2006), depression (Golden, 2007; Mezuk, Eaton, Albrecht, & Golden, 2008) and vulnerable migrants seeking asylum in foreign countries (Agyemang, Goosen, Anujoo, & Ogedegbe, 2011). In a prospective study, Kumari, Head, and Marmot (2004) observed that impaired glucose control was significantly higher in those who were otherwise healthy but working in lower employment grades. Metabolic syndrome (which predisposes individuals to a number of chronic diseases including T2D) was found to be overrepresented in workers experiencing high levels of stress on the job (Chandola, Brunner, & Marmot, 2006). Likewise, workplace burnout (emotional exhaustion, fatigue and cognitive weariness) has been posited as a possible risk factor for T2D (Melamed, Shiron, Toker, & Shapira, 2006). A low sense of coherence in the workplace coupled with low decision latitude has also been shown to generate glucose intolerance and T2D (Agardh et al., 2003).

The work environment has also had a collateral effect on health. Consistent with changing workplace demands and the allocation of time dedicated to work and personal needs, chronic sleep deprivation is becoming increasingly common, with the average length of sleep shrinking from 8–9 hours in the 1960s to 6 hours or less within the last 10 years (Knutson, Spiegel, Penev, & Van Cauter, 2007). Sleep curtailment is yet another novel factor thought to contribute to T2D, largely due to its ability to provoke glucose intolerance and

insulin resistance (Yaggi, Araujo, & McKinlay, (2006). With the increase in habitual sleep deprivation over the last few decades, the resulting metabolic disturbances leading to compromised β -cell function are said to have had a significant impact on the incidence of T2D (Gangwisch et al., 2007).

Some research has contested the association between T2D and psychological stress, raising issues about consistencies in who develops glucose intolerance under stress and who does not (Kramer, Ledolter, Manos, & Bayless, 2000). However, social capital (encompassing social support, trust, and reciprocity) overall confers significant protection against obesity and diabetes (Holtgrave & Crosby, 2006). Moreover, while it is reasonable that coping mechanisms, sense of self-efficacy and social support are important variables requiring attention when interpreting epidemiological data, those with established T2D demonstrate greater glucose instability when under psychological stress (Lloyd, Smith, & Weinger, 2005; Surwit et al., 2002).

With the understanding that the situation of the child creates the foundation by which the determinants of health are built throughout the lifespan, it is important to recognise how childhood circumstance also mediates diabetes. For example, multiple childhood adversities act as strong predictors for adult obesity and poor glucose tolerance; physical abuse (or witnessing abuse), to less severe adversities (such as emotional neglect) increased risk of obesity by 20%–40% in adults, correcting for socioeconomic status (Thomas, Hyppönen, & Power, 2008). A disturbing trend in Canada is that in spite of the nation's wealth, the country demonstrates growing income inequality, family poverty, and declining children's health (Raphael, 2010). With respect to diabetes, a child's susceptibility is significantly influenced by the mother's body mass index (BMI), childhood growth patterns and eating patterns

within the home (Yach, Stuckler, & Brownell 2006). The gravida with an increased BMI is more likely to bear a child predisposed to obesity (Bartz & Freemark, 2011) and therefore T2D in later life. Concurrently, the gravida who develops gestational diabetes is more apt to deliver a child with macrosomia (high birth weight), and impaired insulin production. As the trend continues whereby more women are overweight and/or diabetic during pregnancy (Kim, Dietz, England, Morrow, & Callaghan, 2007), the incidence of T2D children will increase.

Paradoxically, it is not only maternal overnutrition that predicts childhood diabetes. Low birthweight also predisposes the child to T2D in later life (Goldenberg & Culhane, 2007; Whincup et al., 2008). However, not only does the nutritional status of the gravida affect childhood health, but so too does the nutrition provided to the infant and child. Children with interrupted growth patterns (implying nutritional deficiencies and/or poor living conditions) are also at greater risk for diabetes (Asao et al., 2006; Eriksson, Forsen, Osmond, & Barker, 2003). In the United States where adverse birth outcomes are relatively high for a developed country, preterm low weight and growth restriction are predominantly seen in infants of mothers who are Black or poor (Goldenberg & Culhane, 2007). However, childhood obesity is the main predictor of new incident diabetes (Goran, Ball, & Cruz, 2003), and the environment has a significant impact on risk for childhood overweight and obesity; in genetically stable populations, the prevalence of childhood weight gain is increasing rapidly with time (Maziak, Ward, & Stockton, 2008). A U-shaped relationship therefore exists; low and high birthweights both mediate T2D in the child to the same extent (Harder, Rodekamp, Schellong, Dudenhausen, & Plagemann, 2007). This finding is noteworthy in light of the

increasing levels of diabetes seen; childhood overnutrition with substandard food and undernutrition are both symptoms of disadvantage.

T2D has been set within different frames of reference in an attempt to understand its etiological underpinnings and the risk factors that leave individuals vulnerable to the disease. One frame of reference, in keeping with the molecularisation of the subject and the rise of biotechnology, is the genetic basis for being predisposed to T2D. Challenges arise with this reductionist approach to T2D however; T2D, when genetically expressed, is overwhelmingly polygenic,¹ often multigenic (whereby several different genetic combinations generate disease), and inexorably dependent upon ecological interactions (Froguel & Velho, 2001). Genetic variables, identified in the form of single nucleotide polymorphisms, appear to generate such a predisposition in genome-wide association studies. These studies have become the current mechanism of choice to identify single nucleotide polymorphisms and generate conclusions about the genetic susceptibility to a variety of diseases. T2D genome-wide association studies have unearthed novel pathways of disease causation, elucidated understandings of fundamental biological processes, and focused attention on specific physiological aberrations (Billings & Florez, 2010). Of those with the largest odds ratio, TCF7L2 (Franklin et al., 2010), PPARG (Lyssenko et al., 2008) and KCNJ11 (Gloyn et al., 2003) are gene variants of particular significance. However, supporting the multigenic premise, there now appears to be over 150 genetic susceptibility variants (McCarthy, 2010). These variations contribute to physiological conditions such as β -cell deficiency, insulin resistance, dislipidaemia, fat distribution (waist–hip ratio), impaired fasting glucose levels, and adipocyte dysfunction. Their clinical significance, however, is debatable (Feero et al.,

¹ An exception is maturity onset diabetes of the young (MODY). This is an autosomal dominant, monogenic form of diabetes affecting glucose metabolism and/or insulin production. It appears in youth and is very rare.

2008; Hunter & Khoury, 2008). To date, genome-wide association studies findings are limited to small sample sizes, are hard to generalise across ethnicities, and impossible to be separated from environmental interactions (Khoury, Valdez, & Albright, 2008). Although many loci have been targeted for T2D vulnerability, the susceptibility genes identified each in their own right confer a low-odds ratio of developing the disease (Das & Elbein, 2006; Khoury et al., 2008). With T2D, the high numbers of genetic variations that are implicated with the disease collectively confer a small effect size and are not reliable predictors of T2D in the clinic (Hu, 2011). Even when combined, the key loci account for only minimal family aggregate observations (Drong, Lindgren, & McCarthy, 2012). Moreover, genotype does not always confer phenotype, and those—where a genetic tendency to a specific disease happens to be strong—do not necessarily fall ill. Lastly, genetic studies cannot validate the rapid increase in the prevalence of T2D over the last 20 to 30 years (Hu, 2011). It is not that T2D is independent of genetic influence, but its existence cannot be empirically encapsulated by a neat, eloquent genetic explanation. Understandably, when viewed as an aggregate, it remains a challenge to focus and consolidate the specific aetiological factors for T2D.

In spite of the advances in the genetic understandings of the disease, the identified genetic variations only collectively confer a roughly 1.5% predictive power for developing T2D (Bogardus, 2009). It is therefore likely that a ‘composite’ of aetiological factors come together in complex ways to perpetuate T2D development, including gene–gene, gene–environment, and epigenetic interactions (Eckel et al., 2011). Epigenetic variations provide a particularly compelling genetic narrative. Epigenetic changes describe alterations in gene function that do not involve an alteration in nucleotide sequencing (Ling & Groop, 2009), and largely occur from environmental influences. Epigenetic variations are able to express

oncogenesis in the presence of carcinogens, and birth defects in the presence of teratogens. These changes, which include DNA methylations and histone modifications, are of particular interest in the development of T2D (Ling & Groop, 2009). As discussed previously, maternal nutrition influences offspring vulnerability to T2D, and it is through epigenetic modification that this occurs (Ling & Groop, 2009; Nolan, Damm, & Prentki, 2011).

Epigenetic phenomena may be of value in the discussion of T2D incidence in non-White populations. In North America, populations at risk are broadly identified as Hispanic, Black, or Native American. There are concerns, however, with these broad conclusions. First, as a group Hispanics, more than Caucasians in America, experience more poverty and the associated encumbrances: inadequate housing, unsafe neighbourhoods, underemployment and joblessness, crime, pollution, and disease (Abreu, Consoli, & Cypers, 2008). Additionally, the longer Hispanic immigrants remain in America and become acculturated to American behaviours and norms, the greater the risk of developing T2D (Perez-Escamilla & Putnik, 2007). A related issue of noteworthy value is acculturative stress, whereby new Hispanic Americans are needing to cope with such things as a new language, cultural values, and forming new friendships (Ahmed et al., 2009), and discrimination (Morandi & Risco, 2006). Second, the American Black population, still to this day, are subject to residential segregation that is not self-imposed, creating pockets of poverty that adversely affect educational opportunities, prospects for employment, equal access to healthcare (Williams, 1999), and increase the likelihood of food deserts (Moore & Diez-Roux, 2006), exposure to pollution, restricted areas for recreation (Landrine & Corral, 2009), and chronic stressors (Krishnan, Cozier, Rosenberg, & Palmer, 2009). Even when having obtained a higher education and personal income, living in a neighbourhood of lower SES confers a greater

risk for T2D among Black Americans (Krishnan et al., 2009). Exposure to food marketing might also play a compelling role in the distribution of obesity and T2D; food marketing targets ethnic groups (Grier & Kumanyika, 2008), and junk food advertisements are more replete in Black-oriented media, both for television programming (Henderson, 2005) and print, than in White-targeted media (Pratt, 1995). Racial discrimination persists and generates a chronic, pernicious stress that adversely affects physical health (Williams, Yu, & Jackson, 1997).

Third, while Native American populations (particularly the Pima Native Americans) are disproportionately at risk for T2D, indigenous points of view and historical understandings of disease among indigenous people are lacking. The story might be compelling. The Pima tribes that reside in Mexico are physically active, eat indigenous food, and rarely suffer from T2D (Schultz et al., 2006). In Arizona, Pima Indians have the highest incidence and prevalence of T2D in the world (Schultz et al., 2006). Through the effects of colonization, and marginalisation, it is more likely that poverty, poor nutrition, lack of opportunities and minimal resources contributed to their plight than inherent predisposition (Benyshek, Martin, & Johnston, 2001). Canadian indigenous people share similar narratives of colonialisation and marginalisation, and demonstrate the same asymmetric distribution of T2D in comparison with the rest of the Canadian population (Young, Reading, Elias, & O'Neil, 2000).

With respect to T2D, and in keeping with the understanding that certain latent genetic vulnerabilities are expressed in the presence of strategic external factors, it is important to reflect upon other environmental influences that may potentially impact endocrine function. A variety of environmental influences have been recently highlighted, variously referred to

as obesogens, metabolic disrupting chemicals or endocrine disruptor chemicals (EDCs). Collectively, these are environmental chemicals (including, but not limited to plasticizers, pesticides, fungicides, and flame retardants) that shape and moderate various metabolic and endocrine activities in the body. Many studies support the claim that exposure to external environmental toxins alter lipid metabolism (Grün & Blumberg, 2006;), metabolism (Casals-Casas & Desvergne, 2011), and insulin resistance (Alonso-Magdalena, Morimoto, Ripoll, Ruentes & Nadal, 2005). Organochlorine pesticides (e.g., DDT) and polychlorinated biphenyls (PCBs) display a significant dose-response relation to T2D (Lee et al., 2006), and are carried transgenerationally (as the degradation product DDE), to produce negative impacts on subsequent offspring (Porta, Lee, & Puigdomènech, 2009). Flame retardants, such as PBDE, influence both T2D predictability and vulnerability to metabolic syndrome (Lim, Lee and Jacobs, 2008). Perfluoroalkylated substances encompass a wide range of chemicals noted for heat stability, oil and water resistance. Ubiquitous in the environment, they are positively associated with elevated serum non-HDL cholesterol levels (Nelson, Hatch, and Webster, 2010). Bisphenol A (BPA) alters insulin sensitivity (Alonso-Magdalena, Quesada, & Nadal, 2011), liver function, dislipidaemia, (Lang et al., 2008) and influences the development of metabolic syndrome (Hugo et al., 2008). Phtalates, including plasticizers like BPA, are associated with obesity and insulin resistance (Stahlut, van Wijngaarden, Dye, Cook, & Swan, 2007). Arsenic is a metallic element found in pesticides, agricultural feed, wood preservatives, and some water supplies. The widespread industrial use of arsenic has also exposed its action as an endocrine disrupting chemical acting as an obesogen, carcinogen, and diabetes-promoting agent (Mead, 2005). Current investigations are additionally highlighting the contributory effects of air pollution to T2D (Brook, Jerrett,

Jeffrey, Bard, & Finkelstein, 2008; Krämer et al., 2010). Lastly, several common pharmaceuticals have been identified as endocrine disruptors and therefore contributors to iatrogenic obesity. As an example, antidepressants, including the new SSRIs are commonly prescribed drugs in North America, and demonstrate obesogenic effects that can have long-term physical consequences (Mauro, Taylor, Wharton, & Sharma, 2008). Ironically, commonly prescribed antidiabetic agents including the sulfonylureas, thiazolidinediones and glinides all alter lipid metabolism and are therefore considered endocrine disrupting or obesogenic in nature (Phung, Scholle, Talwar, & Coleman, 2010). While the sudden progression of T2D is not adequately explained by a genetic vulnerability to obesity, the incidence of the disease does correlate with the substantial change that has occurred in chemical production and use over the last 40 years (Casals-Casas & Desvergne, 2011). These tendencies suggest that the modern environment in which we live, powerfully influenced by the drive for the production of goods, is generating byproducts that impact endocrine function.

The Obesogenic Environment

Amid the intricate and multitudinal variables that come together in a way that provokes T2D, the main catalyst of T2D remains excess weight (Yach et al., 2006); of those living with diabetes, 80–95% are overweight or obese (Astrup, 2001). Obesity is socially located, and those living in compromised socioeconomic circumstances are more likely to be obese (Agardth et al., 2011; Bjornstrom, 2011; Lovasi, Hutson, Guerra, & Neckerman, 2009; Pickett et al., 2005). Weight gain is incrementally less marked as education level increases (Molarius, Seidell, Sans, & Tuomilehto, 2000). Income and wealth also mediate trends in body mass index, and a decrease in either closely correlate with increased body mass index

measurements (Sundquist & Johannson, 1998; Wang, Kim, Gonzalez, MacLeod, & Winkleby, 2007). This trend is prevalent in not only North America (Zagorsky, 2005), but also in Europe (Roskam & Kunst, 2007).

The compelling evidence that T2D and obesity are situated within a broader, ecologic setting warrants an investigation into what predominant forces are contributing to an obesogenic environment. Viewing obesogenic environments from an ecological lens is a means to highlight the broader influences that contribute to current trends in obesity beyond the integrity of one's personal discipline (Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Egger & Swinburn, 1997). Ecologic influences on behaviour amalgamate notions of transenvironmental barriers and social inequality. Socioeconomic status, reticulated with the ubiquity of fast food restaurants, food deserts, access to community centres and safe green spaces, all have generated conditions for compromised health outcomes.

Distribution of healthy food

The geographic distribution of fast food restaurants has received considerable attention in the literature and warrants exploration. In communities of lower socioeconomic status there is a propensity of restaurants offering energy-dense foods. In an Australian study, those living in areas with the lowest individual weekly incomes had 2.5 times the exposure to fast-food outlets compared to areas bearing high-income earners (Reidpath, Burns, Garrard, Mahoney, & Townsend, 2002). This evidence coincides with similar observations in New Zealand (Pearce, Hiscock, Blakely, & Witten, 2009), and the United States (Larson, Story, & Nelson, 2009). When analysing fast-food clusters in the US, it was found that—after controlling for SES factors—there was a 1% increase for stroke for every neighbourhood

fast-food outlet present (Morgenstern et al., 2009). Emerging research in Canada is supporting this trend; Canadian neighbourhoods with lower socioeconomic status specifically reveal concentrated clusters of fast-food outlets (Smoyer-Tomic et al., 2008).

Concurrently, suburbanization has created urban ‘food deserts’ as supermarket retailers follow the affluence out of the urban core, leaving a sparsity of supermarkets or vendors that offer both affordable and healthy dietary choices. In various urban locations throughout Canada, distinct food deserts now exist; city neighbourhoods bearing the lowest socioeconomic profile have the poorest access to supermarkets, limiting their access to food that is affordable, varied, healthy, and fresh (DeMattia & Denney, 2008; Larson & Gilliland, 2008; Latham & Moffat, 2007). Many urban centres lack access to fresh food or produce stands, limiting the choices only to what's available in local convenience stores (Wieting, 2008). Overall, proximity to supermarkets as opposed to convenience stores is associated with less overweight, obesity, hypertension and T2D (Morland, Diez Roux, & Wing, 2006). City areas bearing the least advantaged dwellers additionally have fewer restaurants offering healthful food options on the menu, and bear inflated costs associated with higher quality food (Sallis & Glanz, 2006). The result is, on the basis of physical location alone, low-income families are more likely to experience nutritional compromise and related negative health outcomes, including obesity and T2D, than higher income families.

Food advertising

Food advertising also has a profound effect on food choice and desirability. The promotion of snack food to adults in TV advertising primes eating behaviour during viewing, and stimulates increased dietary intake that persists well after the viewing time (Harris,

Bargh, & Brownell, 2009). Adults find the advertisements appealing, and in tandem with following the normative values of their peers, opt for higher-fat foods (Arroyave et al., 2008). Although adults respond to food advertising, children and adolescents have been favourable targets for marketing drives because of their purchasing influence and tendency to become ongoing consumers as adults (Story & French, 2004). Indeed, the majority of advertisements targeted at children are food related (Gamble & Cotunga, 1999).

Advertising is largely television based, but extends to the Internet, product placements, branded toys, and schools (Story & French, 2004). Schools are particularly appealing to marketers because large populations can be reached in a contained area, and the lure of financial incentives by marketers appeases educational institutions hit hard by funding cuts (Levine, 1999). Annually, these children will have seen thousands of advertisements overwhelmingly promoting candy, pop, high sugar cereals, and fast food restaurants (Wieting, 2008). In fact, nearly all food advertising directed at children promotes products that can adversely affect their health (Harris, Pomeranz, Lobstein, & Brownell, 2009). Using vivid images and memorable characters, these advertisements directly influence the food preferences of children (Harris et al., 2009) and generate ‘pester power’ (Henderson, Coveney, Ward, & Taylor, 2009). Parents contend with the pleas and coercion of children during snacks and mealtimes. If pester power is overwhelming, parents yield to their child’s demands and allow them the food they want to avoid conflict (Dwyer, Needham, Simpson, & Heeney, 2008).

In spite of the ubiquity of ‘junk food’ advertisements geared at children, the Canadian government prefers a self regulatory mechanism by food corporations (Government of Canada, 2007) and the encouragement of individual ‘discipline’ for making appropriate

lifestyle choices. Unfortunately, corporate self-regulation seems to have had limited effect as food advertising has imbued all environments in which children exist. Moreover, corporate food advertising has increased remarkably over the last 20 years, particularly as it infiltrates the Internet, music, gaming, and entertainment sectors (Harris et al., 2009). Arguably, in light of the disease promoting nature of processed food, the risk to health is spread to children as food corporations permeate this cohort with advertisements (Freudenberg, 2005).

Physical activity

Another contributor to weight management and T2D is physical activity. A commitment to regular physical exercise is extolled as a positive contributor to overall health. Physically active individuals are at a significantly lower risk of developing chronic disease, with the greatest improvements being in those who are physically unfit and take up activity (Warburton, Nicol, & Bredin, 2006). However, aerobic physical activity is only regularly undertaken by roughly one third of Canadians (Katzmarzyk, Gledhill, & Shephard, 2000). Additionally, among non-diabetic adults, there is an inverse relationship between the propensity to engage in physical activity and preference for sedentary behaviours (Salmon, Owen, Crawford, Bauman, & Sallis, 2003). While there are multiple barriers to activity, it is clear that socioeconomic position plays a significant role in whether or not physical activity is regularly adopted (Boehmer et al., 2007), and propagates many of the barriers that are in place.

People of lower SES perceive their communities as having too much traffic for safe activity (Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Giles-Corti & Donovan, 2002). Lower SES populations also perceived higher levels of neighbourhood crime and

reduced sense of personal safety (Brownson et al., 2001; Wilson, Kirtland, Ainsworth, & Addy, 2004). When it comes to the physical activity of children, there is homogeneity in attitude toward a neighbourhood's surroundings. Irrespective of SES, parents are concerned with outdoor play in light of traffic and abductions (Irwin, He, Bouck, Tucker, & Pollett, 2005), street crime (Canadian Institute for Health Information, 2006), and risk of injury (Dwyer, Needham, Simpson, & Heeney, 2008).

Aesthetic features of a neighbourhood additionally influence outdoor activity, and those living in areas that have excess garbage or unsightly landscapes are significantly less likely to be active in the environs (Brownson et al., 2001; Wilson et al., 2004). Green space, access to walkable areas, and traffic patterns contribute to outdoor activity; all factors compromised in low prospering neighbourhoods (Huston, Evenson, Bors, & Gizlice, 2003). Walkable neighbourhoods that generate more physical activity have more low density roads, more connected streets, accessible public transport, and more mixed land use; features less apparent in modern suburbs (Saelens, Sallis, Black, & Chen, 2003; Sallis & Glanz, 2006). Limited community centres or outdoor recreational facilities offering exercise opportunities also act as a substantial limiting factor for physical activity (Gordon-Larson, Nelson, Page, & Popkin, 2006; Sternfeld, Ainsworth, & Quesenberry, 1999). Facilities that offer resources to engage in exercise are not only less abundant in areas of low SES, but are also ironically less accessible due to a lower proportion of resources that are cost free (Estabrooks, Lee, & Gyurcsik, 2003). When describing barriers specifically for preschooler and childhood activity, parents report lack of accessibility and poor transportation options to community centres or playgrounds. Community centres in particular are often seen as too far, have only modest programmes for preschoolers, or have hours that are not attendant to working

parents' schedules (Dwyer, Needham, Simpson, & Heeney, 2008). In low-income neighbourhoods there are fewer parks and sports fields (Ben-Sefer, Ben-Natan, & Ehrenfeld, 2009). Parents from these lower income areas report greater barriers to allowing their children play outside; children residing in these areas not surprisingly spend more time in front of the TV screen (DeMattia & Denney, 2008).

Finally, those of lower SES contend with psychosocial barriers, and a sense of limited self-efficacy is inversely related with the motivation to exercise for health (Barrett, Plotnikoff, Scourneya, & Raine, 2007; Cherin & Leslie, 2008; Delahanty et al., 2008). Diabetics with middle and high level incomes exercised more, and income (particularly among men) also closely correlated with sense of self efficacy (Barrett et al., 2007) in this cohort. Among women, social support in collaboration with sense of self-efficacy determined physical activity (Sternfeld et al., 1999). As collateral, limited social capital can negatively affect an individual's sense of being able to influence health determinants and precipitate barriers to social participation and peer support (Lindström, Hanson, & Östergren, 2001); a potential contributor to limiting one's sense of self-efficacy.

Time constraints

Time constraints are particular factors cited as both a barrier to physical activity (Arroyave et al., 2008) and the preparation of healthy meals. Work intensification has paralleled the increase in competing global markets, job insecurity and flexible working day so that leisure time is compromised (Strazdins & Loughrey, 2007). For many adults, lack of time paralleled the belief of experiencing pain or discomfort while exercising as the main barrier for physical activity (Symons Downs & Hausenblas, 2005). Working parents are

particularly faced with time poverty (Caprio et al., 2008) and are circumscribed in their ability to negotiate the amount of time needed to prepare fresh, home cooked meals with other daily demands. Individuals with children desire more direct interaction with their offspring rather than cook when they have available time, while time constraints negate any possibility for other families to share a meal together (Dwyer, Needham, Simpson, & Heeney, 2008). When time is valued more in the labour market, the consumption of prepackaged and ready-to-eat (including restaurant) food increases. Women who are not employed spend approximately 8 hours per week on meal preparation, while the working woman spends just over 4 hours per week (D. Rose, 2007). The time needed to travel for fresh food and prepare it for often-impatient children (Dwyer, Needham, Simpson, & Heeney, 2008), monitoring the cooking process itself, and clean-up time after meals is onerous for a working parent (D. Rose, 2007). Healthy foods are more costly both in terms of money and time for low-income, dual-worker families and single parent family units (Gable & Lutz, 2000).

Profound social and political changes are required to address the obesogenic environment that is permeating much of the world today, although initiatives to regulate and monitor the corporate food industry will be met by fierce corporate interests and consumer rights organisations wanting their civil rights to remain intact (Hossain, Kavar, & El Nahas, 2007). However, living in a lower income area correlates with higher rates of childhood obesity, adult obesity and type 2 diabetes. In the established diabetic, food insecurity fundamentally affects diabetes management and overall health, imputing a significant impact on quality of life (Maddigan et al., 2005). In its own right, low SES coexists with food security, food choices, exercise patterns, and behavioural choices. As an additional burden,

low socioeconomic status (SES)—on its own or conflated by racial or ethnic discrimination—also influences biological modifiers like cortisol secretion, and is hypothesised to have a negative impact on lipid metabolism (Caprio et al., 2008). Volitional behaviours, willpower, and even genetic tendency are unable to explain the creeping prevalence of obesity. More accurately, unhealthy choices become economically smarter choices (Yach et al., 2006). From a Foucauldian perspective, the neoliberal subject now navigates the social world on cost-cutting analyses and market principles rather than what is inherently the better option (Hamann, 2009). While SES is not in its own right a modifiable factor, the *situation* or environs in which many low SES families find themselves is modifiable, arguably by capacity-building public policies. Behavioural and self-disciplinary understandings of the type 2 diabetic are complicit in the expectation that there is an equal distribution of resources among all groups. Access to transportation, time availability outside of work, fresh food markets, and the ability to pay for such food are privileges that are not uniform across all socioeconomic strata (Caprio et al., 2008) and have a significant impact on health.

Chapter 3

Neoliberal Capitalism and Health

It is important to explore neoliberalism and how specifically the neoliberal ideology has impacted not only political and economic, but also social aspects of everyday life. This chapter concentrates on how neoliberal capitalism and globalisation contribute to global trends in health and disease. It includes how neoliberalism as a whole has shaped healthcare, medical research, and the way disease is interpreted and treated. In keeping with the investigation regarding how and where various technologies disseminate particular interpretations about chronic disease, the chapter also highlights appropriate research in this field. Specifically, how neoliberalism has impacted what we see about chronic disease in public healthcare campaigns and mass media will be the areas of focus.

Neoliberalism does not exert clear-cut paths across demographic and sociopolitical arenas; instead it is a system that manifests, shapes and directs social, political, economic, and historical contextual spaces (Bailey, 2007; Dodson, 2006). However, as a natural evolution to the unrelenting need for the production of capital and wealth, market constraints such as government regulations on trade have declined. On the whole, neoliberal capitalism has hastened deregulatory processes, shifted manufacturing from richer to poorer countries, reduced the social wage, extolled privatisation and has enforced global free trade. What was seen by Milton Friedman (1962) was a virtuous system that extolled the freedom of individuals, emphasising the importance of skeletal governmental institutions situated only to protect, but not impede, such freedom. Additionally, in the name of free enterprise and the development of competitive markets, Friedman stated another broad principle of free market

economics was the decentralising of government, seeing federal intervention as detrimental to personal freedom, constricting to creative enterprises, and compliant with economic mediocrity (Friedman, 1962). What has resulted, however, is a hands-off approach by the state towards not only economic, but also broader political and social processes. The freedom of market and trade has increasingly permeated into all aspects of human consciousness as a pervasive neoliberal ideology (Allman, 2007), including the health and well-being of citizens.

The current neoliberal paradigm, irrespective of the various nuances it assumes around the world, has an impact on the epidemiological trends and distribution of health locally, nationally, and transnationally. It is with ambiguous conviction at best that neoliberal capitalism and globalisation have been beneficial to health. Coburn (2011) critiques the idea that economic growth is the backbone of improvements in health that have been achieved internationally. Instead he recognises powerful social movements such as conscientious social welfare policies, decent wages, the right to organise, occupational safety measures, and universal suffrage as mediators of advances in public health. Although proponents of a free market argue that poverty reduction is a beneficial outcome of such an economy (Baumol, 2002; Friedman, 1962), Labonté, Mohindra, and Schrecker (2010), argue poverty reduction has been modest. More accurately, occupational dangers, the spread of infectious disease, economic instability, and precarious migratory patterns of populations have been manifested in association with free markets (Labonté et al., 2010). An additional insight offered by Blouin et al. (2009), supports that the relationship between global reductions in poverty and liberal movements in trade are convincingly contentious, while highlighting growing income and economic instability as important burdens on health. The intent of neoliberal capitalism

is to roll back the welfare state in the name of deficit reduction, corporate interests and elites. While relying on a trickle down effect so that all may benefit, those at the bottom of the hierarchy suffer disproportionately in all aspects of health and access to care (Poland, Coburn, Robertson, & Eakin, 1998). In fact, creating any sort of meaningful positive link between trade liberalisation and the generation of wealth for populations most in need has been frustratingly tenuous (Blouin et al., 2009).

The manifestations of neoliberal capitalism are highly context specific, conforming and moulding to local nuance (Sager, 2011). However, neoliberal ideology has a powerful influence on shaping biomedical understandings, attitudes, and actions towards both communicable and non-communicable disease. Additionally, it shifts attention from environmental aetiological factors, disregards social determinants (more specifically, the social gradient) of health, extols individual responsibility for health and enforces power differentials in society.

Within the medical field, neoliberal ideology reconstructs the understanding of chronic disease in a number of ways. It shifts attention from broader ecological risk factors, disregards the social determinants of health and pronounces a morality of self-responsibility and self-discipline by witnessing health as something that is a result of sound lifestyle behaviours adopted by individuals. Additionally, it shifts research agendas in a way that appeases biotechnology, the agenda of evidence-based medicine, and the pharmaceutical industry. This chapter therefore continues by exploring some of the foundational mechanisms neoliberal policy employs to influence and mediate these trends. A global perspective is adopted where appropriate, but the focus is on how the expressions of neoliberalism in North America intersect with current health concerns.

Socioeconomic Status

As previously discussed, the maldistribution of income within a country has a significant effect on the distribution of disease, including T2D. Most apparently, income supports access to shelter, nutrition and water, sanitation and education. While in developing countries absolute income is of primary importance, it appears that relative income—or income distribution—has a significant impact on health in developed countries (Blouin et al., 2009). On a global scale, trade liberalisation has generated an intensified income gap, allowing skilled labour to benefit while generating only informal and temporary employment to unskilled workers (Blouin et al., 2009), unprotected jobs, and overwork (Vosko, 2002). To offset widening inequalities, taxes, transfer systems, and social programmes support those with low income, counterbalanced by a taxation framework for corporations. In Canada the system of tax and transfer was able to keep pace with income inequality until the 1990s, at which point its impact was much less effective (Heisz, 2007). Income inequality is increasing, and it has done so at an accelerated rate since the rise of the persistent neoliberal drive for prosperity (Poland et al., 1998). Particularly under the Thatcher (Townsend, 1990) and Reagan (Plotnick, 1993) regimes has there been a marked increase between the wealthy and poor, with the less fortunate bearing most of the negative outcomes associated with new ‘efficiency’ and ‘cost effective’ policy reforms (Poland et al., 1998). To highlight an example, those living in Britain earning less than half of the national average rose from 8% to 24% between 1977 and 1995 (Raphael, 2002). In the United States, the lowest earners shouldered a loss in net income between 1977 and 1999 whilst the highest earners saw generous increases in post-tax income (Coburn, 2004). While income maldistribution continues, so too does the maldistribution of wealth. Stiglitz (2012) emphasises that by 2007,

more than one third of America's wealth was held by only 1% of the population. He concludes the current economy has concentrated wealth, is responsible for pervasive unemployment, and has contributed to the decline in the standard of living for most Americans (Stiglitz, 2012). In terms of health, those of lower socioeconomic status are vulnerable to higher rates of mortality, and the gap in mortality rates between higher and lower socioeconomic strata have increased since the late 1970s (Mackenbach et al., 2003). The proposed reasons for this are twofold: as an example, there has been a marked reduction in mortality rates from cardiovascular disease in higher socioeconomic populations, hypothesised to be a result of access to health services and socially contextualised adoptions of healthier lifestyle behaviours. Concurrently there has been an increase in mortality rates among lower socioeconomic populations from breast cancer, lung cancer and respiratory illness, gastrointestinal disease, and occupational injury. The patient with T2D is no exception; diabetes-related mortality is inversely related to the socioeconomic gradient, so that those of lower SES will be vulnerable to higher disease specific complications and death (Saydah & Lochner, 2010). Again, in addition to substandard working conditions, access to healthcare services combined with socially influenced behaviours leave this population vulnerable (Mackenbach et al., 2003).

Within a global perspective, while the International Monetary Fund was envisioned as a means to ensure global equitable economic growth and stability, 'conditionalities' that were introduced in the mid-1980s altered the effects of IMF intervention—and therefore health—in low- and medium-income countries. Consistent with the neoliberal voice, the IMF began to impose expectations of curtailing social spending, liberalising markets, and the privatisation of public ventures in exchange for IMF support. Low- and middle-income

countries receiving IMF intervention and adhering to the required austerity measures clearly expressed increased rates of overall economic-related mortality, infant morbidity and mortality, access to family and medical services, unfettered tobacco marketing, and the influx of inexpensive tobacco products (Stuckler & Basu, 2009). Economic recession, even within progressive social welfare states like Sweden, generate increases in morbidity and mortality spanning a multitude of illnesses, including psychological stress (encompassing the maladaptive use of drugs, cigarettes and alcohol), depression, cardiovascular disease, cerebrovascular accident, total malignancies, cirrhosis, and infant illness (Brenner, 1987). In times of economic instability, the loss of social support within the work environment, social unrest on the macro level, strained marital and family relationships all impact mental health in ways that include not only maladaptive behaviours but also the exacerbation of preexisting psychopathology and increased psychiatric hospital admissions (Zivin, Paczkowski, & Galea, 2011). Self-reported mental health disability has increased in the US, particularly between 2007–2009, coinciding with a decline in social capital and precarious employment (Mojtabai, 2011). Physiologically, environments of precarious employment are related to modifications in adrenal function (Ferrie, Shipley, Marmot, Stansfeld, & Davey Smith, 1998), immunological capabilities (Boscolo, et al., 2009; Mohren, Seaen, van Amelsvoort, Borm, & Galama, 2003), and cardiovascular events (Vahtera et al., 2004). Job insecurity is associated with the greater use of health services, both by individuals coping with insecurity and their families (Beale & Nethercott, 1986; Iverson, Sabroe, & Damsgaard, 1989; Rowlands & Huws, 1995).

The globalised movement of trade and generation of surplus value has indiscriminately propelled economic instability through currency devaluation, unstable

labour markets, insecure employment, the displacement of workers (Blouin et al., 2009), and reshaped class structures (Coburn, 2004). Since the 1970s, downsizing, restructuring, and the use of temporary workers within both public and private occupational settings has increasingly become commonplace (Quinlan & Bohle, 2009). With the addition of market instability and fluctuating currency values (Blouin et al., 2009; Wagner, 2005), there develops an unstable environment for health.

The Environment

The rapid increase in marketization and production of surplus goods has a remarkable impact on ecosystems at all levels of existence. Current economic priorities require the need to generate surplus value, not uncommonly through continuous, poorly planned, and frequently irrational growth. The production of commodities has shifted the pattern of land use and has consumed immeasurable amounts of fossil fuels, creating an incredible environmental burden as industrial pollutants, consumption patterns, water contamination, and climate change exert their effects on the planet and its population. The depletion of biodiversity alters water quality and disrupts ecosystem homeostasis, resulting in a wide spectrum of challenges to health including vector-borne illness, salination, the spread of invasive species, soil compaction and erosion (McMichael & Beaglehole, 2000). The international movement of goods introduces invasive diseases and pests to native flora and fauna. However, while the World Trade Organisation (WTO) consents to protective mechanisms by nations at risk, these measures must not inhibit free trade; biosecurity becomes at odds with neoliberal ideology and the privileged voice of international trade interests (Maye & Dibden, 2012). The chemicalisation of land represents a particularly exemplary snapshot of how open and unfettered neoliberal market ideologies manifest.

Chemicalisation, in cooperation with the intensification of agricultural production, stimulates the depletion of biodiversity (Padmavathy & Poyyamoli, 2011; Saith, 2006). Health is compromised as biodiversity declines and the stresses on terrestrial and ocean food-producing platforms increase (McMichael & Kovats, 2000). The entire accelerated mechanisation of agriculture in the name of increasing output at reduced cost depletes labour opportunities and uproots local and peasant farmers. The decline of local economies and concern for cultural sustainability are additional casualties to the corporatising of agriculture (Desmarais, 2008).

The response to climate change and the depletion of natural resources appears to also be situated in a way that adheres to class alliances that favourably support market interests whilst devaluing core environmental protection. Governmental regulation strategies are increasingly seen as cumbersome and inefficient, favouring instead the cost-effectiveness and competitiveness of market based regulation (Bailey, 2007). Addressing climate change is strongly mediated by the pernicious influence of transnational corporations and stakeholders focused on wealth creation or short-term strategies; power and politics shape the very outcomes of food and water security, urban planning, and population health directives (Costello et al., 2009).

The neoliberal fundamentalism coupled with economic growth aspirations precipitate a situation whereby market interests influence and discipline all levels of political governance, including municipal. Although peppered with local variation, the neoliberalised urban centre garners inherent features—many of which compromise the health of its citizens. Overall, the privatization of development disempowers localities and diminishes democratic planning processes (Sager, 2011). Private sector interests have infiltrated public-based urban

development initiatives directed at creating a rich, multifaceted human experience (including a sense of security and belonging) and have manipulated it to answer to a globalised, competitive approach to urban design, marketability, and corporate appeal (Gunder, 2011). The protection of wealth and social segregation is seen in an upsurge in ‘gated communities’, mirroring the neoliberal notion of preservation, aestheticisation, and accumulation of wealth (Gunder, 2011; Sager, 2011). The result however, is social segregation, erosion of the public sphere, the fortification of urban inequality, and greater sense of distrust (Sager, 2011). Additionally, the ‘neighbourhood effects’ of economic clustering affect health via channels that include access to quality education, crime rates, and opportunities for local financing (Chen, Myles, & Picot, 2012). Areas of urban decay (McMichael & Beaglehole, 2000), an expansion in the illicit drug trade (McMichael & Beaglehole, 2000; Storti & De Grauwe, 2009), and organised crime are collectively married with the politically driven practices that increase the income divide, erode social cohesion, abort social policies, and allow the unregulated, free movement of goods including contraband, counterfeit products...and humans (Reynolds & McKee, 2010).

In addition to creating an aesthetic urban environment that satisfies global scrutiny, there has been a retrenchment of social housing programmes. The existence of a secure shelter for those in need has been destabilised under neoliberal political regimes. In Canada, the federal government cancelled its support for the development of social or nonprofit housing in 1993 (Hulchanski, 2006) and the Ontario government downloaded the responsibility to the municipalities in 2000 (Sousa & Quarter, 2003). As a result, there has been very little new development and long waitlists (Prince, 1998; Sousa & Quarter, 2003). Neoliberal social housing is consistent with the curtailing or roll back of social assistance and

includes the individualisation of once a collective or unified understanding of disadvantage; one's housing situation is now seen to be based on rational, volitional choice. In concert with the privatisation of housing programmes, public housing is both dwindling and increasingly punitive (Dodson, 2006; Hackworth, 2005).

Degrading environmental conditions have been implicated in a variety of chronic disease (Argo, 2010; Gersh, Sliwa, Bongani, & Yusuf, 2010; Schell, Burnitz, & Lathrop, 2010), and globalisation with the inherent notion of accelerated production and consumption intensifies the trend. The hegemony of neoliberal capitalism closely affiliated with the capital surplus driven ideal of globalisation generates a collection of social and ecological tensions that are destructive to human health and well-being. As the unabated use of finite resources continues, the natural world becomes exclusively a source of raw material for the generation of capital in parallel with the estrangement and alienation of human beings from the environment. Perhaps then, when describing public health in relation to environmental degradation, it is necessary for the biomedical field to recognize, and consolidate into its means of conceptualization, the inherent alienation between humans and nature that has taken place within the neoliberal climate. Discrete segments of biomedicine deserve commendation for efforts in highlighting environmental conditions as they relate to certain diseases, although this research is frequently met by critics who dismiss the evidence by pronouncing the findings as wholly correlative and not causative. Additionally, while these select foci in the epidemiological sciences may be trending away from the risk factors of disease to the analysis of broader systems of causations (Koopman, 1996) an emphasis on the impact of these systems must be trumpeted in *all* aspects and disciplines of healthcare in a way that invites political attention and action.

Healthcare Services

Healthcare is malleable to the social and political forces in which it is situated, and in contrast to being autonomous and self-interested, is shaped continuously by external forces. Indeed, universal healthcare found its genesis in Canadian history by means of dominant social and political strength, irrespective of what practicing physicians thought at the time (Marchildon & Schrijvers, 2011). In keeping with this premise, medical power is currently being realigned with the decline of the welfare state and retrenching of healthcare. Although perhaps less apparent than the cutbacks to other social services, healthcare in Canada has also been vulnerable to fiscal conservatism and governmental downsizing (Poland, 1998). Influenced and shaped by neoliberal ideology, understandings of health and health services move from social realisations to market realisations. The medical profession and its role as advocate for what is best for the patient's health is being usurped by what is in the best interest for biotechnology and pharmaceutical corporations.

Delisting of Services

Universal healthcare remains present in Canada. However, the commodification of healthcare services has slowly eroded the principles of medicare since the early 1980s, leaving the system prone to underfunding, welcoming to public-private partnerships, and supportive of private clinics (Whiteside, 2009). Public private partnerships, particularly within the Canadian healthcare system have accelerated since the growth of neoliberal capitalism, working to the advantage of both parties in that there is the downloading of responsibility by the public sector while introducing new opportunities for economic growth within the private sector (Whiteside, 2011). Delisting involves both the privatisation of provisions as well as the privatisation of funding. With respect to the former, decisions made

regarding what is deemed medically necessary is left to the hands of Joint Management Committees; members who are selected from medical associations and the provincial government, and who are for the most part anonymous and invisible (Gilmour, 2002). In the latter situation, health insurance agencies base funding on output and generate avenues that solidify partnerships with providers (Holden, 2005). As components of healthcare funding shifts to the hands of private insurance companies, there becomes a culture of reconfiguring risk, the control of what healthcare services are offered, and exposure to surveillance, including the surveillance of electronic billing patterns (Ericson, Barry, & Doyle, 2000). Like the decision making regarding the delisting of services, who decides what health insurance resources are allocated is also 'elitist'. Termed 'allocative privatisation' (Gildiner, 2006), current public policy empowers certain privileged voices to decide how and what healthcare provisions are delivered. Whilst a neoliberal ideology boasts a liberal, hands off approach to governance, surveillance of the citizen actually increases (Navarro, 2007a) in the spirit of risk analysis. Insurance companies become a strategic means by which to act as private governance technologies, providing population security and handling risk management (Ericson et al., 2000). With respect to diabetes care, the patchwork of coverage within the universal healthcare system has raised obstacles. Insurance coverage is not always equitable or consistent for glucose monitoring equipment, antidiabetic agents and the often wide variety of pharmaceuticals needed to keep patients stabilised within recommended norms (Rock, 2005a).

The privatisation of medical care is consistent with neoliberal policy (Pitts-Taylor, 2010), and delisting of once publicly supported healthcare services becomes desirable in the name of administrative streamlining and cost cutting. In synchrony with neoliberal ideology,

all services, including social services (like health and education) are seen to be better managed, distributed and organised through market control (Givel, 2006). In synchrony with infusing hegemonic interests into the social sphere, Canada is witnessing an unannounced proliferation of private healthcare clinics in a way that is slow, pernicious, and therefore ‘normalised’ into society (Glauser, 2011). State intervention becomes a component of only caring for those in absolute poverty (Feo, 2008), whilst leaving the remainder of the population to resource care for themselves. The movement to increasing privatisation in healthcare benefits the top 20% of earners at the expense of those remaining who utilise public services (Navarro, 2007a), and defeats the tenet of universality. Observed by Rylko-Bauer and Farmer (2002), the issue of healthcare in a neoliberal economy is an issue of what is just and compassionate versus what is profitable. In what they term “structural violence” (Bauer & Farmer, 2002, p. 493), social inequalities are perpetuated by for-profit medicine through problems with access to treatment, ethnic disparities in provision of care and outcomes, quality issues, and increasing healthcare and pharmaceutical costs (Rylko-Bauer & Farmer, 2002).

Decentralising Services

Decentralising healthcare is consistent with neoliberal ideology in that it relieves the state from intervening in public affairs; the regulating and decision making regarding health services migrates to local stakeholders. Decentralising is, in theory, a means by which to improve the delivery of services, cut costs, increase efficiency, and ensure the specificities of a local regions healthcare needs are met (McGregor, 2001). In Canada, decentralising began in 1977 when the federal government introduced the Federal–Provincial Fiscal Arrangements and Established Programs Act (Whiteside, 2009). This served to both allocate fiscal decision-

making regarding healthcare costs to provinces, and base federal funding to provincial healthcare on GNP growth rather than absolute need (Whiteside, 2009). In Ontario, to further cost cutting and improve efficiency, local health integration networks (LHINs) were established in 2006. These not-for profit organisations are a collection of provincially appointed board members who work in close contact with stakeholders of communities to strategically manage and direct healthcare spending. While theoretically convincing, the selection process of the board members by the province is unclear, although it appears it does not include input from the public (Pazionis, 2006). It remains to be seen if healthcare at the community level has undergone cost-cutting changes that have eased public spending yet compromised service. Additionally, it is uncertain if the overall financial commitment to supporting 14 boards of directors has been money well spent. Overall, it is suggested that the decline in state involvement with administration of such services has resulted in the downloading of responsibilities to local and regional levels where resources and expertise are compromised (Feo, 2008). Allocating service organisation to local councils disperses accountability, hinders accessibility and veils visibility, therefore perpetuating the desired message that private care is the preferred option (McGregor, 2001). Observed collectively, the shape of healthcare is undergoing a new morphologic evolution. No longer is the profession one of autonomy, and self-regulation, but is now exposed to the market directives that favour private interests and the commercialisation of the biological subject (Pitts-Taylor, 2010).

Biotechnology and Biomedicine

The different aspects of healthcare are vulnerable in different ways. While public health suffers, the fields of biotechnology and the mechanistic, curative aspect of medicine

are seeing a surge in popularity. Health expenditures are rising rapidly in an attempt to cover the costs of more complex medical technologies (Smith, Newhouse, & Freeland, 2009). In absolute amounts, spending in the fields of curative, technological and research areas of medicine overwhelmed the dollars directed to public health interests (Kinner & Pellegrini, 2009). This amplification of biomedical power conveniently displaces interest or importance in the socioeconomic determinants of health. Globally, as borders dissolve for free trade and the expansion of consumerism, environmental life-supporting systems erode; both situations that propagate declining health and social inequality (McMichael & Beaglehole, 2000). With national public health interests continuing to wane in the neoliberal atmosphere, simultaneously with an increase in global health crises, issues of health disparity and the burden of worldwide communicable and non-communicable disease will be greatly neglected.

The interests of corporate biotechnology are in a symbiosis with governmental policy makers. What has developed is the molecularisation of the subject with a simultaneous proliferation in for-profit, biotech industries (Rose, N., 2007a). Neoliberal capitalism, coexisting with globalisation, has emancipated pharmaceutical trade so that—on the basis of western biomedically based research—pharmaceuticals are permeating countries worldwide. It is advantageous to developed, neoliberal countries in a number of ways; research dollars are invested in developing countries, and through the western scientific methods employed, western treatment options become the preferred solution. Clinical trials are increasing, and are moving from local initiatives to transnational endeavours (Clarke, Fosket, Mamo, Fishman, & Shim, 2010). In turn, global demand for pharmaceuticals increases, and indigenous self-sufficiency declines (Jasso-Agular & Waitzkin, 2011). Additionally, in

keeping with the *aidez-faire* approach, neoliberal policies have generated interventionist measures via the protection and subsidisation of such sectors as agriculture, the military, and biomedicine (Navarro, 2007b). In this spirit, and while self-responsibility for health is deemed virtuous, surveillance of the neoliberal subject through biotechnology becomes another interventionist strategy, particularly as product development becomes increasingly privatised. Genetic profiling and screening, computerised scanning/imaging technologies, and ongoing screening programmes are now promoted as optimal approaches to monitoring and ensuring good health (Clarke et al., 2010). The interventionism dominant in these facets of the health services is concurrent with the hands off duality that disengages political interest from the social disparities, power differentials, and environmental decline that impacts the health of the population.

Evidence-Based Medicine

A final aspect of healthcare as it exists within a neoliberal climate is the rapid growth and expanding importance of evidence-based medicine (EBM). Introduced in the early 1990s, EBM—or the process of basing clinical decision making on the most sound and current biomedical research (Mykhalovskiy & Weir, 2003)—was considered more streamlined and appropriate than decision making based on professional experience or the particular needs of the patient. Concurrent with the overwhelming impact it has had on modern biomedicine, EBM has appropriately received critical observation regarding its genesis and dominance in the medical field.

Within a Foucauldian paradigm, the systems that normalise EBM in biomedicine are systems of power that shape organisational discourse (Isaac & Franceschi, 2008). EBM

enforces power differentials between the interests of biotechnology and the clinic where the social, economic, environmental, and physiological aspects of illness are subjectively experienced. Although illnesses are a result of a complexity of ecological forces, the patient–practitioner clinical experience is restrained by decisions based on reductionist, randomised controlled trials. Qualitative research becomes distrusted (Isaac & Franceschi, 2008), and the hegemony enforced by proponents and researchers in the quantitative realm is instilled in clinical practice. The ecological priorities for health are distilled to discrete categories amenable to discrete treatment options. The subjective experiences by the patient and outcomes observed by the clinician are appropriated and devalued by positivist ideas that biologies are reducible and homogenous.

The predominance of EBM also perpetuates power differentials between biomedicine and patients. Disadvantaged populations are underrepresented in the decision making of what research receives funding (W. A. Rogers, 2004). Additionally, those who participate in research—particularly in clinical trials—are predominately white, middle-aged men (Giuliano et al., 2000). What becomes problematic is that the research shaping clinical practice is not representative of those experiencing illness who are socially disadvantaged, aged, female, or of an ethnic minority (W. A. Rogers, 2004). As suggested by Goldenberg (2006), EBM does not augment objectivity as such, but censors natural subjectivity in the inquiry process. Experience is realised upon the knowledges that constitute the EBM oeuvre and the gatekeepers that protect it.

EBM is the basis of what are healthcare priorities and is inclined to serve pharmaceutical corporations and insurance companies interested in profits and efficiency (Feinstein et al., 1997; Murray, Homes, Perron, & Rail, 2007; Mykhalovskiy & Weir, 2004).

Clinical research has shifted from academic centres to commercially oriented research organisations in an attempt to expedite the investigative process and move pharmaceuticals more quickly to market. Rigorous controls are jeopardized, however, and in the name of profit, biased research is circulated (Bodenheimer, 2000). Pharma employs a variety of instruments of persuasion in its drug narratives (Matheson, 2008). The practices of ghostwriting, marketing, awarding research contracts and providing fringe benefits to committee members setting clinical practice guidelines are self-regulated practices; larger public regulatory controls are not in place to control corporate behaviour (Brennen et al., 2006). While disclosure requirements are now seen in journal guidelines, it is unlikely that they protect recipients from the findings and advice provided in the published articles; in fact, it is more likely to give authors and their interests the moral license to further exaggerate their claims, while less likely to generate any attempts at discounting or downplaying their messages (Cain, Loewenstein, & Moore, 2005). This has an impact on patients and critically undermines what is in their best interest. Pharma-funded research tends to overproduce positive outcomes, minimalise negative findings, be exposed to design biases, and duplicates known positive results (Sismondo, 2008). Additionally, meta-analyses of randomised controlled trials for pharmaceuticals are inclined to demonstrate duplicate publications, selective publications and selective reporting (Melander, Ahlqvist-Rastad, Meijer, & Beermann, 2003), lending significant bias into the findings regarding the use of pharmaceuticals for effective treatment. EBM is nonetheless valued because it focuses on small numbers of interventions, and is therefore presented as a way to streamline healthcare expenditures (Hope, 1995). EBM is presented as a value-free tool by which to budget healthcare spending (Hope, 1995) while supporting market approaches to care. Meanwhile,

nonpharmaceutical interventions become neglected and are diluted amid the overwhelming evidence produced by drug trials (Hope, 1995; W. A. Rogers, 2002); the emphasis on curative measures with the use of biotechnology and pharmaceutical research directs attention away from the fundamental directives that include primary prevention and health promotion (Woolf, 1999).

The Subject as an Individual

Complementary to the molecularisation of the subject is a parallel emphasis on the individualisation of responsibility, or the moral opinion that individuals—by way of volitional behaviour alone—are responsible for the ills that befall them. The neoliberal structure seen as decentralising services and encouraging economic autonomy has simultaneously come to involve the relegation of health to the individual. Individuals are guaranteed freedom in the marketplace, but they are also deemed responsible for their own well-being within the realms of welfare, education, and health (Harvey, 2005). Within a neoliberal approach to public health, any obligation by the state in the care and protection of its people is reduced, and the broader political environment becomes a catalyst to the current ‘healthism’ trend; a trend which not only locates health as an individual obligation, but concurrently fortifies an elevated notion of ‘health’ as a moral priority (Crawford, 1980). The moralisation of self-discipline for healthy lifestyle behaviours reflects an ideological commitment by health promoters that fails to entertain a plurality of voices reflecting a variety of privileges (Kline, 2006), and raises fundamental ethical concerns when one’s own sufficiency is held entirely accountable in the prevention of disease (Guttman & Ressler, 2001). The modern subject is a politicalised body, directed to self-care and one’s own health rather than to the social network (Greene & Labonte, 2008). Moving away from the term

patient (which implies transferring health management to the expertise of the physician) to 'healthcare consumer' also shifts the responsibility of making health related decisions to the self; health becomes a commodification (Fisher, 2007). Here, another contradictory notion of neoliberal ideology is observed. Healthcare funding, the delisting of services and privatization are done without public discourse, presumably in the name of efficiency and cost containment. Concurrently, the public is left to make decisions about health and healthcare in the same way they are able to exercise freedom of choice in the market environment. This is done on the contested assumption citizens are equipped with adequate information, resources, and the empowerment to do so.

While encapsulating chronic disease within a neoliberal agenda acclaims the value of individual decision making within a capitalist economic perspective, it also invites the permeation of the free market mentality through the aforementioned lens of molecularisation. This molecularisation (or atomisation) of the subject does not leave one powerless to the whims of genetic makeup, however. Indeed, the narrowing 'somatisation of self' fuels self-improvement and the policing of one's own body with renewed vigour. Now, self-improvement means exercise routines, diets, vitamins, supplements, and cosmetic surgery; an awareness of one's potential genetic vulnerabilities implores responsible lifestyle decision making, or *biological responsibility* (Rose, N., 2001). While seemingly paradoxical, the two contextualisations are not. The individualistic emphasis on the prevention and management of disease is paralleled with the ensconced drive to combat chronic illness with the consolidating of resources on the production, marketing, and selling of pharmaceuticals. The reductionist lens through which the medical profession increasingly views the individual is congruent with the tailoring of targeted products to treat specific parts of the body. 'Health

consumers' are entrenched in the same mentality, and influenced by the introduction of "direct-to-consumer" advertising, seek out the drugs they believe will cure or enhance the parts of their bodies they're concerned about (Fisher, 2007). Pharmaceutical companies have also addressed the escalating incidence of chronic disease vigorously; wherever possible, pharmaceutical preparations promise quick solutions to the burden of poor health. The powerful culture of consumerism induces and intensifies the expanding commodification of all forms of health products. With comfortable efficiency, the medical prioritisation of treatment over prevention becomes directly beneficial to both pharmaceutical companies and to the state; corporations reap profit, and the state is relieved of addressing the core sociopolitical underpinnings of poor health. Furthermore, only those who can afford the drugs generally enjoy a positive outcome; those without economic means are held in their position of powerlessness and subjugation. The virtue of individualism impairs social responsibility, and diminishes the ethical practice of social solidarity (Navarro, 2007a; Ter Meulen & Maarse, 2008).

The Expression of Neoliberal Ideology in Health Messages

Neoliberal policies have shaped the healthcare sector across all planes. Additionally, the neoliberal narrative has been expressed through public health campaigns and mass media publications (as news items or articles of general interest). When presented to the public, both public health campaigns and mass media articles are strongly inclined to present chronic illness in terms of self-regulation and individualism. To a much lesser degree has any research been dedicated to such social, political, and economic framing within postsecondary textbooks.

Public Health Campaigns

Deconstructed within the Foucauldian framework, documents on depression produced by the province of British Columbia were seen to be strongly aligned with minimalising the effects of dwindling public policies and emphasising individual-level variables as the source of the mental health problem (Teghtsoonian, 2009). Research looking at selected American public health campaigns draws similar conclusions. Locating the findings within Brown and Singhal's conceptual framework of the ethical dilemma, Guttman (1997) concludes health campaigns instil the value of education rather than institutional or structural change for health. Further, it is suggested health becomes a metaphor for self-control, promotes the values of individualism instead of the value of connectedness and caring, and is idealised as a super value that should be vigorously pursued by the individual.

In a critical thesis on the global prevalence of HIV/AIDS, Katz (2002) emphasises that individual behaviour alone cannot adequately explain the wide variation in HIV prevalence between populations and countries. By observing the incidence of AIDS in Africa, she observes that those most vulnerable to AIDS are also burdened by inadequate nutrition and diseases of poverty, such as parasitic infections, malaria, or tuberculosis which all leave biological resilience to co-infection low. Katz critiques behavioural-targeted campaigns by the international AIDS community, and argues the obstacles to adopting a more compassionate and targeted social determinants approach include the globalisation of neoliberal economic systems and the unequal distribution of international economic power (Katz, 2002). In other words, making significant advances in addressing AIDS will involve addressing the structural roots of the maldistribution of resources, wealth, and power rather than simply treatment and behavioural change. In a similar vein, Kaplan presents a value-

critical policy analysis on the prevalence of AIDS in America. Highlighting the burden AIDS disproportionately places on Black and Hispanic Americans, Kaplan argues there are critical limitations to individualising social problems, and suggests policy based on dominant values to the neglect of larger social and cultural tensions is limiting and problematic.

Specific public health campaigns targeted towards healthy eating, weight management, and T2D carry similar tropes of minimalising social issues while maximising self-responsibility and individualism for health. However, these campaigns produce particular outcomes. In New Zealand, for example, public health messages about weight loss and healthy eating generated moral judgments about lifestyle choices, serving to potentially engender stigmatisation by deemphasising the social differentials contributing to healthy eating and physical activity (Thompson & Kumar, 2011). Public health campaigns launched in the United Kingdom to promote eating healthful foods for weight management and the prevention of T2D merged neoliberal notions of self-management and corporeal regulation with a marketised, consumerist approach (Thanem, 2009). Situated within a solid consumerist culture, and disregarding social influence on behaviour, the result was an increased awareness and subsequent consumption of fruit and vegetables, but no change in the consumption of unhealthy food (Thanem, 2009). In the paradigm of moralising health behaviours in a conflictual relationship with production and consumption, concentrating on health behaviours in an attempt to control the incidence of T2D is problematic. In Britain, amid the stigmatisation and ineffectual moralising of public health campaigns critically observed by Mackenzie (2010), the Royal College of Surgeons justified the use of bariatric surgery as a means to ensure a strong workforce, ease the long-term burden of healthcare costs, and alleviate social welfare spending (Royal College of Surgeons, 2010). The burden

of T2D and obesity was framed in terms of economics and not in terms of social situation. The solution put forth was not through policy change but by the consumption of biomedical procedures.

In North America, similar trends within the public health setting are seen. In the United States, a variety of campaigns have been launched to promote healthy eating, exercising more, and controlling weight all in the name of reducing the burden of mounting levels of T2D. Collectively, these campaigns have emphasised individual behavioural control at the expense of addressing the social structure conducive to T2D (Garcia, 2007). It is also suggested they have been a waste of public health funds while negatively stereotyping overweight and obesity (Garcia, 2007). Canadian educational initiatives for healthy eating are similar in their approach to individualism, again in spite of their lack of effectiveness in altering trends in obesity and T2D (Lange & Faulkner, 2012). The current direction by Canadian public health continues, in spite of preliminary research that suggests there is ample popular support for initiatives that minimise individualism in favour of addressing broader social issues, such as irresponsible food marketing and production, work and time constraints (Lange & Faulkner, 2012). Guttman and Salmon (2004) raise broad ethical concerns about the tendency to move beyond the protection of public health in campaign messages to social marketing techniques that moralise health decisions, responsabilise lifestyle choices, and expand social divisions.

Overall, within a critical epidemiological point of view, the individualization of causation and prevention of chronic disease carries with it a number of technical and statistical incongruencies. Pointedly, Rockhill (2005) insists the errors inherent to applying epidemiological trends to individual behaviour should be vigorously exposed with the

concurrent message that macrolevel issues (such as social determinants) are the more strategic issues needing attention. She emphasises the narrative of individual-level risks and benefits be superseded by population level trade-offs, simply on the basis that the latter approach can be undertaken with more consistency and accuracy. Irrespective of the wider social and ethical considerations, statistical epidemiological trends more accurately direct attention to population-wide shifts: distilling individual risk estimates and demanding a personal, "rational" behavioural response is in conflict with foundational population health tendencies (Rockhill, 2005).

Research dedicated to neoliberal persuasion within the public health narrative effectively highlights the predictable characteristics of individualism, distant governmental interest, and the commodification of research and care. What is generally missing in research to date is an exploration into the extent to which a neoliberal political trajectory contributes to the forces that generate a pathogenic environment for chronic disease. Furthermore, limited insight can be found on whether neoliberal policies shape public health promotion, or whether a dominant biomedical presence has influenced the evolution of public health in a way inherently self-serving but coincidentally similar to its politicoeconomic partner. In other words, are the increasingly neoliberal approaches to public health a result of the broader political climate, or are they a systemic manifestation of internal interests and biases? Lastly, while research emphasises the need to critically evaluate (and ultimately temper) the prevalence of individualism and self-responsibility in public health campaigns, it is questionable how effective such solutions might be if the social, political and economic environments that provided the genesis for neoliberal ideology aren't confronted.

Mass Media

The embodiment of neoliberal ideology in medicine is reflected clearly in current mass media; health reporting and related articles of interest are almost exclusively directed to personal lifestyle and the provision of health services rather than socioeconomic status, early childhood development or the environment (Gasher, Hayes, Hackett, & Gutstein, 2007). The emphasis on the individualistic approach to health management while simultaneously shifting responsibility from health and welfare services is also prevalent in *Men's Health* magazine (Crawshaw, 2007). An analysis of cancer and heart disease articles in major North American mass magazines uncovered similar findings. In coming to understand the degree to which these conditions were medicalised (as opposed to being framed as social or policy concerns), biomedicine trumped. As the authors describe, the emphasis on the medical interpretation of causation and intervention for cure is entirely consistent with a neoliberal capitalist environment; it is assumed that individuals will access and attend screening clinics, take the appropriate medications, and assume responsibility—upon advice from a healthcare professional—for initiating healthy behaviours. The responsibility for adopted health behaviours is emphasised within an empirical vacuum that entirely disregards social determinants. The additional emphasis on biomedicine as the facilitators for health serves the interests of biotechnology industries, including managed care industries (Clarke & van Amerom, 2008).

On a slightly different tack, Canadian newspapers were codified and analysed to gain insight on what types of health related issues were raised in mass media. By using *Toward a Healthy Future* (TAHF) as a basis for query (a governmental document outlining policy developments for reducing health inequity), Hayes et al. (2007) undertook a sweeping

content analysis of Canadian newspapers in order to extract the degree to which the concepts specifically outlined in TAHF were echoed by media articles on Canadian health. The areas of interest included such topics as socioeconomic determinants, childhood development, and the physical environment and their impact on the health of Canadians. In spite of the importance given to these factors within not only the TAHF but also the Lalonde Report and the Ottawa Charter (all Canadian achievements), newspaper coverage of social determinants was virtually nonexistent (Hayes et al., 2007).

Finally, a pertinent article looked at not to what extent individualism reflective of neoliberal thought appeared in the public voice, but *how* it appeared. With a presupposed understanding that self-responsibility and volitional behaviour is ensconced in American culture, Kirkwood and Brown (2006) sought to determine in what way public communications influence such beliefs. Working with extractions mainly from mass media but including public health pamphlets, books, and a presidential address, they concluded public communications translated ‘knowledges’ predominately rhetorical and frequently conflictual. Non-diagnosed audiences received messages of self-responsibility for their state of health, buttressed by the message that the sick were largely to blame for their fate. Messages to the sick, while placating guilt and distress by offering biomedical reasons for poor health, still allocated responsibility back to the patient for seeking a solution (Kirkwood & Brown, 2006).

In light of the prevalence of health messages framed within a neoliberal context, the framing of T2D in mass media necessitates reflection. In a recent study by Rock (2005), Canadian newspapers were surveyed for reporting accuracy in the portrayal of T2D. The study found that the framing of T2D involved generally situating it as an insidious, sinister

disease conferring high mortality rates, and increasing in prevalence across North America. Noteworthy was the fact that Aboriginal people were described as particularly vulnerable, but instead of concentrating on societal causes and policy-based solutions, personal lifestyle changes, medical research, and disease surveillance were the reported solutions of choice (Rock, 2005a)

This chapter has reviewed the social determinants of health, the influence on health by neoliberal capitalism, and the conceptual idea that neoliberalism is a method of solidifying power differentials within social settings. As a result, messages of health and disease are largely understood and discussed within a neoliberal perspective. Public health campaigns situate health-based messages in ways that reinforce self-responsibility for health without addressing social policy issues that may offer more strategic and effective protection of public health. Mass media generally mimics neoliberal discourses, and reports on societal healthcare challenges in much the same way. In spite of the multifactorial causes of T2D that ultimately require attention within all ecological spheres, this consideration is underrepresented in health discourse. Health messages embedded with a neoliberal ideology fail to recognize the complex influences on the development of chronic disease and are weak in scientific rigour. Health rests primarily upon socioeconomic factors, gender, ethnicity, the physical environment and social cohesion; thus it is in part a political issue (Hodgetts et al., 2008). Together, the emphasis on behaviour *and* medical intervention creates a synergistic relationship that collectively relieves policy makers from creating an environment that is less dedicated to corporate gains and more to social and environmental policies. Neoliberal health messages effectively stress the importance of poor lifestyle choices and behavioural transgressions in ‘blaming the victim’ rhetoric that simultaneously relieves the state from any

obligation to ensure well-being for its citizens. Focusing on self-attention to lifestyle occurs at the expense of revealing social, material, relational and structural determinants of health (Hodgetts et al., 2005).

Chapter 4

Theoretical Framework

The deconstruction of the data and building of thematic hierarchies were located within the tradition of critical discourse analysis. Because the manifestation, perpetuation, and normalisation of power differentials are a core component of modern neoliberal ideology, Michel Foucault's observations on hegemonic relationships were also pertinent to this research. Therefore, with the addition of Foucauldian ontology, the two understandings of discourse and power were consolidated to create the theoretical structure in which to analyse the data obtained. This chapter briefly outlines both the development and premise of critical discourse analysis. It concludes with an overview of Michel Foucault's, concepts of governmentality, biopower, and discursive formations, as they pertain to healthcare policy.

Critical Discourse Analysis

Critical discourse analysis (CDA) was grounded upon a multidisciplinary foundation (including, among others, the influences of Marx, Bourdieu, and Althusser) and developed by Norman Fairclough and Ruth Wodak in the mid 1990s (Blommaert, 2005). It is a social analytical framework that offers a means to interpret what textual messages carry. More specifically, CDA extends beyond pure, formal linguistics to unveil and expose the core meaning of text, its function to maintain power differentials, perpetuate ideologies, and influence ways of thinking. Therefore, CDA moves beyond form and function of language. It is an "empirical analysis of how such form–function correlations themselves correlate with specific social practices that help constitute the very nature of such practices" (Gee, 2008, p. 19). CDA is therefore both a method and theory in that it combines a basis for defining

relationships between words and society as well as interpretations regarding why and how these relationships are in place (R. Rogers, 2004). CDA seeks to discover the structures, strategies, or other components of written or verbal text that perpetuate dominance, whether it takes the form of social, political, cultural, racial, ethnic, or gender inequality (van Dijk, 1993). CDA is also useful for revealing contradictions embedded within discourses in incongruencies between them (Jäger & Maier, 2009). Additionally, CDA assumes social processes and arrangements of power are formalised by broad, powerful versions of reality (or discourses) that are ideological. These texts shape human subjectivity and, when analysed systematically, reveal how discourses consolidate power (Locke, 2004). In the critical tradition, CDA recognises that social phenomena—and the observer of such phenomena—are historically located and consequently relative. Discrete objectivity within the research field is therefore obfuscated to an extent by virtue of the methodological apparatus selected; critical theory locates knowledge forms as decidedly subjective phenomena. Put another way, analysis occurs within discourse and is therefore not a means to solidify universals and absolute truths; it too is pliable and modifiable (Jäger & Maier, 2009). Power differentials are assumed and informed as entities requiring redress (Rubin & Rubin, 2011).

CDA was determined then to be the most suitable foundation for the methodological process and the most advantageous launching point for the reconstruction of the findings through a Foucauldian lens. CDA and Foucauldian discourse analysis are complementary for a number of reasons. First, CDA understands discourses to represent broader structural and ideological intentions in a similar way that Foucauldian discourses are technologies of power relations and expressions that establish inequalities in society (Wooffitt, 2005). Secondly, both traditions attempt to expose and illuminate how subjectivities are responsive to power

arrangements (Wooffitt, 2005). Lastly, the analytical frameworks both situate power differentials within an historical perspective (Wodak & Meyer, 2009 introduction) and acknowledge the transmission of knowledge/power through discursives. Foucault's genealogical explorations undertaken in *Discipline and Punish* (1995) add a particularly compelling dimension. Here he argues systems of knowledge are based upon historical regimes of power and not upon objective, rational truths.

Combining CDA with a Foucauldian conceptualisation of discourse provides avenues of investigation that seek to answer a number of questions. According to Jäger and Maier (2009), such inquiries include: What it is that constitutes knowledge at a given historical point? How does this knowledge come to permeate society and how it is transmitted? What is the purpose of this knowledge as it pertains to the constituting of subjects? Lastly, what are the broader ramifications of this knowledge on society as a whole? Therefore, CDA and Foucauldian discourse analysis form a theoretical foundation to construct how power works and afford a lens in which to view social relations. For this reason, the Foucauldian descent on governmentality through the biopolitical regulation of human health offers an appropriate framework to interpret the data of this thesis. Together with critical discourse analysis, Foucault's framework serves as the basis for understanding the content analysis undertaken as the primary methodology of this research.

Foucault, Power, and Neoliberal Ideology

Of all the theorists who have critiqued neoliberalism, including its implications for healthcare, Michel Foucault's ideas are particularly important. He presented an historical outline of German neoliberalism and American neoliberalism in a series of lectures

encapsulated in the *Birth of Biopolitics* (2008). Through these lectures, he elaborated and consolidated his ideas on the nature of power and situated them within the neoliberal phenomenon. Foucault's early observations of neoliberal capitalism in the late 1970s were astute. While the exchange and trade of goods are deemed a natural aspect of society, Foucault defined neoliberal capitalism as representing, "not commodity and uniformity of commodity, but towards the multiplicity and differentiation of enterprises (Foucault, 2008, p. 149). Neoliberal capitalism is therefore not about a standardised view of mass consumption, but an unnatural state of competition that is precarious, unstable, and requiring supportive mechanisms. In this respect, Foucault highlights one of the binaries of neoliberal society. He notes it is at once, "an enterprise society and a judicial society, a society orientated towards the enterprise and a society framed by a multiplicity of judicial institutions" (Foucault, 2008, p. 150). The binary is that the enterprising, liberal subject is simultaneously subjected to judiciary mechanisms as a means to stabilise a neoliberal economy. The way this is done is through the shaping of the environment in which the subject exists; it is not the market that is regulated as such but the conditions of the market (Foucault, 2008). Foucault stresses the importance of enterprise and the enterprising self in neoliberal ideology. He states, that the "multiplication of the enterprise form within the social body is what is at stake in neoliberal policy. It is a matter of making the market, competition, and so the enterprise, into what could be called the formative power of society" (Foucault, 2008, p. 148). Foucault therefore concludes economy is not something tangible in as much as it is a form of power and knowledge. The liberal subject rationalises governmentality, and it is this system by which neoliberal society performs. The movement of power and the ways in which power is distributed as knowledges, actions, and rationalisations, as seen by Foucault, serve as a

structural guide for this research. The impact of neoliberal ideology on healthcare and the understandings of health and disease can be interpreted neatly within a Foucauldian analysis of the fluidity of power among and within social structures (including, but not limited to, the state) and the subject.

Within a Foucauldian understanding, knowledges of truth are not neutral but constructed and manipulated by power structures (Lemke 2002). Neoliberal capitalism injects market and economic discourse into all aspects of social existence, and normalizes these discourses as rationalities. In the name of liberty or free will, self-reliance becomes preferable so that the failure to overcome any number of social pitfalls is the result of lack of self-care, not lack of state accountability. Additionally, noted by Foucault, the liberalist environment limits and minimalises the power of the public voice (Peters, 2007). These examples of neoliberal rationalities are collectively deconstructed and explained by the commentary of Foucault, particularly his conceptualisations of governmentality, biopolitics, and discourse. For this reason, a Foucauldian lens will serve to illuminate the intersection between neoliberal ideology and the understandings of T2D. Each of Foucault's offerings on governmentality, biopolitics and discourse are explored below.

Governmentality

Foucault (1991) constructs governmentality as an elaborate “ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics” (p. 102) that allow for the installation of a particular power apparatus; the result becoming “governmentalized” (p. 103). Governmentality is an inseparable entity that simultaneously recognises technologies of power and regulation (govern) and the thoughts and rationalities

(mentality) supporting them (Lemke, 2011). Governing is a process that is seen in the broadest sense: in the Foucauldian tradition it is not unilaterally political, but embraces religious, social, philosophical, pedagogical and medical purviews (Lemke, 2011). Described as the conduct of conduct, the notion of governmentality therefore explains how multiple aspects of individuals are shaped. In his lecture *The Subject and Power*, Foucault states, “the exercise of power consists in guiding the possibility of conduct and putting in order the possible outcome. Basically power is less a confrontation between two adversaries or the linking of one to the other than a question of government” (Foucault, 1994, p. 228). Although subjects are identified as free, strategies and regimes are implemented to direct the practices of individuals (Foucault, 1988b).

Governmentality is the infusion of ideals into all aspects of life in a way that confers a normalising and internalising of the ideals. While a population is the “subject of needs, of aspirations, it is also the object in the hands of the government, aware, vis-a-vis the government, of what it wants, but ignorant of what is being done to it” (Foucault, 1991, p. 100). Technologies of the self, a manifestation of governmentality, had its roots in Foucault’s musings about early Greco-Roman philosophy and Christianity in the first five centuries CE (Martin, Gutman, & Hutton, 1988), in which he pondered formation of the self. Although the practice of self-examination was developed in different ways in these respective eras, the premise was that identity formation was constituted within technologies of power or domination. Foucault identified “the interaction between oneself and others and in the technologies of individual domination, the history of how an individual acts upon himself, in the technology of self” (Martin, Gutman, & Hutton, 1988, p.19). Techniques, or technologies of the self, are therefore self-initiated actions that transform and modify subjectivities for

desired outcomes (Foucault, 1993), but are driven to action by others. Subjectivity, or the relationship of one to oneself, is the result of external persuasions that create a moral² conduct from which evolves technologies of self-reflection, self-knowledge, and self-examination (Foucault, 1990a). For this reason, technologies of the self are a form or expression of governmentality. He continues, “the techniques of the self are integrated into structures of coercion and domination” (Foucault, 1993, p. 203). In other words, the ambitions of those in power are construed and moulded to align “ideals and aspirations of individuals, with the selves each of us want to be” (Rose, N., 1990, p. 213). As a result, the new political paradigm that is a governmentality situated within the ideals of liberalism involves not only the existence of an external gaze, but also the evocation of an internal surveillance; it spans a continuum from political regulation to self-regulation, or the *technologies of the self* (Lemke, 2002). Governmentality is the intersection between technologies of domination and technologies of the self; it is a perceived regulation of self as a normalized practice that is in appearance liberalism, but adheres to the shaping and coercive whims seen in the technology of domination. With respect to health and disease, the essence of governmentality tactically relegates the responsibility of well-being to individuals in the name of liberalism (Nye, 2003); today, governmentality generates a sort of cultural imperialism as it equates self-responsibility for health with being good citizen (Vander Schee, 2008).

² Foucault defines moral conduct as the actions based upon the values and rules of various prescriptive agencies. These values and rules may be indoctrinated, or more nebulous and diffuse as a “moral code”. He adds that morality is also the behaviour of individuals in relation to what is recommended; to what extent they adhere to values or obey a prescriptive system (Foucault, 1990, p. 25).

Biopolitics

Although a technology of governmentality, Foucault referenced biopolitics in a variety of philosophical landscapes and used the term interchangeably with biopower. At its nexus, biopolitics consolidates the physical self and moral–political existence (Lemke, 2011), exercising the complementary technologies of discipline and regulation to control and optimise biological life (Collier, 2009). This philosophical sway from more juridical forms of rule requires continual oversight—through qualifying, measuring, appraising—for its maintenance (Foucault, 1990b), and in that way politics is legitimated as steering the vital processes of human existence (Rose, N., 2001); biopolitics is pervasive and surveilling. Biopolitics therefore loosely refers to the pervasive controlling mechanisms of a political entity over its subjects (Lazzarato, 2006). Broadly, it does so in the following ways: (a) by presenting a discourse on living beings determined to be factual and disseminated by authoritative voices; (b) by implementing strategies that shape the life of a collective population; and (c) affirming truth discourses that impress individuals to assume certain lifestyle behaviours for both personal and collective benefit (Rabinow & Rose, 2006).

A form of biopolitical expression is the clinical or medical gaze. Foucault described the clinical gaze in a historical context when articulating the medical epistemology of the 18th century. At that time medicine was making advances in the clinical visualization of patients and recorded observations of living patients that could be compared with their autopsy results post-mortem. According to Foucault, the foundation was in place for further advances in the clinical (or medical) gaze, which broadly is the insistence on externalizing all aspects of the physical interior (Foucault, 1973). The gaze contorted and evolved in tandem with history, in a way Foucault (1973) termed the ‘spatialisation’ of medicine and illness. In

the early 18th century for example, illness was synonymous with the symptom; the responsibility of the physician was to visit the patient at home and correlate the progression of symptoms with the movement of the illness (Armstrong, 1995). In the 19th century, bedside medicine slowly became replaced by hospital medicine, whereby illness was a triangulation of pathology, sign and symptom (Armstrong, 1995). The gaze was not only removed from the personal space of the home to the hospital, but the somatic self became a dimensional unit of external presentation and internal pathology. Spatialisation was extended by laboratory medicine in the 20th century, whereby the patient was objectified by the numbers, lab values, images and analyses bestowed by the maturing field of biotechnology (Armstrong, 1995). Today, surveillance medicine has moved to the forefront. In concert with the pressing priority of risk management, the Foucauldian gaze manifests in genetic screening, monitoring and measuring those deemed at risk for illness. A population may not be ill, but if the potential for illness is established, interventionary measures are required in the name of preserving the subject. All are exposed to the medical gaze.

Today, in the age of biotechnology and advances in genetics, biopolitics assumes new dimensions in relationships of power. As a means to situate biopolitics in the current neoliberal milieu, Nikolas Rose (2001) expresses it as a triangulation of technologies. As a risk politics it popularises genetic makeup and personal vulnerabilities in a way that “*individualises* human worth, *essentialises* variations in human capacities, *reduces* social phenomena to the aggregate of individual actions, and *discriminates against, constrains or excludes* those found biologically abnormal or defective” (Rose, N., 2001, p 2). A population at risk becomes subject to a collective of risk factors and vulnerabilities, required by medical technology to screen, survey, monitor, and measure potentialities of disease. Biopolitics as

risk appropriates abstract uncertainties as quantifiable realities, consequently justifying processes of surveillance and legitimising self-regulation. As a molecular politics human life is reduced to chemical explanations and observations. It becomes wed to the technologies and instruments that observe at the molecular level and the development of pharmaceutical preparations that act at the molecular level. Molecularization has reorganised the focus of the biological sciences, “their institutions, procedures, instruments, spaces of operation, and forms of capitalization” (Rose, N., 2007b, p. 44). The cumbersome weight of protracted visits to the family physician is expedited by biotechnological and pharmaceutical alternatives. Additionally, molecularisation hones technological solutions to individual problems rather than upstream solutions. The body, although biological, also becomes a space of technological exploration and marvel. Resultantly, it is additionally political.

Finally, biopolitics is an ethopolitics. Rose suggests biopolitics involves using the ethos (or character) of human existence, including “the sentiments, moral nature or guiding beliefs of persons, groups, or institutions” as a channel “within which the self-government of the autonomous individual can be connected up with the imperatives of good government” (Rose, N., 2001, p 18). Within a neoliberal society, the promotion of individual and community self-sufficiency, agency and resilience is the solution for broader societal ailments. Again, individual freedom is more of an obligation to be free (Rose, N., 1996); the obligation being both external (via political ideology), and internal (via self-governance). There is an expectation to be free, utilising what a government has to offer in a self-directed and enterprising way (Dukelow, 2004). In agreement with the previous forms of biopolitics, the mechanism of self improvement occurs—and is viewed as—a wholly somatic mechanism; the discovery of one’s inherent biological makeup is not a fatalistic discovery,

but an opportunity for using such knowledge to make sound lifestyle choices and decisions about responsible behaviours.

It should be noted that biopolitics and biopower are not exclusively for the provision and sustenance of life-giving forces. By nature, biopower is equipped and distributed in a way that is selectively life affirming; offering and encouraging the utilisation of biotechnology and resources to some, while disregarding the needs of others. In this way, amid the inculcation of healthism and surveillance, voices of the marginalised—whether by race, age, social status, gender, for example—are left unheard.

Discursive Formations

Foucault situates one method of political influence within the notion of discursive formations or discourses. Described as assemblies of knowledges that “systematically form the object of which they speak” (Foucault, 1972, p. 54), discourses are the means and ways that shape social phenomenon and set power relations that exist at a particular moment in time. They are systems of representation, existing in effect as power/knowledge complexes. Power here is “a whole series of particular mechanisms definable and defined, that seem capable of producing behaviours or discourses” (Foucault, 2007, p. 60). *Knowledge* in this context is of the Foucauldian sense in that it is not a material reality but that of an utterance of power distribution. The power equilibrium is decidedly discordant, yet when diffused as knowledges, become implemented in a way that is interpreted as common sense, everyday and natural; power through knowledges informs and constitutes behaviours. Foucault therefore located discourse as a meaningful representation of the rules, values and practices behind it (Hall, 2001). Discourse is knowledge as it applies to how concepts are put into

practice, and its means of dissemination is in language. Discursive formations, according to Foucault, are collective representations of discourses, or discursives.

While discourses and discursive formations serve as the language technologies of power dissemination, there is also a mechanism to bridge discourses with objects. Foucault suggests the mechanism combining discourse with objects is the dispositive, in which the constituent elements are connected by a purpose for “dealing with an urgent need”, or more accurately, the stabilisation of hegemonies (Jäger & Maier, 2009, p. 41). What consists in the dispositive are language (the discursive), action (the non-discursive), and materialization (Jäger & Maier, 2009). It is through the dispositive that power relations are infused, incorporated, normalized, and enacted in society. Dispositive analysis becomes a means by which to discern how “assignments of meaning create reality” (Jäger & Maier, 2009, p. 39).

An important feature of Foucault’s interpretation of power is that it is not a discrete entity acquiescent to a solid definition or meaning, but a fluid energy that persists between relationships. The organic plasticity of power therefore implies it is not rigid, fixed, or necessarily repressive. There is room for change, and over time there is movement of power. This is an important realisation in that it invites the generating of questions about how neoliberal ideologies aim to enforce hegemonic interests within healthcare at the expense of social prerogatives. Additionally, it offers opportunities for the renegotiating of protected interests that are currently directing healthcare policy and delivery.

Chapter 5

Methodology

Overview

To answer the research question—Does the interpretation of T2D in pathophysiology textbooks reflect neoliberal thinking? —a content analysis of T2D was undertaken in current pathology, pathophysiology, and disease process textbooks. This chapter outlines the methodological process in which the data were retrieved and interpreted. Reliability, validity, and trustworthiness considerations are addressed.

Textbook Selection

For the content analysis, current textbooks used in pathology, pathophysiology, and disease process courses were analysed. The content of these textbooks are largely similar in premise, although there are subtle differences that lead one type of text to be preferred over another for particular classroom settings. Pathology textbooks as a whole, discuss diseases and disease processes on a more somatic, or macro level. Disease is discussed with a focus on tissue, organ, and broader, observational alterations. Disease process textbooks are in general similar to pathology textbooks in content, focusing again on tissue, system, and to a degree the clinical presentations of disease, more than the molecular understandings of illness. Occasionally they are written in a more succinct form for students taking a one-term course in human disease. Pathophysiology textbooks interpret disease processes much the same way as pathology texts, but concentrate on a more micro level of pathological findings. Laboratory references, cellular changes, and biochemical markers are emphasised in pathophysiological understandings of illness. Ten current editions written for the North

American market were used for the content analysis, and were selected based on the following criteria:

- They were written for a one or two-term postsecondary level program for nursing students, medical students, or those studying within the allied healthcare fields (e.g., physiotherapists, chiropractors, naturopaths, occupational therapists)
- They were the most recent editions and known to be in use in Canada
- Their sales figures indicated they were widely used texts

The sales figures for 2012 were determined by direct contact with the publishing firms and verified with the Login Brothers 2012 report of the most commonly ordered texts for postsecondary medical education (Login Canada Best Sellers, 2012). Upon compilation, the following textbooks were determined suitable for analysis:

- *Essentials of Pathophysiology* (3rd ed.). (2011). C. M. Porth (Ed.). Philadelphia, PA: Lippincott, Williams and Wilkins.
- *Handbook of Pathophysiology* (3rd ed.). (2008). E. J. Corwin. Philadelphia, PA: Lippincott, Williams and Wilkins.
- *Human Diseases* (3rd ed.). (2010). M. Neighbors & R. Tannehill-Jones (Eds.). Clifton Park, NY: Delmar.
- *Pathophysiology* (4th ed.). (2010). L. Copstead-Kirkhorn & J. L. Banasik (Eds.). St. Louis, MO: Saunders.
- *Pathophysiology: Concepts and Applications for Health Care Professionals* (3rd ed.). (2011). T. J. Nowak & A. G. Handford. Boston, MA: McGraw-Hill.

- *Pathophysiology: Concepts of Altered Health States* (8th ed.). (2011). C. M. Porth & G. Matfin (Eds.). Philadelphia, PA: Lippincott, Williams and Wilkins.
- *Pathophysiology: Functional Alterations in Human Health*. (2007). C. A. Braun & C. M. Anderson. Baltimore, MD: Lippincott, Williams and Wilkins.
- *Pathophysiology: The Biologic Basis for Disease in Adults and Children* (6th ed.). (2010). K. L. McCance, S. E Huether, V. L. Brashers, & N. S. Rote (Eds.). Philadelphia, PA: Mosby.
- *Robbins Basic Pathology* (8th ed.). (2007). V. Kumar, A. K. Abbas, N. Fausto, & R. N. Mitchell (Eds.). Philadelphia, PA: Saunders.
- *The Nature of Disease: Pathology for the Health Professions*. (2007). T. H. McConnell. Baltimore, MD: Lippincott, Williams and Wilkins.

Content Analysis

Content analysis was determined to be the most suitable method for the purpose of this research because it affords a rigorous approach to detecting the existence of specific trends in communications, spotlights the focus of particular textual presentations, reveals biases, and audits content against objectives (Weber, 1990). The analysis of textbook content assists in uncovering trends in content as well as testing hypotheses about symbolic representations of knowledge, or indeed to confirm what is already believed (Krippendorff, 2004). More broadly, content analysis assumes that cultural forms of ideas and expressions are reflected in texts; therefore content analysis reflects social realities (Bos & Tarnai, 1999; Krippendorff, 2004).

A content analysis summarizes the characteristics of messages and can lend insight about the individuals or groups who formulated them (Neuendorf, 2002). Content analysis

serves to expose social realities unearthed as nonmanifest contexts from manifest texts through the interpretive (and ideally verifiable) lens of the analyst (Krippendorff, 2004). As a scientifically rigorous process (Neuendorf, 2002) the analysis exposes precise thematic trends from which to build critical assertions. As described above, the qualitative aspect of the research involved the assimilation of codes and configuration of a code catalogue. The descriptors were assembled and presented as frequency counts. The thematic analysis was undertaken to consolidate the repetitions of ideas, statements, and words discovered in the content analysis. According to Krippendorff (2004) the themes—represented in the way text and images are presented—shape actions based upon their meanings. Identified thematic entities within texts are “rich in information” (p. 110) and potentially offer epistemological complexities to the findings. However, thematic distinctions have an inclination to diminish reliability (Krippendorff, 2004). Where possible, the thematic distinctions were therefore encapsulations of broad coding units that were contextually very similar, and unlikely to perpetrate misunderstandings.

Coding Procedure

This data collection incorporated both deductive a priori coding and inductive categorisation as its qualitative basis. For deductive analysis, a series of codes were developed based on phenomena highlighted in the literature review. These were extrapolated from discourses on neoliberalism, the political economy of healthcare, social determinants of health, the social gradient, and current research on the aetiological and risk factors for T2D. The categories, or defining groups of words, which were coded using deductive analysis were based on the following constructs:

- personal decision making and lifestyle behaviours
- socioeconomic and social gradient components of health
- environmental risk factors for disease
- the use of biotechnology in the understanding and treatment of T2D

Data-driven inductive coding reinforced the theory-driven deductive aspect of content analysis. The addition of the inductive approach was necessary to augment the directed process. The inductive coding allowed for the amassing of themes previously overlooked and unaccounted for in the deductive coding. To create inductive codes, several readings of each text took place. This led to an assimilation of raw data and the consolidation of the codes (Corbin & Strauss, 2008). This process was necessary to code and categorise content falling beyond the parameters of the deductive codes derived from theoretical conceptual understandings. The codes highlighting epidemiological statistics for T2D (like age and ethnicity) are some examples of those derived from the inductive process.

Coding involved the deconstruction of the texts in a variety of ways. First, specific borders within the books themselves broadly defined the transcribed sections of texts; the descriptions of T2D were pulled from the chapters specifically addressing diseases of the endocrine pancreas. This was done to reduce the chance of erroneously coding data that reflected other conditions that often coexist with hyperglycaemia, such as other endocrine disorders, neurological conditions, or acute cardiovascular events. For clarity and reliability, the transcriptions discounted embedded figures, charts, tables, pictograms, and summary boxes. Secondly, codes included syntactical divisions, whereby key words characteristic of the theoretical premise of the research were highlighted. Thirdly, codes were developed as a

means to capture and highlight broader, conceptual ideas presented in the text. From the parameters described, a final coding catalogue was formulated. Table 1 lists the 23 identified codes and their descriptions.

Table 1
Coded Words, Coded Statements, and Their Descriptions

Coded word or statement	Description
Access to exercise	Are barriers to exercise mentioned as risk factors for T2D?
Access to quality food	Is food security or poor access to quality food mentioned as risk factors for T2D?
Age	Is age mentioned as a risk factor, and what age ranges are specifically mentioned?
Endocrine disrupting chemicals	Is the exposure to endocrine disrupting chemicals mentioned as a risk factor for T2D?
Environmental factors	What general environmental conditions exist that either perpetuates the onset of T2D or affects its management?
Ethnicity	Are specific ethnicities targeted as at-risk populations?
Genetic predisposition	Are genetic understandings of T2D mentioned?
High caloric intake/overeating	Is there specific mention of excessive caloric intake as a risk factor for T2D?
Lack of exercise/sedentary lifestyle	Is a lack of physical activity mentioned as a risk factor for T2D?
Lifestyle	What volitional behaviours generally pertaining to lifestyle are mentioned as risk factors for T2D?

Coded word or statement	Description
Obesity	Is obesity mentioned as a risk factor for T2D?
Obesogens	Is the exposure to obesogens identified as a risk factor for T2?
Rapid increase in incidence/prevalence	How are the rapid changes in diabetes epidemiology expressed?
Social determinants	Are social determinants mentioned in context with T2D?
Socioeconomic status	Are socioeconomic factors discussed as risk factors for T2D?
Unknown aetiology/risk factors	Are limitations in the understanding of diabetes epidemiology acknowledged?
Individualized approach to care	Are descriptions of the management of T2D focused on individual care?
Biomedical management and monitoring	Is there importance placed on the monitoring and surveillance of patients with T2D?
Pharmaceutical intervention	Are pharmaceutical interventions mentioned for the treatment of T2D?
Dietary management/weight loss	Are weight loss and dietary management regimes mentioned as treatment techniques?
Education for behavioural change	Are behavioural change methods mentioned as a part of treatment protocol?
Exercise regime	Is physical exercise mentioned as a modality for the treatment of T2D?
Surgery	Is surgery mentioned as a treatment option?

Coded word or statement	Description
Prevention	Are prevention or preventative measures for T2D discussed?

Many of the codes were established deductively and fell within the broader conceptual ideas regarding the impact of neoliberal capitalism on the social determinants of health and healthcare. The codes established inductively were age, ethnicity, genetic predisposition, unknown aetiology, and prevention.

To ensure validity of the coding framework, an external researcher collaborated in the refining of the codes. Concurrently, descriptives of the codes were also established and refined; reliability is reinforced by the inclusion of code definitions so that transrater interpretations and conceptualisations are kept to a minimum (Weber, 1990). Inconsistencies were deliberated and agreements reached before the coding catalogue was finalised for implementation; the collaborative interaction generated an intersubjective agreement that served as a criterion for objectivity (Lincoln & Guba 1985).

Data Collection and Reviewing Process

The process by which the data was collected and categorized was through computer assisted qualitative data analysis (CAQDAS). Computer-assisted analysis aids research by generating an audit of the data analysis and formulates an accurate, non-partial display of data (Welsh, 2002). The software incorporated was NVivo, and was predominately used for the organizing of data, recording of codes, construction of hierarchies (or supercodes), and descriptive, qualitative analysis.

The construction of the findings involved defining the areas of the textbooks for transcription and subsequent cataloging of the transcripts in NVivo. After coding following the procedural outline described above, the hierarchies were arranged based on the clustering of similar themes. Frequency counts were used to provide a clarified, contextual overview of what themes were most heavily represented and any that were minimised or neglected in the texts. Finally, the themes or hierarchies were considered within the tradition of critical discourse analysis with additional insight gleaned from Foucauldian commentary.

Reliability

Just as texts reflect social realities, content analysis and the interpretation of text are likewise socially embedded. Nonetheless, a degree of precision is desirable and achievable within the qualitative tradition. To achieve it within this endeavour, several checks and balances were incorporated. First, training in coding procedures was undertaken before the assimilation of data took place. Second, the established codes and their definitions were finalised in a collaborative effort with an external researcher experienced in the field before being catalogued. Third, stability was ensured by minimising intrarater variation through the coding of the transcripts several times. Fourth, two additional researchers with competence in content analysis were recruited to test the coding catalogue in an independent analysis of sample texts as a means to solidify reproducibility. These researchers were briefed on the research question, theoretical premises, and historical context of the work before undertaking their independent work. The external researchers coded the material from a total of five textbooks, and the final percent agreement between all three researchers was 96.6%. Lastly, a hermeneutic interpretive approach was incorporated to instill objectivity in all stages of analysis. The hermeneutic procedure involved interpretive readings and continual comparing

of individual texts with broader historical constructs to form broader conceptual frameworks. As higher levels of theoretical cognition developed, interpretive explanations of texts (Bos & Tarnai, 1999) were refined and expanded upon.

Summary

This chapter outlines and discusses the content analysis procedure that was applied to 10 leading college textbooks of pathology, pathophysiology, and disease process courses to attempt to understand how they characterize T2D. The codes for the content analysis were based upon a combination of theory (deductive codes) and careful reading of the textbooks (inductive codes). Using these processes, 23 codes were established, as outlined in Table 1 (pp. 98–100). Interrater reliability of 96.6% was established with two other researchers.

Chapter 6

Results

As described in the methodology chapter, the coding catalogue was determined by both inductive and deductive means. Upon compiling the data, these 23 thematic and linguistic codes were concentrated within two broad hierarchies, namely aetiology and risk factors and preventive and treatment measures. Table 2 summarises the codes placed within each hierarchy.

Table 2
Codes Organised According to Hierarchy

Aetiology and risk factors	Preventive and treatment measures
Access to exercise	Individualized approach to care
Access to quality food	Biomedical management and monitoring
Age	Pharmaceutical intervention
Endocrine disrupting chemicals	Dietary management/weight loss
Environmental factors	Education for behavioural change
Ethnicity	Exercise regime
Genetic predisposition	Surgery
High caloric intake/overeating	Prevention
Lack of exercise/sedentary lifestyle	
Lifestyle	
Obesity	

Aetiology and risk factors	Preventive and treatment measures
Obesogens	
Rapid increase in incidence/prevalence	
Social determinants	
Socioeconomic status	
Unknown aetiology/risk factors	

With further analysis, the broad hierarchies were found to be conceptually subdivided into smaller groups sharing similar content. The code clusters were subsequently categorized to highlight these differences. Within the aetiology and risk factor hierarchy, the codes were conceptually organised between *social influences*, *behavioural influences*, and *biological/non-modifiable influences* on the development of T2D. Within the prevention and treatment measures hierarchy, the codes were conceptually organised to represent *preventive measures*, *behavioural modification*, and *pharmacological/surgical interventions*. Within each of these subdivisions, the frequency of coded statements was tabulated. Table 3 highlights the distribution of coded statements among the subdivided categories:

Table 3***Codes Organised in Subcategories***

Aetiology / Risk factors		
Social influences	Behavioural aspects	Biological / non-modifiable factors
Environment	Obesity	Genetics
Rapid increase in incidence/prevalence	Lack of exercise/sedentary lifestyle	Age
Socioeconomic status	Lifestyle	Unknown cause
Endocrine disrupting hormones	High caloric intake/overeating	Ethnicity
Obesogens		
Social determinants		
Access to exercise		
Access to quality food		
Prevention and treatment measures		
Preventive measures	Behavioural modification	Biomedical management strategies
Prevention	Dietary management / weight loss	Pharmaceutical intervention
	Exercise regime	Monitoring by laboratory tests
	Education for behavioural change	Surgery
	Individualised approach to care	

When the results were tabulated, it was found that the frequencies of the codes varied considerably. Overall, within the aetiological and risk factors hierarchy, the social aspects of T2D were not represented at all, while genetics and behavioural elements were strongly represented.

Tables 4 to 19 (pp. 107–127) summarise both the number of textbooks represented within each code and the number of coding references. The codes from each hierarchy and subcategory will be discussed systematically and according to the frequency with which they appeared in the texts. Each conceptual idea within the broad hierarchies will be highlighted in a table. The individual codes represented in each table will likewise be interpreted and discussed as appropriate. In keeping with the methodology of the research, the number of coding references does not reflect the frequency in which specific words occur, but rather each time a concept is mentioned or reiterated with a different emphasis throughout the text.

Aetiology and Risk Factors

Social Influences

The environment was mentioned as a significant risk factor for T2D, represented in nine references among 6 of the 10 textbooks. Following environment, the rapid increase of T2D was mentioned several times, but only in one text. Socioeconomic status was also mentioned in two texts, while the remaining five codes representing social factors influencing T2D were not mentioned at all (see Table 4).

Table 4
Codes Representing Social Influences

Aetiology / Risk factors		
Social influences	Number of sources	Number of references
Environment	6	9
Rapid increase in prevalence/incidence	3	5
Socioeconomic status	2	2
Endocrine disrupting chemicals	0	0
Obesogens	0	0
Social determinants	0	0
Access to exercise	0	0
Access to quality foods	0	0

The code *environment* was intended to extract textual content discussing social influences on the development of T2D. Thus, the term was selected to identify themes such as ‘obesogenic environment’, ‘an environment lacking safe places to exercise’, or ‘an environment that hinders maternal health’. In the textbooks, however, references to *environment* were only on occasion defined, while five of the nine coded references offered no description of what environment meant in terms of a risk factor for T2D (see Table 5).

Table 5***Examples of Statements Coded Under Environment as a Risk Factor for T2D***

Coded statement	Source
“...genetic and environmental factors appear to contribute...” Braun & Anderson, (p. 465)	<i>Pathophysiology: Functional Alterations in Human Health</i>
“The pathogenesis of type 2 diabetes involves both genetic and acquired (environmental) factors.” Guven, Matfin, & Kuenzi, (p. 809)	<i>Essentials of Pathophysiology</i> , Porth (Ed.)
“Environmental influences, such as a sedentary life style and dietary habits...” Maitra, (p. 778)	<i>Robbins Basic Pathology</i> , Kumar, Abbas, Fausto, and Mitchell (Eds.)
“...combined with environmental influences, such as obesity....” Jones, Brasher, & Huether, (p. 750)	<i>Pathophysiology: The Biologic Basis for Disease in Adults and Children</i> , McCance, Huether, Brashers, and Rote (Eds.)

T2D has increased at a fast pace over the last 20 to 30 years. Only three texts specifically highlighted this trend, and it was appropriately coded under *rapid increase in prevalence/incidence*. Tannehill-Jones (2010) numerically described how T2D had become more apparent in the American population between the mid-1970s to mid-1990s. McConnell inferred this rapid increase with an urgent statement: “Experts warn that the United States is headed toward an epidemic of type 2 diabetes” (2007, pp. 435–436). In the text edited by McCance, Huether, Brashers, and Rote (2010), the rapid increase in T2D since the mid-1980s was described as a doubling in incidence in all age groups. Both textbooks failed to offer a socially or biologically constructed explanation why this phenomenon was occurring.

Socioeconomic status was another code put in place to illuminate textbook references to the demographic pattern T2D follows. As a referential code, it was selected deductively to

determine if textbooks mentioned social conditions as a risk factor for T2D. It was directly cited in two textbooks, but only in reference to serving as an influential factor in treatment compliance and not as a risk factor for the disease. For this reason, while it was tallied as a social influence with respect to T2D, it was thematically regarded as a statement reflecting the treatment and management of the disease.

The codes inviting references to the other social and environmental factors provoking the onset of T2D failed to be mentioned. There was no reference among the 10 textbooks reflecting any aspect of the social determinants of health or situating eating and exercising patterns within the context of accessibility to inexpensive, healthy food, green space, or safe areas for outdoor recreation. Although representing biological influences, obesogens and endocrine disrupting chemicals were also neglected in the texts.

Behavioural Aspects

Behavioural aspects and lifestyle choices as risk factors for T2D were heavily represented in college textbooks. While obesity falls under many hierarchies, for the purposes of this analysis, it was included in the behavioural theme not because it was represented solely as a result of volitional choice, but because of how it was subsequently discussed within treatment and management options. Obesity was a risk factor cited the most within behavioural aspects, while specific references to excessive calorie intake were mentioned the least. Table 6 summarises the findings.

Table 6
Codes Representing Behavioural Aspects

Aetiology / Risk factors		
Behavioural aspects	Number of sources	Number of references
Obesity	10	36
Lack of exercise / sedentary lifestyle	5	8
Lifestyle	6	3
High caloric intake/overeating	2	3

The causative factors of obesity are complex and many, including biologic, genetic, social, economic, and behavioural inputs (Kushner, 2011). All 10 texts made a total of 36 discrete separate references to obesity, although none offered an overt opinion regarding the multifactorial aetiological and risk factors for obesity itself; most statements simply made the association between obesity (sometimes conflating obesity with overweight) and the onset of T2D. The exceptions that located obesity within a causative frame were Braun and Anderson who stated, “The most significant risk factor is obesity, which results from both genetic and environmental influences” (2007, p. 465), and another reference in the text by Nowak and Handford who indicated “When obesity and the genetic beta cell defect interact over years, NIDDM emerges” (2011, p. 465). In *Essentials of Pathophysiology*, Guven, Matfin, and Kuenzi interpreted obesity within an environmental lens by stating, “Among the acquired factors that predispose to type 2 diabetes, obesity and physical inactivity are paramount” (2011, p. 809). Other comments typical of what was discussed are summarised in Table 7.

Table 7***Examples of Statements Coded Under Obesity as a Risk Factor for T2D***

Coded statement	Source
“Obesity is the strongest risk factor for type 2 diabetes.” Dawson, (p. 956)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“...the number one risk factor for type 2 diabetes mellitus is obesity.” Corwin, (p. 558)	<i>Handbook of Pathophysiology</i>
“Obesity is the cause of 80% of type 2 diabetes.” McConnell, (p. 435)	<i>The Nature of Disease</i>
“Insulin resistance is the link between obesity and diabetes.” Maitra, (p. 779)	<i>Robbins Basic Pathology</i> , Kumar, Abbas, Fausto and Mitchell (Eds.)

The term *lifestyle* appeared in six of the texts reviewed. It was anticipated that the term would be used in the context of choosing behaviours inconsistent with health, but in four of the seven texts, *sedentary lifestyle* was used as a synonym for lack of exercise. For this reason, these four references were tabulated under the *lack of exercise/sedentary lifestyle* code. The remaining three textbooks inferred lifestyle choice as a risk factor for T2D but in reference to treatment. McConnell suggested, “weight reduction is very important and calls for diet and lifestyle counseling” (2007, p. 442). In *Pathophysiology: Concepts of Altered Health States* (2009), an emphasis was placed on the important role that a dietitian plays in patient care through planning healthy food choices. Dawson (2010) empathetically stated, “Each treatment involves lifestyle changes that are difficult to accomplish initially and challenging to maintain” (2010, p. 954).

There were eight distinct statements regarding lack of exercise as a risk factor for T2D in 5 of the 10 textbooks analysed. While the statements did not highlight issues regarding the socioeconomic factors and obstacles to physical activity, 5 of the 7 coded statements suggested a lack of exercise was a volitional phenomenon. Examples of statements are highlighted in Table 8.

Table 8

Examples of Statements Coded Under Lack of Exercise / Sedentary Lifestyle as a Risk Factor for T2D

Coded statement	Source
“Risk factors include aging and a sedentary lifestyle...” Dawson, (p. 949)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“Among the acquired factors that predispose to type 2 diabetes, obesity and physical inactivity are paramount.” Guven, Matfin, & Kuenzi, (p. 809)	<i>Essentials of Pathophysiology</i> , Porth (Ed.)
“Environmental influences, such as a sedentary lifestyle...clearly have a role...” Maitra, (p. 778)	<i>Robbins Basic Pathology</i> , Kumar, Abbas, Fausto and Mitchell (Eds.)
“A lack of exercise is also a characteristic shared by many who develop NIDDM.” Nowak & Handford, (p. 465)	<i>Pathophysiology: Concepts and Approaches for Health Care Professionals</i>

Obesity was mentioned frequently as a risk factor for T2D but only occasionally as an entity with clear aetiological factors. The specific mention of an excessive calorie intake was only mentioned three times within two textbooks, and most often in reference to obesity. Tannehill-Jones offered a very specific theory of T2D and excessive caloric intake by stating, “It is believed that excessive carbohydrate consumption over the life of the individual places

such a heavy demand on the pancreas to produce the needed insulin” (2010, p. 293). The other statement, found in *Robbins Basic Pathology*, located diet within an environmental approach: “Environmental influences, such as...dietary habits, clearly have a role, as will become evident when obesity is considered” (Maitra, 2007, p. 778). Maitra also offers, “there have been pronounced changes in human behavior, with...poor eating habits” (2007, p. 775).

Biological / Non-Modifiable Factors

This collection of codes was limited to risk and aetiological factors that are out of the control of those with the disease. Four coding categories captured the range of factors deemed non-modifiable: *genetics*, *age*, *ethnicity*, and *unknown causes*. The distribution and frequency of the coded statements are summarised in Table 9.

Table 9

Codes Representing Biological / Non-Modifiable Factors

Aetiology / Risk factors		
Biological / Non-modifiable factors	Number of sources	Number of references
Genetics	9	36
Age	9	20
Unknown cause	7	11
Ethnicity	6	11

As discussed in the review of literatures, the genetic aetiology of T2D—and including obesity—is complex, multifactorial, and difficult to solidify in terms of specific genetic variations. While epigenetics are receiving increased interest with respect to metabolic

disorder, obesity, and T2D, the commentary did not specify the specific context in which genetic vulnerability was framed. Overall, in the textbooks analysed, the genetic basis for T2D was strongly emphasised. All but one text mentioned genetic vulnerability as an aetiological factor, with 36 distinct references. The one textbook that did not comment on genetic variation was *Human Diseases* (Tannehill-Jones, 2010) instead opting to concentrate on dietary habits and carbohydrate consumption as strong predictors for T2D. How genetics contributed to the development of the disease was occasionally mentioned (usually in the context of β -cell dysfunction), but so too were leptin-producing genes, as was a reference to obesity genes. Otherwise, the specific details of genetic predisposition were not elucidated, in spite of the popularity of the topic. Table 10 explores a sample of statements coded under genetic predisposition with interpretive commentary where appropriate.

Table 10

Examples of Statements Coded Under Genetic Predisposition as a Risk Factor for T2D

Coded statement, source, and interpretive comments		
Quote	Source	Comments
"...studies indicate a strong genetic component, but no specific Human Leukocyte Antigen (HLA) type has been identified." Dawson, (p. 949)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)	Implies a genetic predisposition is present, but is dissimilar to the genetic risk seen in type 1 diabetes.
"...the genetic tendency to develop the disease is strong." Corwin, (p. 559)	<i>Handbook of Pathophysiology</i> ,	Suggests the genetic component of the disease acts as a powerful predictor.
"An environmental-genetic interaction appears to be responsible for type 2 diabetes" Jones, Brashers, & Huether, (p. 750)	<i>Pathophysiology: The Biologic Basis for Disease in Adults and Children</i> , McCance, Heuther, Brashers, and Rote (Eds.)	Relates the possibility of genetic expression under optimal conditions.

Coded statement, source, and interpretive comments		
Quote	Source	Comments
“There is a strong genetic component that operates in NIDDM, more so than IDDM, with multiple genes thought to be involved.” Nowak & Handford, (p. 464)	<i>Pathophysiology: Concepts and Approaches for Health Care Professionals</i>	Recognition of a powerful, multigenic influence.
“...however, genetic and environmental factors appear to contribute to its development.” Braun & Anderson, (p. 465)	<i>Pathophysiology: Functional Alterations in Human Health</i>	Acknowledges the possibility of a genetic/acquired interplay of causative factors

When describing risk and aetiological factors, the specific mention of *familial* transmission occurred 8 times among 5 texts. Identifying whether the familial tendency was determined to be acquired or genetic, however, was less clear. As families tend to share environments as well as genetic attributes, the lack of clarity raises questions about the intent of the statements. Finally, a specific type of T2D—MODY, or mature-onset diabetes of the young—is an established monogenic form of the disease, and received recognition in three texts.

Age was selected as a code of interest with the intent of highlighting how the age of onset of T2D has changed over the last 20 to 30 years and to elicit suggestions to explain why this was happening. Age was mentioned frequently throughout 9 of the 10 texts; however, comments were more inclined to describe older adults at particular risk for the disease. While the onset of T2D in children and adolescents was also clarified, there were no explanatory statements regarding the epidemiologic shift in incidence.

The great deal of uncertainty that still exists within the biological models of understanding T2D received recognition in six of the 10 texts with a total of nine citations. Robbins *Basic Pathology* describes how genetic defects in the insulin signaling pathway have been uncovered through experimentation using knockout mouse models, but clarifies, “the extrapolation of these single-gene knockout models to human disease has been less than gratifying” (Maitra, 2007, p. 778). Other statements were general in content, offering the “exact cause of T2D is unknown” (Braun & Anderson, 2007, p. 465); perhaps associated with the overproduction of amylin seen with genetically based β -cell destruction (Nowak & Handford, 2011); or otherwise “poorly defined” (Guyen et al., 2009, p. 1057). Of particular interest was one statement from Nowak and Handford that considered non-biological risk factors: “There are several other non-genetic variables that may contribute to the etiology of NIDDM and research into their precise role continues” (2007, p. 778).

Heritable genetic variations are phenotypically present throughout different ethnicities, as are acquired epigenetic variations. In many parts of the world, visible minorities also face socioeconomic hardship and marginalisation. Therefore, while particular ethnicities may be at risk for certain diseases, in not all cases are there definitive explanations as to why. Indeed, conflating the concepts of race, ethnicity, and genetics is scientifically unsound and inappropriate for public health policy (Pearce, 2004). In the textbooks analysed, six discussed the epidemiological distribution of T2D by ethnicity through eleven distinct statements. One textbook stated the genetic expression of T2D was particularly strong in the Pima Native American population (McConnell, 2007), while five others highlighted the vulnerability of Native Americans in general. Although ethnic vulnerability exists, the texts failed to delineate what type of genetic influence contributed to the disease or if specific

ecological factors particular to different ethnic minorities served as contributing factors.

Table 11 summarises some examples of what textbooks stated regarding the ethnic distribution of T2D.

Table 11

Examples of Statements Coded Under Ethnicity as a Risk Factor for T2D

Coded statement	Source
“Other risk factors include...Native American, Hispanic, or Black race.” Braun & Anderson, (p. 465)	<i>Pathophysiology: Functional Alterations in Human Health</i>
“Non-Caucasian...populations are disproportionaltely affected.” Dawson, (p. 949)	<i>Pathophysiology, Copstead-Kirkhorn and Banasik (Eds.)</i>
“There also is an increased prevalence of type 2 diabetes in children, especially in Native American children...” Jones, Brashers, & Huether, (p. 750)	<i>Pathophysiology: The Biologic Basis for Disease in Adults and Children, McCance, Heuther, Brashers, and Rote (Eds.)</i>
“Type 1 diabetes...is less common among Asians, African Americans, and Native Americans, who tend to get type 2 diabetes.” McConnell, (p. 434)	<i>The Nature of Disease</i>

Because all of the ethnic populations referred to in these textbooks have also experienced marginalisation in North America, it would be of interest to gain insight on the role of social and economic circumstances on the prevalence of T2D within these ethnic groups.

Prevention and Treatment Measures

The second broad categorisation or hierarchy of codes investigated how T2D can be prevented, how it's surveyed or monitored, and approaches to its treatment and management. Similar to the Aetiological/Risk Factor category, this category was also subdivided into three specific contexts: preventive measures, behavioural modification, and biomedical management strategies. Also in keeping with previous findings, certain codes were more heavily represented than others.

Preventive Measures

The first context within this broad heading was prevention. The code used to convey preventive ideas highlighted in the texts was its syntactic representation. In all, four of the textbooks offered five separate statements regarding the prevention of T2D. Preventive recommendations were largely directed at individual, volitional behavioural change. Table 12 displays the coded statements.

Table 12

Examples of Statements Coded Under Prevention

Coded statement	Source
“(Exercise) has been shown to prevent the onset of type 2 diabetes in persons who are genetically at risk.” Dawson, (p. 957)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“The most important goal of those who study or treat diabetes mellitus is prevention.” Corwin, (p. 567)	<i>Handbook of Pathophysiology</i>
“For type 2 diabetes, prevention of obesity, especially childhood obesity, is imperative...” Corwin, (p. 568)	<i>Handbook of Pathophysiology</i>

Coded statement	Source
“Dietary measures, including restriction of the total caloric intake, are of primary importance in both the prevention and treatment of type 2 diabetes.” Jones, Brashers, & Huether, (p. 753)	<i>Pathophysiology: The Biologic Basis for Disease in Adults and Children</i> , McCance, Heuther, Brashers, and Rote (Eds.)
“...people at risk for type 2 diabetes can prevent or delay developing type 2 diabetes by losing weight and exercising.” Tannehill-Jones, (p. 295)	<i>Human Diseases, Neighbors and Tannehill-Jones</i> (Eds.)

Similar to what was found in the *aetiology and risk factors* hierarchy, no social understandings of the disease were considered when discussing preventive measures.

Behavioural Modification Methods

The area of prevention and treatment receiving the most commentary was *behavioural modification methods*. Within this context, statements were coded under *dietary management and weight loss, exercise regime, education, and individualised approach to care*. Diet and exercise received the greatest amount of attention in the texts, followed by educational techniques for behavioural change. Table 13 table displays the frequencies of coded statements.

Table 13
Codes Representing Behavioural Modification

Prevention and treatment		
Behavioural modification	Number of sources	Number of references
Dietary management and weight loss	9	30

Prevention and treatment		
Behavioural modification	Number of sources	Number of references
Exercise regime	8	22
Education	5	17

While it might be assumed that dietary management inherently includes patient education, unless it was specifically mentioned as an exercise in education, dietary management was considered as an independent statement without making an assumption of what it entailed. When looking at the recommendations for dietary management and weight loss, all but one text mentioned specific modalities for treatment. There were 30 coded references, with comments generally emphasising the importance of dietary management as a primary modality for the treatment of T2D. These are listed in Table 14.

Table 14

Examples of Statements Coded Under Dietary Management and Weight Loss

Coded statement	Source
“Nutrition has often been called the cornerstone of diabetes therapy.” Dawson, (p. 952)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“...the first approach to treatment of the individual with type 2 diabetes is appropriate meal planning...” Jones, Brashers, & Huether, (p. 753)	<i>Pathophysiology: The Biologic Basis for Disease in Adults and Children</i> , McCance, Huether, Brashers, and Rote (Eds.)
“Integral to diabetes management is a prescribed plan for nutrition therapy.” Matfin, (pp. 812–813)	<i>Essentials of Pathophysiology</i> , Porth (Ed.)

Coded statement	Source
"Type 2 diabetes is usually controlled with diet..." Tannehill-Jones, (p. 293)	<i>Human Diseases</i> , Neighbors and Tannehill-Jones (Eds.)

Diet and weight loss were solidly represented. The only text where these were absent was *Robbins Basic Pathology*, where treatment and management protocol for T2D was not addressed in any form. When discussing dietary interventions, no explicit comments were made regarding quality of food or access to healthful nutrition. When present, specific recommendations were limited to balancing proteins, carbohydrates, and fats (Guven et al., 2011), restricting caloric intake (Jones, Brasher, & Huether, 2010), or following the guidelines of the American Diabetes Association (Dawson, 2010).

Exercise was the second most popular behavioural modification intervention. Two of the 10 textbooks studied did not mention exercise as a treatment, while the other 8 made a total of 22 references to its importance. Some statements exemplifying the importance of exercise as a treatment modality appear in Table 15.

Table 15

Examples of Statements Coded Under Exercise Regime

Coded statement	Source
"Treatment of type 2 diabetes begins with weight control through an individualized nutrition and exercise plan." Braun & Anderson, (p. 466)	<i>Pathophysiology: Functional Alterations in Human Health</i>
"Exercise, one of the oldest treatments for diabetes, was prescribed in India in 500 BC." Dawson, (p. 956)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)

Coded statement	Source
“...with modification of diet and the initiation of an exercise program, many type 2 diabetics can normalize their blood sugar.” Corwin, (p. 568)	<i>Handbook of Pathophysiology</i>
“...much NIDDM can be controlled with diet and exercise...” Nowak & Handford, (p. 466)	<i>Pathophysiology: Concepts and Applications for Health Care Professionals</i>

The type or duration of exercise was not identified in the texts, and while personal physical barriers were mentioned as potential confounders to a prescribed exercise regime, social barriers, differences in cultural norms, or environmental impediments were not.

Another aspect of treatment through behavioural change involved educational interventions. Among 5 of the 10 texts, there were 17 separate references made to educating the patient as a treatment modality. Education took many forms, including education about foot care and the management of the side effects from medication (Dawson, 2010), and the long-term risks of the disease (McConnell, 2007). Other statements are highlighted in Table 16.

Table 16

Examples of Statements Coded Under Education

Coded statement	Source
“The efficacy of education programs is increased when behavior change approaches are emphasized.” Dawson, (p. 960)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“Management of the disease is dependent on education...” Tannehill-Jones, (p. 294)	<i>Human Diseases</i> , Neighbors and Tannehill-Jones (Eds.)

Coded statement	Source
“Among the methods used to achieve these treatment goals are education in self-management and problem solving.” Guevin, Matfin, & Kuenzi, (p. 1061)	<i>Pathophysiology: Concepts in Altered Health States</i> , Porth & Matfin (Eds.)
“For patients with type 2 diabetes, weight reduction is very important and calls for diet and lifestyle counseling.” McConnell, (p. 442)	<i>The Nature of Disease</i>

When discussed in detail, education was emphasised in some texts as an important vehicle for the patient to understand the physiological mechanisms of the disease and their effects. Overall, however, education was largely discussed in terms of diet planning, exercise regimes, and weight control.

Biomedical Monitoring and Management

The final component representing prevention and treatment strategies was a biomedical management category. Three codes were selected for this category: *pharmaceutical intervention*, *monitoring by laboratory tests*, and *surgical approaches*. Pharmaceutical interventions were mentioned the most frequently, while surgery received the least attention. The frequencies of statements and the number of sources are summarised in Table 17.

Table 17***Examples of Codes Representing Biomedical Management Strategies***

Prevention and treatment		
Biomedical management strategies	Number of sources	Number of references
Pharmaceutical intervention	10	29
Monitoring by laboratory tests	7	22
Surgery	3	4

While Robbins *Basic Pathology* neglected treatment options, it did make a reference to TZDs as a major advance in the attempt to eliminate insulin resistance in T2D. For this reason, all 10 texts were represented under the pharmaceutical intervention code. Among the 29 statements specifically discussing drugs as a modality for treatment and management, Table 18 presents the typical references.

Table 18***Examples of Statements Coded Under Pharmaceutical Intervention***

Coded statement	Source
“Treatment of type 2 diabetes begins with weight control...and can include oral glycemic agents or insulin replacement therapy.” Braun & Anderson, (p. 466)	<i>Pathophysiology: Functional Alterations in Human Health</i>
“...metformin is recommended at the time of diagnosis.” Dawson, (p. 955)	<i>Pathophysiology</i> , Copstead-Kirkhorn and Banasik (Eds.)
“Management of the disease is dependent on...a lifetime commitment to following the treatment regimen of diet, medication, and exercise.” Tannehill-Jones, (p. 294)	<i>Human Diseases</i> , Neighbors and Tannehill-Jones (Eds.)

Coded statement	Source
<p>“If glucose normalization cannot be achieved by diet and exercise alone...many type 2 diabetics benefit from oral hypoglycemic drugs.” Corwin, (p. 568)</p>	<p><i>Handbook of Pathophysiology</i></p>

The statements tallied for the purpose of this research were not a complete representation of what was discussed regarding the pharmaceutical approach to diabetes treatment and management. A considerable amount of information was provided on the pharmaceuticals themselves, including drug classifications, actions, and advantageous combinations. While the attention paid to the nature of pharmaceuticals speaks to their importance from the perspective of critical discourse analysis, the nature or content of the discussions did not contribute the same richness of information. For that reason, discrete statements about general pharmaceutical protocols were tallied for coding purposes, but the extensive information underlying the mechanisms of action for each of the drug categories employed for T2D was not analysed for this study.

Surgery as a treatment modality for T2D is an option considered when conservative methods fail to manage the disease. Surgical procedures are specific to the type of diabetes an individual has. Three of the 10 texts carried a total of four statements regarding the use or effectiveness of surgery. Pancreatic transplantation, although not explicitly clarified in the three references coded, is used as a treatment option for type 1 diabetes. The text edited by McCance, Huether, Brashers, and Rote was the only text that highlighted surgical intervention (bariatric surgery) as a means of combatting T2D.

Lastly, the monitoring of the diabetes status by laboratory surveys was a code selected to understand in general how the patient with T2D was managed within the biomedical field, and accordingly in what way, if at all, surveillance of the subject was occurring. Upon analysing the texts, surveillance was often expressed in the context of monitoring the quantity and quality of food intake. Monitoring also took the form of regular HbA1c testing, serum glucose monitoring, lipid levels, weight checking, and blood pressure measurements. Table 19 highlights typical statements regarding the management of patients with T2D through biomedical monitoring and surveillance.

Table 19

Examples of Statements Coded Under Monitoring by Tests

Coded statement	Source
<p>“Because of the high prevalence of undiagnosed type 2 diabetes mellitus, current recommendations are to screen all adults over the age of 45 for diabetes at least every 3 years.” Dawson, (p. 949)</p>	<p><i>Pathophysiology</i>, Copstead-Kirkhorn and Banasik (Eds.)</p>
<p>“Frequently monitoring blood glucose levels and controlling these is beneficial...” Tannehill-Jones, (p. 294)</p>	<p><i>Human Diseases</i>, Neighbors and Tannehill-Jones (Eds.)</p>
<p>“Evaluating the effectiveness of the meal plan requires monitoring metabolic parameters, such as blood glucose, A1C, lipids, blood pressure, body weight, and quality of life.” Guven, Matfin, & Kuenzi), (p. 813)</p>	<p><i>Essentials of Pathophysiology</i>, Porth (Ed.)</p>

Coded statement	Source
<p>“The main thrust of treatment is control of blood glucose levels, which can be monitored by direct measurement of blood levels of glucose and periodic measurement of blood levels of glycohaemoglobin.” McConnell, (p. 442)</p>	<p><i>The Nature of Disease</i></p>

Summary of the Results

From the 10 textbooks selected for this research, the discursive objects, shared meanings, and vocabularies forming common narrative across all texts were identified. A premise of critical discourse analysis is that sociopolitical and critical theories of society and its institutions are constituents of analysis; discourse and social practice are a form–function correlate (Gee, 2004). Therefore, the coding catalogue guided the identification of repeated objects of meaning (and omitted knowledges). Moreover, these objects were grouped according to themes consistent with neoliberal ideology. The frequency distribution offered by the coded words and phrases gave rise to six clear thematic categories. First, genes and gene–environment interactions, albeit loosely defined, are indicated as strong predictors for the onset of T2D. Second, lifestyle choices and volitional behaviours are also presented as strong factors in the development of T2D. Third, those with T2D require ongoing monitoring, whether through regimented dietary management, exercise programmes, waist measurements, checking weight, or through biomedical testing for blood markers. Fourth, successful treatment is reliant upon behavioural change. Fifth, treatment is also strongly dependent on the compliant use of pharmaceuticals. Lastly, the social factors that influence the incidence and prevalence of T2D and its epidemiological profile are not addressed in any

of the textbooks. This omission is important and speaks to the frame of reference through which these college textbooks interpret T2D.

Chapter 7

Discussion

The research question that guided this thesis was: Does the interpretation of T2D in pathophysiology textbooks reflect neoliberal thinking? That issue will be discussed through the six themes presented at the end of the previous chapter.

- Genetics confer a risk for T2D
- Behavioural choices are a risk factor for T2D
- Non-diabetic and diabetic patients benefit from biotechnical surveillance and monitoring technologies
- The treatment of T2D involves behavioural change
- The treatment of T2D involves pharmaceutical intervention
- Broader social and ecologic factors that influence the epidemiology of T2D are not mentioned

This discussion will critically interpret the findings organised within these themes and highlight their theoretical relevance. Through this discussion, it will be argued that there is indeed evidence that the presentation of T2D in the textbooks does reflect neoliberal thinking.

Genetics Confer a Risk for T2D

A dominant theme in the textbook was the emphasis on the genetic aspects of T2D. Nine of the 10 texts made a total of 36 references to the genetic component of the disease;

half of the texts made conclusive statements that T2D was strongly genetically based (Braun & Anderson, 2007; Copstead-Kirkhill & Banasik, 2010; Corwin, 2008; Nowak & Handford, 2011; Porth & Matfin, 2009). While genetic patterns may indeed impact susceptibility to T2D, it is erroneous to conflate family aggregation with genetic vulnerability. Familial patterns of T2D are not synonymous with genetic transmission (Drong, Lindgren, & McCarthy, 2012). Additionally, genetic transmission is a complex phenomenon that may be constructed in different ways, leading to misunderstandings regarding the absolute risk for developing T2D.

Genetic discourse emphasises individual vulnerability to disease, one expression of neoliberal thinking, rather than the social determinants. Neoliberal thought is reflected in the reification of the subject deemed vulnerable to illness and consequent maintenance of power differentials. Labeling ethnic minorities as genetically vulnerable also may perpetuate subordination and benefit protected interests. Additionally, genetic understandings of disease create an avenue for surveillance and screening technologies, which is in keeping with the neoliberal interest in risk management and shaping a productive citizen.

The emphasis on the genetic predisposition to T2D is an expression of biomedicalisation, or the permeation of medical technology into all aspects of life. In a Foucauldian sense, it speaks to the expression of molecularisation, or of a particular cultural sphere in which subjects become defined and shaped according to a scientific ontology (Paul, 2002). Molecularisation is the means by which current biopolitics operates; the reduction of human life to DNA fragments works in tandem with screening, mobilization, manipulation, pharmaceutical research, and ultimately control (Rose, N., 2007b). Geneticisation, therefore, might be more a reflection of culture or social process than actual advances in genetic

technology (Clarke, Mamo, Fishman, Shim, & Fosket, 2003; Hedgecoe, 2002; ten Have, 2001). The textbooks, with the exception of *Robbins Basic Pathology* (in which caution was demonstrated about causative genes), impressed a sense of certainty about the value of genetic understandings. An imbalance however arises with the overselling of certainty and the suppression of doubt (Fugelli, 2006). When considering the aetiological basis of T2D, an emphasis on genes engenders certain discrete and selected outcomes. In the neoliberal setting, genetic dialogues confer power differentials by privileging biotechnology and intensifying the reification of those inferentially left to the mercy of their genes. Current biological narratives in public health are conveniently “double-blinded” in that they simultaneously disregard both the cultural and political failings on health (Fugelli, 2006, p. 268). Populations, who, for the most part are socioeconomically disadvantaged or of an ethnic minority group, are seen to be phenotypes of their vulnerability and not products of the current social situation in which they exist.

The concentrated effort of understanding life at the genetic level is best described as *geneticization*, which Lippman (1991) defines as “the process by which interventions employing genetic technologies are adopted to manage problems of health” (Lippman, 1991, p. 19). Geneticisation broadly confers benefits to market powers as genetic research intensifies, whilst simultaneously shifting interest and resources away from the sociopolitical and economic contributors to T2D. In the neoliberal domain, the market ideology has infused healthcare by naturalizing genetic inquiry and the growth of the biotechnology industry without concurrent questions about ethics or true social benefit (Birch, 2006). The identification of genetic markers (such as TCF7L2) is the stepping-stone to generating a market for T2D tests, but the advantage of genetic testing for the prediction of T2D is

questionable, particularly when a low odds ratio for developing the disease are associated with these markers.

Genetic technologies have also catalyzed a convenient and reciprocal relationship with the pharmacogenomics industry (Hedgecoe & Martin, 2003). Genetic research occurring after the climax of the human genome project (which defined all humans as essentially the same) has now been driven by seeking nuances or deviations, such as single nucleotide polymorphisms. Identifying genetic deviations and variations becomes a reason to develop pharmacogenomic solutions and screening technologies. Therefore, genome-wide association study initiatives are not suited to minimise health disparities and improve clinical best practices, but are more suited to augmenting the pharmacogenetic industry and supplementing the potentially profitable field of tailored treatment interventions (Feero, Guttmacher, & Collins, 2008; van Tilburg, van Haeften, Pearson, & Wijmenga, 2001). In a neoliberal society, promoting genetic research as a way to decrease disproportionate ill health among ethnic minorities is palatable to the public, and makes acceptable the appropriation of disadvantaged populations for profit rather than focusing policy on social change.

Another component of the geneticisation conundrum is the discourse on ethnic vulnerability. Geneticisation of ethnic minorities supports inequality and discrimination. The multifaceted aspects of life are disregarded when a subject is reduced to a molecular understanding of existence. The textbooks studied made a number of references to certain ethnic minorities vulnerable to T2D. For example, McConnell directly linked genetics to ethnicity in the statement, “The strong genetic influence toward diabetes is especially evident in some ethnic groups that have very high rates of type 2 diabetes” (2007, p. 435). Braun and Anderson offer, “a family history of type 2 diabetes, and Native American, Hispanic, or

Black race” all contribute to T2D development (2007, p.465). Provocatively, Duster (1996) suggests it is not explicit genetic variables that catalyses biomedical inquiry among these populations, but social concerns that are neatly packaged and deconstructed through scientific discourse. Likewise, genetic homogeneity does not exist within, nor does it define, racial differences; genetic variation is more marked within a race category than between defined classifications (Williams, 1999). Geneticisation is in play when groups or cultures are defined according to genetic category, as are racialized preconceptions of health and disease.

The textbooks further express geneticisation by imparting that all visible minorities are deemed equally susceptible. In other words, racial classifications of Black, Hispanic, Asian, or Native American create reified classifications that fail to recognize geographical heterogeneity. No clarifications are made, for example, that Mexican Americans are more vulnerable to T2D than Cuban Americans (Myers, Lewis, & Parker-Dominguez, 2003) or the Pima Indians of Arizona suffer disproportionately to the Pima tribe of Mexico.

Viewing the material within a critical discourse analysis, the neoliberal discursive formations in the textbooks position social relationships and dominance through a veil of scientific neutrality. The expression of genetic vulnerability in the texts, in spite of the inherent flaws with genetic understandings of T2D, legitimates reification on biological grounds; elaborate genetic explanations and justifications implicitly select and favour a particular knowledge. In an attempt to disqualify social injustice as a means of poor health, neoliberal knowledge technologies enforce biotechnological accounts of illness when marginalisation is self-evident. Generally, the technologies of life that transform individuals to their molecular roots, particularly within ethnic minorities, serve to promote a sense of

susceptibility and the conclusion that these populations are “presymptomatically ill” (Rose, N., 2007a, p. 9) and therefore encumbered. Additionally, if there are expectations from genetically vulnerable ethnic minorities to self-instill healthy behaviours, it bears questioning whether these populations are enabled, equipped, or have the power to do so. With the impression the textbooks advance, a triple bind exists for non-White individuals bearing the ‘genetic predisposition’ to T2D; at once they are disempowered by virtue of their genetic label, expected to exercise a particular sense of empowerment in the form of self-monitoring and diligence to prevent illness, and more often than not required to do so with limited resources.

Finally, what was not clarified in the textbooks, and what might be helpful to students was the distinction between inherited genetic linkages to T2D and the epigenetic expression of T2D. It may be a trivial delineation at first glance, but the social, economic, and political implications are compelling. Epigenetic understandings of the disease move beyond single nucleotide polymorphism identification to environmental influences on genetic expression. Epigenetic discussions would unavoidably include maternal nutrition and intrauterine development in today’s environment. Epigenetic interpretations of the disease would challenge ideas of classifying individuals on the basis of inherent debility and expose the impact of modifiable environmental factors on the incidence of T2D. From a Foucauldian critical discourse perspective, the language of genetics consolidates with biotechnology to normalise the geneticisation of T2D in a discursive. Geneticisation as a practice represents a biopolitics that individualizes human worth, defines human capacity by biology, reduces social phenomena to individual actions and discriminates against those labeled biologically defective (Rose, N., 2001). Geneticisation also shapes patterns of consumption (Briggs &

Hallin, 2007) as individuals are ushered increasingly towards the profit-driven interests of companies marketing screening, surveillance, monitoring, and pharmaceuticals. The emphasis placed on genetics in the textbooks therefore appears to reflect neoliberal thinking embedded in the understanding of health and disease.

Behavioural Choices Are a Risk Factor for T2D

The textbooks emphasised individual and personal lifestyle choices as a causative factor for T2D. Whether sedentary lifestyle or dietary choices were implicated in disease causation, the non-modifiable conundrum faced by those with apparent genetic vulnerabilities was juxtaposed by poor or careless volitional behaviours. Again, such conflict is not unique in a neoliberal ideology, and both viewpoints coexist in the sense that both confer power to protected interests. In a neoliberal setting, a population that is sound and economically productive is preferable, although policies that ensure protective social measures that support optimum population health tend to be deemphasised. Prioritising poor lifestyle *choices* as the foundation of poor health can be interpreted as reducing the responsibility of governments to protect social programmes (Chin, Monroe, & Fiscella, 2000). An additional interpretation is that in the name of maintaining the productive citizen, those with T2D are converted into the patient–consumer.³ The patient–consumer is an important component of the health and healthcare market, through actively seeking pharmaceuticals, vitamins, home testing kits, diet programmes, and gym memberships (Moncrieff, 2006). However, while patients might prefer autonomy and choice in the sense

³ The patient as consumer was a concept that took hold during the Regan-Thatcher era in which healthcare delivery was restructured within a business model as government involvement with the care of citizens regressed. Universal entitlements to were eroded in the name of individualistic rights to select and employ services to their own liking (Mold, A., 2011).

that they are not in a paternalistic relationship with the government or their healthcare team, autonomy is a privileged ideal. The concept of choice is ostensibly unrealistic for those with limited empowerment, lack of information, or marginal accessibility to resources. Neoliberal ideology insists that free choice is a valued entity, available to all, consistent with a free market mentality, and produces health when exercised in that realm. However, when market strategies generate monopolies, promote the consumption of health-degrading products, stratify societies and violate the environment, free choice is in fact a *non sequitur* (Naidoo, 1986). Notwithstanding, lifestyle discourse, in concert with geneticisation, implores as virtuous a sense of self-responsibility and health-seeking action.

Behavioural Choices and Diet

The individualization of risk for T2D was divided between eating behaviours and the choice of an inactive lifestyle. With respect to food intake, the textbooks made repeated references to obesity as a major risk factor for T2D, complemented by guidelines for controlled weight loss through diet and exercise. Concurrently, the texts were amiss at not highlighting the increasing prevalence of food deserts, lack of marketing restrictions on advertisements making false claims about ‘healthy’ food, making nutritious food more affordable, or the necessity to tax junk food. While the food industry claims that regulations on what they produce is inherently unfair and discriminatory to the industry, the population is becoming progressively more obese.

Corporate interests block attempts at decreasing junk food in schools, nutrition labeling, and junk food taxes. The modus operandi of the industry appeals to the powerful ideas of individual freedom within, and freedom of the market, thereby weakening collective

actions against objectionable production practices. Within this neoliberal climate, individuals are strongly influenced by relatively minor environmental triggers, making accessibility considerations, pricing, packaging, and portion sizes significant factors on the decision of what to eat (Brownell et al., 2010). In the last 30 years, increasing portion sizes (Young & Nestle, 2002), fat levels (Blundell & Gillett, 2012), salt (Dötsch et al., 2009), and sugar content (Johnson et al., 2009) have reshaped natural hunger and satiety cues. In addition to affordability and accessibility, nutrient type influences intake. Energy dense, highly processed and marketed foods have become ubiquitous, have disrupted eating patterns and resulted in excessive caloric intake. Social stress is directly associated with visceral adiposity, and subordination confers greater truncal obesity (Hammond, 2010). Seeing that individual social capital is inversely related to body mass index, it is a reasonable presumption that those of lower socioeconomic status are particularly vulnerable to developing T2D (Holtgrave & Crosby, 2006; Moore, Daniel, Paquet, Dubé, & Gauvin, 2009).

Contextualizing weight gain, obesity and T2D as a result of inappropriate lifestyle choices panders to the neoliberal zeitgeist that advocates individualism and disengagement from public health responsibilities (Guthman, 2009). By default, the individual who chooses to overeat has chosen to be obese. The neoliberal emphasis on individual *choice* focuses responsibility on the patient–consumer. Regulation and control of the food industry to eliminate misleading nutritional claims, aggressive marketing, or the manufacturing of nutritionally devoid and calorie dense products are not necessary when consumer choice is

the deciding factor for poor health. The paradox of course is that choice is an exercise ingrained in an environment best suited to particular interests and specific market pursuits.⁴

Behavioural Choices and Physical Activity

In keeping with the self-responsibility for health and the prevention of T2D, textbooks also emphasized sedentary lifestyles as powerful contributing factors to the epidemic of diabetes. Exercise indeed contributes to physiological integrity, but it warrants critical reflection if the rapid rise in T2D runs parallel to a rapid decline in the decision to be physically active. Neoliberal capitalism and globalization have directed ideas of meaning and of self from ascribed categories to achieved projects; the somatic self has become a site of production, while inspection, improvement and management have become the inherent tools for the project (Maguire, 2008). Discursive formations of self-governance and self-work that include living an active lifestyle are permeating forms of biopower in place to construct a citizen of choice, but they are in place avulsed from the social meanings and understandings of citizens. Moreover, the textbooks also don't address why those who are most at risk for T2D are also living within circumstances that are the least amenable to active lifestyles (Powell, Slater, Chaloupka, & Harper, 2006).

Neoliberal ideology appears in the texts in the form of *healthism* (Crawford, 1980), whereby discourses regarding healthy behaviours and lifestyles are infused as normative, moral values. The idea of healthism solidifies the political ideology of healthy lifestyle choices as a moral prerogative, omitting the moral prerogative, perhaps, of upholding the welfare state and the need to sustain a healthy social environment. This healthism trend

⁴ The Canadian government prefers self-regulation of marketing practices by the corporate food industry to broader, policy-based controls. The messages delivered to the public are decidedly partial and may misrepresent important information.

permeates what is taught to healthcare students. In the texts, several examples alluded to the healthism motif by impressing the importance of maintaining a healthy weight, smoking cessation, physical exercise, following a healthy diet, and watching blood pressure levels. Healthism is predominantly a middle-class phenomenon, however. As applied to T2D, healthism is less from advances in research on the epidemiological trends of the disease, and more from an amalgam of economic, social, demographic, and ideological persuasions (Greenhalgh & Wessely, 2004). Accordingly, the texts create the impression that T2D is a result of careless and undisciplined approaches to everyday living by individuals, but through healthism, T2D can be overcome independent of changes in the social environment.

Whether by genetic inclination or by body mass, poor diet or sedentary lifestyle, there is a discourse of risk, a central feature of neoliberal thinking. Turner (1997) states it is the deregulation of the market on a global level that has generated political and economic instability, therefore informing a culture of risk. The risk discourse is an example of Foucault's biopolitics, in which power is embodied and wielded within the biological self. Shaping the somatic self is legitimated through biotechnological and medical expertise. The overseeing of the subject is not incongruent with the notions of neoliberal ideology that exalt individual freedom; the model citizen is not overtly controlled, but *constructed*. In upholding the virtue of liberty, the construction takes place through the moral obligation and emphasis placed on self-regulation.

The textbooks reinforce the risk initiative by detailing everything from the risk factors for developing T2D to the risks of complications. In the current medico-political risk landscape, health becomes almost exclusively an entity involving risk assessment, risk management, risk control, risk surveillance, and risk reduction (Fugelli, 2006).

Described as the “tyranny of risk”, individuals are conferred not only the responsibility to do something about their health, but also to do so in a way that involves making selective choices that meet medical industry-defined options and goals (Lippman, 2000, p. 2).

According to Lupton (1995), the riskscape as it applies to health is the scaffolding in which moral decisions about such things as diet and exercise are made. Further, as the risk narrative for disease catalyses healthcare dependence and use, the healthcare industry as a whole also benefits from such a narrative (Førde, 1998) at the detriment of social understandings of disease causation.

The language of risk, typified in the textbooks, is a neoliberal language that according to Galvin (2002) does three things. First, it generates and channels vigilance towards risk from the exterior to the interior; from the social to the individual. Second, risk serves as a source of power; creating players who overcome or succumb, and sequestering those who are responsible from those who are not. Third, risk allocates sectors that will generate solutions; inevitably these sectors are ‘experts’ or market interests who will benefit most from the riskscape portrayed. Creating a particular and strategically directed discourse surrounding health creates beneficial avenues for certain players.

In concert with Foucault’s ideas of governmentality, the individualisation of health therefore ensures the subject is regulated and directed, but in a subversive and normalizing sense. Enforcing this new ‘common sense’ approach, the textbooks mirror the changing formation of the citizen: when once—for most of the post-World War II period—citizenship represented universalism and a mentality of collectivism, it is now reworked as a model of individualism and consumerism (Higgs, 2005). Today, and mirrored by the textbook content, the historically embedded technology of the self is that of a moral commitment to self-

regulation for somatic integrity in the name of productivity. The disciplinary gaze is internalized in a form of self-actualisation that is inherently and inseparably enmeshed in systems of power. Nikolas Rose (1999) complements Foucault's viewpoint by suggesting the hegemony of healthism is not so much a pressure to do good, but a moral scrutiny when behavioural choices are bad.

The textbooks have perpetuated neoliberal ideology by emphasising efforts of the self: self-discipline, self-monitoring, and self-actualisation as facilities for health. In a capitalist society, behaviours that compromise the productive and economically efficient self are akin to sin; the individuals who are either diabetic or pre-diabetic and otherwise not overly attendant to their situation are viewed with trepidation because they are resisting normalization (Vandereycken, 1993). Concurrently, the moral discourse surrounding the management of T2D may impact the identity of the patients, who may view themselves as being embodied by a culture of surveillance, balancing between the sins of improper eating or exercise with the salvation bestowed upon them for rigorous self-care (Broom & Whittaker, 2004). The textbooks replicate neoliberal thoughts on health by emphasising the limitations of the self in terms of lack of education, awareness, and self-discipline while deemphasising the limiting factors of social stratification, environmental degradation, and poverty. Shifting the cognitive paradigm from the former to the latter arguably adjusts T2D from a manifestation of sin to an illness that in large part is determined by social factors (Weiner, 1993).

Non-Diabetic and Diabetic Patients Benefit From Biotechnical Surveillance and Monitoring Technologies

Foucault elaborated on the clinical, or medical, gaze as a technique of governmentality; a technique specifically oriented to making visible all aspects of the internal self (Foucault, 1973). Today, encapsulated in biopower, modern screening practices privilege the gaze as a knowledge technology, and serves to confirm the necessity of such interventions as pharmaceuticals or lifestyle interventions (Joyce, 2010). Both diabetics and non-diabetics are exposed to the surveillance and monitoring tools brought forth by a variety of medical technologies. In the textbooks analysed, Foucault's clinical gaze through these technologies was apparent in several contexts, broadly divided among surveillance of the healthy and surveillance of the sick.

Pre-Diabetes Surveillance

In the textbooks studied, both the person with T2D and the general population were determined to be worthy of scrutiny by biomedical surveillance. The current climate was reflected by Banasik (2010), who conveyed that regular screening for T2D of adults over the age of 45 was recommended.⁵ Corwin (2008) suggested regular monitoring as a preventive measure. Guven et al. (2009), stated that the waist-to-hip ratio measurement is a useful clinical tool for determining insulin resistance potential. The texts present an interpretation that indulges not only the ill but *all* to the medical gaze. Biomedical observation of the non-diabetic means that now everyone falls within a continuum of illness to wellness. Everyone is now vulnerable and therefore worthy of the gaze (Armstrong, 1995).

⁵ Clinical practice guidelines recently published in the Canadian Medical Journal concur that regular screening is important, although they qualify screening should take place in non-diabetics determined to be high risk (Buijsse, Simmons, Griffin, & Schultze, 2012).

Surveillance of the Patient With Diabetes

With those having T2D, pathology textbooks iterated regular technologies of monitoring and surveillance. As an example, Porth and Matfin's *Pathophysiology: Concepts of Altered Health States* (2009) emphasized regular measurements of serum glucose levels, blood pressure, HbA_{1c}, lipids, weight, and quality of life as a means to determine treatment effectiveness. While the maintenance of physiological homeostasis is necessary for health, the tight physiological parameters to which the diabetic is expected to adhere and the emphasis placed on the conversion of somatic function to analysable data merit critical analysis. In the diabetic patient, conforming to criteria such as appropriate weight, HbA_{1c} level, or blood pressure reflects a normalized ideal that speaks of productivity and self-discipline. They represent virtues of the work ethic that, when kept in check, demonstrate productive success. In a way that Foucault describes as "cultivation of the self" (Foucault, 1988a, p. 29) the relations of oneself to oneself have been intensified and validated through the technology of self-monitoring. Movements of power develop in ways that are binary and contradictory: the patient is to assume responsibility for their illness, but their own intuitive sense of bodily function is ignored and devalued in favour of 'objective', medicalised measurements.

The modern gaze that penetrates the skin to the molecular level has given medical knowledge and molecular pathology the "last word" on the disease (Mol & Law, 2004, p. 45), and it is the objective of the patient to conform and fit within these measurements. This conforms to another binary of neoliberal society that at once extols individual freedom whilst instilling conformity of citizenship. Health and sense of well-being rely on medical and technological information (Berg & Honkasalo, 2000), and in that respect rescind personal

power to larger forces. According to Foucault (1980), power impresses itself on the somatic self so that the body is constructed in a particular way. Foucault asserts, “nothing is more material, physical, corporal than the exercise of power” (1980, p. 57). Encouraging self-surveillance is a mechanism of control; it is a transmission of microphysics, or a means by which to inject the transformation of life in a regulatory way, but also in a normalized way (Foucault, 1980). The spatialisation of medicine, from its historical bedside manner, has once again entered the home in the form of surveillance and monitoring in a way that self-validates the penetration of medical technology into personal spaces. Home glucose measuring devices, A-1_C tests, ketone urine strips, exercise logs, and portion plates have encapsulated the object-body of the diabetic (Berg & Honkasalo, 2000) within tight quantitative ideas of what the controlled diabetic should strive for, and has done so in a way that advances the hegemony of biotechnology—even within the household.

The textbooks convey surveillance through two broad mechanisms. First, biomedicalisation includes the transforming of the body through technological means as an interventionary measure (Clarke, Mamo, Fosket, & Fishman, 2003). However, the biomedical technologies of surveillance, including measures ranging from monitoring weight to HbA_{1c} levels, engender certain conclusions or perceptions about not only the way routines are established around the disease, but also about those with it (Rose, N., 2007b).

Second, medicalization, or the medical control of diabetic management, is the other technology of surveillance. Medicalisation is apparent in the textbooks through their prescriptions for nutrition therapy and ongoing commitment to medication and exercise therapy. Within a neoliberal construction of health and healthcare, compliance with treatment becomes an action that is for a broader social good. For that reason, the recruitment of the

wound care specialist, dietician, endocrinologist, diabetes educator, ophthalmologist, podiatrist, and exercise therapist for the diabetic patient are justifiable in the medicalised realm. In the capitalist realm, as hospital managers are impressed upon to run hospitals like businesses and physicians to budget their practice, patients (or potential patients) are entrepreneurs of their own health (Osborne, 2000).

With the permeation of the riskscape into medicine, surveillance medicine spatialises the medical gaze in a new way that monitors healthy subjects and places them on a continuum that inscribes wider parameters around what constitutes illness. Non-diabetics who enter the physician's office lend themselves to the medical gaze of pre-diabetic screening. Diabetics in the clinic are surveyed with questionnaires, case histories, measurements, laboratory tests and biomonitoring. Beyond the clinic, they may now encounter the use of pagers, emails, web-based programmes and phone apps for monitoring behaviours, glucose levels, and drug adherence (Fisher & Dickinson, 2011). In this neoliberal medical setting, the monitoring is for the means of shaping the citizen, and is a rich expression of the medical gaze.

The Treatment of T2D Involves Behavioural Change

In neoliberal society, self-responsibility is congruent with the enterprise culture whereby personal choices in everyday life are emphasised within a specific consumer or market ontology. Self-management is a neoliberal "virtue ethic" (Fitzsimons, 2002, para. 9), and this ethic is framed within the precipitous risk discourses of genetic vulnerability and poor lifestyle choices. Concurrently, an extension of this philosophy is that ill health, unemployment, and any other barriers to being fully productive are the responsibility of the

subject. The individualised subject is extolled for individual choice-making, particularly choices that reflect market principles. Responsibilisation offers a means by which to regulate subjects and ensure their economic value as productive citizens, but in a way that negates state responsibility for their health (Lemke, 2001). In other words, what is positive in a marketised society is the efficiency of costs and benefits for selected outcomes. Therefore, fiscal efficiencies lie more in self-responsibilisation discourses rather than broad social reforms. In the textbooks, responsabilisation was not only widely represented, but also extolled as a virtue. Banasik (2010) was clear in enforcing the necessity of personal change: “The efficacy of educational programs is increased when behavior change approaches are emphasized” (p. 962). Clearly, the textbooks reiterate how current biomedical rationalities have come to define health behaviours and conditions that are deemed normal (Crawford, 2006).

Neoliberal capitalism encourages and compels responsabilisation in the name of productivity, individual contribution to the market economy, and cost reductions. Banasik (2010) remarked on the economics of patient care by highlighting, “the rate of diabetic ketoacidosis decreased by 86% after educational interventions. A reduction in the incidence of foot lesions, amputations, and congenital malformations has been demonstrated and has led to healthcare cost savings” (p. 962). Responsibilisation involves the expectation that educational directives will be adhered to. To be certain individuals with T2D do not wish to endure the multiplicity of complications that come with uncontrolled disease, but responsabilisation has invalidated any obligation to explore the complex ecological climate

that precipitates diabetic complications beyond patient ignorance.⁶ Subjects, including diabetic patients, are historically situated and in a predicament. In the dichotomous neoliberal environment, there exists an unfettered amount of marketing and promotion of consuming (particularly fast food), whilst simultaneously incurring disciplinary messages to those who eat it (LeBesco, 2011). The contradictory notions of neoliberal capitalism hold surplus distribution and consumption as normative values while framing the management of diabetes as a system of restraint and self-discipline. The result is calculated hedonism (Turner, 1984), whereby the diabetic is required to internalize the governmentality of the body in the midst of alluring messages of consumption. The *conduct of conduct* is clear in the texts, whereby prescriptive measures are employed as a means to solidify control measures around the diabetic patient who is inevitably in need of refocus, regulation, and behavioural change. The prescriptives appear predominantly in the form of education for dietary change, physical activity, and self-management practices.

Behavioural Change and Diet

Dietary change, monitoring, and self-surveillance were prominent ideas in the management of the patient with T2D. McConnell (2007) stated the management of T2D relied on diet and lifestyle counselling. Braun and Anderson (2007) emphasized an individualized nutrition plan as an important measure, and Guven et al. detailed “medical nutrition therapy” as a mechanism by which T2D could be managed (2009, p. 1061). All of these recommendations reflect the organised practices of the neoliberal state that implore a certain set of conducts by citizens. The dietary suggestions are examples of rational

⁶ The 1960s–1970s witnessed an anti-authority, civil-rights trajectory that met with the neoliberal movement that valued individual choice and free-market mentality. Together they contributed to the perfect storm that propelled the current self-responsibilisation trend (Greenlaugh, & Wessely, 2004).

discursives based on ‘scientific evidence’ or expertise. The impression created in the name of expert opinion is that there is an established baseline of how citizens should manage their desires and dietary decisions in a way that is morally acceptable (Ristovski-Slijepcevic, Chapman, & Beagan, 2010). Obesity appears to be more an expression of personal control and less of the social and economic climate in which it exists; a climate shaped and formed by a protected class. Perhaps then, it is no surprise that diabetes management requires a rigid and demanding regimen not seen in other chronic illnesses (Callaghan & Williams, 1994). The emphasis on individualised approaches to dietary control speaks to Foucault’s technology of the self, in the sense that individuals develop a self-awareness—or sense of themselves as subjects—through the transmutation of governmental ideals of behavioural choice to forms of self-regulation (Ristovski-Slijepcevic et al., 2010). What is determined to be good eating through ‘expert opinion’ is encouraged to become internalized and normalized through medical nutrition therapy and calorie control.

Behavioural Change and Physical Activity

Within a Foucauldian understanding of technologies of power, the treatment measures that generate behavioural changes are issuing control mechanisms in the name of clinical care. Prescriptive exercise was another prominent example in the textbooks analysed. As an example, in *Handbook of Pathophysiology* (2008), an exercise programme was determined to be part of the first stage of treatment for T2D as a means to normalize blood sugar levels.

Foucault (1980) observed that somatic control was in the best interests of societies embarking into industrial capitalism in the 18th century. The budding industrial economic

climate of that time was served by a physical body capable of production and discipline. Like other technologies that serve to shape the subject, the biomedical system of fitness and physical exercise as a cultural production has also resulted from the historical construct in which it exists. In the neoliberal society, control of the body has become internalized and individualised; the technologies of power are expressed by the virtue of self-maintenance and individual somatic control. Neoliberalism involves the governing of leisure so that non-work time is dedicated to the productive work of refining the somatic self (Maguire, 2008).

Foucault reminds us that discipline produces the individual through the development of desired habits and self-regulatory action (Foucault, 1995). The desired outcome is the development of a patent internal gaze. Like the recommendations for dietary intake, ideals are in place for physical activity. Exercise, once an activity of leisure and social interaction, has been embodied within healthism and the disciplinary drive to generating the valued 'healthy lifestyle'. In *Pathophysiology: Concepts of Altered Health States*, this is exemplified when the author indicates that exercise not only confers a decrease in body fat and improvement in insulin sensitivity for the diabetic, but also improves cardiovascular health and overall psychological well-being (Güven et al., 2009). Viewed critically, this appropriation of leisure activity as a healthism modality reflects larger systems of control, and is at once about consumer culture, leisure and class, identities, gender roles, and oppressions (Kirk & Colquhoun, 1989).

The Emphasis on Educating Healthy Behaviours

Overall, in the current health-valuing culture, subjects are defined by the degree to which healthy behaviours are adapted, and all are expected to acquire a degree of health knowledge in the name of being a good citizen (Crawford, 2006). The subtle internalization

of control and power in the modern neoliberal era would not be a surprise to Foucault. Commenting on power, Foucault observes that it “reaches into the very grain of individuals, touches their bodies and inserts itself into their actions and attitudes, their discourses, learning processes and everyday life” (Foucault, 1980, p. 39). Biopower is enacted by truth discourses about subjects. These discourses are a set of authorities that speak truth strategies for modeling and refining existence in the name of health (Rabinow & Rose 2006). Biopower couples neoliberal thought to the individualization of treatment; individual behaviour modification involves patient resolve in concordance with ongoing interventions by medical personalities. The discourse of the patient in concert with medical scaffolding is biopolitical in that behavioural change is for the greater social good (Guthman, 2006).

Patient education is a way to promote the nation’s health while simultaneously containing costs. However, there is evidence to suggest that the educational techniques to impress behavioural change in response to health problems like T2D perpetuates the structural status quo that initially inflicted the problem (Lupton, 1996); patient education does not address the social conditions of T2D and supports the industries producing goods to manage it. Additionally, in spite of the valiant attempts in the construction of the ideal, the productive subject and the medicalization of all aspects of the daily goings-on of the individual with T2D, problems exist with the approach. Overall, dietary and exercise regimen adherence is low (Peyrot et al., 2004), and up to 50% of patients are unable to maintain serum glucose levels within the narrow range suggested for the prevention of secondary complications (Zoffman & Kirkevold, 2005).

Notably, socioeconomic status also plays a significant role in the management of T2D. The diabetic bearing the burden of low SES meets barriers to obtaining professional

care for the illness (Oladele & Barnett, 2006), paying for medications (Rubin, 2005), and travelling to appointments (Nam et al., 2011). Additionally, lower SES, whether in childhood or as a cumulative influence over time, generates psychosocial stressors, tendency to depression, and lower sense of self-esteem—all characteristics that affect lifestyle habits in ways that may provoke a diabetic physiology (Everson, Maty, Lynch, & Kaplan, 2002). These lifestyle habits are a result of the social environment, and are reproduced as part of the social fabric (Raphael et al., 2003).

The promoted discourse of irresponsible eating choices, avoiding physical activity, and the general lack of self-care resulting in obesity is a trope that readily conjures ‘blame the victim’ inclinations. The patient with T2D, while attempting to conform and adhere to the management protocol, describes frustration (Nagelkerk, Reick, & Meengs, 2006), psychological stress (Bradley & Gamsu, 1994), and fear of long-term complications (Glasgow, Toobert, & Gillette, 2001). Meanwhile, neglect of the economic and sociopolitical influences on T2D means that social costs have continued to increase.

The Treatment of T2D Involves Pharmaceutical Intervention

Risk management is impressed on the diabetic subject through the necessity of behavioural self-control, and reinforced by market intervention. Five of the 10 textbooks suggested pharmaceutical intervention, if behavioural change was not forthcoming, while the remaining 5 stated pharmaceuticals were a first-line defense upon initial diagnosis.

Critical discourse analysis exposes a particular discursive formation in the textbooks. Here, in the climate of corporate and market advancement, the medical and scientific trope is conflated with commerce. The scientific direction entrenched by pharmaceutical industries

(pharma) is to produce knowledge that is appropriate for corporate gain. For example, publication plans, gap analyses, and strategic title planning (Matheson, 2008) ensure specific pharma messages are presented in the literature. Ghostwriters are often hired to reduce pharma exposure in the research (Matheson, 2008), and it is estimated these ghostwritten articles represent a disproportionate number of ‘independent’ research items in peer-reviewed journals (Healy & Cattell, 2003). Additionally, pharma interests penetrate patient groups or start their own. In the United States, 80% of patient groups or associations receive industry sponsorships (Mintzes, 2007). With T2D, in particular, pharma also offers a visible presence through corporate sponsorship of the American Diabetes Association (Our Corporate Sponsors, n.d.) and Canadian Diabetes Association (Donor Acknowledgements - 2011, n.d.). When pharmaceutical corporations endow financial support, the agendas of patient organisations (like diabetes associations) are inclined to be influenced and distorted (Herxheimer, 2003; Matheson, 2008; Mintzes, 2007). Through sponsoring patient groups, pharma is able to communicate uses for their product to prescribers, regulatory bodies, and policy makers (Ball, Tisocki, & Herxheimer, 2006). Moreover, when distributing treatment information to patients, groups under the influence of pharma financial support are less likely to disclose the adverse effects of such drugs (Mintzes, 2007). Consequently, it is likely that the best interests of the patients, the understandings of T2D causation, and the protocol for care are shaped by the corporate interests that support patient organisations.

Clinical guidelines may also be influenced by pharma. These guidelines are based on current evidence for practice, and are therefore reflective of evidence-based medicine. Notably, it was discovered by Choudry, Stelfox and Detsky (2002) that a full 87% of clinical practice guideline authors had interaction with pharmaceutical corporations, over half

received financial support from pharma for research, and over one third had worked directly in the pharmaceutical industry. Furthermore, two-thirds to three-quarters of randomized controlled trials published in major, highly respected journals are funded by pharmaceutical agencies (Egger et al., 2001). The evidence-based medicine upon which clinical practice guidelines have been built represents not only political rhetoric, but epistemological, social, and economic power (Hallstrom, 2009). What is published and subsequently used in constructing evidence-based medicine and best practices does not necessarily reflect the ideas that have emerged from more advanced ideas in biology or new frontiers in biotechnology (Charlton & Miles, 1998; Miller & Miller, 2011).

Through the influence of pharma, the social construction of disease is replaced by a corporate construction (Moynihan, Heath, & Henry, 2002). Individuals become various degrees of hypertensive or diabetic, so that they are now borderline hypertensive, or with impaired glucose regulation (The Merck Manual of Diagnosis and Therapy, 2012). Critical discourse analysis of the textbooks highlights the conflation of medicine and corporate influence. With one exception, the texts studied here dedicated a large amount of space detailing the classifications, therapeutic actions, and positive outcomes of the drugs available for treating T2D without including the side effects and possible complications of pharmaceutical interventions. Pharma interests, in concert with the associated interests by medical device and imaging industries, have become normalized within the medical and scientific ontologies. The result is an articulation of medicine and corporate interests in a way that confers immense biopower in the public space.

Broader Social and Ecologic Factors That Influence the Epidemiology of T2D Are Not Discussed

The textbooks analysed in this research failed to discuss the importance of the social determinants of health in T2D. *Essentials of Pathophysiology* (Guyen et al., 2011) provided an informed comment on how treatment measures should be constructed with the socioeconomic status of the patient in mind, but it was not sufficiently detailed.

As discussed in chapter 2, T2D is mediated by a number of social determinants, including socioeconomic status, income inequality, childhood adversity, the intrauterine environment, and obesogenic influences. The current ecological climate is a sociopolitical representation and historically embedded. Accordingly, neoliberal capitalism has shaped the current status quo. Medicine, in concert with medical education, is a representation of decisions codified by the discursive formations of historic distributions of power and protected interests. Through critical discourse analysis, the political undercurrent of this neoliberal thinking was elucidated in the texts. But why are the social determinants of health ignored within this neoliberal narrative? A Foucauldian perspective suggests three avenues for discussion: the understanding of politics and knowledge as an amalgamation, the state and market as a continuum, and the technology of the self.

Politics and Knowledge

Politics and knowledge are not juxtaposed, but are a composite political knowledge. Practices are in relation to contextual realities. Rationality is not pure or objective, but represents a governed reality (Lemke, 2001). Foucault contends that to understand the wielding of a particular power embodied in knowledge, it is important to understand “how

forms or rationality inscribe themselves in practices or systems of practices, and what role they play within them” (Foucault, 1991, p. 79). In the textbooks, political knowledge was forthcoming. Genetics and lifestyle choices were conclusively described as the causative factors for T2D, while de facto neoliberal environments that are detrimental to health were not. For example, the obesogenic terrain is a manifestation of neoliberal capitalism in numerous ways: increased working hours generates time poverty, making it difficult to consider healthier behaviours (Crawshaw & Newlove, 2011); the expansive urbanization of land for private use has depleted public spaces for exercise (Jackson, Harp, & White, 2002); lack of market regulation has resulted in the prolific advertising of poor quality food (Government of Canada, 2007); rising income insecurity generates psychosocial distress (Offer, Pechey, & Ulijaszek, 2010); industrialization and corporate agriculture practices have injected without restraint more endocrine disrupting chemicals into the food chain and environment (Diamanti-Kandarakis, et al., 2009). The negative impact on T2D of these profound social changes is without mention in the textbooks. Furthermore, this impact is more pronounced as it descends the social gradient. The omission of this knowledge and the concurrent emphasis on genetic causations of T2D represent neoliberal thinking, which downplays collective and corporate responsibility and highlights the individual’s role as a consumer of the widening market of industry products (Stempsey, 2006).

The textbooks reflect a binary comprehension of T2D causation as seen in comments both highlighting genetics and lifestyle choices. The comments regarding unhealthy lifestyle choices suggest a self-imposed obesogenic environment rather than one that is socially constructed. The texts are a representation of the social distribution of power that has been exerted with a precise mechanism. First, reality is produced in such a way that specific

discursives are prominent at the expense of undesirable truths. Secondly, these discursive formations are normalized (Fiske, 2011). The textbooks galvanize for the reader the genetic and lifestyle causations for T2D, normalising it at the expense of the social and environmental context. Highlighting treatments based on pharmaceutical interventions assuage corporate interests while subjugating criticisms about the policies in place that generate poor health. In the Foucauldian sense, forms of knowledge as discourses are central to the shaping of what is deemed reality; what is social reality are power relations (Gordon, 1991). The ‘scientific’ explanations of the disease, while intuitively objective and representative of modern scientific inquiry, are challenged in a Foucauldian understanding. More critically, science is shaped to a degree by external power (Foucault, 1984). The lack of an important voice that speaks to inequalities and environmental injustices is a disregard for that voice; indeed, a repression of that voice. Foucault speaks to this when he offers the notion that a liberalist environment serves to curtail and mute the public voice (Peters, 2007). The textbooks present a truth that is a manifestation of this hegemony, and in the words of Apple (1982, p. 26), serves as “a reproductive force in an unequal society”.

The State and Market

As much as neoliberal capitalism is inclined to assert, the state and market are not independent entities but are conjunctive. The act of production necessarily requires a political investment in the subjective body (Foucault, 1995). Neoliberal governmentality represents rationalities embedded in economic terms; policies are consequently the manifestations of this ontology. As with Harvey’s notion of neoliberalism as a system of classism and social stratification, Foucault situates the modern political economy as a means by which to stabilize societal power relations (Lemke, 2001). To solidify and normalize this hegemonic

discourse into the subjectivities of citizens, technologies are in place. In matters of health and illness, the market is projected as a source of good. Biomedicine, biotechnology, pharmaceutical innovations, surveillance technologies, and genetic research are all examples of profitable market technologies obscured under the veil of private enterprises serving the best interests of the public. Promoting pharma and biotechnology as positive players in T2D without a discussion about the ethical consequences of screening, or the short- and long-term adverse effects of anti-diabetic preparations, minimalises the limitations of biomedicine.

Additionally, the textbooks convey the current discourse that it is easier to treat socially embedded illnesses through the market than through social reform, much to the succor of corporate interests. Anti-obesity, anti-diabetes, and lipid-moderating drugs are all pharmaceutical technologies lauded for easing the effects of chronic illness and sustaining life. Bariatric surgery and its technological advances are also framed as a viable and effective option in T2D therapy. Meanwhile, disregarding the effects from growing socioeconomic inequality and other social determinants absolves the market and the state of their responsibility for the meteoric increase in T2D. The discourse in the textbooks speaks of market approaches to health and not social approaches, therefore protecting the voice of market mechanisms, and de facto the voice of exclusive groups.

Ignoring the importance of social determinants augments the message that the market economy is the preferred solution for the management of T2D, not a source of the problem. However, as outlined in chapter 2, there is strong evidence that the neoliberal economy, with its emphasis on weakening government regulations and stronger corporate control, has incontrovertibly contributed to the rise in socially stratified illnesses, including T2D. Presenting T2D as an illness embedded in neoliberal capitalism also raises environmental

concerns, particularly around the growing ubiquity of endocrine disrupting chemicals on a global level. Unregulated and competitive enterprise is both the preferred economic mechanism and the concomitant architect of such things as plasticisers, pesticides, flame retardants, and surfactants; all chemicals disruptive to such physiological mechanisms as adipocyte proliferation and metabolism, leptin activity, food preferences, and insulin function (Holtcamp, 2012). Provoking awareness and advancing the potential importance of endocrine disrupting chemicals as candidates in catalysing obesity and T2D may have the effect of elevating the imperative for policy change. In the current setting of enterprise, economic growth and the unregulated production of goods, this critical dialogue is objectionable, but also necessary.

The textbooks studied failed to provide any insight into how the ideologies of globalized, free market economies generate social, and therefore health, inequalities. Yet these manifestations are profound, and by witnessing the effects of neoliberal influence on previously controlled or command economies the resulting adverse health effects become lucid (Deacon, 2000; Gao, Qian, Tang, Eriksson, & Blas, 2002; Men, Brennan, Boffetta, & Zaridze, 2003). Moreover, with the globalisation of food distribution, countries once sequestered from Western diets are experiencing an influx of Western fast food outlets over the last 20 years, and with them an influx of T2D and cardiovascular disease (Pan, Malik, & Hu, 2012). As fast food marketing is targeted to and disproportionately represented in lower-income social segments, it serves as a catalyst to the distributive patterns of T2D. That an economic environment affects health is not an unrealistic position; the absence of such commentary in medical textbooks reflects more about a sectarian discursive rather than the lived realities of non-communicable diseases. Placing T2D as a social illness raises questions

about fundamental issues of deregulation, free trade, the widening of the income gap, and the broader concerns regarding the distribution of health within neoliberal capitalism.

Technologies of the Self

Governmentality is a continuum that extends to the self. It endeavours to generate a subject able to make rational decisions, assume self-care and exercise self-determination. By controlling through this discursive rationality, social risks are not state responsibilities but subjective responsibilities. The biopolitical identity is one of biological responsibility (Rose, N., 2001), and this identity was clear in the textbooks when describing both the causative factors and management of T2D. Neoliberal ideology is implicated in this narrative, as neoliberalism itself promotes subjectivities and categorical notions of citizenship. The incidence and prevalence of T2D have grown exponentially in tandem with the rigorous movement of globalized neoliberal capitalism (and its controvertible repercussions) over the last 25 to 30 years. Although chronic illness such as T2D is correlated with social factors such as precarious employment, occupational stress, environmental toxins, and urbanization, the textbooks minimize the importance of these factors in their pages. In the neoliberal climate, liberty is situated as a moral virtue, and the liberty to choose health is a convenient transpiration in light of the weakening of social safety nets. The textbooks serve the neoliberal apparatus by acting as a medium to convey the ideological trope of self-actualisation and self-determination. Simultaneously, the textbooks protect neoliberal interests by diverting attention away from such issues as the health-damaging effects of austerity measures, the decline in social housing programmes, weakening of rent control, and income tax reductions for the well off (Bryant, 2009; Raphael, 2000).

The technology of the self, or the construction and surveillance (both from internal and external gazes) of the subject, is both a metaphor and manifestation of the neoliberal binary of freedom (to make volitional choices) and control (for the preservation of the productive citizen). The textbooks relate the healthism trend by enforcing the ethics of exercise, dietary restriction, regular health checkups, and continual self-monitoring. However, healthism is a classist construction that assumes healthy behaviours are universally constructed, always desirable or indeed attainable. For example, body shape becomes a homogenized concept; it is assumed a fit and firm body is a unified, optimal representation of self-work (Lupton, 1995). Crawford (2006) argues that healthism began to take hold in the 1970s in concert with the neoliberalised self, but the notion was decidedly a professionalised middle-class, White experience in that (a) women desired to shed their passive social roles in favour of self-direction, (b) men wanted to demonstrate a take-charge attitude both professionally and personally, and (c) there was a desire to return to a more structured and rational social existence after the 1960s. The move to self-directed health coincided with the neoliberal destabilization of social safety nets. This impetus propelled a reduction in employer-paid health insurance plans in the United States (Blumenthal, 2006). By the early 1990s, mechanisms were in place to shift more healthcare to community services and the private home, generate patient copayments, restrict resources for acute care, and delist certain services (Cohen, Ferrier, Woodward, & Brown, 2001). Healthism reflects a middle-class experience and particular cultural relevance. From Crawford (2006), healthism is enacted by those “privileged in being able to adopt health lifestyles, vindicated in the privilege because they had done so and confirmed in their privilege with a body that outlived the less responsible” (p. 410).

The textbooks emphasise healthism, but ignore more important social determinants. Personal responsibility and discipline were just as much a factor for the causation of T2D as for the treatment of it. Causation, however, is not accurately understood when placed in individualistic terms. Situations of inequality, whether determined by the metrics of discrete income or wealth, directly influence birth weight, mortality rates, crime, and patterns of morbidity. Understanding causation from an inequality lens directs a much more accurate pronouncement about epidemiologic trends (Mackenbach, et al., 2003). A personal responsibility for health, according to neoliberal epistemology, is a much more efficient approach to maintaining a productive citizen than regulating markets or revitalizing the welfare state. So, instead of addressing the toxic atmospheric conditions that cause cardiovascular-related deaths in urban concentrations, the recommendation is to seek out a cooling centre. Instead of generating regulations to curtail the contamination of water systems by industrial pollutants, pregnant women are advised to limit their fish consumption for the sake of their baby's health. Instead of reconceptualising the endemic social factors that perpetuate inequality and the maldistribution of health, neoliberal subjects are encouraged to watch their diet and to exercise more.

Through a Foucauldian and critical discourse analysis, the dispositive is secured. The discursive narrative distributed to and absorbed by healthcare students is one of self-responsibility and a moral obligation to individual health. The non-discursive manifestation is the perpetuation of education for behavioural change and healthism as a clinical form. The result is the perpetuation of the neoliberal ideal embedded and normalised in medical practice. A lack of attention paid to the social determinants of health in the textbooks depoliticises the unequal distribution of T2D and other chronic diseases along the social

gradient. Neoliberal capitalism has widened the income gap (Stiglitz, 2012), and the distribution of T2D reflects this income disparity. The global distribution of T2D speaks clearly to its social and political embeddedness, yet the textbooks also failed to highlight the rapid increase of T2D on a global level. In doing so, the opportunity to critically analyse the prevalence of T2D through a realisation of how current economics affects health is averted.

For the very reason T2D parallels socioeconomic disadvantage, marginalization, and environmental decline, T2D *is* a political issue worthy of critical analysis in the classroom. Framing T2D as a social illness, however, threatens to dismantle the neoliberal ideology of the *entrepreneurial* self. Crawford (1980) confirms the ideology of individual responsibility has frequently functioned historically as the replacement for broader political commitments. In a neoliberal society, the virtue of individualism as a means to uphold the free market economy and substantiate the retrenchment of social policies outweighs the virtue of collectivism. Invoking structural change for improvement in health outcomes would challenge the hegemonic structure that protects interests higher on the income gradient. Ignoring the broader social determinants in the discussion of T2D (and many other chronic diseases) serves to maintain the status quo. The textbooks analysed in this research presented T2D in a way that situates future medical professionals in a biomedical construction of healthcare that participates in the prioritisation of a market-based approach to treatment and not a social approach to prevention.

Chapter 8

Conclusion

This chapter makes some concluding remarks; presents implications for education and recommendations for practice; discusses the limitations of the research and directions for further study.

This thesis sought to answer the following question: Does the interpretation of T2D in pathophysiology textbooks reflect neoliberal thinking? Ten postsecondary textbooks on pathology, pathophysiology, and disease processes were selected for critical content analysis and interpreted within a Foucauldian framework. Six themes became apparent:

- Genetics confer a risk for T2D
- Behavioural choices are a risk factor for T2D
- Non-diabetic and diabetic patients benefit from biotechnical surveillance and monitoring technologies
- The treatment of T2D involves behavioural change
- The treatment of T2D involves pharmaceutical intervention
- Broader social and ecologic factors that influence the epidemiology of T2D are not discussed

This investigation found that the textbooks reflected discursive formations consistent with neoliberal ideology, embodied within these six themes. These discursive formations were apparent both in the understandings of the risk factors and for the management of the

disease. Additionally, although the social environment plays a significant role in the epidemiology of the disease, no social understandings were forthcoming in the textbooks analysed. Using Foucault's narrative, neoliberal ideology within the healthcare setting generates a strategic riskscape based on political knowledges. In terms of T2D, it is the overcoming of risks (Foucault, 1973), whether through dietary management, exercising, or receiving regular checkups for glucose monitoring, waist measurements, and HbA1c tests. It is a form of governmentality that allots power to the external medical gaze. To substantiate the dismantling of the welfare state, the gaze is also internalized; subjects are held to conforming to productive neoliberal citizenry, but in a way that is disguised as liberalism or personal freedom. Empowerment and autonomy are the virtues of the neoliberal citizen, and through *healthism* are these—in keeping with neoliberal subjectification—instilled. These particular power discursives are technologies of the self. They are knowledges that are normalized and internalized as the subject assumes moral responsibility for eating a certain way or choosing whether or not to exercise; the discursives are substantiated in the individualization of causation and treatment. The textbooks also emphasise the importance of the market in both the understanding and management of the disease. According to Foucault (1995), the state and market are an affiliated correlate and in symbiosis. From this analysis, we see that textbooks have situated T2D within a biopoliticised construct consistent with the values of neoliberal ideology. Biopolitics is seen in the way in which the disease is surveyed and monitored, and the molecularised subject, if not the victim of erroneous lifestyle decisions, is at the mercy of aberrant genes. Genetic understandings of T2D produce a power differential that serves the best interest of both the biotechnology and pharmaceutical industry while simultaneously reifying particular groups on the basis of biology. Treating the

disease by pharmaceutical intervention is an approach heavily emphasised by the texts to the negation of situating T2D prevention within a social setting.

Viewed collectively, the content of the texts parallels a number of dichotomies and incongruities consistent with neoliberal ideology. First, in the current market society, personal discipline as a means to maintain the productive self is in a duplicitous relationship with the message of unrestricted consumption. The healthy subject must avoid inactivity and poor dietary habits amid an environment consisting of rapid urbanisation, marginalisation, precarious employment and the unregulated marketing of inexpensive, processed food bearing marginal nutritional value. The textbooks mirror the preventive strategy of self-control as a means to accord health without conceding the current political milieu has any impact on the health of the population. Secondly, in neoliberal thought, the individual is characterized as one who is able to exercise free will and choice in a market-driven economy. This ideal is counterbalanced by the subduing effects neoliberal capitalism has on the distribution of knowledge and sense of reality as understood by non-market interests. Neoliberalism assumes there is free choice, when in fact informed choices are actually embedded in particular hegemonic discourses. With respect to the risk factors for T2D, the diabetic is seen as someone who has made poor lifestyle choices, or alternatively is genetically predisposed to illness. The choice to become unhealthy is seen in parallel with a biomedical knowledge that sustains marginalisation while preserving the interest of protected voices. Lastly, in an era where the entrepreneurial self is esteemed, it exists in a contradictory relationship with the trope that market solutions and the consumption of goods trump creativity, progressive reforms, and non-market ingenuity. The conceptualisation of diabetes in the texts place the patient at fault for poor lifestyle choice, but unites this understanding

with the contrary notion that individuals are victims of the disease in need of long-standing medical care and lifelong pharmaceutical intervention.

The textbooks did not include any reference to the social location in which T2D dwells. T2D and obesity have both increased since 1980 at rates that cannot be explained by biological, individual, or psychological means (Crossley, 2004). The global incidence and prevalence of T2D outpaces transgenerational genetic distribution and does not accurately represent a collective decision to eat less healthy or refrain from physical activity. A genetic interpretation of the rapid increase and demographic pattern is therefore not persuasive, nor have individuals become exponentially less interested in making lifestyle choices that benefit their health. The epidemiology of T2D does however closely correlate with the rapid social and environmental changes that have occurred with neoliberal globalization. More plausibly, the environmental impact of globalization and counterproductive social policies has abbreviated inclusive and equitable opportunities for health and well-being (Brownell et al., 2010).

Textbooks move the student from an area of lay knowledge to an area of proficiency in the human biological sciences. Textbooks are foundational to medical education, are a source of reference for clinicians, and are, “an important feature of professional orthodoxy and culture” (Rabow, Hardie, Fair, & McPhee, 2000, p. 771). They describe best practices, and inform principles of clinical care. Texts present the understandings and interpretations of disease that health professionals take with them into the clinic. However, textbooks are more than what are assumed to be agreed-upon scientific conclusions, but constructions of social beliefs and attitudes and prone to political and commercial influences (Morning, 2008).

Power is distributed and functions within the mechanics of the educational system. Dominant

modes of thought are produced in the textbooks and reproduced as normative language in the classroom (Lipman, 2006).

Textbook publishing companies are corporate entities that produce and normalise certain knowledges. Publishing companies are constituent players in the free market economy, reaping billions of dollars in profit annually, and making the publishing industry one of the most lucrative in North America (Greco, 1989). They represent the nature of competitive takeovers and free market competition, merging from several dozen publishers in the early 1980s (Shelstad, 2011) to presently five major textbook publishers controlling 80% of total textbook sales in North America (Davis & Usry, 2011). Corporate mergers are a lucrative strategy; they serve a relatively inexpensive way to penetrate discrete markets held by a certain company or title, as well as a quick way to diversify as a means to withstand economic instability (Greco, 1989). What is inevitable is a consolidation of knowledge, the control of discursive formations and the transmission of ideologies consistent with the stability and survival of the status quo. Knowledge that appears in the textbooks is representative of corporations rather than critically assembled reading material. In this sense, the textbooks may neglect what Apple terms “vulgar objectivity” (Apple, 1979, p. 89); the science represented in the textbooks is proclaimed as objective, while in fact it veils political, moral, and intellectual conflict. The students learn the material without an understanding of the political forces and power differentials involved in what determines objective truth and devoid of alternative interpretations (Apple, 1979).

In the pathology textbooks, discursive knowledges are apparent in the constructing of T2D as a disease of individual fallibility without reference to socioeconomic determinants. The textbooks represent what is consistent with what is required for capital accumulation: the

entrepreneurial self, the patient–consumer, the authority of the biomedical and pharmaceutical industry, and the discrediting of the physical environment and equitable social structures as integral components of health. It is questionable what knowledge these healthcare students will have about social justice, environmental justice, and critical understandings about neoliberal legitimacy particularly in terms of what it means for the health of individuals, communities, and nations.

The social aspects of disease are underrepresented in textbooks and (generally) at large, yet they demand attention. The social conditions or determinants of health are not obstacles that need to be overcome, but are conditions that should be the locus of policy endeavours for societal change (Lipman, 2000). The social conditions for the production of disease are ultimately political. The recommended approaches to the prevention and management of T2D can only reasonably be acknowledged after a fundamental change in public policies, health systems, market globalization and urbanization have taken place (Hu, 2011). The epistemological location and biomedicalisation of T2D in the text delineates knowledge for healthcare students and does not bode well for necessary social change.

Implications for Education and Recommendations for Practice

The textbooks present a meaning of T2D that is constructed within a particular social and political structure. This meaning is ideological and it is the manifestation of a neoliberal ontology. As summarised by Agger (1989), the textbook is not a neutral or empty object, but rather a technology that delivers the political interests of both capitalism and stratification based on class, gender, or race. Apple concurs, stating that textbooks represent a selected

‘legitimate knowledge’, a selected culture, a selected morality, and selected ‘truth’ (Apple, 1992). The social explanations of T2D are absent (or unselected), presumably because they are deemed unsuitable, unscientific, or invalid (Agger & Rachlin, 1984) in the context of health.

The research has implications for lecturers of pathology. It is important for professors to reflexively define and determine what knowledge (and more importantly whose knowledge) is being transmitted in the classroom. A brief curricular analysis to determine the extent to which course content moderates textbook content would ensure that neoliberal bias is acknowledged in understandings of T2D and other chronic diseases. Course content should include ancillary readings that introduce meanings for the students about T2D that are absent in the texts. Ancillary readings may instill a sense of critical scholarship in students and assist in the dispelling of notions that textbooks are objective representations of normative facts. Finally, publishing companies reach out to lecturers in the field to supply content review for new and updated texts. It is a recommendation for invited reviewers to look beyond scientific accuracy of the content to the political voice of the content, and comment accordingly.

For students in the healthcare field, the findings of this research means several things. First, in the pathology classroom where aetiologies and the management of disease are discussed, students are exposed to a discussion that suppresses the voice of those subject to poor health as a result of the relations constituted by neoliberal capitalism. Second, students will not be exposed to critical interpretations of capitalism and current social structures as they pertain to health (Wachholz & Mullaly, 2000). As it stands, to disrupt the perpetuation and reproduction of these ideological discursive formations, the pathology professor should at least create an awareness of obesogenic environments, widening social inequality, and the

effects of global neoliberal marketization on both non-communicable and communicable disease. Introducing research highlighting the ecological aspects of T2D will contribute to shifting focus away from genetic determinism, victim blaming, reifying ethnicity or body shape towards inept political policies, the effects of globalization, marginalisation, and retrenchment of the welfare state. Undeniably, conditions such as social stress, environmental toxins, inequitable income differentials, access to healthy food, marketing technologies, and urbanization have impacted the local and global distribution, incidence and prevalence of T2D over the last few decades. It is disappointing that these considerations are not accounted for in textbooks. Until radical changes have been instilled in the publication of textbooks with respect to the privileged voices that continue to fill their pages, students learning what they do about the disease from textbook technologies perpetuate content, framed almost exclusively within a neoliberal imperative.

Limitations

The findings in this study are subject to limitations and should therefore be interpreted with these limitations in mind. First, the instrumentation was limited to textual content analysis and not instructional analysis. How the textbooks are incorporated into the instructional agenda, including what parts of the textbook are included in the lesson or what supplementation occurs by the instructor was not considered. Secondly, the textbooks studied were determined to be the top sellers and therefore determined to be the most represented in pathology classrooms. While these textbooks demonstrated neoliberal bias, it is uncertain whether all pathology and pathology-related texts share the same bias. Put another way, it is uncertain whether the textbooks are used in the classroom *because* they carry a desired neoliberal approach, or *in spite* of carrying a neoliberal bias. Thirdly, it was undetermined in

this study whether the neoliberal tendency to describe T2D in the texts was consistent in the description of other non-communicable disease, such as cancer or cardiovascular disease. As these diseases are also to a great extent socially embedded, it would be of value to reinforce the current findings by identifying parallel discursives in the descriptions of these other diseases. Fourthly, only the chapters on endocrine, and specifically endocrine pancreatic pathology, were analysed. It is not known if broader understandings of the T2D were described within a different conceptual framework in other chapters of the books. However, since the sections on endocrine pancreatic disorders were lengthy and highly detailed, it is unlikely that this would be the case. Fifth, critical discourse analysis is a qualitative method that by its very nature is highly interpretive and subjective. The initial research was undertaken with the input by two additional researchers to mitigate this issue. Inter-rater reliability was strong, and the identification of coding patterns was consistent among all researchers. Lastly, it is necessary to recognise forces other than the current neoliberal climate may be responsible for the specific construction of T2D in the textbooks. A longitudinal study of textbook content over time may help to elucidate historical undertones in the production of knowledge. However, the material identified in this research appeared to strongly resonate with neoliberal ideology and the production of specific discursives. Taken as such, the research speaks to Foucault's position that knowledge reflects not truth but power, and the knowledges reproduced in the textbooks represent a neoliberal ideological persuasion.

Recommendations for Further Study

While this investigation highlighted a number of interesting findings, further research is recommended. It would be interesting to explore to what extent professors in the field of

pathology recognise the inherent bias in the textbooks they use, and in what ways they compensate for it should they choose to do so. More broadly, it would be useful to survey healthcare curricula with the aim to uncover where the social determinants of health are covered, and whether or not this theoretical framework is sublimated across curricular content and indeed into praxis. With this in mind, it would be of benefit to understand how the textbook presentation of T2D, if at all, impacts clinical approaches adopted by new healthcare graduates. From a more ontological perspective, it would also be valuable to explore the broader meaning of what professionalism involves in the healthcare field and whether it is appropriate for healthcare professionals to make the social determinants of health a salient factor in the curriculum. Lastly, a line of study, which would follow from the Limitations section above, might involve tracking textbooks over time to see whether the interpretations of T2D had changed, as one might expect in response to the changing neoliberal political climate.

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