

Balancing Act: The Relationship between Work-Family Balance, Gender, Quality of Life  
Indicators and Self-Rated Health.

by

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## **Abstract**

Substantial numbers of Canadians work shifts. The reasons individuals work shifts are varied and complex. Prior research regarding the relationship between work-family balance, gender, quality of life indicators and health has yielded mixed results. The goal of this research was to examine the association between work-family balance, quality of life indicators and Canadians' overall health status while controlling for socio-economic status, education, family structure and life satisfaction. The two objectives of this study were : 1) to explore how the relationship between work-related characteristics, quality of life and overall health status is different among Canadian male and Canadian female workers, controlling for age, education, socio-economic status, family structure, and life satisfaction and, 2) to examine the relationship between shift configuration and employees' overall health status, controlling for socio-economic status, gender, education, family structure and life satisfaction. This study involved analyses of cross-sectional national data from the General Social Survey (GSS) 2006, Cycle 20. The sample for the study included employed men and women who were married or living in common-law relationships, ages 18 through 69. Bivariate and logistic regression analyses were conducted to address the stated research objectives. Appropriate survey weights were applied to estimate population characteristics. To fully account for the survey's complex sample design, mean bootstrap weights were used for variance estimation and calculation of confidence intervals. Findings indicated that for women and shift workers, both work-to-family spillover and family-to-work spillover were predictive of poor self-rated health. Spillover was not a predictor of poor health for men or day workers. Shift configuration was not found to be significantly correlated with poor self-rated health. Analyses should be repeated to test for interaction between shift work and sleep quality as sleep quality was controlled for in this study.

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## **Dedication**

The findings in this study were a constant reminder to me throughout this journey that when we, as a members of families, take on challenges, we naturally implicate our loved ones in those endeavours. Although this was a wonderful experience of learning, there were many difficult moments for myself and my family as I tried to balance the responsibilities of my varied and demanding roles as student, nurse, spouse, parent and friend. My husband and children were more patient than one ought to expect when this thesis came on vacations, interrupted family plans and when it distracted me to the point where I was a less than ideal partner or parent. Despite this, they rejoiced in my moments of success along the way. My parents were always available to drive kids, cook dinners and entertain my daughter when I was unable to fulfill these responsibilities. This experience has once again reminded me that although personal successes are important, family is essential. I am very lucky to have an exceptional family.

I dedicate this thesis to my husband David, my children, Aaron, Christopher and Emily, and to my parents, Marlene and Allan Pennie.

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## **Chapter 1: Introduction**

It is evident that the rapidly changing work world has provided both opportunities and challenges for individuals and their families. There is increasing workforce participation by women ((Martel, Caron-Malenfant, Vezina, & Belanger, 2007). As well, the 24-hour economy provides a wide variation in the types of employment that are available to individuals.

Substantial numbers of Canadians work shifts. In 2005, 25% of men and 23% of women were employed in non-standard schedules (Williams, 2008). The reasons individuals work shifts are varied and complex. In 2001, 25% of all shift workers were employed in evening or night shifts and most reported that they had no choice in the hours they worked, and women were more likely (11%) to choose shift work to accommodate family needs as compared to men (3%) (Shields, 2002). Regardless of the reasons individuals work shifts, the challenges of achieving health, life satisfaction, and work-family balance can be quite daunting in an economy that places high demands on its workers. This is particularly true for dual income families with children, as the needs of several individuals must be accommodated simultaneously.

The main objective of this research was to examine the relationship between work demands (shift work, work hours), work-family balance (work-to-family spillover, family-to-work-spillover), quality of life indicators (time stress, life satisfaction, sleep difficulties) and self-rated health among Canadian men and women aged 18 to 69 years. To achieve this goal, the study sample of married/common-law, working individuals was extracted from the Canadian General Social Survey (GSS), Cycle 20 (2006).

## **Rationale for the Present Study**

Results from previous research studies are mixed, but do indicate that the type of shift worked (e.g. evening, rotating, and night) can have various health and social impacts, both upon the individual and their family members, and that shift workers experience more time stress and difficulties with work-family balance. The inconsistency of findings calls for the need to further examine this topic. A thorough review of the literature has highlighted the fact that it is difficult to examine health outcomes without considering the social context within which the employee is embedded. Haines, Marchand, Rousseau, & Demers (2008) observed that to this point, few studies have elucidated the influence of work-to-family conflict with regards to the well-being of shift workers and more research needs to be conducted on this topic.

Although there are many studies which examine how specific illnesses are correlated with shift work, few studies look at which work and social demands are related to poor self-rated health.

## **Study Objectives and Research Questions**

### **Main Objective**

The overall goal of this research was to examine the association between work-family balance, quality of life indicators and Canadians' overall health status, while controlling for socio-economic status, education, and family structure and life satisfaction.

**Objective 1.** To explore how the relationship between work-related characteristics, quality of life indicators and overall health status is different among Canadian men and

Canadian women workers, controlling for age, education, socio-economic status, family structure, and life satisfaction.

**Questions.**

1. How do work-related characteristics (shift configuration, occupation, hours worked, workaholism), work-family balance (work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian men, controlling for age, education, socio-economic status, family structure and life satisfaction?
2. How do work-related characteristics (shift configuration, occupation, hours worked, workaholism), work-family balance (work-to-family spillover, family- to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian women, controlling for age, education, socio-economic status, family structure and life satisfaction?

**Objective 2.** To examine the relationship between shift configuration and employees' overall health status, controlling for age, gender, socio-economic status, education, family structure and life satisfaction.

**Questions.**

1. How do work-related characteristics (occupation, hours worked, workaholism), work-family balance (work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian day workers, controlling for age, education, gender, socio-economic status, family structure, and life satisfaction?
2. How do work-related characteristics (occupation, hours worked, workaholism), work-family-balance (work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian shift workers, controlling for age, education, gender, socio-economic status, family structure, and life satisfaction?

Findings of this research will enhance existing knowledge regarding specific psychosocial characteristics, work demands, gender, time pressure and other quality of life factors, and their impact on the self-rated health among Canadian workers. Specifically, analysis was designed to reveal potential gender-specific vulnerabilities with regards to self-rated health, and the impact of shift-configuration on self-rated health.

The information provided is of great use to those who work shifts, staff managers, and human resource managers. This information can be used by managers at different levels to develop more evidence-informed policies for the purpose of maintaining a healthier and more



satisfied workforce. As well, shift workers themselves can utilize this information in order to make “evidenced informed decisions” for their own lives. To partially achieve this goal, this study and the research findings will be presented to staff and management at the hospital where the researcher is employed, upon the completion of this thesis project. Furthermore, the findings will be presented at scientific conferences and published in scientific journals.

### **Theoretical Perspective for the Present Study**

This study was guided by human ecological theory (Bronfenbrenner, 1979). This theory provides a framework for examining how “...intrafamilial processes are influenced by extrafamilial conditions and environments” (Bubolz & Sontag, 1993, p. 424). This theory has been used in previous studies that examine the impact of shift work on individuals and families (Davis, Goodman, Pirretti, & Almeida, 2008), and work-family balance (Kulik & Rayyan, 2006). As well, it has been suggested as a valuable theory to utilize when conducting research that focuses on the interaction between work and family (Holliday Wayne, Grzywacz, Carlson, & Kacmar, 2007). The theory is quite broad, and in this study was used as a tool to assist with the review of literature, selection of study sample and variables, as well as the discussion of findings and recommendations.

Human beings are inherently social, that is, they do not operate independently and in isolation. Therefore, it follows that the behaviour and responses of individuals cannot be fully understood without considering the environment within which they are embedded. Human ecological theory “...is concerned with interaction and interdependence of humans (as individuals, groups, and societies) with the environment” (Bubolz & Sontag, 1993, p. 421). A key concept in this theory is the process of adaptation — the way in which individuals and

families attempt to cope with their ever-changing environments. Particular attention is given to the decision - making processes and the underlying values which guide these decisions (Bubolz & Sontag).

Bronfenbrenner recognized four levels of environmental systems: micro-, meso-, exo-, and macrosystems, with family being the primary microsystem within which the individual develops (Bubolz & Sontag, 1993, p. 424). The focus of this framework is on “the individual family members as well as the family as a whole” (Bubolz & Sontag, p. 424).

Human ecological theory conceptualizes relationships as bidirectional and as operating simultaneously throughout all systems. For example, when the work setting impacts individuals, individuals will then impact their families. Families’ adaptations to members who work shifts or who have other work and time demands are also important to consider. For example, it has been shown that women who experience work exhaustion significantly predicted high exhaustion in their partners (Demerouti, Bakker, & Schaufeli, 2005). In other words, these women brought their exhaustion home and it affected their spouses. In this same study, it was found that women in dual-earner families are sensitive to the level of exhaustion and life satisfaction of their partners; if their partners were not satisfied, women were less likely to be satisfied. The authors of this study proposed that this finding may have something to do with gender-role socialization where women are socialized to be the nurturers in families. The risk of this for women is that in an attempt to maintain equilibrium, they may have the tendency to overcompensate inside the home and sleep less in order to finish all of the household tasks, perhaps leaving them vulnerable to fatigue and illness. Furthermore, once women become fatigued and stressed, they may find it difficult to effectively parent their children. These powerful feedback loops can be explained, predicted, and studied using human ecological theory.

**Previous studies related to work and family which utilize this theory.** Although relevant, this theory has not been frequently used in research relating to the work-family interface. However, Strazdins, Clements, Korda, Broom, & D' Souza used human ecological theory effectively in a 2006 study that explored the complexities of understanding the full impact of shift work on individuals and their families. Their study compared parents who worked nonstandard schedules (shifts) to parents who worked days. They found that those parents working nonstandard schedules reported impaired family functioning, more depressive symptoms, and less effective parenting. Furthermore, their children had more social and emotional difficulties, and these associations were partially mediated through the well-being of the parents and family relationships. In this study, shift work negatively impacted the parents, and the parents, who were having adaptational difficulties, then negatively impacted the children.

Human ecological theory provides a framework for understanding these intricate relationships, and it also has predictive power. For example, one can predict that a family, where all or most individuals are experiencing behavioural, affective and/or physical difficulties, would be experiencing much stress, and those individuals' expressions of stress will affect other family members. For these reasons, this theory is particularly useful for finding meaning for potential research findings.

### **How the Theory was used in the Present Study**

**Literature review.** The literature review includes research which examines the impact of work demands on the individual, and how the quality of these relationships within the work environment is salient with regards to health outcomes. The review also considers the relationship between the employee, the workplace and the family members, with a theoretical

understanding that whether employees have positive or negative relationships within their exosystems will ultimately impact them and their families.

**Sample.** The sample was purposely chosen to represent individuals who were part of a nuclear family; that is, married or common-law individuals (with or without children in the home). As well, employed individuals were selected in order to examine how relationships within their exosystems (i.e. work environment) impact their self-rated health. The individual of interest for this study was the working spouse.

**Variables.** Variables were chosen to include different aspects of the individual's ecosystem. When studying how individuals and their families adapt to shift work and other work demands, one must consider the layers of systems within which the individual exists.

**Microsystem.** Individual and family characteristics were included to represent the microsystem; these include gender, age, educational attainment, workaholism, plans to slow down, sleep difficulties, (individual) and household income, presence of children, time with family and time with friends (family).

**Mesosystem.** The mesosystem is the relationship between the family and other systems where individual learning takes place, such as schools and daycare settings (Bubolz & Sontag, 1993, 423). This aspect of the theory will not be included in this current study.

**Exosystem.** Exosystems are environments that adults participate in which, in turn, affect the individual and the family as a whole. Examples of these systems are work settings, sports organizations and volunteer settings (Bubolz & Sontag, 1993, p. 423). The exosystem that is the focus of this study is the work setting. Analysis was conducted on two subsamples which represent different patterns of interaction with the work system – day workers and shifts workers. Employed individuals are active in these systems. The quality of their interactions with their

exosystems affect their own health and well-being and, according to human ecological theory, the well-being of other family members. Work variables which represent different demands placed on the individual and family unit were chosen to represent the exosystem and these include hours worked, occupational type, shift work, spousal employment.

The qualities of connections between individuals and their exosystems have been shown to be quite salient with regards to health outcomes and the well-being of individuals and their families. Variables which represent the qualities of the individual's relations with the work system are work-to-family spillover and family-to-work spillover. Other variables included in this study that represent qualities of interactions the individual has with the broader exosystems are, cut back on sleep to make more time, time stress and community belonging.

**Macrosystem.** This study will integrate macrosystem concepts in the discussion section. The macrosystem includes societal belief systems, resources, life options, life-styles, and patterns of social exchange that influence individual beliefs and actions (Bretherton, 1993). Macrosystems relevant to the purposes of this study include employment opportunities, economic conditions, culturally-mediated gender roles, cultural values and norms. These norms and belief systems impact how individuals act and adapt to life demands. Although, none of these norms or beliefs is mentioned in the source survey, they are useful to consider when explaining research findings.

**Discussion.** The discussion will integrate all levels of systems — microsystems, exosystems, and macrosystems — to arrive at possible explanations for research findings. As well, recommendations will incorporate all system levels to include individual, family, work and social policy recommendations.

In conclusion, this theory is useful for creating the study design, for containing the discussion and findings within a conceptual framework, and for discussing relevant practice and policy implications of the findings.

## **Chapter 2: Literature Review**

This section provides an overview of current research related to the relationship between work demands, with a special emphasis on shift work, quality of life indicators and health outcomes. Consistent with the human ecological viewpoint, individuals cannot be studied without recognizing the importance of the system within which those individuals are living. Therefore, literature which examines how employees' work demands can affect family relationships and family members' health and well-being, will also be included in this review. When reviewing literature on work-family balance and health, it was evident that there are gender differences for workers with regards to impacts of shift work and work-family balance issues. These differences will be highlighted throughout this chapter.

In the first part of this section, the concept of cumulative stress will be introduced and a brief discussion of psychosocial stress as a cause of poor health will be provided. Although logistic regression analysis — the analysis technique that will be employed in this study — measures the independent effects that each predictor variable has on the outcome variable, the overall model fit accesses some information regarding the cumulative effect of all of the predictors. Additionally, this concept helps bring some clarity to the discussion portion of this research; that various combinations of predictors may have a negative synergy with regards to the outcome.

In the second section, the topic of work and health is examined, with particular emphasis on shift work and specific work characteristics, such as work hours and occupation, which have been shown to impact health. A brief section on demographic and socio-economic determinants of health and quality of life factors will follow, and the final section has topics included that

provide information regarding the work-family interface, with a focus on work-family spillover and family relationships, particularly as they relate to shift work.

### **The Concept of Cumulative Stress**

Employees do not live in a vacuum, but rather, they are affected by their experiences and environment, and in turn, they impact their environment and those around them. The constant feedback of these relationships creates a dynamic and ever-changing interaction. It is not one, single factor that creates the perception of poor health within an individual, but it is an accumulation and interaction of many inputs that create this outcome.

Researchers have found evidence that there is a cumulative effect of stressors, simultaneously originating from the workplace and home, that result in poor self-rated health. For example, recent studies have shown that high job strain is more likely to result in depressive symptoms in individuals if they have parental responsibilities and low social support at work (Ertel, Koenen, & Berkman, 2008; Melchior, Berkman, Niedhammer, Zins, & Goldberg, 2007), and that as work demands increase and number of dependents increase, absenteeism and mental health problems also increase (Melchior et al.). Holmgren, Dahlin-Ivanoff, Bjorkelund & Hensing (2009) found that as various types of work stress accumulate (i.e., organizational difficulties, high individual demands and commitment, and low influence at work), and when these work demands interfere with leisure time, individuals were significantly more likely to report poor health and work absence was more likely. Therefore, cumulative stress is an important concept when exploring the issue of work demands and self-rated health. It is with this understanding that all indicators included in the current research study and the literature reviewed consider not only work demands related to health outcomes (e.g., work-family spillover, family-work spillover, work hours, etc. ), but other factors which may exacerbate or



modify the impact of these work demands (e.g., gender, household income, education, etc. ). Additionally, by including these indicators in the logistic regression analysis, each potential predictor can be tested for its independent effect on self-rated health.

### **Stress and Health**

The current study considers the possibility that certain work and time demands, through various mechanisms, create stress for the individual. This stress then has the potential to affect the health of the individual. Esler, Schwarz and Alvarenga (2008) reviewed research literature that links stress to poor health outcomes. They summarized the conclusions, which suggest that mental stress, including stress which originates in the workplace, is an important cause of cardiovascular disease.

Various work demands such as shift work (Heymann & Earle, 2001; Newey & Hood, 2004) and the tendency for some workers to compulsive tendencies with regard to how they approach work (Bakker, Demerouti, & Burke, 2009) have been shown to negatively impact the marital relationship and family functioning. This creates feedback, and the worker operates from a dysfunctional family system, compounding the stress. This stress has the potential to impact the workers' health in a negative manner. For example, men in happy marriages are less likely to have health problems, and both men and women in happy marriages are more likely to access health care services when required (Sandberg, Miller, Harper, Robila, & Davey, 2009). Kiecolt-Glaser and Newton (2001) reviewed evidence from 64 articles published from 1991 to 2001, and concluded that poor marital quality negatively impacts health of individuals both directly and indirectly, through poor health habits and depression.

## **Work and Health**

There are many aspects of work that can present challenges to the individual such as shift configuration, number of hours worked and the nature of the work. As well, people have individual characteristics which affect how work is managed in their lives, such as a tendency towards workaholism. Additionally, gender roles may influence the amount of stress work imposes on individuals. This section will examine factors which may influence the impact of work on personal health and wellbeing.

### **Shift Configuration**

There has been extensive research conducted regarding the impact of shift work on employees, and it is quite evident that the individual can be affected both physically (Costa, 2003; Knutsson, 2003) and emotionally (Bildt, & Michelsen, 2002; Haines et al., 2008; Jamal, 2004). However, it is difficult for researchers to disentangle these sequelae because the affective and physical wellbeing of each individual is intricately intertwined. There are a wide variety of health outcomes related to shift-work which have been studied including gastrointestinal disease (Knutsson, 2003; Pietroiusti, 2006), cardiovascular morbidity (Knutsson, 2003; Mosendane, Mosendane, & Raal, 2008), fertility difficulties (Poissonnett & Vernon, 2000), metabolic syndrome (Esquirol et al., 2009), pre-term births and miscarriage (Rich-Edwards, 2007), and various cancers such as breast (Lahti, Partonen, Kyyronen, Kauppinen, & Pukkala, 2008) and colon cancer (Schernhammer, et al., 2003). The night shift has been implicated in research findings as the shift most likely to cause adverse health outcomes (Biggi, Consonni, Galluzzo, Sogliani, & Costa, 2008; Lahti, et al., 2008; Schernhammer, et al., 2003).

**Sleep difficulties and shift work.** The effects that working shifts have on sleep are particularly well documented. Several studies have found that sleep is affected by shift work

(Drake, Roehrs, Richardson, Walsh, & Roth, 2004; Garey, 1995; Hurst, 2008; Winwood, Winefield, & Lushington, 2006) and that when workers are exposed to the night shift, this has a particularly detrimental effect on restful sleep (Costa, 1996; Drake et al.; Khaleque, 1999). Disturbed sleep can greatly affect the quality of an individual's life. There is also some evidence that poor sleep may be a risk factor for illness. For example, shortened sleep duration has been found to be a risk factor for diabetes (Gangwisch, et al., 2008).

Drake et al. (2004) studied the phenomenon of shift work sleep disorder which is one of the four types of circadian rhythm sleep disorders listed in the DSM-IV-TR (American Psychiatric Association, 2000). A circadian rhythm sleep disorder is a sleep disturbance characterized by insomnia, difficulty staying asleep, and/or excessive sleepiness which results from a mismatch between the individual's natural circadian rhythm and the demands of the environment (American Psychiatric Association). These researchers found that 32% of night workers and 26% of rotating shift workers met the criteria for shift work sleep disorder (SWSD), compared to 2% to 5% of the general population. The quality of life of individuals with SWSD was impaired beyond what would be predicted based on their shift work status and sleep difficulties. Additionally, those shift workers with SWSD exhibited more impairment related to their disorder compared to those individuals on the day shift with identical symptoms. This study indicates that persons on nights or rotating shifts are more vulnerable in terms of difficulties related to health and social functioning.

**Gender and health outcomes related to shift work.** Several studies have found that shift work is associated with physical illness in men and women (Costa, 1996; Costa, 2003; Drake et al, 2004; Khaleque, 1999; Poissonnet & Vernon, 2000; van Amelsvoort, Jansen, Swaen, van den Brandt, & Kant, 2004). However, Costa (1996) reviewed multiple studies related to the

impact of shift work on health and observed that “shift and night work may have more specific adverse effects on women’s health both in relation to their particular hormonal and reproductive function, and their family roles” (p.9). For women, exposure to the night shift has been linked to increase risk of breast cancer (Hansen, 2001; Megdal, Kroenke, Laden, Pukkala, & Schernhammer, 2005; Schernhammer et al., 2001), higher rates of miscarriage (Poissonnet & Vernon, 2000; Rich-Edwards, 2007; Whelan, Lawson, Grajewski, Hibert, & Spiegelman, & Rich-Edwards, 2007; Knutsson, 2003), sub-fertility (Poissonnet & Vernon, 2000), ischemic stroke (Brown et al., 2009), and endometrial cancer (Viswanathan, Hankinson, & Schernhammer, 2007).

Men are not immune to the deleterious effects of shift work. A longitudinal study by Shields (2002) found that men who worked evening, rotating or irregular shifts over a four year period had increased odds of being diagnosed with a chronic condition, and that for both sexes, working shifts over a period of two years was associated with increased reports of psychological distress. Additionally, a large scale Finnish study which utilized Census data found that men who had been exposed to the night-shift had a significant increase in the overall risk of developing non-Hodgkin lymphoma (Lahti et al., 2008).

For both sexes, studies have associated shift work with increased rates of coronary artery disease (Biggi, et al., 2008; Haupt et al., 2008; Knutsson, 2003; Mosendane et al., 2008), myocardial infarction (Haupt, et al., 2008), peptic ulcer disease (Knutsson, 2003), duodenal ulcers (Pietrojusti, et al., 2006), obesity (Knutsson, 2003; Park, 2009) and metabolic syndrome (Biggi et al., 2008; Esquirol et al., 2009). Additionally, research has revealed a consistent link between physical and emotional difficulties and disruption in circadian rhythms (Costa, 1996; Drake et al., 2004; Poissonnet & Vernon, 2000). Several studies have associated exposure to

shift work with psychological disturbances in workers (male and female), such as depression and anxiety (Bildt, & Michelsen, 2002; Costa, 1996; Drake et al., 2004; Michelsen, 2002; Perry-Jenkins, Goldberg, Peirce, & Sayer, 2007). A study by Haines and colleagues (2008) found that the relationship between shift work and depression was partially mediated through work-family conflict, which underscores the complexity of health outcomes of shift workers. It seems that, at least in some cases, an accumulation of stressors conspire to create poor health outcomes in these individuals.

There is a paucity of research which examines mortality as it relates to shift work. Akerstedt, Kecklund, and Johansson (2004) conducted a study involving a sample of 22,411 individuals in Sweden. Their analysis and findings underscore the importance of controlling for sex and occupation when assessing health and quality of life outcomes for shift workers. Mortality was significantly increased for female white-collar workers when compared to their day-working counterparts. There was no evidence that blue-collar shift work was related to mortality.

**Age and health outcomes related to shift work.** Shift work does not affect all workers equally. Older workers seem particularly vulnerable to the deleterious effects of shift work (Brugere, Barrit, Butat, Cosset, & Volkoff, 1997; Costa, 2005; Costa & Sartori, 2007; Folkard, 2008). As individuals age, their ability to cope with circadian rhythm disruptions diminishes, which leads to increased sleep disturbances in older workers as compared to younger workers (Costa, 2005; Monk, 2005). This, combined with the propensity of older workers to acquire chronic health conditions, contributes to the difficulties this age group has when it comes to coping with shift work. However, it is important to consider “survivor effect” or “healthy worker effect” when including older workers in studies regarding shift work (Costa, 2005).

There has been an interesting finding in a number of previous empirical studies regarding this “survivor effect” or “healthy worker effect”. There are individuals who have remained in shift work over long periods of time with few negative effects (Kilpatrick & Lavoie-Tremblay, 2006; Winwood et al., 2006). Winwood and colleagues found that in their study of shift-working nurses, the youngest age group had the highest levels of fatigue and the poorest recovery compared to older nurses. Workers who have been able to adjust to, and cope with, the demands of shift work may be overrepresented when studying older workers, and individuals who have not been able to cope may have left the workforce or have found positions in day-time work. This may be a contributing factor in the mixed results seen in studies that examine tolerance to shift work (Costa, 2003; Costa, 2005). Consequently, it is important to consider age as an important variable when examining the impact of shift work on individuals.

**Life style factors related to shift work.** Numerous studies have shown that shift workers tend to have poorer health habits than their day-working counterparts (Zhao & Turner, 2008). There is a tendency for shift workers to be obese (Kivimaki, Kuisma, Virtanen, & Elovainio, 2001; Park, 2009) and to smoke (Kivimaki, et al., 2001; van Amelsvoort, Jansen, & Kant, 2006). It is likely that poor health outcomes associated with shift work may be partially related to obesity and smoking in this employee group. It is important to consider these modifiable factors when designing educational interventions created for maintaining the health and well-being of these workers.

### **Workaholism and Health Impacts**

Previous studies have shown a correlation between over commitment to work and poor physical health (Burke, 1998; Chamberlin & Zhang, 2009; Holmgren et al., 2009), sick leave from work (Holmgren et al., 2009) and poor mental health (Burke, 1998). This particular work

style has been shown to be strongly associated with poorer social functioning, which has a tendency to affect family relationships and the wellbeing of family members (Bakker et al., 2009; Chamberlin & Zhang, 2009). Chamberlin and Zhang's study also found that adult children of workaholics had more physical health complaints and suggested that this result may be because this group had poorer psychological health compared to adult children of non-workaholics. Alternatively, they suggested that these adult children may be experiencing more physical symptoms compared to the other group due to their own workaholic tendencies.

Research findings with regards to the relationship between workaholism and health are conflicting and some researchers have found no evidence of poor health outcomes for workaholics (McMillan & O'Driscoll, 2004; Vodanovich, Piotrowski, & Wallace, 2007). For example, Vodanovich and colleagues utilized objective measures of health including myocardial infarction and blood pressure, and suggested that subjective data are insufficient to measure health outcomes. It may be that because health outcomes are measured differently across multiple studies, that this is the reason for conflicting findings, not only with regards to workaholism and health, but also for other predictors as they relate to health outcomes.

## **Occupation and Health**

**Occupations.** As highlighted previously, there is abundant evidence that occupations that demand irregular hours from workers, have the propensity to create health risk for those employed in these jobs. In fact, the Danish government recently awarded financial compensation to a group of nurses and flight attendants who worked shifts and then subsequently went on to develop breast cancer (McCarthy, 2009). The decision was based on a finding by the International Agency for Research on Cancer (part of the World Health Organization), that night work is linked to the development of breast cancer. The action has been quite controversial as

many researchers believe it is an interaction of risk factors (including shift work), that results in the development of breast cancer (Chung, Wolf, & Shapiro, 2009).

It is suggested that the nature of the work may be in some way related to the development of cancer. For example, nurses' mortality rates from breast and ovarian cancers are higher than that of teachers, and hospital workers have been shown to be more likely to develop breast cancer after exposure to the night shift compared to shift workers in other professions (Chung et al., 2009). Chung and associates suggest that this increased risk may be due to the stressful nature of nursing work or the fact that hospital shifts may be longer than shifts in other professions, (twelve-hour shifts and double shifts as compared to eight-hour shifts).

**Work requiring emotional effort.** The type of work has been shown to be a salient factor with regards to health outcomes in other studies as well. Van Daalen, Willemsen, Sanders and van Veldhoven's study (2008) investigated the relationship between job characteristics and family-to-work conflict on the mental health and emotional exhaustion of mental health care employees. They found that employees who had high patient interaction (i.e., frequent face-to-face interactions) tended to have greater emotional demands and reported more emotional exhaustion and mental health problems compared to those with low patient interaction (i.e., infrequent face-to-face interactions). Certainly, front-line healthcare workers tend to have high patient interaction, which may be a contributing factor regarding the stressful nature of that type of work.

**Occupational position.** Research has shown that the occupational position may be an important predictor of health outcomes. A large cross-sectional population study in the Netherlands found that the lowest occupational position was associated with higher risk of poor health compared to those in higher occupational positions for both men and women (Volkers,



Westert, & Schellevis, 2007). They found that those in the lowest occupational positions were more likely to suffer from depression, diabetes, heart disease, arthritis, muscle pain, neck and back pain and tension headache. Therefore, within a work-structure hierarchy, those in positions of lower power would be at risk of poorer health.

### **Hours Worked and Time Stress**

Long working hours have been associated with poor health and poor health habits in both men and women (Shields, 1999). Analyzing the longitudinal data from the Canadian National Population Health Survey (1994/1995 and 1996/1997), Shields found that women who worked long hours had increased odds of experiencing depressive symptoms. With regard to health habits, working long hours was associated with unhealthy weight gain and an increase in smoking for men, and an increase in smoking and drinking for women.

From a practical point of view, it makes sense that the more hours that people spend at their jobs, the more difficult it will be to balance the competing demands of home and work. This increased stress has the potential to put pressure on the individual resulting in exhaustion and perhaps illness. A 2007 study which looked at the impacts of work to family and family to work interference on self-rated health found that part-time working women fared much better than full-time working women with regards to self-rated health (Nylen, Melin, & Laflamme 2007). Part-time working women have more time to complete home-related tasks, resulting in more time for relaxation and rest, and are, therefore, less likely to get to the point of exhaustion. Women who are struggling with multiple demands also are quite vulnerable to stress resulting from a scarcity of time. Often, when time availability is reduced, people cut out physical activity and tend to eat convenience products. A recent study that involved a survey of 1,580 women found that 41% of the women reported time pressure as a barrier to healthy eating and 73%

reported time pressure as a barrier to physical activity. The respondents who identified time pressure as a barrier to healthy life habits tended not to meet the requirements for physical activity or for fruit and vegetable consumption and tended to report eating fast food more frequently (Welch, McNaughton, Hunter, Hume, & Crawford, 2009). It is likely that if these time stressed women are also responsible for feeding their family members, that the eating habits of their family members are also likely to be in greater jeopardy. Poor health habits, over time, tend to create poor health outcomes for people.

## **Demographic and Socio-Economic Determinants of Health**

### **Socioeconomic Factors**

Studies have found lower-socioeconomic status to be associated with fair to poor self-rated health (Dunn, Veenstra, & Ross, 2006; Shields & Shooshtari, 2001). Dunn and colleagues found that both actual and perceived socio-economic status were strong predictors of self-rated health. Perceived socio-economic status was a measure of individuals' perceived socio-economic standing compared to all other Canadians. Individual perceptions regarding how they economically rank within the larger community system appear to be a salient issue with regards to health perception.

Lower educational attainment has been linked to lower subjective ratings of health (Pama & Ringmets, 2010), particularly for men (Shields & Shooshtari, 2001). These demographic and socio-economic factors will be controlled for in the current study.

### **Gender**

As discussed previously, gender seems to be important with regards to health outcomes when considering the impact of various work and social stressors (Costa, 1996). Gender roles

tend to affect the way men and women interact with their social systems (i.e., work and family) and how they physically and emotionally react to these external demands (Costa, 1996; Shields, 2002). Reactions to these potential stressors may have an impact on self-rated health.

## **Quality of Life Variables Linked to Health**

### **Community Belonging**

From a human ecological theoretical perspective, it is important not only to consider the individual's family system, but also the wider systems within which the individual is embedded. All individuals live within communities, but existing within a community does not necessarily guarantee connectedness. Individual characteristics of the community member such as personality structure, communication ability, and physical mobility, and community characteristics such as geography, services and community responsiveness, come together to create ties between individuals and their environment. Weak ties have been shown to be correlated with poor health and premature death (e.g., Berkman, Glass, Brissette, & Seeman, 2000). Using data from the Canadian Community Health Survey, Shields (2008) investigated the connection between the perceived level of community belonging and mental and physical health. She found that a sense of community belonging was significantly related to both mental and physical health; those with lower community connected ratings were more likely to report poorer physical and mental health.

### **Life Satisfaction and Health**

Life satisfaction is a subjective measure included in a wide range of population surveys throughout the world. Dissatisfaction with life has been shown to be a strong predictor of poor self-rated health (e.g. Al-Windi, 2005) and mortality (Collins, Glej, & Goldman, 2009;

Koivumaa-Honkanen, Honkanen, Viinamaki, Kaprio, & Koskenvuo, 2000), and individual life satisfaction scores tend to remain stable over time (Koivumaa-Honkanen, Kaprio, Honkanen, Viinamaki, & Koskenvuo, 2005). Because individual life satisfaction ratings have been shown to remain stable over the life course, scores obtained in cross-sectional data are likely to be quite valid. For example, Koivumaa-Honkanen et al. (2000) found that dissatisfaction was correlated with increased disease mortality in men, particularly in heavy drinkers. Therefore, they concluded that the effect of low levels of life satisfaction on health seems to be partially mediated through poor health habits. Collins and colleagues (2009) were able to show that life satisfaction and depressive symptoms independently predict mortality risk, so including low life satisfaction in an analysis is not just another way of measuring depression, but rather, it has independent predictive power.

## **The Work Family Interface**

### **Work-family Balance**

Families face the daunting task of balancing the needs of the family against the demands of the workplace. There are many factors which impact the ability of a family to rise to this challenge: the number of children, employment status of the adults, number of work hours each person works, financial means to purchase services which help balance the workload (i.e., childcare, housekeeping), family support, community resources, competing stressors, and the internal resources that each adult possesses.

Previous research has operationalized work-family balance in various ways. It is important to consider the concept of spillover when examining this issue – both work-to-family spillover and family-to-work spillover. Negative work-to-family spillover implies that demands from the workplace are negatively impacting the ability of the individual to manage home

responsibilities and negative family-to-work spillover implies that family demands are negatively impacting an individual's ability to manage work responsibilities. In the present study, spillover is operationalized as being too exhausted to perform duties in both home and work environments. Research that examines this concept looks at how stress transfers from the work environment to the home environment and vice versa.

High work demands such as full-time work for females who are also responsible for home duties (Nylen, et al., 2007) and shift work (Williams, 2008) have been shown to be related to negative spillover. Furthermore, higher negative work-family conflict has been associated with poor physical health (Kinman, 2010; Nylen et al., 2007) and poor mental health (Wang, Afifi, Cox, & Sareen, 2007). The stress and exhaustion caused by this spillover has been shown to transfer from the individual experiencing the stress to the individual's spouse (Demerouti, et al., 2005). This transfer underscores the importance of considering the whole family system when examining this issue.

### **Shift Work and Families.**

Research has shown that various shift configurations of individuals who work in non-standard schedules tend to impact family relationships and family functioning, which can, in turn, potentially affect the health and quality of life of the individual and the family members (Haines et al., 2008; Heymann & Earle, 2001, Hsueh, & Yoshikawa, 2007; Strazdins et al., 2006) and family satisfaction (Grosswald, 2004). Shift workers have been shown to spend less time with their spouses than regular day workers (Hattery, 2001; Wight, Raley, & Bianchi, 2008; Williams, 2008) but more time with their children (Wight et al., 2008; Williams, 2008). As well, Wight and associates (2008) found that shift-working parents tend to get less sleep and spend less time in leisure activities than other working individuals. It is possible that less sleep and less

leisure activity for these parents may affect their perceptions of life satisfaction and work-family balance.

A study by Newey and Hood (2004) highlights the complexity of the interaction between shift work, quality of life indicators and health indicators observing that family relationships are particularly vulnerable when it comes to the impact of shift work on well-being. They utilized self-report questionnaires to obtain subjective data from 59 nurses and their partners regarding levels of tolerance of sleep/fatigue, health/stress and social/family life across three shifts: day, evening and night. Participants identified social/family life as the most disrupted element of lifestyle. In addition, these shift workers experienced more health/stress and social/family problems when partners perceived that their own lives were disrupted. Research has also suggested that women, in particular, report increased stress when their partners are unhappy (Demerouti, Guerts, Bakker, & Euwema., 2004; Milkie & Peltola, 1999). If male partners are unhappy because their lives are disrupted by the shift work of their female partners, these female workers may possibly experience added stress because their male partners are unhappy. These complex feedback loops create great challenges for researchers who examine these issues.

**Shift work and the marital relationship.** As previously mentioned, shift workers tend to spend less time with their spouses (Hattery, 2001; Wight et al., 2008). There is some evidence that shift work may negatively influence the marital relationship (Perry-Jenkins, et al., 2007; White & Keith, 1990). White and Keith (1990) hypothesized that shift work damages marital quality, which was strongly supported by their results. Shift work was found to have a negative effect on every indicator of marital quality including marital happiness, interaction, disagreements, general problems, sexual problems and child-related problems.

Working shifts has been associated with increased rates of divorce (Presser, 2000; White & Keith, 1990). In particular, Presser (2000) found that shift configuration, presence of children and gender were important variables to consider when examining which workers were more likely to divorce. Presser found that male shift-working parents who worked fixed nights were six times more likely to divorce, and female shift-working parents were three times more likely to divorce than their day-working counterparts. Davis, et al. (2008) also found that working the nightshift was particularly detrimental to the marital relationship. They suggested working the night shift was more likely to result in fatigue and negative moods and that the negative moods then carried over to the night workers' family interactions, resulting in poor relationship outcomes.

**Shift work, parent-child relationship and child well-being.** There have been a few studies which implicate shift work as a factor contributing to parent-child relationship difficulties and poor outcomes in children. Parental shift work has been associated with more behavioural and emotional difficulties in children (Hsueh & Yoshikawa, 2007; Joshi & Bogen, 2007; Strazdins et al., 2006), lower school engagement and performance (Hsueh & Yoshikawa, 2007), depression and lower levels of self esteem in daughters of shift-working fathers (Barton, Aldridge & Smith, 1998), lower relationship intimacy between shift-working fathers and their adolescents (Davis, Crouter & McHale, 2006), increased risk of being overweight in adolescents whose mothers worked non-standard schedules (Miller & Han, 2008), and poor cognitive outcomes in children of shift-working mothers, particularly if shift work commenced in the child's first year of life (Han, 2006). Han postulated that poor cognitive outcomes in children may be related to the type of child care utilized by the parent. Working outside of daytime hours may limit child care choices making it difficult to secure quality care.

Shift work has been shown to negatively impact the home environment and family functioning (Heyman & Earle, 2001; Strazdins et al., 2006). There is some evidence that negative child outcomes are partially mediated through increased parenting stress (Joshi & Bogen, 2007; Strazdins et al., 2006) and impaired family relationships (Joshi & Bogen, 2007). Heymann & Earle (2001) found that evening parental work has a negative impact on the home environment. When studies discriminated between different shifts and their effects on parenting issues, the evening shift tended to be the most problematic (Heymann & Earle, 2001; Newey & Hood, 2004; Wight et al., 2008). These results are certainly understandable because children need a great deal of guidance after school and throughout the evening, and having one or both parents absent during this time has the potential of creating difficulties and added stress. Parents may worry about older children who are not being monitored, and reliable evening child care for younger children may be difficult to secure.

**Shift work and work-family balance.** Although shift work can be a strategy used by some families to simultaneously manage the demands of work and home (Grosswald, 2002; Hattery, 2001), family-work balance and family satisfaction can be difficult to achieve when shift workers are working while the other family members are enjoying “free time” together. For example, weekends and evenings provide opportunities when families can spend time together if parents work day shifts and children are off school because their schedules are synchronized.

Williams (2008) found that shift workers were significantly more likely to report being dissatisfied with their work-family balance than regular day workers and Demerouti and colleagues (2004) found that fixed non-day shifts, including weekends, increased the likelihood that workers would have increased work-family conflict. In order to attempt to balance work and family demands, shift workers tend to sleep less (Wight et al., 2008; Williams, 2008), take part



in fewer leisure activities (Loudoun & Bohle, 1997; Wight et al., 2008) and spend less time with their spouses (Hattery, 2001; Wight et al., 2008). These sacrifices have the potential to diminish the health and life satisfaction of the shift worker. Impaired work-family balance has been associated with lower job and life satisfaction (Yildirim & Aycan, 2008), role overload (Williams, 2008) and depression (Haines et al., 2008).

Loudoun and Bohle's 1997 study regarding the subjective health of female nurses found that when nurses experienced higher work-family conflict they were more likely to report more negative psychological and physical symptoms. Interestingly, the importance of the family system within which the workers were embedded was also evident in the findings. Nurses who perceived low levels of family support were more likely to have psychological and physical complaints. Essentially, this result suggests that a supportive family system may assist female workers to adapt to shift work more effectively. In this study, a lack of supervisor support was also implicated in the likelihood that nurses would have physical and psychological complaints. These findings underscore the importance of considering the family and work systems of individuals when studying shift work effects and further validates the relevancy of Bronfenbrenner's ecological theory in this present study.

**Gender variations with regards to work-family balance.** It is important to consider gender when examining issues related to work-family balance in shift workers. As previously mentioned, women are more likely to choose shift work as a means to accommodate family needs as compared to men (Shields, 2002). Jacobs and Gerson (2001) observed that there are increasing expectations for workers both on the job and at home and emphasized that this is particularly challenging for women in developed countries where the culture now favours a model of "intensive mothering", which creates expectations that mothers must be intensively

involved in their children's education and development. The presence of children in dual-earner families tends to leave women with a greater burden of childcare and homemaking than men in these families (Jacobs & Gerson, 2001; Loudoun & Bohle, 1997; Presser, 1994).

There is evidence that women, as compared to men, tend to feel more responsible for childcare and home duties (Cinamon & Rich, 2002; Garey, 1995; Milkie & Peltola, 1999; Parasuraman, Greenhaus & Skromme Granrose, 1992). Cinamon & Rich's study (2002) examined gender differences in the importance of work and family and found that women reported higher parenting *and* work values than men did. The authors speculated that this result may be because women still feel they need to prove themselves in the "world of work" while simultaneously meeting their family responsibilities. It is not surprising then that Williams (2008) found that family type was a significant factor in satisfaction with work-life balance for women, but this was not the case for men. For this reason, this current study will examine gender differences with regards to health and quality of life indicators for shift workers.

**Shift work and family – benefits and positive outcomes.** Not all research suggests that shift work is problematic for families. For some, it can be used as a way to balance work and family. Hattery (2001) examined the phenomenon of "tag team parenting" where parents work opposite shifts in order to avoid paying for child care. Many parents choose this option so that they can care for their own children. Essentially, these parents are consciously utilizing shift work as a life-management strategy.

There are a few studies that have found that parental shift work provided some benefits for the parent-child relationship. Davis et al. (2006) found that adolescents reported more relationship intimacy with their shift-working mothers as compared to adolescent girls whose mothers worked during the day. As well, Barnett & Gareis (2007) found that fathers whose

wives worked evening shifts are more engaged in the parenting role. The fathers in their study spent more time with children, knew more about the children's activities, received more disclosures from children and had better parenting skills than fathers whose wives did not work the evening shift. Presser had similar findings in her 1994 study, which showed that increased father care enhanced father-child interactions. The mixed findings with regards to shift work, family functioning and child outcomes suggest that this issue is very complicated and warrants further study in order to gain a clearer picture of these issues. The current study considers family structure as it explores the effects of work stressors (including spillover) on the health of Canadian shift workers, day workers, men and women.

## **Summary**

The literature reviewed highlights the fact that gender and shift configuration are factors that should be considered when examining the relationship between work-family balance and the health of individuals who face the often conflicting demands of these two systems. Therefore, in order to examine the impact of gender and shift configuration on the self-rated health of workers, logistic regression models were created for men, women, shift workers and day workers. Additionally, previous research also suggests that it is important to consider the family and community systems within which individuals are embedded when examining the how various stressors may impact the health of these individuals. For this reason, it was important to choose variables that provided some information regarding these wider systems (e.g., spousal employment, presence of children, household income, and community belonging). This research was crafted with the understanding that individual responses to various stressors are not only dependent on characteristics of the individual, but also can be impacted by the many relationships and interactions the individual experiences in his or her every-day life.

## **Chapter 3: Methods**

### **Ethics Approval**

This study was approved by the Health Research Ethics Board of the University of Manitoba.

### **Data Source**

This study was conducted using secondary data analysis. The data source for this study was the master file of the General Social Survey (GSS) 2006, Cycle 20. To access master data file, an application was made to and approved by the Social Sciences and Humanities of Canada (SSHRC) and Statistics Canada. Data from the master file was accessed through the Manitoba Research Data Centre

### **Survey Objectives**

The GSS is a telephone survey which is conducted regularly across the 10 Canadian provinces. The purpose of this survey is to gather data on social trends in order to monitor any changes regarding the well-being of Canadians and to provide information regarding important, emerging social policy issues (Statistics Canada, 2008a). Every five years the GSS is focussed on obtaining data relevant to the topic of “family”, and the 2006 survey was part of that group of surveys. This particular cycle focussed on family transitions such as marriage, divorce, death, and birth. The GSS is very useful as it provides information that enables researchers to examine the interaction of both quality of life and social variables along with health variables. The research review on the topic of shift work and the effects on the health and quality of life of workers has illuminated the fact that there is a complex interaction between shift work

configuration, health, quality of life and work-family balance. Therefore, it is useful to use a data base that collects information on individuals' health and well-being along with information regarding their quality of life, work-family-balance and social functioning.

### **Data Collection and Target Population**

The 2006 GSS is a cross-sectional survey with a stratified design, which was conducted in four waves from June – October 2006, in order to control for seasonal variation (Statistics Canada, 2008a). The target population for the General Social Survey, Cycle 20 was all individuals 15 years and older living in the ten provinces of Canada. Residents of the Yukon, Northwest Territories and Nunavut and full-time residents of institutions were excluded from the survey. The target population was divided geographically, and households were then selected using a Random Digit Dialling (RDD) method so that each telephone number in each stratum had an equal chance of being selected. Computer assisted telephone interviewing (CATI) was utilized to collect the data. After households were selected, one individual from each household, who was 15 years or older, was then selected to participate in a telephone survey. Interviews by proxy were not allowed (to maintain reliability), and each individual was interviewed in the official language of their choice. The response rate for Cycle 20 was 68% with a total of 23,608 respondents. Little is known about the non-respondents (32%) except perhaps that they most likely have a larger representation of lower income individuals who were not able to be accessed via phone service (Statistics Canada, 2008a).

Sampling error of the estimate is the difference between the estimates obtained from the sample and the results of a complete count taken under similar conditions (Statistics Canada, 2008a). Non-sampling errors are errors in sample estimates due to factors such as non-response, processing errors, imperfect coverage, and response errors (Statistics Canada, 2008a). To control

for non-sampling errors while collecting this data, Statistics Canada used highly skilled interviewers, provided extensive training for the interviewers, observed interviewers to detect problems with the questionnaire design or misunderstanding of instructions, and used coding checks to ensure that data was being correctly processed. The complex method of survey sample selection was used to minimize sampling error.

### **Study Sample**

The sample analyzed for this study was selected from the GSS-20 survey using SPSS version 17. It consists of 5,500 respondents who were employed men and women, either married or living in common-law relationships and aged 18-69 (inclusive). Research on the topic of shift work has revealed interactions between shift work, health, quality of life, and work-family balance. The marital relationship has been shown to be vulnerable to various work configurations (Newey & Hood, 2004; Perry-Jenkins et al., 2007), so including individuals within relationships is important..

### **Study Variables**

Study variables are classified into two groups of dependent and independent variables, which are discussed in the following section.

#### **Dependent Variable**

**Self-rated health.** For the purpose of this study, self-rated health was measured based on a single question: “In general, would you say your health is: 1=excellent, 2=very good, 3=good, 4=fair, 5=poor, don’t know or refusal. This indicator measures survey respondent’s perception of their own health over the past several months [6 months or longer]. The benefit of framing the question in this manner is that short-term illnesses, such as influenza, are much less likely to bias

results. The response categories were collapsed to create a dichotomous variable. The three response categories of excellent, very good and good were combined and assigned a code of zero and were representative of those who considered themselves to have good health. Fair and poor response categories were combined and assigned a code of one and were representative of those who considered themselves to have poor health. The remaining response categories, “don’t know” and “refusal” were coded as “missing” and excluded from the analysis (1.7%). For the purposes of this study, it was important to isolate and capture those individuals who were perceiving difficulties with their health. Only 8.8% of those respondents in the study sample fell into the category of poor self-perceived health and the intent was to code to ensure these individuals truly perceived difficulties. The decision to dichotomize the outcome variable was because a low proportion of respondents rated their health, either as excellent or poor, on the extreme end of the scale.

This measure has been shown to be a good predictor of health outcomes at the population level both in terms of predicting mortality (Idler & Benyamini, 1997; Kaplan et al., 1996; Singh-Manoux et al., 2007), functional status (Hubbard, Inoue, & Diehr, 2009) and health care utilization (Menec & Chipperfield, 2001). For example, Jylha and colleagues (2006) found that self-rated health was associated with physiologic states and frequently used biomarkers for health assessment, such as haemoglobin levels and white cell counts. As well, studies have shown that individuals who perceive their health to be fair or poor, are more likely to exhibit unhealthy lifestyle choices such as heavy smoking, infrequent exercise and poor weight management ((Shields, M. & Shooshtari, S., 2001; Shooshtari, Menec, & Tate, 2007).

## **Independent Variables**

### **Demographic and Socio-Economic Variables**

**Gender.** Respondents' self reported sex was used to determine their gender. To address the first objective, logistic regression analyses were conducted for men and women in order to explore gender differences with regards to the impact of work and time demands on self-reported health. To address the second objective, logistic regression analyses were conducted to compare shift workers and day workers and gender was be controlled for in those equations. When used as a control variable, men were assigned a score of zero and women were assigned a score of one.

**Education.** Educational attainment was measured by asking participants the highest level of education attained based on five categories of education: doctorate/masters/bachelor's degree, diploma/certificate from community college or trade/technical school, high school diploma, and some secondary/elementary/no schooling. As well, there were two categories which enabled participants to respond "not stated" or "don't know," and these were coded as "missing". Initially, this variable was coded into three categories – high school or less, some post secondary and bachelor degree or higher. However, there was high collinearity between two of the groups (highschool or less and some post-secondary), so a decision was made to create a binary variable which included the two educational categories "high school or less" (assigned a code of one) and some post secondary and bachelor degree or higher were combined to create a category that was labelled "post secondary" (assigned a code of zero).

**Age.** Age was included in the present study for two reasons. First, it is often used as a control variable in research and second, as mentioned previously, prior research has shown that older workers have difficulty coping with shift work, which is manifested by sleep



difficulties and poor health. Workers up to the age of 69 years were included in the present study because as people live longer, there are more people working into their later years. In fact, in 2001, 1 in 12 persons aged 65 years and older – over 300,000 people – had a job (Duchesne, 2004). Therefore, it was important to include workers up to the age of 69 years in the analysis. The continuous level age variable from the master file was used to create a dichotomous age variable, which would allow the comparison of older and younger workers. Those aged 18-49 were categorized as younger workers and were assigned a code of zero, and those aged 50-69 were categorized as older workers and were assigned a code of one.

**Income.** Income was controlled in this study as it is possible that there is a relationship between income and the outcome variable. Respondents were asked what their best estimate was of the total income, before deductions, of all household members from all sources during the past 12 months. Possible responses spanned 12 categories from no income or loss to \$100,000 or more. As well, there were two categories where responses were “not stated” and “don’t know” . The responses were recoded to create a categorical variable where those reporting income under \$50,000 were assigned a code of zero, those reporting income as \$50,000 or more were assigned a code of one(reference category). Additionally, because those who answered “not stated” or “don’t know” represented just over 10% of the respondents to this question, these categories were combined into one group (i.e., “not reported”) and were assigned a code of two.

The income cut-off of \$50,000 was chosen because it is close to the value of the average household income in Canada in 2006, which was \$53, 870 (Statistics Canada, censuses of population, 2001 and 2006, 2006). Therefore, it is an approximate measurement of those households who had greater than average household incomes and a lesser than average household incomes.

**Presence of children.** This variable was included in the analysis as a control variable. For this question, respondents provided information regarding the number of their children, of any age or marital status, living in the home. There were five response categories from no children to four or more children. Respondents were divided into two groups, those with no children living in the home, who were assigned a code of one, and those with children living in the home, who were assigned a code of zero.

### **Work-Related Variables**

**Spousal employment.** Respondents were asked about the activities of their spouses in the past 12 months. Those spouses who were looking for paid work, going to school, caring for children, doing household work, retired, on maternity or paternity leave, affected by a long-term illness or who responded with “other”, were grouped together and assigned a code of one (i.e., spouses not working). Those who had spouses who were employed were assigned a code of zero.

It is difficult to predict how spousal employment may affect health of respondents. For example, spousal employment may increase the time demands on the family unit, and in turn, affect the respondent. Alternatively, the lack of an extra income could create financial stress for the family and the individual, and consequently affect health and well-being. As well, if the spouse is unemployed due to long-term illness, then this extra burden may also be difficult for the respondent. The impact of spousal employment on the health of respondents is unknown and yet perhaps, quite salient. Therefore, spousal employment was controlled for in this study.

**Workaholism.** This question is part of the time stress scale in the GSS 20, but the measure was used individually in the current study. This measure has been used independently (i.e., not as part of the time stress scale) in previous research, where it was considered a “well-being indicator” (Williams, 2008). As discussed previously, there has been much research regarding

workaholism and health, which is justification for treating this question as an independent variable in this research.

For this measure, respondents answered the question “Do you consider yourself a workaholic?” Those who responded “no” were assigned a code of zero and those who responded “yes” were assigned a code of one. Responses “not stated” and “don’t know” were excluded as missing (1.4%).

**Occupations.** Classification of occupation was included as a work-related variable as there is some evidence that there is a relationship between the types of occupations of respondents and health outcomes (Akerstedt et al., 2004; Chung et al., 2009). Shift work is a major focus of the current study, so the four occupational categories that were of particular interest in this study were the occupations with the highest proportion of individuals who work shifts (proportions ranging from 16% to 39%). The other six occupational groups were combined into a reference category.

The Standard Occupation Categories were used which include: management occupations, business, finance, and administrative occupations, natural and applied sciences, health occupations, occupations in social sciences and education, artistic/ culture - recreation - sport, sales and service , trades, transportation & equipment, occupations unique to primary industry, occupations unique to processing & manufacturing, not asked, not stated, and don’t know. The last three categories were combined and labelled as “missing”. The four occupations of interest were “health” (assigned a code of zero), “sales and service” (assigned a code of one), “trades & transportation” (assigned a code of two) & “equipment, processing and manufacturing occupations” (assigned a code of three). The remainder of the occupations were combined to create the reference category “other occupations” (assigned a code of four). Due to low cell

counts, for regression analysis for women, trades and transport and manufacturing occupations were combined (both had lower cell counts) and for regression analysis for men, health and manufacturing occupations were combined due to low cell counts. For the day worker and shift worker regressions, low cell counts for occupations were not a problem, so all information was retained for these regression equations.

**Hours worked.** Respondents were asked how many hours they worked in a week at all jobs. This variable can be considered a work demand as more hours worked tends to add more challenge for work-family balance and may affect family and individual stress levels. This variable was continuous and was initially divided into three categories where less than half time was assigned a code of zero, half to full time was assigned a code of one, and full time or more was assigned a code of two. However, due to low cell counts, it was necessary to recode the variable into a binary variable where less than full time was assigned a code of zero and full time or more was assigned a code of one.

**Type of work schedule.** For the purposes of the current study, the type of schedule worked is viewed as a potential work-based demand/stressor as evidenced by the reviewed literature.

Participants were asked “Which of the following best describes the hours you usually work at your main job?” Is it: a regular daytime schedule or shift, a regular evening shift, a regular night shift, a rotating shift (one that changes periodically from days to evenings or to nights), a split shift (one consisting of two or more distinct periods each day), a compressed work week, on call or casual, an irregular schedule, other – specify. The type of shift worked was utilized in two different ways for the analysis.

*Shift divided.* There is a large body of research which examines how different shift configurations affect the health and well-being of individuals. For the bivariate analysis, this variable was coded to analyze how different shifts may be correlated with self-rated health. “Regular days” was assigned a code of zero, “regular evenings” was assigned a code of one, “regular nights” was assigned a code of two, “rotating shifts” was assigned a code of three and “other shifts” was assigned a code of four. Lower cell counts in some of the categories made it impractical to use this coding for the logistic regression.

*Shift stratified.* For the purpose of multivariate regression analyses for men and women, “type of work schedule” was recoded to separate shift workers from all other workers. The responses regular evening shift, regular night shift, rotating shift, split shift and compressed work week were combined to create the category “shift work” and assigned a code of one, and the responses regular days, on call or casual, irregular schedule and “other” shifts were combined into “days and other” and assigned a code of zero (reference group). The reasons the categories were grouped in this manner is that the shift configurations on call or casual, irregular schedule and “other” shifts are highly variable and somewhat vaguely defined. When comparing findings across shifts, it is important to have a clear definition of each of those shifts (reliability).

For the purpose of multivariate regression analyses for shift and day workers, the sample was stratified into two categories: shift workers and non-shift workers. For these logistic regression equations, a regular daytime schedule (Monday to Friday) was considered non-shift work and regular evening shift, regular night shift, rotating shift, split shift, compressed work week, on call and casual, irregular and “other” shifts were considered shift work. Initially, this variable was coded to divide day workers into one group for regression analysis and shift workers who worked regular evenings, regular nights, rotating, and split shifts, into another

group for regression analysis. Those who work a compressed work week, casual shifts, irregular shifts and “other” shifts, were excluded from analysis. However, regression results showed wide confidence intervals on a few variables and large standard errors, indicating that the model was unstable and lacked precision. It was determined that the ratio of the number of variables to the number of those responding that they had poor health was an inappropriate ratio for reliable logistic regression results (Bagley, White, & Golomb, 2001; Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996). Therefore, in order to increase the sample size, those who worked compressed work weeks, casual shifts, irregular shifts and “other” shifts, needed to be included in the “shift workers” sample. This raised the number of those who said they had poor health to 140, which in conjunction with decreasing the number of variables, produced a more stable model.

**Spillover.** More recent research studies have examined the concept of “spillover” , where individual responses to stress, demands, or positive aspects of work, can carry over between the two systems of work and home (Kinman, 2010; Nylén et al., 2007). . For the purposes of this study, questions from the GSS-20 were combined to create two variables that were designed to measure work-to-family spillover and family-to-work spillover.

***Work-to-family spillover.*** This variable was defined based on the responses to the following two questions: 1) In the past 12 months how often have you come home from work too tired to do the chores that needed to be done? 2) In the past 12 months how often has it been difficult to fulfill family responsibilities because of the amount of time you spent on your job? (Please included responsibilities concerning your spouse and (child)ren, it applies, as well as your own parents, siblings and related persons). Possible responses included: 1=all of the time,

2=most of the time, 3=sometimes, 4=never, 5=not applicable, don't know, refusal. A binary variable was created by combining those who responded "sometimes" and "never" and assigning them a code of zero which represented "low spillover" (reference category). Then, those who answered "all of the time" and "most of the time" were combined and assigned a code of one which represented "high spillover" .

***Family-to-work spillover.*** This variable was defined based on the responses to the following two questions: 1) In the past 12 months how often arrived at work too tired to function well because of the household work you have done? 2) In the past 12 months how often has it been difficult for you to concentrate or fulfill your work responsibilities because of your family responsibilities? (Please include responsibilities concerning your spouse and child(ren), if it applies, as well as your own parents, siblings and other related persons. Possible responses included: 1=all of the time, 2=most of the time, 3=sometimes, 4=never, 5=not applicable, don't know, refusal. A binary variable was created by combining those who responded "sometimes" and "never" and assigning them a code of zero which represented "low spillover"(reference category). Then, those who answered "all of the time" and "most of the time" were combined and assigned a code of one which represented "high spillover" .

### **Quality of Life Variables**

**Plan to slow down.** For this variable, respondents were asked if they plan to slow down in the coming year. Individuals answered yes or no. Thus, a binary variable was created where those answering no were assigned a code of zero and those answering yes were assigned a code of one. Those who did not answer or answered "don't know" were excluded as "missing" (2.5%). The survey included this question in the group of questions measuring perception of

time, but after factor analysis (described in this chapter under the heading of “time stress”), the decision was made to include this variable as an independent predictor.

**Cut back on sleep to make time.** To measure this concept, respondents were asked how often they cut back on sleep when they needed more time. The responses were rated on a scale of 1-4 where 1=all the time, 2=most of the time, 3=sometimes, 4=never, 5=not applicable, 8=not stated, and 9=don’t know. A binary variable was created where “all of the time” and “most of the time” responses were combined to create a category “frequently cuts back on sleep to make time” and this was given a code of one. To create the category “infrequently cuts back on sleep to make time”, “sometimes” and “never” responses were combined and assigned a code of zero. The responses “not applicable”, “not stated”, and “don’t know” were excluded as “missing” (1.8%).

This question had also been part of the perception of time module in the questionnaire, but due to factor analysis, it also was included in the analysis as an independent predictor. This measure is different from the variable “sleep difficulties” because in this case, people are making the conscious decision to give up “sleep time” in order to do other things. In other words, it is a technique they utilize to manage their time.

**Quality time with children.** This question was originally part of the work and family balance section (perception of time module). Because the decision was made to use work-family spillover as a separate indicator, this question was left as an independent measure. Respondents were asked in the past twelve months, how often they felt that the time they spent with their children was good quality time. Responses to this question were measured on a scale of 1-4 where 1=all the time, 2=most of the time, 3=sometimes, 4=never, 7=not asked, 8=not stated, and 9=don’t know. A binary variable was created where responses “all of the time” and “most of the



time” were combined to create a category “frequently spend quality time” , which was assigned a code of zero. The responses “sometimes” and “never” were combined to create a category “infrequently spend quality time” , which was assigned a score of one. The remainder of the categories “not asked” , “not stated” , and “don’t know” were excluded as missing (37.7%).

**Enough time with friends.** For this indicator, using a scale of 1 to 4, respondents reported how often, in the past twelve months, they worried that they were not spending enough time with their friends where 1=all the time, 2=most of the time, 3=sometimes, 4=never, 7=not asked, 8=not stated, and 9=don’t know. A binary variable was created by combining “all the time” and “most of the time” to create a category “frequently worry about time with friends” (assigned a code of one), and by combining “sometimes” and “never” to create a category “infrequently worry about time with friends” (assigned a code of zero). The remainder of the categories, “not asked” , “not stated” , and don’t know were excluded as missing (2.4%).

**Enough time with family.** This indicator is a combination of two questions from the work-family balance section (perception of time module). Respondents were asked, 1) in the past twelve months, how often did they worry that that they were not spending enough time with their spouse/ partner, and 2) in the past twelve months, how often did they worry that they were not spending enough time with their child(ren). The possible responses were on a scale of 1 to 4 where 1=all of the time, 2=most of the time, 3=sometimes, and 4=never. Binary variables were created for each of the questions, by combining “all the time” and “most of the time” to create a category “frequently worry about time with spouse/child(ren)” (assigned a code of one), and by combining “sometimes” and “never” categories to create a category “infrequently worry about time with spouse/child(ren)” (assigned a code of zero). The remainder of the categories, “not

asked” , “not stated” , and don’t know were excluded as missing. The two variables were then combined to create one indicator “enough time with family” .

Originally, “enough time with friends” had also been included in this indicator. However, there was concern that including this question with the other two may weaken the measure, so a Cronbach’s Alpha test was conducted to check for internal reliability. The Cronbach’s Alpha result was .593 with all three variables combined, but increased to .695 when “time with friends” was removed, so the decision was made to remove it and leave “enough time with friends” as a separate indicator.

**Community belonging.** As stated previously, human ecological theory has been used as the theoretical framework for this current study. In order to remain consistent with the theory, it was important to include a variable which ensured that the exosystem was included in the analysis. Therefore, community belonging was chosen as a representation of this concept. Respondents were asked to rate their sense of community belonging on a scale of 1 to 4 where 1=very strong, 2=somewhat strong, 3=somewhat weak, and 4=very weak. A dichotomous variable was created where the responses “very strong” and “somewhat strong” were combined into a category labelled “strong community attachment” (assigned a code of zero) and the responses very weak and somewhat weak were combined into a category labelled “weak community attachment” (assigned a code of one). The remaining responses “no opinion” , “not stated” and “don’t know” were excluded as missing (5.3%).

**Life satisfaction.** Respondents were asked to rate their overall life satisfaction on a scale of 1-10 where 1=very dissatisfied and 10=very satisfied. Frequencies, median and mean were run to ascertain a meaningful cut-off point for the indicator. The mean was 8.2 and the median was 8.0. The decision was made to have the cut-off point for low life satisfaction be 6.0 to ensure a

reliable measure of low life satisfaction. A dichotomous variable was created by combining responses 1 through 6 into a category labelled low life satisfaction (assigned a code of one) and by combining responses 7 through 10 into a category labelled high life satisfaction (assigned a code of zero). The remainder of the responses, “no opinion”, “not stated” and “don’t know” were excluded as missing (4.1%).

**Sleep difficulties.** For this indicator, individuals were asked if they had difficulty falling asleep or staying asleep, with possible responses being yes, no, not stated or don’t know. Those who answered “yes” were put into a category “sleep difficulties” and assigned a code of one, and those who answered “no” were placed into a category “no sleep difficulties” and assigned a code of zero. Those who responded “not stated” or “don’t know” were excluded as missing (1.6%).

**Time stress.** For studies using the GSS as a data source, time stress has typically been measured by combining ten indicators which are: 1=do you consider yourself a workaholic? 2=do you plan to slow down in the following year? 3=when you need more time do you cut back on your sleep? 4=at the end of the day, do you often feel that you have not accomplished what you set out to do? 5=do you worry that you don’t spend enough time with your family or friends? 6=do you feel that you’re constantly under stress trying to accomplish more than you can handle? 7=do you feel trapped in a daily routine? 8=do you feel that you just don’t have time for fun any more? 9=do you often feel under stress when you don’t have enough time? 10=would you like to spend more time alone? Most of these questions were available in the 2006 GSS except that the question regarding time with family and friends was broken down into four separate questions: 1=do you worry that you are not spending enough time with your children? 2do you worry you are not spending enough time with your spouse? 3=do you worry you are not spending enough time with your friends? 4=is the time you spend with your children

quality time? Therefore, for this cycle, there are thirteen questions to combine into the time-crunch variable.

When reviewing these questions, intuitively it did not seem that the questions were all measuring the same concept. For example, “do you plan to slow down in the following year?” asks individuals if they are making a decision which may be based on either an internal state or external circumstances, or a combination of the two, not necessarily because they are time stressed. Because of this observation, an effort was made to look for evidence that showed if perhaps different variations of the scale had been used in previous research. Tezli and Gauthier (2009) noted that this scale has been used in the past due to a Cronbach’s alpha that suggests excellent internal reliability. However, in their review of the literature, they were not able to find any discussion of why this scale was considered conceptually consistent or why individuals who answered “yes” to seven or more questions were considered “time crunched” . Therefore, Tezli and Gauthier created their own time-crunch scale with indicators from the 2005 General Social Survey (Time Use), utilizing factor analysis and Cronbach’s alpha for confirmation; in other words, they used a two-step process to create their scale. The questions that were accessible in the 2005 survey were different than in 2006. The time crunch scale was available in 2005 with the noted difference that “time with family and friends” was measured in one question, and questions on General Time Use were also available. Tezli and Gauthier included questions on General Time Use with the Time-Crunch indicators in their factor analysis and one question from the General Time Use section was retained in their scale after factor analysis (i.e. “how often do you feel rushed?”) Because these researchers had included different questions in their factor analysis than were accessible in the present study, their process was repeated again for this current research (i.e. factor analysis and confirmation with Cronbach’s alpha).

Factor analysis was conducted on 13 items that made up the typically used time crunch scale (slightly altered due to four items being used to measure “time with family and friends”). Each of the questions was converted into binary variables. Two questions, “do you consider yourself a workaholic?” and “do you plan to slow down in the following year?” had yes/no responses, but all of the other questions were answered on a scale of 1 to 4 where 1=all the time, 2=most of the time, 3=sometimes, and 4=never. Those who answered “all the time” and “most of the time” were considered to be struggling with time demands and were assigned a code of one, and those who answered “sometimes” and “never” were considered to be coping with time demands and were assigned a code of zero. It is important to highlight that for the current study, even though those who answered “sometimes” in response to the various time crunch questions were conveying that they did at times struggle with demands upon their time, this was not considered out of the norm, but rather, just a typical life experience. The other possible responses, “not asked” , “not stated” and “don’t know” were excluded as missing. For the factor analysis oblique rotation (direct oblimin) was used because this is the rotation recommended when components are found to be correlated (components one and two were correlated) (Polit, 1996). The 13 items loaded onto four components giving strong indication that different concepts are represented in this scale (see appendix B). After analysis, six items were retained for the time stress scale 1=at the end of the day, do you often feel that you have not accomplished what you set out to do? 2=do you feel that you’re constantly under stress trying to accomplish more than you can handle? 3=do you feel trapped in a daily routine? 4=do you feel that you just don’t have time for fun any more? 5=do you often feel under stress when you don’t have enough time? 6=would you like to spend more time alone? These items have a Cronbach’s alpha of .744, indicating that the scale has good internal reliability. As well, when subjectively assessing these

questions, they appear logically connected to one another and seem to indicate a measure of time pressure.

To convert the six items in the time stress scale into a single item “time stressed” , the items were summed and the average was obtained to assist in making the decision as to which respondents would be considered to be “time stressed” . The average was 1.05 which meant that, on average, respondents only answered “yes” to one question. Therefore, using this average as a guide, for the current study those who were considered time stressed were those who answered “yes” to two to six questions. The majority of the respondents to the GSS (73.2%) did not consider themselves to be time stressed, but 26.8% of the respondents were struggling with time demands.

### **Data Analysis**

The main objective of this research was to examine the relationship between Work-related variables (e.g., work-family balance, shift work, work hours), quality of life indicators (e.g., time stress, sleep difficulties, sense of belonging to community) and self-rated health among Canadian men and women aged 18 to 69 years. To achieve this goal, the study sample of married/common-law, working individuals was selected from the Canadian General Social Survey (GSS), Cycle 20 (2006) and then this sample was divided into four groups: men, women, shiftworkers, and day workers. There were several stages of analysis, each with a different purpose which will be outlined in this section.

### **Descriptive Analysis**

As previously explained, factor analysis (see Appendix B) and Cronbach’s alpha was used to inform the development of reliable predictor variables, specifically the “time stress” and

“time with family” variables. Then, the study population and sample were described using weighted and unweighted frequencies of selected variables, using SPSS version 17.

### **Bivariate Analysis**

Bivariate analysis was conducted using chi square test results to assist with the selection of independent variables for multivariate regression analysis. To fully account for the effects of survey sampling design, bootstrapped weights were applied during this part of the analysis to ensure accurate chi square results.

**Collinearity diagnostics.** In order to obtain valid and generalizable findings, it is essential that collinearity be avoided. If highly correlated predictor variables are included in the same logistic regression model, the researcher risks producing an unstable model (Polit, 1996, p. 282), and risks producing imprecise results since the estimated impact of the highly correlated variables and all other predictor variables may be inaccurate (Bagley et al., 2001). It is recommended that correlation analysis and collinearity diagnostics including variance-inflation factors (VIF) and tolerance should be conducted prior to performing the logistic regression analysis (Schroeder, Lander, & Levine-Silverman, 1990). Tolerance refers to the proportion of variability that an independent variable creates in a dependent variable that cannot be explained by the other independent variables (Schroeder et al., 1990, p. 178). When the VIF is high, the tolerance is low because the two values have an inverse relationship (Schroeder et. al, 1990, p. 180). However, obtaining both allows the researcher a way to cross-check values that suggest borderline multicollinearity (Shroeder et al., 1990, p. 180). Based on these recommendations, correlation analysis, including the determination of VIF and tolerance for the predictor variables, was conducted on each of the samples.

## **Multivariate Analysis**

To achieve the objectives of the proposed research, the relationship between various factors associated with work (e.g., work-to-family spillover, family-to-work spillover, shift configurations, workaholism) and self-rated health, and the relationship between quality of life variables (e.g., time stress, sleep difficulties, sense of belonging to community) and self-rated health, while holding constant the effects of education, age, socio-economic status, family structure and life satisfaction, was examined. Logistic regression is commonly used to examine the impact of multiple predictors on a dichotomous outcome (Bagley et al., 2001; Pampel, 2000). The logistic regression model expresses the predicted outcome (dependent variable) as a sum of products (predictor variables multiplied by their independent coefficients) (Bagley et al., 2001). The coefficients, which are calculated from the data, provide information to the researcher regarding how much each predictor contributes to the outcome while holding constant the other predictor variables (Bagley et al., 2001, p. 979). Bagley et al. (2001) observe that logistic regression is commonly used in research relating to health and "...is particularly appropriate for models involving disease state (diseased/healthy) and decision making (yes/no)" (p. 979). Because the current research examines the effect of multiple predictors on a dichotomous outcome relating to health (good health/poor health), logistic regression was deemed to be the appropriate analytical technique to use to address the stated research objectives.

Four logistic regression models were developed. First, the sample was stratified along gender lines to create two logistic regression models to examine differences between men and women with regards to the impact of work-related stresses on health. Then, the sample was divided by day workers and shift workers to create two more models for the purpose of closely examining and comparing the impact that various work-related demands have on the health of



these groups of workers. Therefore, for the purposes of meeting the main objectives of the research, four different logistic regression models were created: men, women, shift workers, and day workers.

***Model 1. How do work-related characteristics (shift configuration, occupation, hours worked, workaholism, work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian men, controlling for education, age, socio-economic status, family structure and life satisfaction?*** This study sub-sample consisted of 2,986 Canadian men who were employed, either married or living common-law and aged 18-69. Of these respondents, 244 rated their health as poor.

***Model 2. How do work-related characteristics (shift configuration, occupation, hours worked, workaholism, work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status self-rated health of Canadian women, controlling for education, age, socio-economic status, family structure and life satisfaction?*** This study sub-sample consisted of 2,514 Canadian women who were employed, either married or living common-law and aged 18-69. Of these respondents, 240 rated their health as poor. All models included the same independent variables, but the model for women also included “cut back on sleep to make time”. The reason it was included in the women’s model is because this factor was correlated with self-rated health in chi-square analysis for women, but not for any of the other study sub-samples.

***Model 3. How do work-related characteristics (occupation, hours worked, workaholism, work-to-family spillover, family-to-work spillover) and quality of life indicators (time***

*stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian shift workers, controlling for gender, education, age, socio-economic status, family structure, and life satisfaction?* This study sub-sample consisted of 1,308 Canadian shift workers who were either married or living common-law, aged 18-69. Of these respondents, 140 rated their health as poor.

*Model 4. How do work-related characteristics (occupation, hours worked, workaholism, work-to-family spillover, family-to-work spillover) and quality of life indicators (time stress, sleep difficulties, sense of belonging) affect the overall health status of Canadian day workers, controlling for gender, education, age, socio-economic status, family structure, and life satisfaction?* This study sub-sample consisted of 4,192 Canadian day workers who were either married or living common-law, aged 18-69. Of these respondents, 344 rated their health as poor.

**Interpretation of odds ratios.** Logistic regression analysis provides the researcher with an odds ratio which is "...an estimate of relative risk-the risk of the event occurring given one condition, versus the risk of it occurring given a different condition." (Polit, 1996, p. 392). When interpreting the odds ratio, it is important that each predictor variable is compared to its reference group (Pampel, 2000). Additionally, a coefficient which is greater than one indicates that the odds of the outcome occurring is higher for the study group relative to the reference group and a coefficient less than one indicates lower odds of the outcome occurring for the study group relative to the reference group. Pampel, 2000, p. 22).

### **Methodological Considerations**

**Sample size.** With logistic regression, it is important to assess if the sample size is adequate to support the complexity of the analysis. An inadequate sample size can result in

unstable regression coefficients which result in findings which are difficult to interpret and not generalizable (Babyak, 2004; Polit, 1996) and inaccurate confidence intervals (Bagley et al., 2001).

When reviewing the literature on the subject of sample size, there are a number of opinions on the subject. One suggestion is that a sample size with a ratio of 20 for each predictor variable is adequate, but that a larger case to predictor ratio is necessary when the outcome variable is skewed rather than normally distributed (Polit, 1996). In this study, the outcome variable (self-rated health) is skewed, so a different rule was necessary. It is important that the number of events per variable be adequate for the analysis, so when the least common of the two possible outcomes (for this study, poor self-rated health) is divided by the number of predictor variables, the value should be 10 or more (Bagley et al., 2001; Peduzzi, et al., 1996).

As previously discussed, it was determined that the ratio of predictor variables to outcome events was inadequate for the shift worker sample, so recoding was necessary to increase the sample size for this logistic model. The remaining three logistic models had adequate event-to-predictor variable ratios.

**Weighting.** The cross-sectional data of the GSS 20 were weighted to represent the population of the 10 Canadian provinces in 2006. Additionally, because the GSS employs a complicated sampling process, access to the Statistics Canada Research Data Center was obtained in order to access the bootstrap weights for the master file and the SUDAAN program for design-based analysis. Respondents to this survey were selected through stratification and in four stages over a period of five months. To accommodate this complex design, Statistics Canada provides bootstrap weights with the data which allows the user to take a design-based approach to the analysis of the data (Statistics Canada, 2008a, p. 850). That is, the bootstrap

weights provide additional information about the survey design. An important feature of the GSS Cycle 20 is that it uses mean bootstrap weights where each bootstrap weight is obtained from 25 survey bootstrap samples (Statistics Canada, 2008a, p. 850). So in addition to employing the bootstrap weights, the adjustment for mean bootstrap weights was made during analysis. It was important to ensure that the weighting of the data was as accurate as possible so that results for the current study can be generalized to all married or common-law working Canadians (ages of 18 and 69).

### **Summary**

The goal of this research was to examine the association between work-family balance, quality of life indicators and Canadians' overall health status, while controlling for demographic and socio-economic factors and life satisfaction. Previous research has found that the outcome variable, self-rated health, is a good predictor of health outcomes and mortality. Independent variables were carefully chosen with consideration of findings from previous, relevant research. Furthermore, human ecological theory, the theoretical framework which was used as a guide for this research also informed the selection of independent variables..

The two objectives for this study were: 1) to explore how the relationship between work-related characteristics, quality of life and overall health status is different among Canadian men and Canadian women workers, controlling for gender, education, age, socio-economic status, family structure, and life satisfaction and, 2) to examine the relationship between shift configuration and employees' overall health status, controlling for education, age, socio-economic status, family structure and life satisfaction. This study involves analysis of cross-sectional national data from the General Social Survey (GSS) 2006, Cycle 20.

The master file was accessed through the Research Data Center where the analyses were conducted utilizing SUDAAN. The sample for the study included employed men and women, married or living in common-law relationships, ages 18 through 69 (N=5,500). Four regression models were created for men, women, shift workers and day workers because previous research suggests that gender and shift configuration are factors which may influence an individual's response to various social demands (home and work), which in turn, may manifest in poor overall health. Bivariate analyses, including correlation analyses and cross tabulations, were conducted to assist in choosing variables to include in the logistic regression models. Human ecological theory was also employed to assist in choosing factors which were relevant to include in the analyses. Then, logistic regression analyses were conducted to address the stated research objectives. Appropriate survey weights were applied to estimate population characteristics. To fully account for the survey's complex sample design, mean bootstrap weights were used for variance estimation and calculation of confidence intervals.

## Chapter 4: Results

In this chapter, a description of the sample is presented. As well, the study sample is compared to the full GSS Cycle 20 data set which represents all Canadians (excluding the territories). Then, the correlation analysis results, the chi square results, and the results produced by the four logistic regression models are presented.

### Description of Study Population

The sample for the current study, which was extracted from the GSS (2006) consisted of 5,500 individuals (women=2,514, men=2,986) representing 7,181,140 Canadians who were employed, either married or living in common-law relationships and aged 18-69 inclusive (study population). The survey sample for GSS (2006) consisted of 23,608, representing all individuals 15 years and older living in the ten provinces of Canada, excluding the Northwest Territories, Nunavut and full-time residents of institutions (N=26,559,181). When comparing the study population to the survey target population, which represents all Canadians, aged 15 and older living in the 10 provinces and not residing within institutions, there were some notable differences, some of which will be highlighted in this section.

**Demographic and socio-economic characteristics.** The details regarding survey population and study frequencies relating to demographic and socio-economic characteristics are presented in Table 1. Of the 23,608 respondents to the GSS, 57.5% report themselves as working and 61.6% report that they are either married or living common-law. The individuals in the study population (employed, married/common law individuals aged 18-69) have an average age of 45 years which is slightly older than the GSS survey respondents who have an average age of 44 years. Additionally, the study population has a larger proportion of men (59.0% men and 41.0%

women) compared to the population survey which shows a much more even gender distribution (49.3% men 50.7% women). The study population for the current research is comprised of persons who are relatively financially well off, with 74.0% reporting household incomes near to or greater than the Canadian national average income of \$53,870 (Statistics Canada, 2006). Furthermore, these individuals are also well educated with, 74.9% reporting having post secondary education. Considering that the study population included individuals who are either married or living common-law, it is not surprising that 77.9% of these individuals report that they have children living at home.

**Work-related characteristics.** The details regarding survey population and study frequencies associated with work-related indicators are presented in Table 2. The GSS survey shows that in 2006, 30.1% (5.5 million) employed Canadians worked shifts that varied from regular days. For married/common-law individuals 18-69 years, there were 1.6 million irregular shift workers representing 22.7% of workers in this group. In 2006, Canadian women were slightly less likely to be working irregular hours compared to men (30.0% vs. 31.2% for men) and both genders were less likely to be working irregular shifts if they were in a marital or common-law relationship, with 26.7% of men and 24.8% women in this group reporting irregular working hours. As well, there was a notable difference between the study population and overall population represented in the GSS with regards to hours worked per week; the average number of hours worked by study population was 42 hours per week and the average number of hours worked per week by the GSS survey population was 60 hours per week. It seems that when individuals become embedded in nuclear families, the hours dedicated to the workplace are fewer and these individuals are less likely to work irregular hours. Despite the fact that married/common-law Canadians aged 18-69 work fewer hours than the overall population,

they are more likely to consider themselves to be workaholics (33.7% and 29.5%, respectively), but less likely to report high work-to-family spillover (25.5% and 28.5%, respectively).

Canadians, irrespective of family type or age, are much less likely to report family-to-work spillover compared to

work-to-family spillover, as evidenced by the fact that only 5.0% of the study population and 5.8% of the survey population report this as a problem. It would seem that individuals are protective of their work environments and there is lower boundary permeability in the direction of family to work with regards to the impact of exhaustion on the ability to perform.

When examining proportions of workers in the occupations with large ratios of shift workers to day workers, both the study population and the survey population have the greatest number of workers in the sales and service sector; 18.8% and 25.7%, respectively.

**Quality of life characteristics.** The details regarding survey population and study frequencies relating to quality of life indicators are presented in Table 3. The respondents in the study population generally perceive themselves to be quite healthy. In 2006, approximately 600,000 working Canadians, aged 18-69 who were living in married or common-law relationships (8.4%) reported poor health. This proportion indicates that they perceive themselves to be relatively healthier than the overall Canadian population where approximately 3.5 million reported poor health (13.4% of total population). Just over one quarter of the Canadian population reported sleep difficulties (25.3%), but sleep difficulties were less common for those represented in the study population (22.9%). Furthermore, the study population is relatively more satisfied with life compared to the overall Canadian population, with just 9.6% reporting low life satisfaction compared to the overall Canadian population where 13.9% of individuals reported low life satisfaction. However, despite the fact that the study population



reported better health and life satisfaction, they perceive themselves as more time stressed (29.2% vs. 26.8% for the survey population).

### **Cross-Tabulations and Chi Square Analysis**

The study population of employed individuals (aged 18-69) living married or common-law, was divided into four separate sub-populations in order to examine gender differences and differences between day and shift workers with regards to the correlation of work-related variables and quality of life and self-rated health. The four sub-groups were: 1) men, 2) women, 3) shift workers, and 4) day workers. In order to inform the multivariate models, bivariate analysis was conducted on each of the four sub-populations. In this section, the results are organized by groups of variables and chi-square results are presented to report correlation between these indicators and self-rated health of each of the study sub-samples. First, results of the demographic and socio-economic determinants and self-rated health will be discussed, followed by work-related variables and self-rated health and finally, quality of life variables and self-rated health.

#### **Demographic and Socio-Economic Variables and Self-Rated Health**

Demographic and socio-economic determinants were included in the analysis as it was important to control for these potential confounders. Presented in the following cross-tabulation tables for men, women, shift workers and day workers (Tables 4, 5, 6, and 7) are the chi-square test results with regard to the association between demographic and socio-economic factors and the outcome of self-rated health.

**Gender.** It is evident that although there was a significant relationship between gender and self-rated health for shift workers, this was not the case for day workers (Tables 6 and 7). With respect to day workers, 8.2% of women and 7.6% of men reported poor health (Table 7).

Shift-working women more often than men reported poor health (13.1% vs. 8.9%) (Table 6). As well, greater proportions of shift workers reported poor self-rated health compared to their day-working counterparts, particularly female shift workers (Tables 6 and 7).

**Education.** The relationship between education and self-rated health was significant across all four sub-groups, but the relationship was particularly strong (highly significant) for men and day workers. For all groups, lower levels of education were associated with poor self-rated health. Women who attained high-school or lower levels of education compared to those who have post secondary education were more likely to report poor health (11.6% vs. 8.5%) (Table 5). These proportions are similar to men's where 11.9% of those who achieve lower levels of education report poor self-rated health compared to 6.5% of those who have post secondary education (Table 4). Shift workers who achieved lower levels of education had the highest proportion of individuals reporting poor self-rated health (13.6% who have lower levels of education and 9.0% of those who have post secondary education) (Table 6). Finally, 11.1% of day workers who had lower levels of education reported poor self-rated health compared to 6.7% of those who had obtained post secondary education (Table 7).

**Age.** The relationship between age and self-rated health was significant across all four sub-groups. This relationship was strongest for women (Table 5). Not surprisingly, younger individuals were less likely to report poor self-rated health. For men, 7.0% of those aged 18-49 reported poor self-rated health compared to 9.7% of those aged 50-69. Compared to men, a larger proportion of women reported poor self-rated health with 8.0% of women in the younger age group reporting poor self-rated health and 11.8% of older women reporting poor self-rated health (Table 5). Younger shift workers were much less likely to report poor self-rated health compared to older shift workers (8.6% vs. 14.2%) (Table 6). There was a smaller difference

between young and older day workers regarding the proportions of respondents reporting poor health (7.0% and 9.5%, respectively) (Table 7,).

**Income.** Across all four sub populations, lower income was associated with reports of poor self-rated health, but this association failed to reach levels of significance for shift workers. However, the relationship between income and self-rated health was significant for men, women, and day workers. A higher proportion of women who reported poor self-rated health compared to men who reported poor self-rated health, had incomes less than or equal to \$50,000 (14.5% vs.12.8%, respectively) (Tables 4 and 5). For men whose incomes were equal to or greater than \$50,000, only 7.0% reported poor health and for women in the higher income category, 8.2% reported poor health (Tables 4 and 5). For day workers, the relationship between income and self-rated health was highly significant with 12.9% of those in the low income category reporting poor health and 7.0% of the respondents in the high income category reporting poor health (Table 7).

**Presence of children in the home.** Across all four study sub-groups, the relationship between presence of children in the home and self-rated health was significant (Tables 4, 5, 6 and 7). The absence of children was associated with poor self-rated health. A higher proportion of women who had no children living with them rated their health as poor compared to men with no children living with them who rated their health as poor (12.1% vs. 11.2%, respectively) (Table 5). However, when children were present in the home, only 8.3% and 7.1% of men rated their health as poor Table 4). For shift workers who had no children living in the home, 15.5% reported poor health, but when children were present in the home, only 9.0% of shift workers reported poor self-rated health (Table 6). In comparison, 10.5% of day workers who had no

children living in the home reported poor self-rated health and 7.1% of those with children reported poor self-rated health (Table 7).

### **Work-Related Variables and Self-Rated Health**

Presented in the following cross-tabulation tables for men, women, shift workers and day workers (Tables 8, 9, 10, and 11, respectively) are the chi-square test results to examine the association between work-related factors and poor self-rated health.

**Spousal employment.** The relationship between spousal employment and self-rated health was significant for women and it approached significance for shift workers (Tables 9 and 10). Across all four study sub-groups, respondents whose spouses were not working had higher proportions of respondents reporting poor self-rated health compared to those whose spouses were working (Tables 8, 9, 10 and 11, respectively). For women, 15.7% of those who reported that their spouses were not working reported poor self-rated health compared to only 8.4% of those who reported that their spouses were working (Table 9). In the case of shift workers, where the relationship between spousal employment and self-rated health approached significance, 13.5% of those who reported that their spouses were employed also reported poor self-rated health compared to only 9.2% of those who reported that their spouse was working (Table 10).

**Workaholism.** The relationship between workaholism and self-rated health was significant for two study sub-samples; women and day workers, and in the case of women, this relationship was highly significant (Tables 9 and 11). Across all four study sub-samples, respondents who identified themselves as workaholics had higher proportions of respondents reporting poor self-rated health. For women who perceived themselves as workaholics, 12.6% reported poor self-rated health compared to only 7.6% of those who did not perceive themselves as workaholics (Table 9). The day-working group was also more significantly likely to report

themselves as having poor self-rated health if they identified themselves as workaholics compared to those who did not identify themselves as workaholics (9.8% vs. 6.9%, respectively) (Table 11).

**Occupation.** The relationship between occupation and self-rated health was highly significant for men and day workers but not significant for women and shift workers. However, the relationship between occupation and self-rated health approached significance for women (Table 9). For all groups except shift workers, the lowest proportions of persons reporting poor self-rated health were those in the “other” category (i.e., management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry). The other four categories, sales/service, trades/transportation, manufacturing, and health, were occupations with high proportions of shift workers and, based on findings in previous research, were occupations of interest for this study. Men, women and day workers who identified themselves as working in a career in the “other” category reported lower levels of poor self-rated health (5.8%, 7.9%, and 6.3%, respectively), compared to other occupational categories, and this difference was significant for men and day workers (Tables 8 and 11). One other notable finding is that day workers who worked in the health care field had a significantly smaller proportion of individuals reporting poor self-rated health compared to day workers who work in sales/service, trades/transport, and manufacturing (6.4%, vs. 10.6%, 10.6%, and 10.6%, respectively) (Table 11).

**Hours worked.** Men, women, and shift workers who worked equal to or greater than full time hours had slightly higher proportions of respondents reporting poor self-rated health (8.2%, 9.3%, and 11.0%, respectively) in comparison to men, women and shift workers who worked less than full time (6.4%, 9.1%, and 9.1%, respectively) (Tables 8, 9 and 10). For day workers,

those who worked less than full-time had slightly higher proportions of respondents reporting poor self-rated health (8.1%) compared to those who worked equal to or greater than full time (7.8%) (Table 11). However, the relationship between hours worked and self-rated health failed to reach levels of significance for any of the four study sub-populations.

**Shift types.** The relationship between shift types and self-rated health failed to reach levels of significance for men, women or shift worker sub-populations (Tables 8, 9, 10, and 11).

### **Work-family Balance**

**Work-to-family spillover.** The relationship between work-to-family spillover and self-rated health was highly significant for all four sub-populations. Men who reported high work-to-family spillover were significantly more likely to report poor self-rated health compared to men who reported low work-to-family spillover (14.2% vs. 6.1%, respectively) (Table 8). Similarly, women who reported high work-to-family spillover were significantly more likely to report poor self-rated health compared to those who reported low work-to-family spillover (16.7% vs. 5.9%, respectively) (Table 9). Notably, higher proportions of women who reported high work-to-family spillover rated their health as poor, compared to men (16.7% vs. 14.2%, respectively) (Tables 8 and 9). Of all four study sub-populations, shift workers who reported high work-to-family spillover had the highest proportion of those reporting poor self-rated health (20.3%) (Table 10). In contrast, only 6.2% of shift workers who reported high work-to-family spillover rated their health as poor. Day workers who reported high work-to-family spillover were significantly more likely to report poor self-rated health compared to those reporting low work-to-family spillover (13.7% vs. 6.0%, respectively) (Table 11).

**Family-to-work spillover.** The relationship between family-to-work spillover and poor self-rated health was significant across all four study sub-populations. Higher proportions of

women who reported high work-to-family spillover compared to men who reported family-to-work spillover, reported poor self-rated health (29.8% compared to 17.9%, respectively) (Tables 8 and 9). Women who reported high family-to-work spillover were significantly more likely to report poor self-rated health compared to women who reported low family-to-work spillover (29.8% vs. 8.0%, respectively) (Table 9). Men showed a similar pattern where those who reported high family-to-work spillover were significantly more likely to report poor self-rated health compared to those who reported low family-to-work spillover (17.9% vs. 7.4%, respectively) (Table 8). Higher proportions of shift workers who reported high work-to-family spillover compared to day workers who reported high family-to-work spillover, reported poor self-rated health (34.4% vs. 18.4%, respectively) (Tables 10 and 11). Shift workers and day workers who reported high family-to-work spillover (34.4% and 18.4%, respectively) were significantly more likely to report poor self-rated health compared to shift workers and day workers who reported low work-to-family spillover (8.6% and 7.4%, respectively) (Table 10).

### **Quality of Life and Self-Rated Health**

Presented in the following cross-tabulation tables for men, women, shift workers and day workers (Tables 12, 13, 14, and 15) are the chi-square test results to examine associations between quality of life related factors and the outcome of poor self-rated health.

**Plan to slow down.** The relationship between plan to slow down and self-rated health was significant across all four study sub-populations, and for day workers and men, the relationship was highly significant. Men and women who have plans to slow down were significantly more likely to report poor self-rated health (12.2% and 12.3%, respectively) compared to men and women who have no plans to slow down (6.5% and 8.2%, respectively) (Tables 12 and 13). The most notable difference between men and women was that a lower

proportion of men who had no plans to slow down reported poor health compared to women (6.5% vs. 8.2%, respectively). Both day and shift workers were also significantly more likely to report poor self-rated health if they had plans to slow down (11.4% and 15.0%, respectively) compared to day and shift workers who did not have plans to slow down (6.7% and 9.0%) respectively (Tables 14 and 15). A higher proportion of shift workers, compared to day workers, reported poor self-rated health.

**Cut back on sleep to make time.** The relationship between tendencies to cut back on sleep to make more time was significantly associated with self-rated health for women, but not for any of the other three study sub-populations. However, this relationship did approach significance for day workers (Table 15). Across all four study sub-populations, those who reported that they did frequently cut back on sleep to make more time more frequently reported poor self-rated health. For women, those who were frequently cutting back on their sleep to make more time were significantly more likely to report poor self-rated health than those women who did not use this time management technique on a regular basis (12.6% vs. 8.2%) (Table 13).

**Quality time with children.** Across all four study sub-populations, those who reported that the time they spent with their children was not usually quality time, more often reported poor self-rated health as compared to those who felt the time spent with their children was usually good quality time. However, the relationship between “quality time with children” and self-rated health failed to reach levels of significance for any of the four study sub-populations (Tables 12, 13, 14 and 15).

**Enough time with friends.** Across all four study sub-populations, those who reported that they often worried about not spending enough time with friends more frequently reported poor self-rated health compared to those who did not worry about time spent with friends.



However, the relationship between “time spent with friends” and self-rated health failed to reach levels of significance for any of the four study sub-populations Tables 12, 13, 14 and 15).

**Enough time with family.** The relationship between individuals’ perceptions that they were spending enough time with their families and self-rated health was significant across all four study sub-populations, and the relationship was highly significant for women and shift workers. Men and women who reported that they frequently worried that they were not spending enough time with family were significantly more likely to report poor self-rated health (12.0% and 14.2%, respectively), compared to men and women who infrequently worried that they were not spending enough time with family (6.9% vs. 7.8%, respectively) (Tables 12 and 13). Higher proportions of shift workers who frequently worried that they were not spending enough time with family reported poor health compared to day workers who worried that they were not spending enough time with family (17.1% vs. 11.5%, respectively) . For shift workers and day workers, those who worried about time spent with family were significantly more likely to report poor health (17.1% and 11.5%, respectively) compared to those who did not worry about time spent with family (8.3% and 7.0%, respectively) (Tables 14 and 15).

**Community belonging.** A sense of belonging to community was significantly associated with self-rated health across all four sub-populations. Men and women who rated their sense of belonging to community as weak were significantly more likely to rate their health as poor (11.8% and 12.6%, respectively) compared to those who had a strong sense of belonging to community (6.4% and 7.9%, respectively) (Tables 12 and 13). As well, shift workers and day workers who rated their sense of belonging to community as weak were also significantly likely to rate their health as poor (17.0% and 10.9%, respectively) compared to those who felt a strong sense of belonging to community (7.7% vs. 6.8%, respectively) (Tables 14 and 15).

**Satisfaction with life.** Life satisfaction was highly significantly associated with self-rated health across all four study sub-populations. Men and women who reported that they were not satisfied with life had similar proportions reporting poor health (30.0% and 30.3%, respectively). Men and women who felt satisfied with life were significantly less likely to report poor self-rated health (5.5% and 7.0%, respectively) (Tables 12 and 13). Similarly, shift workers and day workers who did not feel satisfied with life were also significantly more likely to rate their health as poor (35.6% and 28.0%, respectively) compared to those who felt satisfied with life (7.0% vs. 5.9%, respectively) (Tables 14 and 15).

**Sleep difficulties.** Sleep difficulties were highly significantly associated with self-rated health across all four sub-populations. Men and women who reported sleep difficulties were significantly more likely to rate their health as poor (16.5% and 21.3%, respectively) compared to those who did not have sleep difficulties (5.8% and 4.6%, respectively). Women with sleep problems had much higher proportions of respondents reporting poor self-rated health compared to men (21.3% vs. 16.5%) (Tables 12 and 13). As well, shift workers and day workers who reported sleep difficulties were also significantly more likely to rate their health as poor (22.0% and 17.7%, respectively) compared to those who did not have sleep problems (5.8% vs. 5.2%, respectively). Shift workers reporting sleep problems had higher proportions of respondents reporting poor health compared to their day-working counterparts (22.0% vs. 17.7%) (Tables 14 and 15).

**Time stress.** Time stress was highly significantly associated with self-rated health across all four study sub-populations. Men and women who reported high time stress were significantly more likely to rate their health as poor (13.4% and 15.3%, respectively) compared to those who had low time stress (6.0% and 6.2%, respectively) (Tables 12 and 13). As well, shift workers and

day workers who rated their time stress as high were also significantly more likely to rate their health as poor (18.2% and 13.1%, respectively) compared to those who reported low time stress (7.0% vs. 5.8%, respectively) (Tables 14 and 15). Women who reported high time stress had higher proportions of respondents rating their health as poor compared to men who had high time stress (15.3% vs. 13.4%, respectively), and shift workers who reported high time stress had greater proportions of respondents rating their health as poor compared to day workers who had high time stress (18.2% vs. 13.1%, respectively).

### **Correlation Analysis**

In preparation for the logistic regression analysis, SPSS 17 was used to conduct bivariate correlation analysis for each of the four study sub-populations in order to detect multicollinearity between the study variables. It is important to note that SPSS software was used for this portion of the analysis because SUDAAN software does not provide correlations. The results of the bivariate correlations are presented in Appendices C (men), D (women), E (shift workers) and F (day workers). It is recommended that sets of variables with correlations .85 or higher, should not be used in a logistic regression equation in order to avoid redundancy in the regression models (Polit, 1996). According to this standard, there was no evidence of multicollinearity among sets of variables. However, it was found that by including all variables from the original time stress scale from the GSS (i.e. “time with friends”, “time with family” and “quality time with children”), along with the revised time stress scale for the current study, redundancy was evident in the multiple regression analysis. Even when sets of variables do not show multicollinearity, cumulative multicollinearity can be created by including too many variables that measure aspects of a larger concept. Therefore, the final models did not contain these extraneous variables.

As recommended by Shroeder et al., (1990) variance-inflation factors (VIF) and tolerance were calculated for each of the four sub-populations in preparation for the logistic regression analysis, in order to further assess for multicollinearity. It is recommended that variables with low tolerance values ( $\leq .01$ ) be discarded and variables that have variance-inflation factors greater than 10 be discarded (Schroeder et al., 1990). All variables showed tolerance and VIF values within the acceptable range for all four sub-populations. Appendices G (men), H (women), I (shift workers), and J (day workers) can be referred to for VIF results.

### **Results of the Logistic Regression Analysis**

The main objective of this research was to examine the relationship between work-related variables (e.g., work-family balance, shift work, work hours), quality of life indicators (e.g., time stress, sleep difficulties, sense of belonging to community) and self-rated health among Canadian men and women aged 18 to 69 years. The results of the logistic regression analysis are presented in Table 16 for men, Table 17 for women, Table 18 for shift workers and Table 19 for day workers. SUDAAN output provides the Cox & Snell R Square as a measure of how much of the observed variability is due to the independent variables in each of the models. The Cox and Snell R Square results for each of the four models were: 8.0% for men, 11.0% for women, 14.0% for shift workers and 8.0% for day workers.

Not all variables that were included in the bivariate analyses were included as some were found to be redundant (i.e., “time with family”, “time with friends”) and some were found to be not significantly associated with health (i.e., “cut back on sleep to make time”, “quality time with children”). However, bivariate results suggested that for women, “cut back on sleep to make time” was related to self-perceived health, so this variable was retained in the multivariate analysis for women. Although bivariate analyses revealed that “shift work” was not a significant

predictor of self-rated health for women or men, it was retained in the multivariate analyses because previous research strongly suggested it was related to health outcomes. As well, because significance could not be ascertained for each of the individual shifts, it was possible that different shift configurations did have an impact on self-perceived health.

Because human ecological theory was used as the conceptual framework for this study, three variables that were not found to be significantly related to self-perceived health for all groups in the bivariate analyses, were kept to represent components of this framework (i.e., “spousal employment”, “occupations” and “workaholism”). As well, although “hours worked” was not significantly related to self-perceived health for any of the groups, it was also retained in the multivariate analyses based on concepts underlying human ecological framework. For example, the number of hours worked may not have an effect on the self-perceived health *because* of the interaction of the individual with his or her environment. It is possible that when environmental influences are controlled for, that the number of hours worked does in fact, impact the self-perceived health of the individual. Furthermore, all demographic and socio-economic variables were retained as control variables despite the fact that in the bivariate analyses, they were not all significantly associated with the outcome in all models.

Bivariate analyses revealed that “work-to-family spillover”, “family-to-work spillover”, “plan to slow down”, “community belonging”, “sleep difficulties” and “time stress” were all significantly associated with self-perceived health and these were retained in the multi-regression analyses based on these results and human ecological theory. “Life satisfaction” was found to be significantly related to self-perceived health for all four groups, and because of the fact that the relationship was so strong, life satisfaction was retained in the multivariate analyses as a control variable.

The analysis was undertaken to assess the impact of various factors associated with work (e.g., shift configurations, workaholism, work-to-family spillover, family-to-work spillover) and self-rated health, and the relationship between quality of life variables (e.g., time stress, sleep difficulties, sense of belonging to community) and self-rated health, while holding constant the effects of education, age, socio-economic status, family structure and life satisfaction, was examined. As well, gender was included as a control variable for the multivariate analysis for shift workers and day workers.

The results of the logistic regression analysis are shown in Table 16 for men, Table 17 for women and Table 18 for shift workers, and Table 19 for day workers.

### **Demographic and Socio-Economic Variables**

All demographic and socio-economic variables were retained in the multivariate analysis as control variables.

### **Work-Related Variables**

These were included as variables of interest that represent various work-related stressors which could possibly affect self-rated health (e.g., shift configuration, work-family balance which is measured by work-to-family spillover and family-to-work spillover).

Because the study is driven by human ecological theory, it was important to include spousal employment, as family context is important to consider when using this framework. Additionally, this theory is concerned with the development and adaptations of the individual, so individual level characteristics that may impact how people interact with their environments were also included. Therefore, workaholism was included as a work-related variable. Shift types (evenings, nights, rotating and other) were not included in the analyses for men and women due

to sparse data. However, a binary variable was created (i.e., shift stratified) to compare shift workers to day and “other” workers.

### **Quality of Life Variables**

Several quality of life variables have been shown to be correlated with health outcomes. The variables included were informed by previous research and suggested by human ecological theory. As previously mentioned, an important concept underlying human ecological theory is that human beings work to adapt to their environments, and several variables are included that represent this concept. For example, “cut back on sleep to make more time” , suggests an adaptational strategy that may have an effect on health outcomes for individuals. This variable was included in the model for women because it was significantly related to women’s self-rated health. As well “plan to slow down” is an individual level variable and suggests that individuals, at times, make plans to interact with their environments in a different way in order to adapt to changes, and that these changes may be related to health. Furthermore, “time stress” and “sleep difficulties” suggest that the individuals at times, have difficulty adapting to their environment, and this in turn may have a potential to impact their health.

Human ecological theory also considers the importance of the effect of social systems on individual well-being, so as a representation of the exosystem, the variable “community belonging” was also included in the analysis. Finally, “life satisfaction” is an indicator of an individual’s overall functioning, both at an individual level, and within all systems. Because of this, it was deemed important to include this as a control variable.

The variables “quality time with children” , “time with friends” and “time with family” were not included in the multivariate models because they had originally been part of the time stress variable, and there was a risk of multicollinearity if they were included. Furthermore,

“quality time with children” and “time with friends” were not found to be significantly associated with self-rated health in bivariate analysis for any of the study sub-populations.

### **Demographic and Socio-Economic Variables**

**Gender.** Gender was included in the shift workers’ model and the day workers’ model as a control variable. Gender was not a statistically significant predictor of self-rated health for day or shift workers (Tables 18 & 19).

**Education.** Education was found to be a statistically significant predictor of self-rated health for men and day workers. For both groups, the odds of rating health as poor were statistically higher for those who had high-school education or less compared to those who had some post-secondary education, holding constant the other variables in the model ([OR = 1.77; 95% CI = 1.27-2.46; p = .0007] and [OR = 1.43; 95% CI = 1.06-1.93; p = .0182], respectively) (Tables 16 & 19). For women and shift workers, education was not a statistically significant predictor of self-rated health, but the direction of effect was the same as it was for men and day workers (Tables 17 & 18).

**Age.** Age was a statistically significant predictor of self-rated health for shift workers. For this group, the odds of rating health as poor were statistically higher for those who were in the age 50-69 year old group compared to those who were in the 18-49 year old group, holding constant the other variables in the model (OR = 2.02; 95% CI = 1.06-3.85; p = .0330 ) (Table 18). For men, women and day workers, age was not a statistically significant predictor of self-rated health, but the direction of effect was the same as it was for shift workers (Tables 16, 17 and 19).

**Household income.** Household income was a statistically significant predictor of



self-rated health for women, but not for men, shift workers or day workers. For women, the odds of rating health as poor were statistically higher for those whose household incomes were less than \$50,000 a year compared to those who had salaries that were \$50,000 or more, holding constant the other variables in the model (OR = 1.64; 95% CI = 1.07-2.52;  $p = .0238$ ) (Table 17). For men, shift workers and day workers, income was not a statistically significant predictor of self-rated health, but the direction of effect was the same as it was for shift workers (Tables 16, 18 and 19).

**Presence of children in the home.** The presence of children in the home was not a statistically significant predictor of self-rated health for any of the four study sub-populations (men, women, shift workers & day workers), holding constant the other variables in the model (Tables 16, 17, 18, & 19).

### **Work-Related Variables**

**Spousal employment.** Spousal employment was not a statistically significant predictor of self-rated health for any of the four study sub-populations (men, women, shift workers & day workers), holding constant the other variables in the model (Tables 16, 17, 18, & 19).

**Consider self a workaholic.** The tendency to identify oneself as a workaholic was not a statistically significant predictor of self-rated health for any of the four study sub-populations (men, women, shift workers & day workers), holding constant the other variables in the model (Tables 16, 17, 18, & 19).

**Occupations.** For women and shift workers, there was no occupational category that was statistically predictive of self-rated health, holding constant all other variables in the model. In other words, the type of job these individuals worked did not seem to be statistically correlated with self-rated health. However, occupational category was a significant predictor of

self-rated health for men and day workers. For men and day workers who were employed in the sales and service sectors, the odds of rating health as poor was statistically higher than those who were employed in “other” occupations (i.e., management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry) , holding constant other variables in the model ([OR = 1.65; 95% CI = 1.05-2.59; p = .0313] and [OR = 1.71; 95% CI = 1.22-2.40; p = .00017], respectively) (Table 16 & 19). Additionally, for men and day workers who were employed in the trades and transportation sectors, the odds of perceiving self-rated health as poor were statistically higher than those who were employed in “other” occupations holding constant other variables in the model ([OR = 1.65; 95% CI = 1.05-2.59; p = .0313] and [OR = 1.71; 95% CI = 1.22-2.40; p = .00017], respectively) (Tables 16 & 19).

**Hours worked per week.** Hours worked per week was not a statistically significant predictor of self-rated health for any of the four study sub-populations (men, women, shift workers & day workers), holding constant the other variables in the model (Tables 16, 17, 18, & 19).

**Shift configuration.** This variable was included in the models for men and women and in both cases, was not a statistically significant predictor of self-rated health, holding constant the other variables in the model (Tables 16 & 17).

### **Work-family balance**

**Work-to-family spillover.** Work-to-family spillover was a statistically significant predictor of self-rated health for women, shift workers and day workers. For all of these groups, the odds of rating health as poor were statistically higher for those who reported high

work-to-family spillover compared to those who reported low work-to-family spillover holding constant the other variables in the model ([OR = 1.89; 95% CI = 1.31-2.71;  $p = .0007$ ], [OR = 1.85; 95% CI = 1.10-3.10;  $p = .0196$ ] and [OR = 1.50; 95% CI = 1.06-2.10;  $p = .0206$ ], respectively) (Tables 17, 18, & 19). In contrast, for men, work-to-family spillover was not a statistically significant predictor of self-rated health, but the direction of effect was the same as it was for the other three groups (Table 16).

**Family-to-work spillover.** Family-to-work spillover was a predictor of self-rated health for two groups; women and shift workers. For women and shift workers, the odds of rating health as poor were statistically higher for those who reported high family-to-work spillover compared to those who reported low family-to-work spillover, holding constant the other variables in the model ([OR = 2.29; 95% CI = 1.34-3.92;  $p = .0026$ ] and [OR = 2.67; 95% CI = 1.41-5.04;  $p = .0026$ ], respectively) (Tables 17 & 18). However, family-to-work spillover was not a statistically significant predictor of self-rated health for men or day workers, but the direction of the effect was the same as it was for women and shift workers (Tables 16 & 19).

### Quality of Life Variables

**Plan to slow down in the coming year.** For men, having plans to slow down in the coming year was a statistically significant predictor of self-rated health. For this group, the odds of rating health as poor were statistically higher for those who reported that they had plans to slow down in the next year, compared to those who had no plans to slow down, holding constant the other variables in the model (OR = 1.53; 95% CI = 1.06-2.21;  $p = .0218$ ) (Table 16). In contrast, having plans to slow down was not a statistically significant predictor of self-rated health for women, shift workers or day workers, although the direction of the effect was the same as it was for men (Tables 17, 18, & 19).

**Sense of belonging to community.** Having a sense of belonging to community was a statistically significant predictor of self-rated health for two of the study sub-populations; men and shift workers. For men and shift workers, the odds of rating health as poor were statistically higher for those who reported that they had weak ties to community, compared to those who reported having strong ties to community, holding constant the other variables in the model ([OR = 1.53; 95% CI = 1.11-2.11; p = .0102] and [OR = 1.97; 95% CI = 1.18-3.30; p = .0098], respectively) (Tables 16 & 18). For women and day workers, although the direction of effect was the same as it was for the other two groups, the relationship between a sense of community belonging and self-rated health failed to reach levels of statistical significance (17 & 19).

**Life satisfaction.** Life satisfaction was a significant predictor of self-rated health for all four groups. For men, women, shift workers and day workers, the odds of rating health as poor were significantly higher for those who were dissatisfied with their lives compared to those who were satisfied with their lives, holding constant the other variables in the model ([OR = 5.00; 95% CI = 3.25-7.69; p = .0000] , [OR = 3.19; 95% CI = 2.16-4.17; p=.0000], [OR = 4.06; 95% CI = 2.37-6.96; p = .0000] and [OR = 4.08; 95% CI = 2.84-5.87; p = .0000], respectively) (Tables 16, 17, 18, & 19). Of all four groups, men showed the strongest relationship between low life satisfaction and poor self-rated health (Table 16).

**Sleep difficulties.** Having sleep difficulties was a significant predictor of self-rated health for all four study sub-populations. For men, women, shift workers and day workers, the odds of rating health as poor were significantly higher for those who were experiencing sleep difficulties compared to those who did not have sleep difficulties, holding constant the other variables in the model ([OR = 2.18; 95% CI = 1.53-3.12; p = .0000] , [OR = 4.18; 95% CI = 2.99-5.85; p=.0000], [OR = 3.01; 95% CI = 1.83-4.96; p = .0000] and [OR = 2.88; 95% CI = 2.18-3.80; p = .0000],

respectively) (Tables 16, 17, 18, & 19). Of all four groups, women showed the strongest relationship between sleep difficulties and poor self-rated health (Table 17).

**Time stress.** Time stress was not a statistically significant predictor of self-rated health for any of the four study sub-populations (men, women, shift workers & day workers), holding constant the other variables in the model (Tables 16, 17, 18, & 19).

## **Summary**

Logistic regression results showed that for men and day workers, lower educational attainment was predictive of poor self-rated health. Age did not predict higher likelihood of poor self-rated health for men, women or day workers, but for shift workers, those who were older were more likely to report poor health. For women, but not for men, shift workers or day workers, having lower income was predictive of poor self-rated health. The type of occupation individuals were employed in did not predict self-rated health for women or shift workers, but for men and day workers, being employed in sales and service or trades and transport occupations was predictive of poor self-rated health.

For women and shift workers, both work-to-family spillover and family-to-work spillover were predictive of poor self-rated health. However, work-to-family spillover and family-to-work spillover did not predict poor self-rated health for men and only work-to-family spillover was predictive of poor self-rated health for day workers.

Sleep difficulties did predict poor self-rated health for all four groups, and the correlation was very powerful for women and shift workers. Women who reported sleep difficulties were over 4 times more likely to report poor self-rated health than women who did not have sleep difficulties, and shift workers who reported sleep difficulties were over 3 times more likely to report poor self-rated health than shift workers who did not have sleep difficulties. Men and shift

workers who reported weak community attachment were significantly more likely to report poor self-rated health than men and shift workers who had strong community ties. Community attachment did not correlate with self-rated health for women or day workers. For all groups, reporting low life satisfaction was predictive of also reporting poor self-rated health. Life satisfaction was an especially powerful predictor of poor self-rated health for men; men who reported low life-satisfaction were 5 times more likely to report poor self-rated health.

Finally, across all four models — men, women, shift workers and day workers — high time stress and working shifts did not increase the likelihood of reporting poor health.

## **Chapter 5: Discussion and Conclusions**

There is an extensive body of research that examines how specific illnesses are correlated with shift work but few studies look at which work-related stresses and social demands are related to poor self-rated health. As well, very recently, there have been a few studies which indicate that work-family conflict is correlated with poor physical (Kinman, 2010; Nylen et al., 2007; van der Heijden et al., 2008) and poor mental health (Wang et al., 2007). However, there was no population-based research found that compared shift workers and day workers or men and women with regards to the health effects of work-to-family and family-to-work spillover on self-rated health. Findings of this population-based research will enhance the existing knowledge on factors that affect Canadians' self-rated health with a focus on work-family balance and work shift configuration.

In this chapter, the results of the logistic regression analysis are discussed in the context of the published literature and implications of the results are explored. The chapter concludes with a discussion on limitations of the study and suggested directions for future research.

### **Discussion and Interpretation of Results**

#### **Demographic and Socio-Economic Variables**

**Gender.** There was no statistically significant relationship between gender and self-rated health in the bivariate analysis for day workers, but there was for shift workers. However, when gender differences were assessed while controlling for demographic, work-related, and psychosocial factors, the difference between male and female shift workers with regards to self-rated health was no longer statistically significant. That is, no matter what shift configuration one works, being male or female does not have an independent association on self-rated health. This

contrasts with other studies which suggest that working shifts impact women more significantly (Costa, 1996). Previous research has shown that women and men are physically impacted by shift work in different ways according to objective measures of health (Costa, 1996; Shields, 2002) but this does not necessarily translate into gender differences with regards to poor self-rated health, especially when other factors such as family structure, income, work and time stressors, and psycho-social factors are controlled.

**Education.** Logistic regression analysis revealed that education was a highly significant predictor of health for men. Men had significantly higher odds of reporting poor health if they had not achieved any post-secondary education compared to men who had achieved higher levels of education. For women, lower education was not statistically predictive of poor self-rated health. This result is consistent with previous research that has shown that for men, but not for women, lower levels of education are correlated with poor self-rated health (Shields & Shooshtari, 2001), and that lower socioeconomic status in general has been associated with fair to poor self-rated health (Dunn et al., 2006; Shields & Shooshtari, 2001).

Individuals who worked different shift configurations also differed with regards to lower education being predictive of poor health. For day workers, but not shift workers, the odds of reporting poor health were higher for those with lower educational attainment compared to those with post-secondary education.

It is possible that the social status attributed to individuals with higher educational attainment provides a protective factor with regards to health. When individuals do not attain post-secondary education, self-comparisons to their more highly educated counterparts may negatively impact their perceived socioeconomic status, a factor that has been shown to be a predictor of poor self-rated health (Dunn et al, 2006). Furthermore, it may be that men are more



vulnerable regarding these social comparisons based on educational status. More research regarding this issue may prove useful with regards to men's health and well-being. In the study population, almost 70% of men with high school education or less worked days. It may be that the overlap between the two study sub-populations is relevant with regards to the results of the multivariate analysis.

**Age.** Results of the logistic regression analysis indicate that older workers who work shifts had 2 times the odds of reporting poor self-rated health compared to younger workers who work shifts. This finding is in accord with several previous studies which have shown that older workers are more vulnerable to the negative health effects associated with shift work (Brugere et al., 1997; Costa, 2005; Costa & Sartori, 2007; Folkard, 2008).

Although advancing age is commonly thought to have a linear association with reports of poor health, previous research employing multivariate modelling techniques have shown that age is related to other factors, including the socioeconomic factors which were controlled for in this study (Shields & Shooshtari, 2001). Therefore, it is not surprising that for men, women and day workers, there was no statistically significant relationship between age and poor self-rated health in the current study. Additionally, it should be recognized that the older workers in this study were aged 50-69 and were not comprised of the "oldest old". The fact that they were still working indicates that they were still likely healthy enough to be active.

**Household income.** Logistic regression analysis revealed that household income was not found to be a statistically significant predictor of self-rated health for men, day workers or shift workers. However, women who reported incomes of less than \$50,000 per annum had over 1.5 times the odds of reporting poor self-rated health compared to women with higher household

incomes. Therefore, women seemed to be particularly at risk of poorer self-rated health when faced with financial insecurity compared to men.

It may not be that low income is independently predicting poor self-rated health, but rather, that it is associated with other factors which are not controlled for in this study. From a human ecological perspective, “household” is representative of the family system and the relationships and interactions which take place within that system. Therefore, it may be that relationship issues which are associated with low income are actually the reason for perceptions of poor health in the women in this study. For example, Collier-Tenison (2003) explored factors related to partner conflict and found that financial strain was the most significant predictor of interpersonal conflict between couples. It may be that negative family interactions, in turn, affect women’s self-rated health. Alternatively, women may be particularly susceptible to the effects of income insecurity compared to men due to the fact that women tend to have less earning power than men (Statistics Canada, 2008b). Perhaps this results in a sense of helplessness and powerlessness that manifests as poor self-rated health.

**Presence of children.** In bivariate analysis, the relationship between presence of children in the home and self-rated health was significant for all four study sub-populations with those without children being more likely to report poor self-rated health. However, the presence of children did not remain significantly correlated with self-rated health in any of the four logistic regression models once demographic, work-related and quality of life factors were controlled for, indicating that this variable does not have an independent effect on self-rated health.

The presence of children in itself is a one-dimensional view of this indicator. It was included as a control variable, but also, as an ecological representation of the family system. The variable measures the effects of relationships within the family and the corresponding demands

of those relationships. Once children are part of the family, the complexity of interactions increases which inevitably impacts the individual. These relationships most certainly alter many aspects of the individual's life including life satisfaction, time stress and spillover between the work and family systems. As well, children interact within the exosystem, and in this way, have the potential to “pull” parents into the larger community, which in turn, impacts on the individual’s sense of belonging. Once these multi-level factors are controlled for, it is understandable why the presence of children is not a protective factor with regards to self-rated health.

### **Work-Related Variables**

**Spousal employment.** In bivariate analysis, spousal employment was found to be significantly associated with self-rated health for women, and approached significance for shift workers. Women may be more vulnerable and to feelings of job insecurity because their relative power within the employment sector is less than that of men. The women in this sample are employed, but the burden of earning for the family on what may be a lower wage than a man could earn, may create stress that translates into poor self-rated health.

Spousal employment was retained in all four logistic regression models as a control variable and because the theoretical framework driving this research focuses on “...the individual family members as well as the family as a whole” (Bubolz & Sontag, p. 424). When spousal employment was included in the multivariate models, it lost its statistically significant correlation with the self-rated health of women, after controlling for demographic and socio-economic factors, work factors and quality of life factors. Independently, having a spouse who does not work does not affect the health of women in this study, but rather, it may interact with other factors to create this outcome. It may be that issues such as income and presence of

children are also relevant when considering the impact of an unemployed spouse. For men, shift workers and day workers, the relationship between spousal employment and self-rated health was not statistically significant.

**Workaholism.** Workaholism was included in all four regression models to represent how the individual interacts within the work system. In bivariate analysis, workaholism was a highly significant predictor of poor self-rated health for women and a significant predictor of poor health for day workers, but not for men or shift workers. After controlling for other factors, workaholism ceased to be a significant predictor of poor self-rated health for women and shift workers, and remained not significant for day and shift workers. This result contrasts with previous research that has shown a correlation between workaholism and poor physical health (Burke, 1998; Chamberlin & Zhang, 2009; Holmgren, Dahlin-Ivanoff, Bjorkelund, & Hensing, 2009). However, findings regarding this predictor have been mixed, and the results of the present study are similar to those that show no evidence of poor health outcomes for workaholics (McMillan & O'Driscoll, 2004; Vodanovich, Piotrowski, Wallace & Craig, 2007).

It may be that the affects of this work style on health are mediated through other factors such as relationship conflict and social difficulties as these individuals have been shown to have poorer social functioning (Bakker et al., 2009; Chamberlin & Zhang, 2009). The fact that the current study controls for life satisfaction, spillover, and a sense of belonging, may explain why the relationship between workaholism and self-rated health for women and day workers was not significant in logistic regression.

Alternatively, it may be that the particular personality structure of workaholics prevents them from perceiving health problems even when they are present: to recognize health difficulties would be to recognize something that could potentially interfere with their

compulsive tendencies. Because of mixed research findings regarding workaholism and health, it has been suggested that objective measures of health be used when studying health outcomes for this group. (Vodanovich, et al., 2007).

**Occupations.** The relationship between occupations associated with shift-work and self-rated health was revealed as significant for day workers and men in the bivariate analysis, and this relationship remained significant in the logistic regression analysis. However, not all of the occupational types that were of interest in this study were related to self-rated health. Men who worked in sales and service or in trades and transportation occupations had 1.5 times the odds of reporting poor self-rated health compared to those who worked in “other” occupations (management, business/finance/administration, sciences, social science/education, arts/recreation, and primary industry). For day workers, the results were the same except that the odds of reporting poor health if individuals worked in sales and service or in trades and transportations occupations were slightly higher. For shift workers and women, occupation was not a significant predictor of poor health.

When analyzing possible reasons for the correlation between sales and service occupations and trades and transport occupations and poor health, is necessary to look at the nature of these jobs. For the current sample, it was found that those working in sales and service and trades and transport occupations had relatively lower levels of education and income compared to those working in occupations not associated with shift work. With regards to education, higher proportions of sales and service and trades and transport employees had lower levels of education (34% and 39%, respectively) compared to non-shift working employees (18%), and higher proportions of sales and service and trades and transport employees (24% and 20%, respectively) had low incomes compared to non shift-working employees (10%). Previous

studies have found that both actual and perceived socio-economic status were strong predictors of self-rated health (Dunn et al., 2006). Employment in these sectors may not hold as much social status as employment in management or finance positions, for example. Volkers and his colleagues (2007) found that for both men and women, those employed in jobs with the lowest occupational position are at risk of poor health. It may be that men are particularly vulnerable to these social comparisons, and that this in turn affects their health. As well, day-working employees may be more embedded within hierarchical workplaces that tend to amplify these social comparisons. From a human ecological perspective, the structure of the work and wider social systems (ecosystems), may contribute to individual perceptions of poor health.

**Hours worked per week.** There was no statistically significant association between hours worked per week and self-rated health for the population in this study. This result is surprising since long working hours have been associated with poor health and poor health habits in both men and women (Shields, 1999; Nylén et al., 2007). Although long working hours may create time stress, resulting in extra pressure on the individual and the family, perhaps this hazard is offset by higher income and/or income security.

**Shift configuration.** In the analyses for men and women, shift configuration was included as an indicator. Analyses found no statistically significant relationship between shift configuration and self-rated health, despite the fact that there are a number of studies that show that working shifts has a negative impact on health (Costa, 1996; Costa, 2003; Drake et al, 2004; Khaleque, 1999; Poissonnet & Vernon, 2000).

It may be that the effects of shift work are impacted by another variable in the analyses. It could be useful to re-run the multivariate analyses to include a shift configuration and sleep difficulties interaction variable, since shift work has been associated with sleep disturbances in

previous studies (Drake et al., 2004; Garey, 1995; Hurst, 2008; Winwood et al., 2006).

Furthermore, Chung and colleagues (2009) reviewed existing literature on shift work, sleep, and health and concluded that poor sleep in women shift workers is linked to the manifestation of health difficulties. The benefit of including interactions between variables in multivariate analyses is that it accesses the effects of the accumulation of stressors.

Another possible reason that the current study found no relationship between shift configuration and self-rated health is that self-rated health may not be an appropriate outcome variable to measure this effect. Self-rated is a subjective measure of health, and although it has been found to be correlated with objective measures of health, the particular types of health outcomes that been associated with working shifts may not be captured by this variable. For example, cardiovascular illnesses (Haupt et al., 2008; Knutsson, 2003; Mosendane et al., 2008) and metabolic syndrome (Biggi et al., 2008; Esquirol et al., 2009) have been associated with working shifts, and although these conditions do pose a real threat to health, the individual may not perceive the threat. Therefore, using objective measures of health may produce more accurate results when examining the impact of working shifts on the health of the worker.

**Work-to-family spillover.** Women, day workers and shift workers had higher odds of reporting poor self-rated health if they experienced high family-to-work spillover. For men, those who experienced high work-to-family spillover did not have higher odds of reporting poor health. There is much evidence that women feel more responsible for home responsibilities compared to men (Cinamon & Rich, 2002; Milkie & Peltola, 1999). As well, previous research has found that women, compared to men, feel more responsibility to perform well in both systems (work and family) (Cinamon & Rich, 2002). What is interesting is that there is something about this particular stress – the inability to function well in both work and family

spheres – that is predictive of poor self-rated health for women. The inability to meet these high expectations may create guilt and stress for women, which then translates into an overall impression of poor health.

Alternatively, what may be underlying these results for women are relationship issues related to this variable. Previous research has found that women, compared to men, experience more stress when their spouse is displeased or unhappy (Demerouti et al., 2005; Milkie & Peltola, 1999). Human ecological theory stresses the fact that individuals are not isolated; they react to and are impacted by other individuals and multiple simultaneous demands within multiple systems. Therefore, if a woman has a partner who is unsupportive or judges her harshly because she is not meeting her home demands, this has the potential to create increased levels of anxiety in the woman. The culmination of her struggle to meet multiple system demands while facing negative spousal judgement may result in poor self-rated health.

Shift workers who experienced high levels of work-to-family spillover had higher odds of reporting poor self-rated health compared to those who worked regular days (1.85 vs. 1.50, respectively). Research has shown that shift workers at times work irregular schedules to balance work and family and to avoid the use of daycare or babysitting services (Hattery, 2001). However, these employees then often end up parenting alone and working a “double-day” . For those working nights and evenings, there may be a tendency to shorten the number of hours one sleeps in order to take care of children whose needs can not be ignored.

To measure spillover, the GSS survey asks individuals if they are often too exhausted to perform housekeeping duties and to meet family responsibilities due to work demands. By measuring spillover in terms of feelings of exhaustion, the survey may be tapping into issues related to burnout and high physical and emotional stress.



**Family-to-work spillover.** Family-to-work spillover was found to be predictive of poor self-rated health for women and shift workers, but not for men or day workers. Overall, respondents in all four categories were much less likely to report high family-to-work spillover compared to high work-to-family spillover, indicating that individuals may be protective of their work environments (Tables 1, 2, and 3). However, for women and shift workers who did report high family-to-work spillover, the odds of reporting poor health were quite high (odds ratios of 2.29 and 2.67, respectively) compared to those who did not report high family-to-work spillover. That is, family-to-work spillover was not a common occurrence, but when it did occur frequently for these groups, it was a powerful and statistically significant predictor of poor self-rated health.

According to human ecological theory, societal norms and culture are a part of the macro-system that guides individuals' behaviours within social systems. In the western culture, it is not desirable to have family demands impact work responsibilities. As well, based on these societal norms, there may be great pressure, or even harsh judgement from other workers who may perceive them as individuals who cannot "manage their load", which compounds the stress for these employees. This cumulative stress may translate into greater odds of rating health as poor.

### **Quality of Life Variables**

**Plan to slow down in the next year.** In bivariate analysis, having plans to slow down in the next year was significantly related to self-rated health for all four sub-populations. However, once demographic, work and quality of life factors were held constant, the statistically significant relationship only held for men in the logistic regression analysis. Men who reported that they had plans to slow down in the next year had significantly increased odds of reporting poor self-rated health than men who had no plans to slow down. Williams (2008) described this

variable as a “well-being” indicator; it could be that men who are considering slowing down are actually experiencing physical, or perhaps, mental illness. In an effort to cope and adapt to these changes, men may make plans to interact within their external systems in a different pattern.

For women, planning to slow down in the next year was not a significant predictor of self-rated health once other factors were controlled. It may be that men have a tendency interpret “plan to slow down” *only* as an employee (i.e., related to work) whereas women may interpret it more globally. Previous research has provided evidence that women tend to feel more responsibility for childcare and home duties (e.g., Garey, 1995; Milkie & Peltola, 1999). Therefore, they may interpret “plan to slow down” as a family member who takes care of the home and others, *and* as an employee. If one is financially secure, plans can be made to work less. However, unless services such as child care and housecleaning are purchased, the needs of family and home cannot be altered as easily. Based on this logic, women may not perceive that they have the choice to slow down as readily as men perceive they have this choice.

**Sense of belonging to community.** Previous studies have shown weak ties to community to be predictive of poor self-rated health (Berkman et al., 2000; Shields, 2008). Regression analysis revealed that reporting weak attachment to community was a statistically significant predictor of poor self-rated health for men and shift workers. Men who perceived their attachment to community to be weak compared to men who believed their attachment to the community to be strong had increased odds of reporting poor self-rated health [OR=1.53; 95% CI (1.11-2.11)].

Community belonging was an even more powerful predictor of poor self-rated health for shift workers. Shift workers who reported weak attachment to community, compared to day

workers, had an increased odds of reporting poor self-rated health [OR=1.97; 95% CI (1.18-3.30)].

Human ecological theory stresses the importance of multiple relationships throughout systems, and suggests that the number and strength of these relationships, is related to well-being. Weak attachment to community suggests a sense of isolation. Positive health and well-being can be nurtured through strong ties to community in practical ways such as access to health services, fitness programs, and leisure activities and through relationships that allow individuals to feel belonging and worth. Women, more than men, may have a propensity to have more close relationships and friendships or ties with family than men. That is, women may have more intimate relationships within their microsystems, compared to men. If women do not feel a strong connection to their wider social system, the presence of these intimate relationships may serve as a protective factor with regards to their health. Because of this, men may more heavily depend on their exosystem for a sense of belonging and connection compared to women, and when those ties are not present, men may have the tendency to feel more isolated. Furthermore, it may be that for men, community belonging is also an indicator of disengagement from family as well. This sense of isolation may then translate into poor self-rated health. As well, community connections can also include things like sports and leisure, so it could be that men who ignore these aspects of life are more likely to be unhealthy.

Shift workers, compared to day workers, may have a weaker sense of connection to the wider systems due to the fact that they are “living backwards” and are out of sync with about three quarters of the population. For example, working nights on a regular basis may leave individuals feeling disconnected from the day-to-day decision making and activities of the workplace.

Shift work has also been shown to disrupt family relationships (Joshi & Bogen, 2007). Thus, those who work shifts may feel more disconnected and alienated from their intimate relationships. Furthermore, strong connections to children and spouses can go hand in hand with strong community connections. For example, people may meet other families through their children's activities. It may be that for some individuals this variable is also measuring a sense of connection to family as well.

Finally, parents who are employed as shift workers are often left parenting alone when the other spouse is working, so it may be difficult to get away on their own to participate in sports and social activities that would help them feel more connected to community. For this group, it may be that a sense of isolation is why they are identifying themselves as poorly connected to their community, and this sense of isolation may be a predictor of poor health.

**Life satisfaction.** For all four sub-populations, low life satisfaction was a highly significant predictor of poor self-rated health. This is consistent with previous studies that have shown that dissatisfaction with life is a strong predictor of poor self-rated health (Al-Windi, 2005) and mortality (Collins et al., 2009). The strongest relationship between low life satisfaction and poor self-rated health was found among men: Those who reported low life satisfaction had 5 times greater odds of reporting poor self-rated health, compared to those men who reported high life satisfaction. Women who reported low life satisfaction had 3.19 times greater odds of reporting poor self-rated health compared to women with high life satisfaction ratings.

“Life satisfaction” is a broad measure that spans all systems (i.e., micro, exo, and macro) and has the potential to include multiple relationships and life circumstances. It may be that the measure “life satisfaction” brings other factors, not directly measured in the GSS, into the current

analysis for these samples, and that these “silent” factors are more relevant to men compared to women. Some examples of these “silent factors” may be deaths of loved ones, conflictual relationships and physical pain.

The results of the logistic regression analysis differed very little between day and shift workers. (4.08 greater odds and 4.06 greater odds, respectively).

**Sleep difficulties.** For the four sub-populations, the presence of sleep difficulties was highly predictive of reporting poor self-rated health, and the predictive power of this factor was especially strong for women. The odds of reporting poor self-rated health for women who reported sleep difficulties was 4.08 times greater than the odds of reporting poor self-rated health by women who did not have sleep difficulties. These are not surprising results as there is abundant evidence of the impact of disruption of circadian rhythms on health. The results for women are consistent with research by Costa (1996), who reviewed multiple studies on the disruption of normal sleep cycles and subsequent health impacts, and found that sleep disruption may be particularly harmful to women with regards to their hormonal function. The impacts of poor sleep on the self-rated health of men, shift and day workers were also significant (2.18 greater odds, 3.01 greater odds and 2.88 greater odds, respectively). The consistency of this finding indicates that sleep quality has a significant impact on how individuals perceive their health and sense of well-being.

Poor sleep is a common symptom of depression, so it is important to consider that some individuals who are reporting poor sleep may also be depressed. Furthermore, there may be an overlap between self-rated health and depression, as somatic symptoms often accompany depression (Haug, Mykletun & Dahl, 2004). There is evidence from the literature that suggest a

significant link between depression and self-rated health (Molarius & Janson, 2002; Ruo et al., 2006).

**Time Stress.** In the logistic regressions, time stress was not a significant predictor of poor self-rated health for any of the four study sub-populations, despite the fact that in bivariate analysis, high time stress was significantly correlated with poor self-rated health for all groups. The fact that it did not turn out to have independent predictive power with regards to poor self-rated health, may be that it is related to other factors in the analysis, for example, life satisfaction. Alternatively, the fact that time stress was not found to be a significant predictor of poor self-rated health may have to do with the way the variable was coded for this study. The variable was dichotomized for the multiple regression analyses and the full scale was not used. It would be useful to re-run the analyses using the full time-stress scale as this would provide more detailed information and may possibly reveal a relationship between time stress and perceived health.

### **Summary of Findings**

Findings of this research have met the original research objectives by enhancing the existing knowledge regarding which factors, including gender, shift configuration, work-to-family spillover, family-to-work spillover, time pressure and other quality of life factors, are correlated with Canadian workers' reports of poor self-rated health.

The findings indicate that men and women may experience the work-family interface very differently, with women having a particular vulnerability to work to family and family-to-work spillover. This is not to say that men do not experience spillover, but for some reason, women's inability to balance home and work demands seems to be correlated with a propensity to rate their health as poor. As mentioned earlier, this has been a finding in a few

previous studies, but that fact that spillover in *both* directions was found to be significant for women even while controlling for possible confounders, for example, sleep difficulties, is very interesting. Furthermore, the models were tested with and without life satisfaction (results are not shown), and no matter how the models were run, work-to-family spillover and family-to-work spillover results remained consistent.

The concept of spillover in the literature is presented and measured in many different ways. This particular study examined negative spillover, which is measured by feelings of fatigue, so when findings are compared to previous studies, this must be kept in mind. Additionally, this research was conducted using Canadian data. Based on human ecological theory, the need to consider the cultural and political environment (macrosystem issues) when interpreting these results, is extremely important. Despite the fact that women are actively participating in the workforce, culturally, there still seems to be a lingering expectation that the responsibility of home still lies in the woman's domain. The results of the current study suggest that this expectation may have a negative impact on the health of women. Because Canadian society is still in a time of change regarding this issue, this leaves some women particularly vulnerable to the effects of spillover, whereas other women may be well supported at home.

In Canada, political issues are salient as well when interpreting results. Although some countries have universal daycare, there is no such support in place for women in Canada (excluding Quebec). This may leave Canadian women more susceptible to spillover than women in other countries that have more egalitarian cultures and where universal daycare is provided.

Spillover was also experienced differently for shift and day workers, with evidence showing that shift workers are more sensitive to spillover with regards to their self-rated health, compared to day workers. What is unique to this study is that the direction of spillover was tested

for both groups revealing the fact that shift workers, unlike day workers, had health impacts related to home to work spillover. This suggests the need to examine this issue more closely as it may be necessary to consider workplace policies that support shift workers in their efforts to balance work and home demands.

This research supports the findings from previous studies that suggest older workers may have a more difficult time adjusting to shift work and that this may have negative impacts on their health. In some employment sectors with large proportions of shift workers, for example in health-care sector, there is a growing need to retain the “babyboom” generation in the workforce for a longer period of time. However, the fact that shift work may be detrimental to the health of this cohort needs to be considered. It may be that the need to ensure unique workplace supports for shift workers is an issue that must be taken seriously if older workers are to be retained within the workforce for a longer period of time.

The importance of good sleep on health outcomes is supported by this research. It is an issue which is highly correlated to poor self-rated health for all groups. Women and shift workers are the groups most susceptible to the health effects of poor sleep. There is a very large body of research which suggests that shift workers who have disrupted circadian rhythms experience a variety of negative health outcomes, so the current study lends support to those previous findings. Female shift workers have also been shown to be particularly susceptible to the health effects of shift work, and although this study did not single out that group, it did find that women who reported difficulty with sleep were twice as likely as men to report poor health. The fact that Canadian women are particularly susceptible to the negative health impacts of poor sleep warrants a closer look at this issue.



Working shifts, was not, as expected, correlated with higher reports of poor health. The fact that sleep quality was controlled for in this study may be the reason for this result. There is abundant research that suggests that disturbed sleep may be the reason for poor health outcomes in this group of workers, so the interaction of these two variables should now be tested.

Time stress was not found to be a predictor of poor self-rated health. It may be that the results would differ if life satisfaction was not held constant; perhaps time stress only becomes relevant as a predictor of poor health when the context of an individual's life presents challenges. That is, when there is an accumulation of life stressors resulting in a negative synergistic effect, time stress may be more likely to predict poor health. Independently, time stress does not appear to have a negative effect on health.

Finally, for men and shift workers, disengagement from the community is related to poor self-rated health. For shift workers, there is previous research which suggests that this group suffers from disturbed social relations which may leave them feeling more isolated in general. However, the fact that this isolation is correlated with poor self-rated health for this group suggests a need to examine this relationship further. For men, the lack of social connection was also related to poor self-rated health. Community belonging has previously been shown to be highly correlated with poor health, but it may be that this measure, for at least some people, is part of a larger constellation of depressive or anxious symptoms. When more objective measures are used for indicators such as community belonging and health, it is easier to sort these issues out. However, perceptions are important as well, and warrant being examined, because people act in their life based on these perceptions.

## **Limitations**

Limitations of this research study are related to the cross-sectional design, the fact that the outcome measure was based on self-perception rather than a combination of objective and subjective measures (which is always ideal), the fact that some of the data were sparse in some categories, resulting in information being lost when categories were collapsed, and limitations regarding the information that was captured with some questions.

The sample for this study was drawn from a cross-sectional survey conducted by Statistics Canada, and although many steps were taken to ensure valid and reliable data, there remain some limitations that are related to surveys in general. In all surveys, there will be recall bias, the responses will be subjective, and respondents may provide answers that are socially acceptable but not accurate. As well, if there are people in the room when respondents are answering questions, this may affect their responses.

The sample of married or common-law individuals aged 18-69 was drawn from a Canadian survey that represents the Canadian population. However, for the GSS 20, residents of the Yukon, Northwest Territories and Nunavut were not included, so results cannot be generalized to employed, married/common-law people aged 18-69, living in those regions. Additionally, individuals who do not respond to questions may limit the generalizability of the findings to some extent (i.e. external validity). The non-response rate for the GSS-20 was 33%. (Statistics Canada, 2008a). The responses may be biased to the degree that the non-responding individuals may differ from the individuals who did respond. It is important to note that the findings for this study cannot be generalized to other countries with different social norms, values and political contexts.

There are limitations imposed by the cross-sectional design of the survey that does not allow for time-period comparisons. Therefore, it is impossible to establish causal relationships, and although the correlation between predictors and outcome can be established, the direction of the relationship can not be ascertained in the way it could be using path analysis with longitudinal data. In particular, there is no way to discover if poor self-rated health causes high work-to-family spillover for women, or whether high spillover for women causes poor health. However, when analyzing this association from a human ecological framework, the likelihood is that there is a feedback loop between these two factors – a synergistic effect creating an outcome. This is not a linear viewpoint, but one that assumes the complexity of interactions within systems; a viewpoint that is perhaps more realistic than when looking at psycho-social measures.

As previously discussed, although the outcome, self-rated health, has been shown to be a good predictor of actual health and mortality outcomes, it may be missing a large group of individuals who actually do have very real health threats, but they are not perceiving and reporting these perceptions. For example, the fact that shift work was not significantly correlated with poor health was a surprising result based on comparisons to previous research. However, shift work has been correlated with chronic health conditions and poor health habits, which individuals may not perceive as “poor health” because these conditions and habits are not ominously threatening. So, many actual health threats may be missed by this measure and objective measures of health may be more effective in analyzing the relationship between shift work and health.

As well, when the outcome is self-rated health, there is the risk that what are also being measured are depressive and/or anxious symptoms. Four of the variables highly correlated with

the outcome are low life satisfaction, weak sense of social belonging, disrupted sleep and, in the case of spillover, exhaustion interfering with ability to perform. These may be representations of depressive symptomology (i.e., depressed mood or anhedonia, isolation, sleep disruption and amotivation or exhaustion). Alternatively, those with the tendency to somatise (a common symptom of depression) may also report poor health, when in fact, they are quite healthy. One could argue, however, whether the outcome measures poor physical health, poor mental health, or both, that this still indicates a threat to the health and well-being of the individual.

In this study, time stress was dichotomized and this may have resulted in the loss of information related to this variable. If the full time stress scale had been included in the analysis, this would have provided more detailed and sensitive information, and by doing this, a relationship between time stress and self-rated health may have been revealed.

There was some information lost in some categories due to the need to collapse categories. For some of the variables, there were low cell counts in the poor self-rated health category due to the fact that the study population was relatively healthy. Therefore, getting sufficient data in multiple categories was difficult on some measures.

Initially, the intention was to include a variable that included various shifts (evening, night, rotating and days) in the binary analyses, but the cell counts were a problem in some categories. As a solution to this problem, a binary variable was created that separated shift workers from day workers. However, by doing this information about specific shift configurations was lost. Losing this information was unfortunate, especially since prior research shows the effect of various shifts, especially the night shift on health. Information was also lost in the occupational categories measure. For men, there was a need to combine health and manufacturing occupations together, as the health category lacked sufficient data to analyze and

manufacturing occupations also had lower cell counts. As well, for women, the occupational categories trades/transport and manufacturing needed to be combined for the reason of low cell counts. For the number of hours worked in a week, there had been an effort to include extra categories representing different ranges of hours worked rather than just having a binary measure. However, low cell counts also prevented this.

Finally, some of the information that was captured by some measures was imprecise. In the 2006 GSS, there was no question that captured the number and ages of *all* dependent children in the home. Therefore, the variable that included all children of any age and marital status needed to be used. Dependent children tend to *draw* energy and resources from parents, whereas older children may *provide* resources in the form of money, housekeeping or child care. It is uncertain if the limitation of this variable altered the results of the analyses for this indicator. As well, the question that measured shift configuration had the category “other” which has the potential to produce vague responses. If this category had not been included, individuals would have likely been able to identify a category that most closely represented their pattern of work. If respondents were inclined to give quick responses to “get through the interview”, they may have vaguely responded rather than carefully thinking about the details of their own situation. It is difficult to know to what degree the inclusion of the “other” category altered the accuracy of results, but when shift configuration is central to a research study, how this variable is measured matters greatly.

As well, the category “irregular” has the potential to capture those who also work nights, evenings and rotating shifts, and much of the previous research has focussed on the health impacts of working those shifts. By including this category (“irregular”), the responses become less precise. Since the night shift has been particularly implicated with poor health outcomes, it

would be helpful to have a question that would allow *frequency* of exposure to the night shift to be measured.

### **Implications and Future Directions for Research**

**Research.** Several findings from the current study suggest the need for future research. First, for women and shift workers, the fact that spillover was correlated with poor self-rated health is an issue that warrants a closer look utilizing a combination of subjective and objective measures in order to discern if there is a mental health or physical health component to this correlation, or perhaps a combination of the two. As well, a qualitative approach would be valuable in order to explore some of the deeper, underlying issues related to the relationship between high spillover and poor self-rated health for women and shift workers.

Because working shifts was not independently correlated with poor self-rated health as expected, different outcome measures (i.e., objective measures) of health may be necessary to employ when studying this issue.

The finding that men and shift workers are more likely to rate their health as poor when they view their ties to community as weak, is curious. Although this finding wasn't so surprising for shift workers given that they tend to work when others are enjoying leisure (especially family and friends), it was an unexpected finding for men. It would be worthwhile to explore this result more thoroughly utilizing some qualitative techniques to examine the underpinnings of the correlation of belonging and self-rated health for these groups. As well, research to examine these correlations utilizing more objective measures of health and community belonging would be valuable. By exploring the disengagement of these individuals, it may be possible to find ways to intervene to assist them in feeling more engaged and included, which may, in turn, improve their health and well-being.

Finally, this research focussed on married, working Canadian men and women, a population of individuals that have higher self-rated health than the survey population that represents all Canadians in the ten provinces of Canada. It would be worthwhile to repeat the analyses for unmarried individuals and single parents – groups that may have unique vulnerabilities with regards to shift work and work-family balance. In particular, single parents may experience great stress as they attempt to balance work, the job of single-parenting, and the strains that are sometimes related to shared custody arrangements. This stress in turn, may have a negative impact on their overall health and quality of life.

**Policy Implications.** Careful attention to workplace policies is necessary when there is a desire to retain the large group of “babyboom” employees for a longer period of time. In particular, older workers who worked shifts had poorer self-rated health. It may be that this result has something to do with disruption to circadian rhythms in this group of workers. Careful attention to scheduling, availability of part-time positions, and policies that encourage and support napping on breaks (as many hospitals are doing now), would be helpful. Work-place policies which support practices that minimize the likelihood that individuals will experience sleep difficulties are relevant for shift workers overall, as current findings reveal that sleep difficulties are related to poor self-rated health for this group.

This study suggests women and shift workers are not only struggling at the work-family interface, but that this difficulty is related to poor self-rated health. This result lends support to the fact that workplaces need to become more responsive to the needs of these workers. There is a growing awareness of the value of work and family balance as it relates to health, well-being and quality of life, and some workplaces are addressing this issue with flexible scheduling, availability of part-time work, and providing employee daycares. Additionally, there needs to be

cultural change in the workplace. Managers must strive to maintain a supportive milieu for workers, understanding that employees may have varying degrees of work-family conflict based on individual life circumstances, in order to ensure the health and well-being of the workforce. However, there is a long way to go with regards to work culture catching up with recent social change, and this is quite evident with regards to women who are still having difficulties balancing home and work.

Government policy can also be examined to assist families in balancing home and work. Canada is still without a structured national daycare system, despite the fact that most families are supported on two incomes. Access to quality day care would go far to address the needs and concerns of many families who are, at the present time, scrambling to access a patchwork of widely varying types of child care.

Finally, the salience of community belonging with regards to self-rated health cannot be ignored. Current findings suggest the importance of community engagement as it relates to health outcomes, especially for men and shift workers. Local governments should be encouraged to ensure that adequate leisure and recreational activities are available to individuals to suit a variety of time schedules. Some work places have reduced rates for recreational and fitness centers for their employees. Workplaces should also strive to ensure all workers feel involved with regards to workplace input. There may be a tendency to leave evening and night workers “out of the loop” with regards to workplace discussion and planning, so efforts should be made to engage these workers.

### **Conclusion**

Findings of this research have met the original research objectives by enhancing the existing knowledge regarding which factors, including gender, shift configuration,



work-to-family spillover, family-to-work spillover, time pressure and other quality of life factors, are correlated with Canadian workers' reports of poor self-rated health. Most significant was the finding that for women and shift workers, both work-to-family spillover and family-to-work spillover were predictive of poor self-rated health. The findings that shift configuration and time stress were not related to self-rated health was unexpected and in contrast with e past research with contrary. This might suggest these factors may be linked to poor health through interactions with other factors in the model. For example, shift work may be interacting with poor sleep to create poor health outcomes and time stress may be interacting with life satisfaction to create poor health outcomes. These are interactions that should be tested in future studies.

Finally, the finding that having a weak sense of belonging to community was a predictor of poor self-rated health for men and shift workers warrants a closer look. Qualitative inquiry would be useful to explore some of the reasons why disengagement from community has negative repercussions on the self-rated health of these groups. This type of inquiry can inform possible interventions that may assist in connecting individuals to community in a meaningful way.

As more and more families become supported on two incomes, and as the tendency to work extended hours increases, it is important to remain cognizant of the fact that these trends may have an effect on the health of workers and on the health and well-being of families overall. By exploring the impacts of these social changes, the implementation of the appropriate supports and workplace structures to accommodate these changing needs can be ensured. As well, the identification of who may be at risk for poor health as a result of specific workplace demands can be ascertained.

Table 1  
*Frequencies for Demographic and Socio-Economic Variables for GSS Sample (N=23,608) and Study Sample (N=5,500)*

Variables	GSS survey population		Study population	
	Estimated population	Weighted (%)	Estimated population	Weighted (%)
Totals	26,559,181	100	7,181,140	100
Gender				
Male	13,092,283	49.3	4,235,268	59.0
Female	13,466,898	50.7	2,945,872	41.0
Education				
Highschool or less	9,063,326	34.8	1,803,047	25.1
Post secondary	16,986,611	65.2	5,378,093	74.9
Age				
15-17	1,381,559	5.2	—	
18-49	15,106,009	56.9	4,778,261	66.5
50-69	7,233,590	27.3	2,402,879	33.5
70 and older	2,838,021	10.7	—	
Household income				
Less than \$50,000	7,422,953	27.9	1,069,475	14.9
\$50,000 or more	12,747,881	48.0	5,312,821	74.0
Not provided	6,388,347	24.1	798,844	11.1
Children				
No children	10,292,529	38.8	1,587,925	22.1
Children	16,266,652	61.2	5,593,215	77.9

Note: The GSS sample of 23,608 respondents represents 26,559,181 Canadians (excluding Territories and full-time residents of institutions). The study sample of 5,500 respondents represents 7,181,140 working Canadians (excluding Territories), married or living common-law aged between 18 and 69.

Table 2  
*Frequencies for Work-Related Variables for GSS Sample (N=23,608) and Study Sample (N=5,500)*

Variables	GSS survey population		Study population	
	Estimated pop.	Weighted (%)	Estimated pop.	Weighted (%)
Totals	26,559,181	100	7,181,140	100
Spousal employment				
Working	10,317,914	64.7	5,389,735	75.1
Not working	5,637,063	35.3	1,791,404	24.9
Consider self a workaholic				
No	18,468,744	70.5	4,764,202	66.3
Yes	7,717,439	29.5	2,416,938	33.7
Occupation				
Health	1,090,288	5.8	467,424	6.5
Sales/service	4,858,871	25.7	1,349,613	18.8
Trades/transport	2,516,969	13.3	1,101,001	15.3
Processing/manufacturing	1,142,331	6.1	437,736	6.1
Other	9,265,341	49.1	3,825,365	53.3
Hours worked per week				
Less than full time	6,768,850	38.7	2,362,055	32.9
Full time or more	10,716,115	61.3	4,819,085	67.1
Shift type				
Day	12,341,820	69.3	5,550,202	77.3
Evening	898,986	5.1	164,144	2.3
Night	417,512	2.3	106,816	1.5
Rotating	1,926,406	10.8	667,241	9.3
Other	2,213,539	12.4	692,737	9.6
Work-family balance				
Work-to-family spillover				
Low	13,311,367	71.5	5,349,223	74.5
High	5,306,456	28.5	1,831,917	25.5
Family-to-work spillover				
Low	17,523,420	94.2	6,824,635	95.0
High	1,077,297	5.8	356,505	5.0

Note: The GSS sample of 23,608 respondents represents 26,559,181 Canadians (excluding Territories and full-time residents of institutions). The study sample of 5,500 respondents represents 7,181,140 working Canadians (excluding Territories), married or living common-law aged between 18 and 69.

Table 3  
*Frequencies for Quality of-Life Variables for GSS Sample (N=23,608) and Study Sample (N=5,500)*

Variables	GSS survey population		Study population	
	Estimated pop.	Weighted (%)	Estimated pop.	Weighted (%)
Totals	26,559,181	100	7,181,140	100
Plan to slow down in the coming year				
No	20,267,053	78.3	5,403,807	75.2
Yes	5,625,756	21.7	1,777,333	24.8
Cut back on sleep to make more time				
Infrequently	20,105,574	77.1	5,374,869	74.8
Frequently	5,984,881	22.9	1,806,271	25.2
How often quality time with children				
Frequently	13,861,364	83.7	5,828,142	81.2
Infrequently	2,702,012	16.3	1,352,998	18.8
Worry re: time with friends				
Infrequently	23,637,801	91.2	6,481,034	90.3
Frequently	2,274,100	8.8	700,106	9.7
Worry re: time with family.				
Infrequently	10,699,143	76.2	5,664,776	78.9
Frequently	3,346,400	23.8	1,516,364	21.1
Community belonging				
Strong	17,604,425	70.0	5,157,757	71.8
Weak	7,532,803	30.0	2,023,383	28.2
Satisfied with life				
Yes	21,919,685	86.1	6,492,652	90.4
No	3,527,009	13.9	688,488	9.6
Sleep difficulties				
Yes	6,611,432	25.3	1,645,704	22.9
No	19,501,561	74.7	5,535,436	77.1
Time stress				
Low	18,596,665	73.2	5,084,153	70.8
High	6,802,782	26.8	2,096,987	29.2
Self-rated health				
Good health	22,617,670	86.6	6,574,819	91.6
Poor health	3,488,570	13.4	606,321	8.4

Note: The GSS sample of 23,608 respondents represents 26,559,181 Canadians (excluding Territories and full-time residents of institutions). The study sample of 5,500 respondents represents 7,181,140 working Canadians (excluding Territories), married or living common-law aged between 18 and 69.

Table 4  
*Demographic and Socio-Economic Determinants of Men's Self-Rated Health (N=4,235,268)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Education</b>				
Highschool or less	977,115 (88.1)	132,145 (11.9)	1,109,260 (100.0)	0.0000***
Post secondary	2,923,590 (93.5)	202,417 (6.5)	3,126,007 (100.0)	
<b>Age</b>				
18 to 49	2,587,782 (93.0)	194,328 (7.0)	2,782,109 (100.0)	0.0261*
50 to 69	1,312,924 (90.4)	140,234 (9.7)	1,453,159 (100.0)	
<b>Income</b>				
\$50,000 or more	3,020,034 (93.0)	228,620 (7.0)	3,248,654 (100.0)	0.0096**
Less than \$50,000	499,299 (87.2)	73,425 (12.8)	572,724 (100.0)	
Not reported	381,373 (92.1)	32,517 (7.9)	413,890 (100.0)	
<b>Children</b>				
No	769,482 (88.8)	96,823 (11.2)	866,305 (100.0)	0.0026**
Yes	3,131,224 (92.9)	237,739 (7.1)	3,368,962 (100.0)	

*Note.* There was a study population size of 4,235,268 men; 92.1% (or 3,900,706) rated their overall health as good, and 7.9% (or 334,562) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 5  
*Demographic and Socio-Economic Determinants of Women's Self-Rated Health (N=2,945,872)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Education</b>				
Highschool or less	613,314 (88.4)	80,472 (11.6)	693,786 (100.0)	0.0487*
Post secondary	2,060,799 (91.5)	191,287 (8.5)	2,252,086 (100.0)	
<b>Age</b>				
18 to 49	1,836,277 (92.0)	159,875 (8.0)	1,996,152 (100.0)	0.0069**
50 to 69	837,837 (88.2)	111,883 (11.8)	949,720 (100.0)	
<b>Income</b>				
\$50,000 or more	424,769 (85.5)	169,232 (8.2)	2,064,167 (100.0)	0.0088**
Less than \$50,000	1,894,934 (91.8)	71,982 (14.5)	496,751 (100.0)	
Not reported	354,409 (92.1)	30,545 (7.9)	384,954 (100.0)	
<b>Children</b>				
No	634,108 (87.9)	87,512 (12.1)	721,620 (100.0)	0.0083**
Yes	2,040,006 (91.7)	184,246 (8.3)	2,224,252 (100.0)	

*Note.* There was a study population size of 2,945,872 women; 90.8% (or 2,674,114) rated their overall health as good, and 9.2% (or 271,759) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 6  
*Demographic and Socio-Economic Determinants of Shift Workers' Self-Rated Health (N=1,630,938)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Gender</b>				
Female	522,042 (86.9)	78,508 (13.1)	600,550 (100.0)	0.0373*
Male	939,170 (91.2)	91,218 (8.9)	1,030,388 (100.0)	
<b>Education</b>				
Highschool or less	424,849 (86.4)	66,999 (13.6)	491,848 (100.0)	0.0318*
Post secondary	1,036,363 (91.0)	102,727 (9.0)	1,139,090 (100.0)	
<b>Age</b>				
18 to 49	1,015,354 (91.4)	95,952 (8.6)	1,111,306 (100.0)	0.0178*
50 to 69	445,858 (85.8)	73,774 (14.2)	519,632 (100.0)	
<b>Income</b>				
\$50,000 or more	1,052,750 (90.6)	109,294 (9.4)	1,162,044 (100.0)	0.0886
Less than \$50,000	259,813 (84.8)	46,673 (15.2)	306,486 (100.0)	
Not reported	148,649 (91.5)	13,758 (8.5)	162,407 (100.0)	
<b>Children</b>				
No	294,994 (84.5)	54,281 (15.5)	349,275 (100.0)	0.0079**
Yes	1,166,218 (91.0)	115,445 (9.0)	1,281,663 (100.0)	

*Note.* There was a study population size of 1,630,938 shift workers; 89.6% (or 1,461,212) rated their overall health as good, and 10.4% (or 169,726) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 7  
*Demographic and Socio-Economic Determinants of Day Workers' Self-Rated Health (N= 5,550,202)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Gender</b>				
Female	2,152,072 (91.8)	193,250 (8.2)	2,345,322 (100.0)	0.4818
Male	2,961,536 (92.4)	243,344 (7.6)	3,204,880 (100.0)	
<b>Education</b>				
Highschool or less	1,165,581 (88.9)	145,618 (11.1)	1,311,199 (100.0)	0.0003***
Post secondary	3,948,026 (93.1)	290,977 (6.7)	4,239,003 (100.0)	
<b>Age</b>				
18 to 49	3,408,705 (93.0)	258,251 (7.0)	3,666,956 (100.0)	0.0129*
50 to 69	1,704,903 (90.5)	178,343 (9.5)	1,883,246 (100.0)	
<b>Household income</b>				
\$50,000 or more	3,862,219 (93.1)	288,558 (7.0)	4,150,777 (100.0)	0.0006***
Less than\$50,000	664,255 (87.1)	98,733 (12.9)	762,989 (100.0)	
Not reported	587,133 (92.3)	49,304 (7.8)	636,436 (100.0)	
<b>Children</b>				
No	1,108,596 (89.5)	130,054 (10.5)	1,238,650 (100.0)	0.0020**
Yes	4,005,011 (92.9)	306,540 (7.1)	4,311,552 (100.0)	

*Note.* There was a study population size of 5,550,202 day workers; 92.1% (or 5,113,607) rated their overall health as good, and 7.9% (or 436,595) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05



Table 8  
*Work-Related Determinants of Men's Self-Rated Health (N=4,235,268)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Spousal employment</b>				
Not working	1,320,388 (91.4)	124,627 (8.6)	1,445,015 (100)	0.3535
Working	2,580,318 (92.5)	209,935 (7.5)	2,790,252 (100)	
<b>Considers self a workaholic</b>				
No	2,550,602 (92.6)	204,172 (7.4)	2,754,773 (100.0)	0.2502
Yes	1,350,104 (91.2)	130,390 (8.8)	1,480,494 (100.0)	
<b>Occupation</b>				
Sales/service	596,182 (91.1)	58,593 (9.0)	654,775 (100.0)	0.0008***
Trades/transportation	913,378 (89.6)	106,296 (10.4)	1,019,674 (100.0)	
Manufacturing, health	397,475 (89.6)	45,922 (10.4)	443,397 (100.0)	
Other	1,993,671 (94.2)	123,751 (5.8)	2,117,422 (100.0)	
<b>Hours worked per week</b>				
Less than full-time	677,281 (93.6)	46,130 (6.4)	723,410 (100.0)	0.1526
Full time or more	3,223,425 (91.8)	288,433 (8.2)	3,511,857 (100.0)	
<b>Shift types</b>				
Days	2,961,536 (92.4)	243,344 (7.6)	3,204,880 (100.0)	0.3669
Regular evening	79,929 (90.0)	8,872 (10.0)	88,801 (100.0)	
Regular night	68,572 (85.5)	11,656 (14.5)	80,228 (100.0)	
Rotating	368,996 (89.8)	42,140 (10.3)	411,136 (100.0)	
Other	421,673 (93.7)	28,550 (6.3)	450,223 (100.0)	
<b>Work-family balance</b>				
<b>Work-to-family spillover</b>				
Low	3,100,070 (93.9)	202,136 (6.1)	3,302,207 (100.0)	0.0000***
High	800,635 (85.8)	132,426 (14.2)	933,061 (100.0)	
<b>Family-to-work spillover</b>				
Low	3,747,134 (92.6)	301,080 (7.4)	4,048,213 (100.0)	0.0081**
High	153,572 (82.1)	33,483 (17.9)	187,055 (100.0)	

*Note.* There was a study population size of 4,235,268 men; 92.1% (or 3,900,706) rated their overall health as good, and 7.9% (or 334,562) rated their overall health as poor. Totals may not sum to 100% due to rounding. The occupational categories of manufacturing and health were combined due to low cell counts. The hours worked originally had four categories, but were combined into a binary variable due to low cell counts in the less than half-time category and the greater than full-time category. \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

Table 9  
*Work-Related Determinants of Women's Self-Rated Health (N=2,945,872)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Spousal employment</b>				
Not working	292,181 (84.4)	54,209 (15.7)	346,389 (100.0)	0.0060**
Working	2,381,933 (91.6)	217,550 (8.4)	2,599,483 (100.0)	
<b>Considers self a workaholic</b>				
No	1,855,995 (92.4)	153,433 (7.6)	2,009,428 (100.0)	0.0007***
Yes	818,118 (87.4)	118,326 (12.6)	936,444 (100.0)	
<b>Occupations</b>				
Sales/service	611,327 (88.0)	83,512 (12.0)	694,839 (100.0)	0.0616
Trades/transport, manufacturing	164,881 (91.9)	14,612 (8.1)	179,493 (100.0)	
Health	325,001 (89.4)	38,597 (10.6)	363,598 (100.0)	
Other	1,572,905 (92.1)	135,038 (7.9)	1,707,943 (100.0)	
<b>Hours worked per week</b>				
Less than full-time				0.8633
Full-time or more	1,489,037 (90.9)	149,608 (9.1)	1,638,645 (100.0)	
	1,185,077 (90.7)	122,151 (9.3)	1,307,227 (100.0)	
<b>Shift types</b>				
Days	2,152,072 (91.8)	193,250 (8.2)	2,345,322 (100.0)	0.0659
Regular evening	67,510 (89.6)	7,833 (10.4)	75,343 (100.0)	
Regular night	—	—	—	
Rotating	219,823 (85.8)	36,282 (14.2)	256,105 (100.0)	
Other	234,709 (87.2)	34,393 (12.8)	269,102 (100.0)	
<b>Work-family balance</b>				
<b>Work-to-family spillover</b>				
Low	1,925,647 (94.1)	121,369 (5.93)	2,047,016 (100.0)	0.0000***
High	748,467 (83.3)	150,389 (16.7)	898,856 (100.0)	
<b>Family-to-work spillover</b>				
Low	2,555,136 (92.0)	221,286 (8.0)	2,776,422 (100.0)	0.0000***
High	118,978 (70.2)	50,473 (29.8)	169,451 (100.0)	

*Note.* There was a study population size of 2,945,872 women; 90.8% (or 2,674,114) rated their overall health as good, and 9.2% (or 271,759) rated their overall health as poor. Totals may not sum to 100% due to rounding. The occupational categories of manufacturing and trades and transportation were combined due to low cell counts. The hours worked variable originally had four categories, but were be combined into a binary variable due to low cell counts in the less than half-time category and the greater than full-time category. Night shift (shift types variable) was not reported due to low cell counts.

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

Table 10  
*Work-Related Determinants of Shift Workers' Self-Rated Health (N=1,630,938)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Spousal employment</b>				
Not working	388,169 (86.5)	60,562 (13.5)	448,732 (100.0)	0.0547
Working	1,073,043 (90.8)	109,164 (9.2)	1,182,206 (100.0)	
<b>Workaholic</b>				
No	948,532 (90.4)	100,315 (9.6)	1,048,847 (100.0)	0.2655
Yes	512,680 (88.1)	69,411 (11.9)	582,092 (100.0)	
<b>Occupation</b>				
Sales/service	363,038 (89.7)	41,824 (10.3)	404,862 (100.0)	0.4790
Trades/transport	273,122 (91.7)	24,670 (8.3)	297,792 (100.0)	
Manufacturing	131,137 (84.2)	24,603 (15.8)	155,740 (100.0)	
Health	172,978 (87.7)	24,347 (12.3)	197,325 (100.0)	
Other	520,937 (90.6)	54,282 (9.4)	575,219 (100.0)	
<b>Hours worked per week</b>				
Less than full-time	462,733 (90.9)	46,282 (9.1)	509,015 (100.0)	0.3288
Full-time or more	998,479 (89.0)	123,444 (11.0)	1,121,923 (100.0)	
<b>Shift types</b>				
Regular evening	147,439 (89.8)	16,705 (10.2)	164,144 (100.0)	0.4363
Regular night	92,915 (87.0)	13,902 (13.0)	106,816 (100.0)	
Rotating	588,819 (88.3)	78,422 (11.8)	667,241 (100.0)	
Other	632,040 (91.2)	60,697 (8.8)	692,737 (100.0)	
<b>Work-family balance</b>				
<b>Work-to-family spillover</b>				
Low	1,070,914 (93.9)	70,204 (6.2)	1,141,118 (100.0)	0.0000***
High	390,298 (79.7)	99,522 (20.3)	489,820 (100.0)	
<b>Family-to-work spillover</b>				
Low	1,385,611 (91.4)	130,156 (8.6)	1,515,767 (100.0)	0.0001***
High	75,601 (65.6)	39,570 (34.4)	115,170 (100.0)	

*Note.* There was a study population size of 1,630,938 shift workers; 89.6% (or 1,461,212) rated their overall health as good, and 10.4% (or 169,726) rated their overall health as poor. Totals may not sum to 100% due to rounding. The “shift types” were included to ascertain differences between shift types for shift workers. The “other” category includes split shifts, casual shifts, irregular schedule, compressed work week, and “other” shifts. The hours worked originally had four categories, but were combined into a binary variable due to low cell counts in the less than half-time category and the greater than full-time category.

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

Table 11  
*Work-Related Determinants of Day Workers' Self-Rated Health (N=5,550,202)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
<b>Spousal employment</b>				
Not working	1,224,400 (91.2)	118,273 (8.8)	1,342,673 (100.0)	0.2899
Working	3,889,208 (92.4)	318,321 (7.6)	4,207,529 (100.0)	
<b>Workaholic</b>				
No	3,458,065 (93.1)	257,290 (6.9)	3,715,355 (100.0)	0.0066**
Yes	1,655,542 (90.2)	179,305 (9.8)	1,834,847 (100.0)	
<b>Occupation</b>				
Sales/service	844,470 (89.4)	100,280 (10.6)	944,751 (100.0)	0.0007***
Trades/transport	718,406 (89.4)	84,803 (10.6)	803,209 (100.0)	
Manufacturing	252,133 (89.4)	29,863 (10.6)	281,997 (100.0)	
Health	252,958 (96.7)	17,140 (6.4)	270,098 (100.0)	
Other	3,045,639 (93.7)	204,507 (6.3)	3,250,147 (100.0)	
<b>Hours worked per week</b>				
Less than full-time	1,703,585 (91.9)	149,456 (8.1)	1,853,041 (100.0)	0.7464
Full-time or more	3,410,022 (92.2)	287,139 (7.8)	3,697,161 (100.0)	
<b>Work-family balance</b>				
<b>Work-to-family spillover</b>				
Low	3,954,803 (94.0)	253,302 (6.0)	4,208,104 (100.0)	0.0000***
High	1,158,804 (86.3)	183,293 (13.7)	1,342,097 (100.0)	
<b>Family-to-work spillover</b>				
Low	4,916,658 (92.6)	392,209 (7.4)	5,308,867 (100.0)	0.0016**
High	196,949 (81.6)	44,385 (18.4)	241,334 (100.0)	

*Note.* There was a study population size of 5,550,202 day workers; 92.1% (or 5,113,607) rated their overall health as good, and 7.9% (or 436,595) rated their overall health as poor. Totals may not sum to 100% due to rounding. The hours worked originally had four categories, but were combined into a binary variable due to low cell counts in the less than half-time category and the greater than full-time category.

\*\*\*<0.001, \*\*<0.01, \*p<0.05

Table 12  
*Quality of Life Determinants Related to Men's Self-Rated Health (N=4,235,268)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
Plan to slow down				
Yes				
No	905,950 (87.9)	125,323 (12.2)	1,031,273 (100.0)	0.0002***
	2,994,756 (93.5)	209,239 (6.5)	3,203,994 (100.0)	
Cut back on sleep to make time	2,895,580 (92.5)	233,980 (7.5)	3,129,560 (100.0)	0.1878
Infrequently	1,005,126 (90.9)	100,582 (9.1)	1,105,708 (100.0)	
Frequently				
Quality time with children				
Frequently	3,182,396 (92.5)	257,501 (7.5)	3,439,896 (100.0)	0.1602
Infrequently	718,310 (90.3)	77,061 (9.7)	795,371 (100.0)	
Enough time with friends				
Infrequently worry	3,555,068 (92.5)	289,148 (7.5%)	3,844,215 (100.0%)	0.0654
Frequently worry	345,638 (88.4)	45,414 (11.6%)	391,053 (100.0%)	
Enough time with family				
Infrequently worry	3,161,279 (93.1)	233,596 (6.9%)	3,394,876 (100.0%)	0.0023**
Frequently worry	739,426 (88.0)	100,966 (12.0%)	840,392 (100.0%)	
Community belonging				
Strong	2,843,126(93.7)	192,695 (6.4)	3,035,822 (100.0)	0.0001***
Weak	1,057,580 (88.2)	141,867 (11.8)	1,199,446 (100.0)	
Satisfied with life				
Yes	3,612,494 (94.5)	211,197 (5.5)	3,823,691 (100.0)	0.0000***
No	288,212 (70.0)	123,365 (30.0)	411,577 (100.0)	
Sleep difficulties				
No	3,208,504 (94.2)	197,950 (5.8)	3,406,454 (100.0)	0.0000***
Yes	692,202 (83.5)	136,612 (16.5)	828,814 (100.0)	
Time stress				
Low	2,938,598 (94.0)	186,344 (6.0)	3,124,942 (100.0)	0.0000***
High	962,107 (86.7)	148,218 (13.4)	1,110,325 (100.0)	

*Note.* There was a study population size of 4,235,268 men; 92.1% (or 3,900,706) rated their overall health as good, and 7.9% (or 334,562) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 13  
*Quality of Life Determinants Related to Women's Self-Rated Health (N=2,945,872)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
Plan to slow down				
Yes	654,422 (87.7)	91,637 (12.3)	746,059 (100.0)	0.0126*
No	2,019,692 (91.8)	180,121 (8.2)	2,199,813 (100.0)	
Cut back on sleep to make time	2,062,034 (91.8)	183,275 (8.2)	2,245,309 (100.0)	0.0097**
Infrequently	612,079 (87.4)	88,483 (12.6)	700,563 (100.0)	
Frequently				
Quality time with children				0.1582
Frequently	2,179,163 (91.3)	209,083 (8.8)	2,388,246 (100.0)	
Infrequently	494,951 (88.8)	62,676 (11.2)	557,626 (100.0)	
Enough time with friends				0.7483
Infrequently worry	2,395,513 (90.9)	241,306 (9.2)	2,636,819 (100.0)	
Frequently worry	278,600 (90.2)	30,453 (9.9)	309,053 (100.0)	
Enough time with family				0.0002***
Infrequently worry	2,093,829 (92.2)	176,071 (7.8)	2,269,900 (100.0)	
Frequently worry	580,285 (85.8)	95,688 (14.2)	675,972 (100.0)	
Community belonging				0.0010**
Strong	1,954,214 (92.1)	167,721 (7.9)	2,121,935 (100.0)	
Weak	719,900 (87.4)	104,037 (12.6)	823,937 (100.0)	
Satisfied with life				0.0000***
Yes	2,481,105 (93.0)	187,856 (7.0)	2,668,961 (100.0)	
No	193,008 (69.7)	83,903 (30.3)	276,912 (100.0)	
Sleep difficulties				0.0000***
No	2,031,569 (95.4)	97,414 (4.6)	2,128,983 (100.0)	
Yes	642,545 (78.7)	174,345 (21.3)	816,890 (100.0)	
Time stress				0.0000***
Low	1,838,304 (93.8)	120,907 (6.2)	1,959,211 (100.0)	
High	835,809 (84.7)	150,852 (15.3)	986,661 (100.0)	

*Note.* . There was a study population size of 2,945,872 women; 90.8% (or 2,674,114) rated their overall health as good, and 9.2% (or 271,759) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 14  
*Quality of Life Determinants Related to Shift Workers' Self-Rated Health (N=1,630,938)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
Plan to slow down				
Yes	336,413 (85.1)	59,149 (15.0)	395,561 (100.0)	0.0084**
No	1,124,799 (91.0)	110,577 (9.0)	1,235,377 (100.0)	
Cut back on sleep to make time	1,010,825 (90.6)	104,386 (9.4)	1,115,211 (100.0)	0.1134
Infrequently	450,387 (87.3)	65,340 (12.7)	515,727 (100.0)	
Frequently				
Quality time with children				0.4314
Frequently	1,167,303 (90.0)	129,712 (10.0)	1,297,014 (100.0)	
Infrequently	293,909 (88.0)	40,014 (12.0)	333,924 (100.0)	
Enough time with friends				0.7744
Infrequently worry	1,297,996 (89.7)	149,099 (10.3)	1,447,095 (100.0)	
Frequently worry	163,216 (88.8)	20,627 (11.2)	183,843 (100.0)	
Enough time with family				0.0009***
Infrequently worry	1,132,458 (91.7)	102,040 (8.27)	1,234,498 (100.0)	
Frequently worry	328,754 (82.9)	67,686 (17.1)	396,440 (100.0)	
Community belonging				0.0002***
Strong	1,068,776 (92.3)	89,357 (7.7)	1,158,133 (100.0)	
Weak	392,436 (83.0)	80,369 (17.0)	472,805 (100.0)	
Satisfied with life				0.0000***
Yes	1,335,778 (93.0)	100,520 (7.0)	1,436,298 (100.0)	
No	125,434 (64.4)	69,206 (35.6)	194,640 (100.0)	
Sleep difficulties				0.0000***
No	1,100,372 (94.2)	67,762 (5.8)	1,168,133 (100.0)	
Yes	360,840 (78.0)	101,964 (22.0)	462,805 (100.0)	
Time stress				0.0000***
Low	1,054,576 (93.0)	79,437 (7.0)	1,134,013 (100.0)	
High	406,636 (81.8)	90,289 (18.2)	496,925 (100.0)	

*Note.* There was a study population size of 1,630,938 shift workers; 89.6% (or 1,461,212) rated their overall health as good, and 10.4% (or 169,726) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\*p<0.001, \*\*p<0.01, \*p<0.05

Table 15  
*Quality of Life Determinants Related to Day Workers' Self-Rated Health (N=5,550,202)*

Variable	Self-rated health (Good) count (%)	Self-rated health (Poor) count (%)	Total	p Value
Plan to slow down				
Yes	1,223,960 (88.6)	157,812 (11.4)	1,381,771 (100.0)	0.0002***
No	3,889,648 (93.3)	278,783 (6.7)	4,168,431 (100.0)	
Cut back on sleep to make time				
Infrequently	3,946,788 (92.7)	312,870 (7.3)	4,259,658 (100.0)	0.0526
Frequently	1,166,819 (90.4)	123,725 (9.6)	1,290,544 (100.0)	
Quality time with children				
Frequently	4,194,256 (92.6)	336,872 (7.4)	4,531,128 (100.0)	0.0793
Infrequently	919,351 (90.2)	99,723 (9.8)	1,019,074 (100.0)	
Enough time with friends				
Infrequently worry	4,652,584 (92.4)	381,354 (7.6)	5,033,939 (100.0)	0.0805
Frequently worry	461,023 (89.3)	55,240 (10.7)	516,263 (100.0)	
Enough time with family				
Infrequently worry	4,122,650 (93.1)	307,628 (7.0)	4,430,278 (100.0)	0.0010**
Frequently worry	990,957 (88.5)	128,967 (11.5)	1,119,924 (100.0)	
Community belonging				
Strong	3,728,564 (93.2)	271,060 (6.8)	3,999,624 (100.0)	0.0010**
Weak	1,385,043 (89.3)	165,535 (10.9)	1,550,578 (100.0)	
Satisfied with life				
Yes	4,757,821 (94.1)	298,532 (5.9)	5,056,354 (100.0)	0.0000***
No	355,786 (72.0)	138,062 (28.0)	493,848 (100.0)	
Sleep difficulties				
Yes	4,139,701 (94.8)	227,602 (5.2)	4,367,303 (100.0)	0.0000***
No	973,907 (82.3)	208,993 (17.7)	1,182,899 (100.0)	
Time stress				0.0000***
Low	3,722,326 (94.2)	227,813 (5.8)	3,950,140 (100.0)	
High	1,391,281 (87.0)	208,781 (13.1)	1,600,062 (100.0)	

*Note.* There was a study population size of 5,550,202 day workers; 92.1% (or 5,113,607) rated their overall health as good, and 7.9% (or 436,595) rated their overall health as poor. Totals may not sum to 100% due to rounding.

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$



Table 16  
*Predictors of Poor Self-Rated Health for Working Men, Married or Living Common-Law, Aged Between 18 and 69 (Canada, Excluding the Territories)*

Predictor Variables	Beta Coeff ( $\beta$ )	p Value	AOR ( $e^{\beta}$ )	95% CI
Demographic and socio-economic variables				
Education				
Highschool or less	0.57	0.0007	1.77	[1.27, 2.46]
Age				
50 - 69	0.32	0.1219	1.37	[0.92, 2.05]
Household income per year				
Less than \$50,000	0.29	0.1816	1.33	[0.87, 2.04]
Not provided	-0.01	0.9741	0.99	[0.56, 1.75]
Children				
No children	0.35	0.0927	1.43	[0.94, 2.16]
Work-related variables				
Spousal employment				
Not working	-0.03	0.8585	0.97	[0.69, 1.36]
Consider self a workaholic				
Yes	-0.18	0.3217	0.83	[0.58, 1.19]
Occupation				
Health, manufacturing	0.42	0.0824	1.52	[0.95, 2.45]
Sales and service	0.50	0.0313	1.65	[1.05, 2.59]
Trades and transport	0.46	0.0190	1.58	[1.08, 2.33]
Hours worked per week				
Full-time or more	0.09	0.7022	1.09	[0.70, 1.70]
Shift configuration				
Shift work	-0.01	0.9479	0.99	[0.66, 1.48]
Work-family balance				
Work-to-family spillover				
High	0.31	0.1634	1.36	[0.88, 2.09]
Family-to-work spillover				
High	0.10	0.7833	1.10	[0.55, 2.18]
Quality of life variables				
Plan to slow down				
Yes	0.43	0.0218	1.53	[1.06, 2.21]
Sense of belonging to community				
Weak attachment	0.42	0.0102	1.53	[1.11, 2.11]
Life satisfaction				
Low	1.61	0.0000	5.00	[3.25, 7.69]
Sleep difficulties				
Yes	0.78	0.0000	2.18	[1.53, 3.12]
Time stress				
High	0.31	0.1700	1.36	[0.87, 2.13]
Intercept	-4.15	0.0000	0.02	[0.01, 0.03]
Cox and Snell $R^2$	.08			

Note: The logistic regression model for poor self-rated health was based on a survey sample of 2,986 Canadian men. Of those respondents, 244 rated their health as poor. AOR = adjusted odds ratio; odds ratio for the following reference categories is "1.0": post secondary; 18-49;  $\geq$ \$50,000; presence of children; spouse employed; not a workaholic; 'other' occupations (management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry); <f/t hours; days and 'other' (regular days, on-call or casual, irregular, other); low work-to-family spillover; low family-to-work spillover; no plans to slow down; strong community attachment; high life satisfaction; no sleep difficulties; low time stress.

Table 17  
*Predictors of Poor Self-Rated Health (GSS 2006) for Working Women, Married or Living Common-Law, Aged Between 18 and 69 (Canada, Excluding the Territories)*

Predictor Variables	Beta Coeff ( $\beta$ )	p Value	AOR ( $e^{\beta}$ )	95% CI
Demographic and socio-economic variables				
Education				
Highschool or less	0.08	0.6779	1.08	[0.74, 1.59]
Age				
50 - 69	0.36	0.1062	1.44	[0.93, 2.24]
Household income per year				
Less than \$50,000	0.49	0.0238	1.64	[1.07, 2.52]
Not provided	0.12	0.6892	1.12	[0.64, 1.99]
Children				
No children	0.12	0.6160	1.12	[0.71, 1.77]
Work-related variables				
Spousal employment				
Not working	0.19	0.5032	1.21	[0.70, 2.08]
Consider self a workaholic				
Yes	0.15	0.4237	0.89	[0.64, 1.26]
Occupation				
Health	0.23	0.4056	1.26	[0.73, 2.17]
Sales/service	0.28	0.1768	1.32	[0.88, 1.99]
Trades/transport,manufacturing	-0.18	0.6554	0.83	[0.37, 1.87]
Hours worked/week				
Full-time or more	-0.11	0.5199	0.89	[0.64, 1.26]
Shift configuration				
Shift work	0.16	0.4993	1.17	[0.74, 1.84]
Work-family balance				
Work-to-family spillover				
High	0.63	0.0007	1.89	[1.31, 2.71]
Family-to-work spillover				
High	0.83	0.0026	2.29	[1.34, 3.92]
Quality of life variables				
Plan to slow down				
Yes	0.02	0.9069	1.02	[0.70, 1.49]
Cut back on sleep to make time				
Frequently	-0.30	0.1515	0.74	[0.50, 1.11]
Sense of belonging to community				
Weak attachment	0.22	0.2255	1.25	[0.87, 1.79]
Life satisfaction				
Low	1.16	0.0000	3.19	[2.16, 4.17]
Sleep difficulties				
Yes	1.43	0.0000	4.18	[2.99, 5.85]
Time stress				
High	0.33	0.1034	1.39	[0.87, 2.13]
Intercept	-4.03	0.0000	0.02	[0.01, 0.03]
Cox and Snell $R^2$	0.11			

Note: The logistic regression model for poor self-rated health was based on a sample of 2,514 Canadian women. Of those respondents, 240 rated their health as poor. AOR = adjusted odds ratio; odds ratio for the following reference categories is "1.0": post secondary; 18-49;  $\geq$ \$50,000; presence of children; spouse employed; not a workaholic; 'other' occupations (management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry);  $<$ f/t hours; days and 'other' (regular days, on-call or casual, irregular, other); low work-to-family spillover; low family-to-work spillover; no plans to slow down; infrequently cut back on sleep to make time; strong community attachment; high life satisfaction; no sleep difficulties; low time stress.

Table 18  
*Predictors of Poor Self-Rated Health (GSS 2006) for Shift Workers, Married or Living Common-Law, Aged Between 18 and 69 (Canada, Excluding the Territories)*

Predictor Variables	Beta Coeff ( $\beta$ )	p Value	AOR ( $e^{\beta}$ )	(95% CI)
<b>Social economic and demographic variables</b>				
Gender				
Female	0.27	0.2911	1.31	[0.79, 2.18]
Education				
Highschool or less	0.39	0.1294	1.77	[1.27, 2.46]
Age				
50 - 69	0.70	0.0330	2.02	[1.06, 3.85]
Household income per year				
Less than \$50,000	0.44	0.1704	1.56	[0.83, 2.94]
Not provided	0.14	0.7317	1.15	[0.52, 2.56]
Children				
No children	0.15	0.6642	1.16	[0.59, 2.30]
<b>Work-related variables</b>				
Spousal employment				
Not working	-0.03	0.8585	1.04	[0.60, 1.81]
Consider self a workaholic				
Yes	-0.18	0.3217	0.80	[0.48, 1.33]
Occupation				
Health	0.35	0.3684	1.42	[0.66-3.06]
Sales/service	-0.00	0.9926	1.00	[0.54, 1.84]
Trades/transport	-0.46	0.2532	0.63	[0.28, 1.39]
Manufacturing	0.55	0.1354	1.74	[0.84, 3.59]
Hours worked/week				
Full-time or more	0.32	0.2398	1.38	[0.81, 2.36]
<b>Work-family balance</b>				
Work-to-family spillover				
High	0.62	0.0196	1.85	[1.10, 3.10]
Family-to-work spillover				
High	0.98	0.0026	2.67	[1.41, 5.04]
<b>Quality of life variables</b>				
Plan to slow down in next year				
Yes	0.40	0.0950	1.49	[0.93, 2.37]
Sense of belonging to community				
Weak attachment	0.68	0.0098	1.97	[1.18, 3.30]
Life satisfaction				
Low	1.40	0.0000	4.06	[2.37, 6.96]
Sleep difficulties				
Yes	1.10	0.0000	3.01	[1.83, 4.96]
Time stress				
High	0.22	0.4191	1.24	[0.73, 2.10]
Intercept	-4.61	0.0000	0.01	[0.00, 0.02]
Cox and Snell $R^2$	.14			

Note: The logistic regression model for poor self-rated health was based on a sample of 1,308 shift workers. Of those respondents, 140 rated their health as poor. stress. AOR = adjusted odds ratio; odds ratio for the following reference categories is "1.0": post secondary; 18-49;  $\geq$ \$50,000; presence of children; spouse employed; not a workaholic; 'other' occupations (management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry);  $<$ f/t hours; days and 'other' (regular days, on-call or casual, irregular, other); low work-to-family spillover; low family-to-work spillover; no plans to slow down; strong community attachment; high life satisfaction; no sleep difficulties; low time stress.

Table 19  
*Predictors of Poor Self-Rated Health (GSS 2006) for Day Workers, Married or Living Common-Law, Aged Between 18 and 69 (Canada, Excluding the Territories)*

Predictor Variables	Beta Coeff ( $\beta$ )	p Value	AOR ( $e^{\beta}$ )	(95% CI)
Demographic and socio-economic variables				
Gender				
Female	-0.05	0.7423	0.95	[0.68, 1.31]
Education				
Highschool or less	0.36	0.0182	1.43	[1.06, 1.93]
Age				
50 - 69	0.26	0.1248	1.29	[0.93, 1.79]
Household income per year				
Less than \$50,000	0.32	0.0610	1.38	[0.99, 1.93]
Not provided	0.04	0.8739	1.04	[0.66, 1.64]
Children				
No children	0.26	0.1514	1.30	[0.91, 1.85]
Work-related variables				
Spousal employment				
Not working	0.02	0.9100	0.95	[0.68, 1.31]
Consider self a workaholic				
Yes	0.00	0.9885	1.00	[0.74, 1.35]
Occupation				
Health	-0.04	0.8949	0.96	[0.51, 1.79]
Sales/service	0.54	0.0017	1.71	[1.22, 2.40]
Trades/transport	0.61	0.0020	1.83	[1.25, 2.69]
Manufacturing	0.42	0.1696	1.52	[0.84, 2.76]
Hours worked/week				
Full-time or more	-0.22	0.1687	0.81	[0.59, 1.10]
Work-family balance				
Work-to-family spillover				
High	0.40	0.0206	1.50	[1.06, 2.10]
Family-to-work spillover				
High	0.21	0.4944	1.23	[0.68, 2.22]
Quality of life variables				
Plan to slow down in next year				
Yes	0.24	0.1148	1.27	[0.94, 1.72]
Sense of belonging to community				
Weak attachment	0.22	0.1278	1.25	[0.94, 1.67]
Life satisfaction				
Low	1.41	0.0000	4.08	[2.84, 5.87]
Sleep difficulties				
Yes	1.06	0.0000	2.88	[2.18, 3.80]
Time stress				
High	0.31	0.0861	1.36	[0.96, 1.95]
Intercept	-3.83	0.0000	0.02	[0.01-0.03]
Cox and Snell R <sup>2</sup>	0.08			

Note: The logistic regression model for poor self-rated health was based on a sample 4,192 day workers. Of those respondents, 344 rated their health as poor. AOR = adjusted odds ratio; odds ratio for the following reference categories is "1.0": post secondary; 18-49;  $\geq$ \$50,000; presence of children; spouse employed; not a workaholic; 'other' occupations (management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry);  $<$ f/t hours; days and 'other' (regular days, on-call or casual, irregular, other); low work-to-family spillover; low family-to-work spillover; no plans to slow down; strong community attachment; high life satisfaction; no sleep difficulties; low time stress.

**APPENDICES**

## Appendix A

*Questions used for this Study from the General Social Survey, Cycle 20*

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## Outcome Variable

In general, would you say your health is:

This question refers to long term health, i.e., a condition lasting or expected to last more than 6 months.

1. excellent?
2. very good?
3. good?
4. fair?
5. poor?
6. don't know
7. refusal

## Demographic and Socio-economic Information

1) What is (*fill member1's name*)'s age?

Enter a value between 0 and 130.

2) Male or female?

1. male
2. female

3) What is your marital status?

1. married
2. living common-law
3. widowed
4. separated
5. divorced
6. single, never married

4) Number of respondent's child(ren) living in the household (any age or marital status).

0. none
1. one child
2. two children
3. three children
4. four or more children

5) What is your best estimate of the total income, before deductions, of all household members from all sources during the past 12 months? Was the total household income:

1. less than \$50,000?
2. \$50,000 and more?
3. don't know
4. refusal

## Work-Related Information

1) During the past 12 months, was your main activity working at a paid job or business, looking for paid work, going to school, caring for children, household work, retired or something else?

1. working at a paid job or business

## Appendix A (continued)

- 
2. looking for paid work
  3. going to school
  4. caring for children
  5. household work
  6. retired
  7. maternity/paternity leave
  8. long term illness
  9. other - Specify
  10. don't know
  11. refusal
- 2) During the past 12 months, was your spouse's/partner's main activity working at a paid job or business, looking for paid work, going to school, caring for children, household work, retired or something else?
- 1 working at a paid job or business
  - 2 looking for paid work
  - 3 going to school
  - 4 caring for children
  - 5 household work
  - 6 retired
  - 7 maternity/paternity leave
  - 8 long term illness
  - 9 other – Specify
  10. don't know
  11. refusal
- 3) Do you consider yourself a workaholic?
- 1 yes
  - 2 no
  3. don't know
  4. refusal
- 4) Standard Occupational Classification (1991) of the respondent - 10 categories.
1. management occupations
  2. business, finance and administrative occupations
  3. natural and applied sciences health occupations
  5. occupations in social science, education
  6. artistic/culture/recreation/sport
  7. sales and services occupations
  8. trades, transport and equipment
  9. occupations unique to primary industry
  10. occupations unique to processing and manufacturing
  11. not asked
  12. not stated
  13. don't know
- 5) Which of the following best describes the hours you usually work at your main job? Is it:
1. a regular daytime schedule or shift?
  2. a regular evening shift?
  3. a regular night shift?
  4. a rotating shift? (one that changes periodically from days to evenings or to nights)
  5. a split shift? (one consisting of two or more distinct periods each day)

## Appendix A (continued)

- 
6. a compressed work week?
  7. on call or casual?
  8. an irregular schedule?
  9. other
  10. don't know
  11. refusal

6) What are the number of hours respondent usually works at all jobs in a week?

1. 0-74 hours
2. 75 or more hours
3. not asked
4. not stated
5. don't know

Work-family balance was measured by work-to-family spillover and family-work spillover.

*Two questions were combined to measure work-to-family spillover.*

7) In the past 12 months how often have you come home from work too tired to do the chores that needed to be done? Was it:

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not applicable
6. not stated
7. don't know

8) In the past 12 months how often has it been difficult to fulfill family responsibilities because of the amount of time you spent on your job? (Please include responsibilities concerning your spouse and child(ren), if it applies, as well as your own parents, siblings and other related persons.) Was it:

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not applicable
6. not stated
7. don't know

*Two questions were combined to measure family-to-work spillover.*

9) In the past 12 months how often have you arrived at work too tired to function well because of the household work you had done? Was it:

1. all of the time?
2. most of the time?
3. sometimes
4. never?
5. not applicable
6. not stated
7. don't know

10) In the past 12 months how often has it been difficult to concentrate or fulfill your work responsibilities because of your family responsibilities? (Please include responsibilities concerning your spouse and child(ren), if it applies, as well as your own parents, siblings and other related persons.) Was it:



Appendix A (continued)

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1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not applicable
6. not stated
7. don't know

## Quality of Life Information

1) Do you plan to slow down in the coming year?

1. yes
2. no
3. not stated
4. don't know

2) In the past 12 months when you needed more time, how often did you cut back on your sleep?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

3) In the past 12 months how often did you feel that the time spent with your child(ren) was good quality time?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not asked
6. not stated
7. don't know

4) In the past 12 months how often did you worry that you were not spending enough time with your friends?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

*Two questions were combined to measure time with family.*

5) In the past 12 months how often did you worry that you were not spending enough time with your spouse/partner?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not asked
6. not stated
7. don't know

## Appendix A (continued)

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6) In the past 12 months how often did you worry that you were not spending enough time with your child(ren)?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not asked
6. not stated
7. don't know

7) How would you describe your sense of belonging to your local community? Would you say it is:

1. very strong?
2. somewhat strong?
3. somewhat weak?
4. very weak?
5. no opinion
8. not stated
9. don't know

8) Please rate your feelings, using a scale of 1 to 10 where 1 means "very dissatisfied" and 10 means "very satisfied". How do you feel about your life as a whole right now?

1. very dissatisfied
- ↓
10. very satisfied
11. no opinion
12. not stated
13. don't know

9) Do you regularly have trouble going to sleep or staying asleep?

1. yes
2. no
3. not stated
4. don't know

*Six questions were combined to create a measure of time stress.*

10) In the past 12 months how often did you feel you had not accomplished what you had set out to do during the day?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

11) In the past months how often did you feel under stress trying to accomplish more than you can handle?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

12) In the past 12 months how often did you feel trapped in a daily routine?

Appendix A (continued)

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1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

13) In the past 12 months how often did you feel you did not have time for fun?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

14) In the past 12 months how often did you feel under stress because you did not have enough time?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

15) In the past 12 months how often would you have liked to spend more time alone?

1. all of the time?
2. most of the time?
3. sometimes?
4. never?
5. not stated
6. don't know

**Appendix B***Factor analysis results*

Pattern Matrix<sup>a</sup>

	Component			
	1	2	3	4
Timestress stressed	.733			
Timestress no time	.724			
Timestress trapped	.667			
Timestress accomplish	.662			
Timestress no fun	.623			
Timestress more time alone	.521			
Time with children		.831		
Time with spouse		.801		
Time with friends		.407		
Quality Time with children			-.726	
Workaholic			.513	.424
Timestress sleep				
Slow down in next year				.909

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 16 iterations.

Appendix C

*Bivariate Correlations for Men's Predictor Variables (N=2,986)*

Variables	Education	Age	\$50,000 or more	Less than \$50,000	Not reported	Presence of children	Spousal employment
Education	1	.037**	-.172**	.169**	.051**	.154**	.028**
Age		1	.000	-.036**	.042**	.467**	-.072**
\$50,000 or more			1	-.718**	-.130**	-.016**	-.149**
Less than \$50,000				1	-.597	.022**	.145**
Not reported					1	-.002	.045**
Presence of children						1	-.015**
Spousal employment							1
Sales/service							
Trades/transport							
Manufacturing/Health							
Other							
Workaholism							
Hours worked							
Shift-configuration							
Work-to-family spillover							
Family-to-work spillover							
Plan to slow down							
Belonging to community							
Life satisfaction							
Sleep difficulties							
Self-rated health							

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix C  
*Bivariate Correlations for Men's Predictor Variables (N=2,986)*

Variables	Sales and service	Trades and transport	Manufacturing and health	Other	Workaholism	Hours worked	Shift-configuration	Work-to-family spillover
Education	.034**	.164**	.063**	-.024**	.082**	.032**	.079**	.015**
Age	-.030**	.009**	-.036**	.036**	.000	-.070**	-.046**	-.062**
\$50,000 or more	-.028**	-.097**	-.047**	.133**	-.002**	.003**	-.012**	-.039**
Less than \$50,000	.017**	.053**	.031**	-.133**	.011**	-.020**	.050**	.051**
Not reported	.004**	.027**	.026**	-.036**	-.011**	.019**	-.041**	-.003**
Presence of children	.000	.010**	-.006**	-.005**	.027**	-.065**	-.010**	-.047**
Spousal employment	-.045**	.008**	-.028**	.043**	-.034**	.019**	.013**	.031**
Sales/service	1	-.241**	-.146**	-.427**	-.019**	-.007**	.075**	-.031**
Trades/transport		1	-.193**	-.563**	.050**	.088**	.034**	.032**
Manufacturing/health			1	-.342**	-.017	.041**	.122**	.027**
Other				1	-.018**	-.095**	-.158**	-.021**
Workaholism					1	.141**	.003**	.188**
Hours worked						1	.008**	.108**
Shift-configuration							1	.064**
Work-to-family spillover								1
Family-to-work spillover								
Plan to slow down								
Belonging to community								
Life satisfaction								
Sleep difficulties								
Self-rated health								

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

## Appendix C

*Bivariate Correlations for Men's Predictor Variables (N=2,986)*

Variables	Family-to-work spillover	Plan to slow down	Belonging to community	Life satisfaction	Sleep difficulties	Time stress	Self-rated health
Education	.019**	.027**	-.013**	-.002**	.019**	.020**	.088**
Age	-.040**	.134**	-.044**	-.026**	.027**	-.076**	.047**
\$50,000 or more	-.060**	.019**	-.011**	-.085**	.019**	-.036**	-.058**
Less than \$50,000	.050**	-.028**	.005**	.091**	.031**	.044**	.072**
Not reported	.028**	.006**	.010**	.016**	-.063**	.000	.000
Presence of children	-.053**	.102**	-.037**	-.041**	.048**	-.074**	.061**
Spousal employment	.057**	-.007**	.046**	.077**	-.012**	.008**	.020**
Sales/service	-.017**	.017**	-.043**	-.028**	-.014**	-.009**	.017**
Trades/transport	.042**	.044**	-.002**	.013**	.001**	-.016**	.053**
Manufacturing/health	.005**	-.002**	.009**	.040**	.012**	.016**	.031**
Other	-.027**	-.049**	.027**	-.015**	.002**	.010**	-.076**
Workaholism	.083**	.073**	.007**	.058**	.098**	.269**	.025**
Hours worked	.070**	-.030**	.023**	.046**	-.005**	.133**	.026**
Shift-configuration	.057**	-.015**	.020**	.040**	.085**	.025**	.020**
Work-to-family spillover	.275**	.092**	.097**	.229**	.137**	.452**	.124**
Family-to-work spillover	1	.063**	.045**	.176**	.085**	.251**	.081**
Plan to slow down		1	-.044**	.065**	.066**	.110**	.089**
Belonging to community			1	.151**	.078**	.125**	.091**
Life satisfaction				1	.163**	.228**	.029**
Sleep difficulties					1	.192**	.157**
Self-rated health						1	1

Note. \* $p < 0.05$  two-tailed test, \*\* $p < 0.01$ , two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

## Appendix D

*Bivariate Correlations for Women's Predictor Variables (N=2,514)*

Variables	Education	Age	\$50,000 or more	Less than \$50,000	Not reported	Presence of children	Spousal employment
Education	1	.107**	-.186**	.199**	.032**	.150**	.074**
Age		1	-.117**	.019**	.138**	.524**	.273**
\$50,000 or more			1	-.689**	-.593**	-.132**	-.208**
Less than \$50,000				1	-.175**	.117**	.184**
Not reported					1	.050**	.078**
Presence of children						1	.204**
Spousal employment							1
Sales/service							
Trades/transport and manufacturing							
Health							
Other							
Workaholism							
Hours worked							
Shift-configuration							
Work-to-family spillover							
Family-to-work spillover							
Plan to slow down							
Cut back on sleep							
Belonging to community							
Life satisfaction							
Sleep difficulties							
Time stress							
Self-rated health							

continued

Note. \* $p < 0.05$  two-tailed test, \*\* $p < 0.01$ , two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.



## Appendix D

*Bivariate Correlations for Women's Predictor Variables (N=2,514)*

Variables	Sales and service	Trades/ transport and manufacturing	Health	Other	Workaholism	Hours worked	Shift-configuration	Work-to-family spillover
Education	.199**	.136**	-.152**	-.135**	.032**	.034**	.034**	-.037**
Age	.010**	-.003**	-.001	-.006**	.053**	-.033**	.021**	-.053**
\$50,000 or more	-.176**	-.110**	.096**	.140**	-.208**	.049**	-.011**	.043**
Less than \$50,000	.196**	.106**	-.081**	-.166**	-.006**	-.014**	.079**	-.063**
Not reported	.021**	.032**	-.041**	-.006**	.022**	-.050**	.013**	-.063**
Presence of children	.055**	-.008**	-.045**	-.014**	.030**	-.071**	-.002**	-.067**
Spousal employment	.052**	.064**	-.028**	-.056**	.049**	-.041**	.042**	.047**
Sales/service	1	-.142**	-.208**	-.653**	.013**	-.011**	.110**	-.003**
Trades/transport and manufacturing		1	-.096**	-.299**	.032**	.156**	.051**	.025**
Health			1	-.441**	-.028**	-.130**	.192**	.034**
Other				1	-.008**	.020**	-.247**	-.032**
Workaholism					1	.194**	.052**	.170**
Hours worked						1	.194**	-.130**
Shift-configuration							1	.059**
Work-to-family spillover								1
Family-to-work spillover								
Plan to slow down								
Cut back on sleep								
Belonging to community								
Life satisfaction								
Sleep difficulties								
Self-rated health								

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix D  
*Bivariate Correlations for Women's Predictor Variables (N=2,514)*

Variables	Family-to-work spillover	Time stress	Plan to slow down	Cut back on sleep	Belonging to community	Life satisfaction	Sleep difficulties	Self-rated health
Education	-.012**	-.059**	.034**	-.038**	-.016	.018**	.071**	.046**
Age	-.041**	-.118**	.078**	-.092**	-.052**	-.012**	.061**	.061**
\$50,000 or more	-.019**	.037**	-.019**	.034**	.014**	-.035**	.050**	-.054**
Less than \$50,000	.046**	.022**	.026**	-.010**	.035**	.057**	-.004**	.082**
Not reported	-.026**	-.075**	-.003**	-.034**	-.058**	-.015**	-.063**	-.017**
Presence of children	-.040**	-.098**	.105**	-.100**	-.018**	-.006**	.076**	.057**
Spousal employment	.027**	.030**	.057**	-.001*	.028**	.078**	.035**	.081**
Sales/service	.026**	-.004**	-.015**	-.032**	-.042**	.029**	.028**	.054**
Trades/transport and manufacturing	-.007	.005	-.025**	.034**	.020**	.063**	-.037**	-.010
Health	-.018**	-.005**	.013**	.012**	.005**	.014**	.020**	.018**
Other	-.007**	.005**	.017**	.002**	.024**	-.065**	-.019**	-.054**
Workaholism	.094**	.234**	.155**	.252**	.019**	.072**	.107**	.080**
Hours worked	.041**	.123**	.002**	.154**	.021**	.050**	.013**	.004**
Shift-configuration	.053**	.010**		.064**	-.008**	.049**	.064**	.067**
Work-to-family spillover	.265**	.411**	.097**	.244**	.108**	.160**	.161**	.172**
Family-to-work spillover	1	.234**	.118**	.167**	.012**	.138**	.119**	.176**
Time stress		1	.128**	.313**	.141**	.210**	.165**	.149**
Plan to slow down			1	.047**	.007**	.051**	.063**	.062**
Cut back on sleep				1	.062**	.096**	.192**	.066**
Belonging to community					1	.121**	.075**	.073**
Life satisfaction						1	.158**	.235**
Sleep difficulties							1	.259**
Self-rated health								1

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

## Appendix E

*Bivariate Correlations for Shift Workers' Predictor Variables (N=1,308)*

Variables	Gender	Education	Age	\$50,000 or more	Less than \$50,000	Not reported	Presence of children	Spousal employment
Gender	1	-.063**	.038**	-.133**	.076**	.101**	.053**	-.224**
Education		1	.062**	-.135**	.124**	.042**	.122**	.021**
Age			1	-.055**	.012**	.067**	.502**	.038**
\$50,000 or more				1	.757**	-.524**	-.097**	-.171**
Less than \$50,000					1	-.160**	.098**	.201**
Not reported						1	.018**	-.004**
Presence of children							1	.065**
Spousal employment								1
Sales/service								
Trades/transport								
Manufacturing								
Health								
Other								
Workaholism								
Hours worked								
Work-to-family spillover								
Family-to-work spillover								
Plan to slow down								
Belonging to community								
Life satisfaction								
Sleep difficulties								
Self-rated health								

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix E

*Bivariate Correlations for Shift Workers' Predictor Variables (N=1,308)*

Variables	Sales and service	Trades and transport	Manufacturing	Health	Other	Workaholism	Hours worked
Gender	.141**	-.285**	-.127**	.298**	-.022**	.014**	-.415**
Education	.099**	.108**	.049**	-.217**	-.060**	.088**	.079**
Age	.011**	-.011**	-.022**	-.019**	.026**	.048**	-.033**
\$50,000 or more	-.192**	.035**	.021**	.098**	.065**	.000	.143**
Less than \$50,000	.207**	-.046**	-.037**	-.085**	-.070**	.020**	-.114**
Not reported	.019**	.007**	.017**	-.038**	-.008**	-.026**	-.067**
Presence of children	.038**	.011**	-.020**	-.035**	-.007**	.054**	-.065**
Spousal employment	.017**	.094**	-.010**	-.090**	-.023**	.003**	.070**
Sales/service	1	-.272**	-.187**	-.213**	-.424**	.010**	-.114**
Trades/transport		1	-.154**	-.175**	-.349**	-.004**	.174**
Manufacturing			1	-.121**	-.240**	-.059**	.160**
Health				1	-.274**	-.066**	-.267**
Other					1	.076**	.046**
Workaholism						1	.157**
Hours worked							1
Work-to-family spillover							
Family-to-work spillover							
Plan to slow down							
Belonging to community							
Life satisfaction							
Sleep difficulties							
Self-rated health							

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix E  
*Bivariate Correlations for Shift Workers' Predictor Variables (N=1,308)*

Variables	Work-to-family spillover	Family-to-work spillover	Plan to slow down	Belonging to community	Life satisfaction	Sleep difficulties	Self-rated health
Gender	.097**	.034**	.032**	-.028**	.007**	.085**	.067**
Education	-.007**	.017**	-.012**	.035**	.031**	.101**	.069**
Age	-.029**	-.031**	.120**	-.010**	.025**	-.011**	.085**
\$50,000 or more	.010**	-.030**	.030**	.045**	-.056**	.021**	-.052**
Less than \$50,000	.017**	.066**	-.039**	-.034**	.091**	.027**	.076**
Not reported	-.037**	-.040**	.005**	-.023**	-.034**	-.068**	-.021**
Presence of children	-.035**	-.017**	.128**	-.003**	.013**	.084**	.088**
Spousal employment	.030**	.108**	-.014**	.085**	.114**	.042**	.062**
Sales/service	-.045**	.018**	-.049**	-.082**	-.010**	.000	-.001**
Trades/transport	.013**	.010**	.018**	.054**	.067**	-.035**	-.033**
Manufacturing	-.017**	-.004**	-.058**	.028**	.042**	.011**	.057**
Health	.092**	-.023**	.038**	.008**	-.012**	.029**	.023**
Other	-.022**	-.006**	.040**	.007**	-.063**	.002**	-.023**
Workaholism	.185**	.079**	.067**	-.005**	.037**	.100**	.037**
Hours worked	.085**	.047**	-.011**	.005**	.060**	-.017**	.029**
Work-to-family spillover	1	.325**	.084**	.112**	.226**	.224**	.213**
Family-to-work spillover		1	.096**	.000	.182**	.150**	.216**
Plan to slow down			1	-.017**	.048**	.013**	.084**
Belonging to community				1	.167**	.091**	.138**
Life satisfaction					1	.168**	.303**
Sleep difficulties						1	.240**
Self-rated health							1

Note. \* $p < 0.05$  two-tailed test, \*\* $p < 0.01$ , two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix F

*Bivariate Correlations for Day Workers' Predictor Variables (N=4,192)*

Variables	Gender	Education	Age	\$50,000 or more	Less than \$50,000	Not reported	Presence of children	Spousal employment
Gender	1	-.017**	-.040**	-.059**	.040**	.037**	.045**	-.262**
Education		1	.068**	-.186**	.196**	.042**	.161**	.054**
Age			1	-.047**	-.020**	.086**	.485**	.043**
\$50,000 or more				1	-.688**	-.620**	-.064**	-.130**
Less than \$50,000					1	-.144**	.057**	.113**
Not reported						1	.025**	.054**
Presence of children							1	.037**
Spousal employment								1
Sales/service								
Trades/transport								
Manufacturing								
Health								
Other								
Workaholism								
Hours worked								
Work-to-family spillover								
Family-to-work spillover								
Plan to slow down								
Belonging to community								
Life satisfaction								
Sleep difficulties								
Self-rated health								

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix F

*Bivariate Correlations for Day Workers' Predictor Variables (N=4,192)*

Variables	Sales and service	Trades and transport	Manufacturing	Health	Other	Workaholism	Hours worked
Gender	.096**	-.292**	-.082**	.170**	.097**	-.045**	-.400
Education	.097**	.137**	.153**	-.084**	-.204**	.053**	.029**
Age	-.021**	.021**	-.009**	-.013**	.011**	.015**	-.040**
\$50,000 or more	-.071**	-.080**	-.119**	.049**	.143**	-.003**	.027**
Less than \$50,000	.076**	.090**	.117**	-.045**	-.155**	-.005**	-.010**
Not reported	.014**	.012**	.035**	-.017**	-.027**	.010**	-.026**
Presence of children	.029	-.016**	.014**	-.023**	-.006**	.019**	-.085**
Spousal employment	-.058**	.083**	.007**	-.048**	.003**	.000	.107**
Sales/service	1	-.186**	-.105**	-.102**	-.538**	-.017**	-.031**
Trades/transport		1	-.095**	-.093**	-.489**	.073**	.184**
Manufacturing			1	-.052**	-.275**	.024**	.124**
Health				1	-.269**	-.027**	-.152**
Other					1	-.038**	-.097**
Workaholism						1	.165**
Hours worked							1
Work-to-family spillover							
Family-to-work spillover							
Plan to slow down							
Belonging to community							
Life satisfaction							
Sleep difficulties							
Self-rated health							

continued

Note. \*p < 0.05 two-tailed test, \*\*p < 0.01, two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.

Appendix F  
*Bivariate Correlations for Day Workers' Predictor Variables (N=4,192)*

Variables	Work-to-family spillover	Family-to-work spillover	Plan to slow down	Belonging to community	Life satisfaction	Sleep difficulties	Self-rated health
Gender	-.100	.035	.005	.003**	-.006**	.105**	.012**
Education	-.016**	-.005	.043**	-.030**	-.007**	.011**	.067**
Age	-.069**	-.043**	.108**	-.058**	-.034**	.057**	.043**
\$50,000 or more	-.012**	-.046**	-.008**	-.013**	-.064**	.031**	-.058**
Less than \$50,000	.035**	.038**	.008**	.034**	.067**	.011**	.075**
Not reported	-.021**	.021**	.002**	-.019**	.014**	-.053**	-.002**
Presence of children	-.055**	-.055**	.097**	-.036**	-.039**	.060**	.052**
Spousal employment	.001	.005**	.018**	.025**	.059**	-.044**	.020**
Sales/service	-.001*	-.004**	.022**	-.031**	-.006**	.014**	.046**
Trades/transport	-.006**	.026**	.026**	-.010**	-.003**	-.038**	.041**
Manufacturing	.002**	-.013**	.010**	.007**	.044**	-.018**	.023**
Health	.017**	-.010**	.001**	-.015**	.008**	.015**	-.013**
Other	-.003**	-.005**	-.040**	.034**	-.016**	.018**	-.069**
Workaholism	.171**	.089**	.118**	.017**	.072**	.096**	.050**
Hours worked	.057**	.033**	-.020**	.027**	.040**	-.043**	-.005**
Work-to-family spillover	1	.249**	.099**	.097**	.184**	.128**	.122**
Family-to-work spillover		1	.087**	.041**	.147**	.080**	.084**
Plan to slow down			1	-.025	.063**	.083**	.076**
Belonging to community				1	.129**	.070**	.065**
Life satisfaction					1	.152**	.234**
Sleep difficulties						1	.190**
Self-rated health							1

Note. \* $p < 0.05$  two-tailed test, \*\* $p < 0.01$ , two-tailed test. "Other" occupations include management, business and finance, applied and natural sciences, social sciences and education, art, recreation and sport, primary industry.



## Appendix G

*Collinearity Diagnostics for Men (Tolerance and Variance Inflation Factors) (N=2,986)*

Coefficients<sup>a</sup>

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Sleep difficulties	.917	1.091
	Spousal employment	.952	1.051
	life satisfaction	.858	1.166
	WtoF chores	.708	1.413
	WtoF responsibilities	.684	1.462
	FtoW chores	.814	1.228
	FtoW family responsibilities	.808	1.238
	Timestress sleep	.815	1.226
	presence of children	.753	1.329
	Workaholic	.871	1.148
	Slow down in next year	.941	1.063
	Time with friends	.904	1.106
	Quality Time with children	.958	1.044
	Time Stress	.662	1.511
	sales and service occupations	.863	1.158
	trades and transport occupations	.815	1.226
	combined manufacturing and health occupations	.853	1.172
	Dummy low income	.903	1.107
	Dummy unreported income	.959	1.043
	Sense of belonging to community	.954	1.048
	Hours worked per week	.938	1.066
	Older and younger workers	.743	1.346
	Worry not enough time with family	.726	1.378
	Shift work	.921	1.086
	Education	.894	1.119

a. Dependent Variable: Self-rated health

## Appendix H

*Collinearity Diagnostics for Women (Tolerance and Variance Inflation Factors) (N=2,514)*

Coefficients<sup>a</sup>

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Sleep difficulties	.897	1.115
	Spousal employment	.867	1.154
	life satisfaction	.889	1.124
	Timestress sleep	.801	1.248
	presence of children	.687	1.455
	Workaholic	.848	1.179
	Slow down in next year	.939	1.065
	Time with friends	.907	1.103
	Quality Time with children	.932	1.073
	Time Stress	.680	1.471
	sales and service occupations	.398	2.510
	trades and transport occupations	.553	1.810
	combined trades/ transport and manufacturing occupations	.413	2.420
	other occupations	.369	2.707
	Dummy low income	.837	1.195
	Dummy unreported income	.919	1.088
	Sense of belonging to community	.945	1.058
	Hours worked per week	.891	1.123
	Older and younger workers	.666	1.502
	Worry not enough time with family	.705	1.419
	Shift work	.885	1.130
	Education	.872	1.147
	Work-to-family spillover	.742	1.348
	Family-to-work spillover	.872	1.147

a. Dependent Variable: Self-rated health

## Appendix I

*Collinearity Diagnostics for Shift Workers (Tolerance and Variance Inflation Factors) (N=1,308)*

Coefficients<sup>a</sup>

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	sex for spss	.647	1.545
	Sleep difficulties	.834	1.199
	Spousal employment	.833	1.200
	life satisfaction	.805	1.243
	Timestress sleep	.752	1.330
	presence of children	.751	1.331
	Workaholic	.877	1.140
	Slow down in next year	.952	1.051
	Time with friends	.860	1.163
	Quality Time with children	.927	1.079
	Time Stress	.663	1.509
	trades and transport occupations	.591	1.692
	health occupations	.592	1.689
	manufacturing and processing occupations	.666	1.501
	other occupations	.623	1.605
	Dummy high income	.593	1.685
	Dummy unreported income	.686	1.459
	Sense of belonging to community	.881	1.135
	Hours worked per week	.739	1.353
	Older and younger workers	.758	1.320
	Worry not enough time with family	.584	1.711
	Education	.858	1.165
	WtoF chores	.720	1.389
	WtoF responsibilities	.610	1.640
	FtoW chores	.781	1.281
	FtoW family responsibilities	.803	1.245

a. Dependent Variable: Self-rated health

## Appendix J

*Collinearity Diagnostics for Day Workers (Tolerance and Variance Inflation Factors) (N=4,192)*

Coefficients<sup>a</sup>

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	sex for spss	.700	1.428
	Sleep difficulties	.915	1.092
	Spousal employment	.897	1.115
	life satisfaction	.884	1.131
	Timestress sleep	.825	1.212
	presence of children	.730	1.370
	Workaholic	.864	1.157
	Slow down in next year	.943	1.060
	Time with friends	.914	1.094
	Quality Time with children	.950	1.052
	Time Stress	.671	1.490
	sales and service occupations	.898	1.114
	trades and transport occupations	.812	1.232
	health occupations	.936	1.068
	manufacturing and processing occupations	.892	1.121
	Dummy low income	.881	1.135
	Dummy unreported income	.945	1.058
	Sense of belonging to community	.957	1.045
	Hours worked per week	.775	1.290
	Older and younger workers	.730	1.370
	Worry not enough time with family	.746	1.341
	Education	.875	1.143
	Work-to-family spillover	.718	1.394
	Family-to-work spillover	.890	1.124

a. Dependent Variable: self-rated health

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