ASSESSING THE PORTABILITY OF THE STANDARD SHIFTWORK INDEX: THE IMPACT OF SHIFTWORK ON A NEW ZEALAND TELEVISION PRODUCTION SAMPLE.

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ABSTRACT

The portability of the Standard Shiftwork Index (SSI) and the impact of shiftwork was assessed on a sample of television production employees in Auckland, New Zealand. Sixty three respondents completed the SSI and reported a moderate impact of shiftwork on physical and psychological health and moderately high sleep disturbance. Social and domestic life yielded the greatest detrimental impact. Gender related coping strategies was the only significant difference within the sample. Chronic fatigue, somatic anxiety, general job satisfaction and disengagement were significantly related to intention to leave the organisation. Statistical analysis of effect size indicated equivalent levels of power in both the U.K and the present sample. Overall, the results for the present sample were comparable to the U.K sample, indicating the portability of the SSI to the present sample. Organisational restructuring was considered a potential moderator of the overall moderate impact of shiftwork on the sample.

CHAPTER ONE

Shiftwork in Context

1. Introduction

The study of shiftwork and the measurement of the potential effects of shiftwork on the individual has received considerable world-wide attention for many decades. It will no doubt continue to occupy a considerable space in psychological literature, as well as other disciplines such as management and medicine. What is learnt from one study may or may not fully answer a particular question but almost certainly highlights further gaps in the understanding of shiftwork. The study of shiftwork has presented a challenge to researchers. The multifaceted nature of this construct makes defining, studying and describing it's impact somewhat of an enigma.

In this chapter the difficulties involved in defining shiftwork will be discussed and the definition in terms of the present study outlined. The history of shiftwork will also be described briefly. The prevalence of shiftwork and the rationale which underpins its extensive use in various industries is also examined.

1.1 Shiftwork Defined

To further understand and research shiftwork, like any other construct, requires an operational definition. In the case of shiftwork, reaching a definitive definition is problematic because the term 'shiftwork' inherently holds different meanings to different people. Monk & Folkard (1992) suggest the uncertainty regarding the meaning of shiftwork is evident in shiftworkers themselves as well as in the researchers who study it. As Monk and Folkard highlight some people consider shiftwork to refer only to night work, being work performed between the hours of 10.30 pm and 6.00 a.m. This definition would exclude workers who work in the early evening or very early morning or who work split morning or evening shifts. As proposed by Monk and Folkard, a popular more overarching definition defines shiftwork as being regular work outside of the normal 'day work' time window. Monk and Folkard highlight two further problems with the definition of shiftwork which relate to whether regular overtime comprises

shiftwork and to the problem of defining the outer bounds of a 'normal' work day window.

Individuals who do not work at night, often experience problems in coping with abnormal work hours, suffering worse consequences than those individuals solely employed in night work. As a result a more comprehensive definition is required. For the purpose of this research, shiftwork is defined as any regular employment that includes work outside of the day working window of 7.00am and 6.00pm (Monk & Folkard, 1992).

1.2 A Brief History of Shiftwork

Shiftwork has been a harsh reality for many people since well before the Industrial Revolution. Scherrer (1981) took a historical look at shiftwork and recalls that in the days of ancient Rome, the deliveries of some goods were restricted to the night hours in order to avoid hectic daytime traffic congestion. The jobs of yesteryear's shiftworkers; the night time baker, coal furnace workers of the old steamships and postal workers on night trains, may have changed but the demands of the shift and night workers are still prevalent in the 1990's. It appears the emergence of health and safety legislation in employment may have altered the conditions of work, but the demand for such services and provisions have certainly not changed.

An important consequence of shiftwork that has changed through the ages is the number of people effected by it. Shiftwork was, in the early days, a requirement of only a few specific trades or crafts. If an individual was unable to tolerate or cope with the demands of the job they simply left and found an alternative job (Scherrer, 1981). Industry today is fundamentally different as shiftwork has become highly prevalent across a range of industries and occupations. For the millions of shiftworkers who make up the labour force in these industries finding alternative employment is not necessarily an obtainable option.

1.3 The Positive and Negative Nature of Shiftwork

A considerable amount of literature on shiftwork has been dedicated to assessing the potential detrimental impact of shiftwork, therefore putting the spotlight on the negative consequences of shiftwork. But is shiftwork an entirely negative reality for

shift-working individuals? This question has been a concern to certain researchers such as Sergean (1971) and Wedderburn (1978). They warn that researchers who make dangerous generalisations about the level of negativity amongst shiftworkers towards their shift working lifestyle, are making incorrect and uninformed assumptions. It is therefore important to note that although the literature on shiftwork does not often put shiftwork in a favourable light, it cannot be assumed that it is an entirely negative requirement of work today.

Research conducted on a group of nurses in the United Kingdom, reported that sixty five percent had no desire to change their rotating shiftwork lifestyle even when they had little choice over which shift pattern they worked. This percentage was approximately parallel for nurses who did have some choice in the shifts they worked (Spelten, Barton, & Folkard, 1993).

Other research has reported high rates of intolerance for shiftwork generally. Harrington (1978 cited in Barton et al., 1995a) reported that a mere ten percent of shiftworkers liked their work patterns. Alternatively Folkard, Minors and Waterhouse (1985 in Spelten, Barton, & Folkard, 1993) concluded that sixty percent of shiftworkers tolerate it reasonably well. In the case of how different individuals may feel about the advantages or disadvantages of shiftwork it appears the jury is still out, although recent studies are increasingly showing higher rates of tolerance to shiftwork (Kogi, 1996; Rosa, 1990).

The research literature reports a clear contradiction in the tolerance and preference of shiftwork. This is due to the multi-dimensional nature of the construct which is related to many individual and situational factors (Costa, Lievore, Casaletti, Gaffuri, & Folkard, 1989). It would be sensible to also consider that shiftwork may be a positive work-style for some. A number of individuals undertaking a four day work week tolerate shiftwork reasonably well, as this work pattern allows a longer weekend with friends and family (Fuchsberg, 1994). There is no doubt that there are many individual differences across shiftworkers in, for example circadian type (morning type or evening type) (Harma, 1993), domestic and social responsibilities (Hewitt, 1993) and the impact of motivated choice (Dirkx, 1993), which may explain these findings.

1.4 The Prevalence of Shiftwork

The extensive use of shiftwork can be explained by a number of factors (Folkard, 1993; Snyder, 1995). Modern manufacturing and service sectors today, as in the past, rely heavily on shiftwork. The processes involved in some forms of manufacturing are continuous. Such forms of manufacturing either become economically unfeasible or physically impossible without around the clock production (Bosworth & Dawkins, 1981). For example, it would not be sensible for industries such as nuclear power plants or glass works to halt production between the hours of 5pm and 8am. The extremely high financial investment in machinery and automated processes also requires continuous usage of this machinery if the organisation is to yield a profit (Monk & Folkard, 1992). In order to maximise productivity, minimising the amount of 'downtime', or time the machinery is not being used, is necessary to make optimal use of costly machinery (Colquhoun & Rutenfranz, 1980).

It is evident in some industries that the financial benefits of shiftwork make it an attractive financial option for organisations. For other occupations and industries shiftwork is a necessity that cannot be avoided. In the service sector and for certain occupations shiftwork is required because of the nature of the service. Such services include the medical domain where doctors and nurses are required to perform their job around-the clock, or are required to be on call. A similar requirement is the reality for employees of the armed forces, such as the police force, as well as in the transportation and security industries for example (Colquhoun & Rutenfranz, 1980). The International Labour Office in Geneva predicts that the growth of shiftwork will continue across a variety of industries for this and a number of other reasons (Snyder, 1995).

Given that shiftwork is inevitable for some forms of manufacturing, other business factors also encourage or force organisations to utilise shiftwork schedules. For example, shiftwork is also the product of an ever increasing incidence of downsizing which has created "leaner, meaner" organisations. These organisations require employees to do more work, at a faster speed, with little supervision, whilst maintaining high quality (Snyder, 1995).

Shiftwork is also deemed beneficial as organisations respond to a fluctuating labour market and the high cost of staff recruitment. In such circumstances employers prefer existing staff to work longer hours rather than risk recruiting and training costs of new staff (Monk & Folkard, 1992).

Governmental and international regulations also put pressure on organisations and industries to alter business and work hours in order to prevent environmental

damage such as pollution from traffic. Recommendations are in the form of off-hours commuting or fewer work days per week (Snyder, 1995).

The globalisation of the economy has forced an uncoupling of business hours and hours of work. A given organisation on one side of the world is required to stay working if another organisation half a world away demands goods and services from that organisation. While this is another example of the inevitable use of shiftwork, it is also indicative of the level of world-wide competition which requires those organisations who wish to be competitive to be available to meet customers needs around the clock (Snyder, 1995).

Consumers' demands for products and services are also a strong catalyst for increasing the need and use of shiftwork. The fast food and grocery industry responds to this demand and is also rapidly changing their service to include one which caters to consumers around-the-clock (Monk & Folkard, 1992).

1.5 The Actual Prevalence of Shiftwork

Literature estimating the prevalence of shiftwork varies. Folkard (1993) suggests that some twenty to twenty five percent of those employed in manufacturing and a rapidly increasing proportion of employees in the service sector, are required to work some form of shiftwork. Snyder (1995) also highlights some staggering statistics on the prevalence of shiftwork globally. For example, approximately twenty million shiftworkers in the United States contribute to the ever increasing global contingent of shiftworkers (Soloman, 1993).

In New Zealand the prevalence of shiftwork is not recorded by any official census or Department of Statistics figures. Estimates of the extent to which shiftwork in New Zealand will increase is based on overseas trends. Legislation such as the Employment Contracts Act is considered central to the possible increase in shiftwork as employers have more freedom to dictate the hours of work.

CHAPTER TWO

Research Rationale and Background

2. Introduction

The purpose of this chapter is to report the status of shiftwork research and the measurement issues which led to the formation of the Standard Shiftwork Index (SSI), the central research tool used in the present study (Barton, Folkard, Smith, Spelten, & Totterdell, 1992). This chapter will review the theoretical framework on which the SSI is based and present a brief overview of the SSI structure. The justification of the current study will also be outlined and the objectives of the study explained.

2.1 Researching Shiftwork

Attention to the potential impact of shiftwork on individuals has escalated in recent years because of the vast number of individuals affected by it (Barton et al., 1995a). The detrimental effect of shiftwork on many areas of an individual's life has also focussed attention on this topic. Researchers such as Spelten, Barton, and Folkard (1993b) have suggested that attention to the rectification of problems associated with shiftwork is urgent because of the supposed underestimation of its effects. Folkard (1993) states, "the problems faced by individual shiftworkers are both complex and multifaceted, and, unlike most occupational stresses, can impinge on the whole of their lives"(p. 1). This may explain why considerable attention to addressing these potential problems is at the forefront of current research into shiftwork.

The substantial amount of research dedicated to shiftwork has identified a wide range of problems that individuals may experience both during and after their exposure to shiftwork. These problems are categorised as acute disturbances of circadian rhythms and sleep patterns, disrupted family and social life, as well as mental and physical health problems of a chronic nature (Barton et al., 1995a). These findings illustrate the way in which shiftwork may potentially impact on an individual's life in a number of ways.

Therefore the fundamental purpose of studying shiftwork is to understand the potential impact shiftwork has on individuals who work outside of conventional daytime hours. Findings from such studies may contribute to the formation of strategies which can be used to prevent and/or alleviate some of the negative aspects of shiftwork (Barton et al., 1995a). Such studies may also highlight those aspects of shiftwork which have positive consequences on the individuals concerned.

From the extensive literature and world-wide research on shiftwork it is apparent that it is an international and inter-cultural phenomenon (Nachreiner, 1990). It appears that the adverse effects of shiftwork are not limited to certain countries or occupations but are evident in many parts of the industrialised world. Research on shiftwork must therefore enable comparisons to be made across research groups, countries and cultures. Findings should contribute to the formation of scientifically based recommendations which aim to improve the working and living conditions of shiftworkers. Establishing such recommendations firstly requires a standardisation of methodology in shiftwork research (Nachreiner, 1990).

An area of concern relates to field studies of shiftworkers which have comprised almost solely of experienced shiftworkers. This sampling error may result in studies which have mainly employed groups of hardy shiftworkers. There is a tendency for the more hardy shiftworkers to remain whilst those individuals who have considerable trouble adjusting leave the shift-working lifestyle (Wedderburn, 1995). While valuable in their own right, such studies may inhibit the generalisation of findings to shiftworkers who are not as experienced (Bohle, 1990). This illustrates the need for further studies which are relevant to all shiftworkers regardless of their length of exposure to shiftwork.

The existence of hardy shiftworkers has been attributed to a characteristic referred to as the 'healthy worker effect'. These individuals are characterised as being in some way, more able or determined to continue shiftwork despite the potential difficulties in adjusting to such work schedules. This leaves what is sometimes called a 'survivor' population on which studies are subsequently based (Barton et al., 1995a). These studies may be limiting because they are sampling a 'robust' and 'hardy' group of workers (Frese & Semmer, 1986; Haider, Kundi, & Koller, 1981). In turn such studies may not illustrate the potential effects of shiftwork on individuals who have a wide range of characteristics. Many researchers acknowledge that this problem exists and refer to such a

'drop-out' effect of shiftworkers as being partly accountable for the lack of consistency in research findings (Barton et al., 1995a; Bohle, 1990).

Haider, Kundi, and Koller (1981), point out that in many large European countries selection of shiftworkers is based on identifying individuals who possess this 'effect' (Frese & Semmer, 1986). The need for studies on a variety of individuals in a variety of occupations is highlighted in order to understand tolerance across many individual characteristics. The impact of many individual characteristics besides shiftwork exposure requires further research. This would allow for a more thorough understanding of shiftwork tolerance and intolerance on the basis of many individual differences (Barton et al., 1995a).

2.2 Theoretical Framework

Folkard (1993) emphasised the complex and multifaceted nature in which shiftwork may impact on individuals. A theoretical framework (Figure 1) was developed by Folkard which depicts the combination of the potential effects of shiftwork, and how these problems associated with shiftwork relate to one another and to the characteristics of the shift system.

Folkard's framework (Figure 1) illustrates the extent to which the different outcome factors overlap, suggesting that the potential effects of shiftwork usually do not manifest in one single problem. For example the potential outcomes of sleep disturbance may cause a domino effect by contributing to disturbed family life and mood disturbance. The framework also shows the influence of individual and situational differences on the potential outcomes of shiftwork. This occurrence suggests that the potential outcomes of shiftwork do not act in isolation but are often accompanied with other disturbances and are coloured by individual differences (Monk & Folkard, 1992).

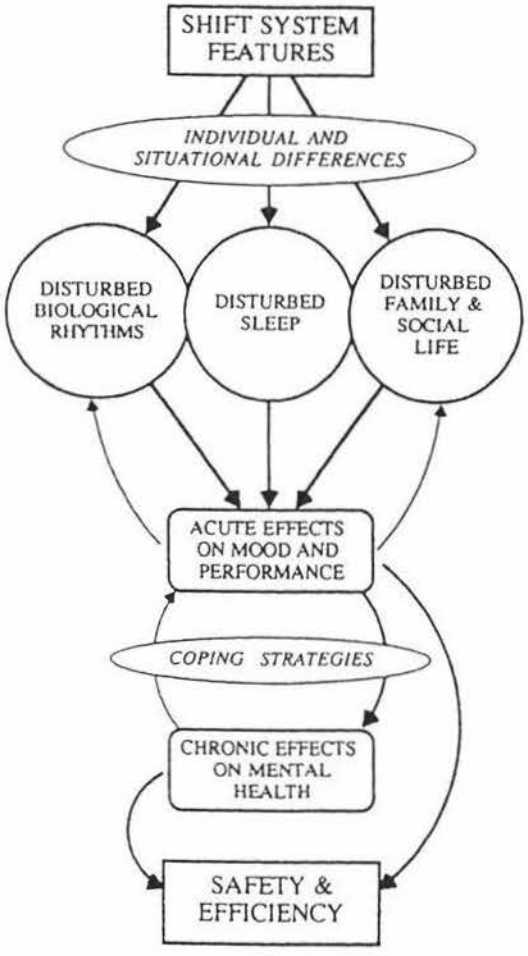

Figure 1. Theoretical framework on which the SSI was based (Barton et al., 1995a)

2.3 Categorisation of the potential effects of Shiftwork

The term 'shiftwork' is a construct which encompasses many associated consequences and problems, as well as for some individuals potential benefits. The potential consequences shiftwork may have on individuals are diverse and overlapping as illustrated in Folkard's (1993) framework (Figure 1). In order to clearly define the multifaceted nature of shiftwork and its impact on the individual and the organisation, the effects of shiftwork may be categorised.

Barton (1994) and Folkard (1993) have classified the potential outcomes of shiftwork. These outcomes of shiftwork form three broad categories:-

1. Acute disturbance of circadian rhythms, including the sleep-wake cycle.
2. Physical and psychological disturbance.
3. Social and domestic disruption.

This categorisation illustrates how the shiftwork may potentially affect many areas of an individual's life, including safety at work (Folkard, 1993). Folkard's theoretical framework (Figure 1) presented earlier forms the foundation on which the following literature and research review is based. The researcher wishes to reiterate that whilst the outcomes of shiftwork are separated for ease of explanation, in reality however, these outcomes are often overlapping and multifaceted. The lines between the outcomes of shiftwork such as physical health and psychological health are not always easily defined.

2.4 Potential Effects of Shiftwork: Outcome Variables - The Individual

This section outlines the different outcome variables and areas of a shiftworker's life which are considered to be potentially vulnerable to disruption as a result of shiftwork. These outcomes are discussed in the four major categories: Sleep and circadian rhythm disturbance; physical and psychological health; social and domestic disruption; and job satisfaction.

2.4.1 Sleep

Literature in general agrees that sleep disturbance is one of the major consequences of shiftwork. The study of shiftwork and how it impacts on sleep has occupied a considerable proportion of shiftwork research. Such studies were initiated in the mid 1950's and have continued to be at the forefront of studies into human physiology and adaptation in relation to shiftwork (Monk & Folkard, 1992). At an increasing pace researchers have taken up the challenge of understanding exactly how sleep physiology is altered by shiftwork and to what extent it is able to be manipulated. Attempts to understand the effects of circadian rhythm disturbance have included a number of experiments, some involving doses of hormones or as they are coined 'time pills' (Barton, 1994). Experiments exposing subjects to mega-doses of bright light have also attempted to understand the effect of light on sleep and circadian functioning. Barton and many other experts remain sceptical as to whether changes in human sleep patterns or 'circadian rhythms' can be altered by anything other than evolution itself.

Nonetheless justification for this research initiative into sleep disturbance is most likely based on the fact that disturbance to sleep is considered a perennial problem facing

shiftworkers. This is an accurate conclusion given that sleep disturbance exhibits itself as a potential 'catalyst' to a variety of other emotional, physical and psychological disorders (Barton et al., 1995a). Akerstedt (1988) reviewed the literature at that time and summarised the far reaching effect which sleep disturbance may have on other body functions. These effects can ultimately effect performance and safety on the job.

2.4.1a Sleep and Circadian Rhythm Disturbance

Research has illustrated that underlying the intolerance of shiftwork is the vital link between sleep and the biological clock or circadian rhythm (Gander, 1996). The sleep disruption which sixty to seventy percent of shiftworkers report is due in part to the temporal displacement of the individuals sleep to a time of day that is out of phase with many physiological circadian rhythms (Akerstedt, 1988; Czeisler, Moore-Ede, & Coleman, 1980; Rutenfranz, Haider, & Koller, 1995 in Barton et al., 1995a). Humans, like other creatures, are a rhythmic species, meaning the timing of certain bodily functions, including sleep patterns follow a specific rhythm, in humans this is known as the circadian rhythm, which may vary slightly from one individual to another (Barton, 1994). Sleep patterns are one such rhythm which dictate that the body readies itself for sleep during the night hours and wakefulness during daylight - daytime hours. Individuals may differ slightly from each other in terms of their relative feeling of greater alertness which may tend towards either the morning part of the day (morningness) or to night hours (Folkard, Spelten, Totterdell, Barton, & Smith, 1995). These types are often referred in layman's terms as being either 'larks' or 'owls', or a combination of the two (Regestein & Monk, 1991; Rosendall Alward, 1988).

The field of chronobiology encompasses the notion of circadian rhythms and is, as defined by Monk and Folkard (1992), "the scientific study of the effect of time on living systems, including the study of biological rhythms" (p. 79) . The relationship between human biological or 'circadian' rhythms and sleep is vitally important in understanding the intolerance to shiftwork. Monk and Folkard (1992) highlight the fact that in understanding the physiological bases of the shift worker's problem, it must be recognised that both sleep and circadian rhythms have an important effect and function in a mutually interactive way. Barton (1994) thus describes the 'first cause' common to all shiftwork related problems is this disruption to the circadian rhythm and particularly the sleep - wake cycle.

The effects of shiftwork on sleep are a serious concern (Regestein & Monk, 1991). These researchers describe the impact of shiftwork on sleep, as recently acknowledged in official doctrines of sleep disorders and discuss whether sleep altered by shiftwork actually constitutes a disorder. The DSM-III-R contains a diagnostic category for "sleep-wake schedule disorder, frequently changing type", which refers specifically to shiftwork. The more recent DSM IV also contains the classification 'Sleep Disorders - Primary-Axis 1' which refers to "Circadian Rhythm Sleep Disorder (Sleep-Wake Schedule Disorder)" (APA, 1994). This focus on the consequences of shiftwork on sleep reinforces the need to further understand it's effects on human physiology.

2.4.1b Sleep and Shift Type

In general the outcomes of sleep disruption manifest in a number of ways, and this manifestation is dependent on the type of shift. The term 'shift' as defined by Tepas and Mahan (1989) is a general one which simply refers to the time of day, on a given day, than an individual is scheduled to be at the workplace. Thus, by definition, all scheduled workers are shift workers. The most common types of shift schedules include fixed or rotating schedules. Fixed shifts involve one type of shift as is often the case with permanent night shifts. Rotating shifts involve a variation of morning, afternoon and night shifts. This pattern of shifts can also be extremely erratic. Of these shift types, morning shifts and afternoon shifts disturb the natural sleep pattern the least, as an individual may still obtain their main sleep period during the night hours (Monk & Folkard, 1992). The night shift is defined by the International Labour Office as " a shift of at least seven consecutive hours between 2200h and 0700h" (Tepas & Mahan, 1989, p. 93). Research has shown the night shift as being associated with the most disruption to sleep patterns. Due to the disturbance to the naturally occurring circadian rhythm, night shift workers as well as shiftworkers in general may experience problems in falling asleep as the time of day of sleep onset is out of line with the body's circadian rhythm (Barton et al., 1995a).

Although night shifts are considered the most damaging to sleep patterns Barton et al. (1995b) found that with more consecutive nights worked sleep quality improved.

This is explained again in terms of the functioning of the circadian rhythm. Wilkinson (1992) suggests that the greater exposure to night work is likely to reduce disruption to circadian sleep patterns by facilitating circadian adaptation. This may work well for permanent night workers, but for those on rotating shifts, the required continual adjustment of the circadian rhythm may pose countless problems.

Costa (1996) discusses further the fact that not only are sleep patterns disturbed but so to are other rhythmic fluctuations including respiratory, cardiovascular, digestive and renal functions which present higher levels of activity during the day and lower levels during the night. The concern is that shiftwork and night work in particular forces the worker to invert the normal 'activity-rest' cycle. This requirement of the circadian rhythms to adjust increases progressively as more night shifts are worked. The rhythm seldom reaches full adjustment or inversion particularly on rotating shifts. The continuous stress placed on the body to adjust to constantly changing demands may potentially cause many physiological problems. This may also contribute to increased experiences of stress. This 'assault' on the circadian rhythm is physiologically similar to symptoms of 'jet-lag' syndrome where such an inversion of the rhythms occur. Such symptoms mirror those of shiftworkers and may manifest in feelings of fatigue, sleepiness, lethargy, digestive problems, decreased mental agility and performance (Comperatone & Krueger, 1990; Folkard et al., 1985).

2.4.2 Alertness

Research cited above highlights sleepiness as a major problem caused by circadian rhythm disturbance. The focus of Akerstedt's (1988) research was on sleepiness as a consequence of shiftwork. Research on sleepiness has largely resulted from questionnaire studies and as Akerstedt and Folkard (1995) found, levels of alertness could be predicted using subjective alertness data, as well as from a number of experiments using physiological measures of sleepiness. Such studies have indicated that shift workers on the whole report more fatigue and sleepiness than do day workers. Usually this fatigue is noticeably widespread on the night shift, somewhat on the morning shift, and virtually non existent on the afternoon shift. Further experimentally designed studies highlighted that reported fatigue increased on entering shiftwork and decreased on leaving it (Akerstedt & Torsvall, 1978). Sleepiness and fatigue have in some cases caused individuals to fall asleep during the night shift (Akerstedt, 1988). This is of major

concern especially in some occupations such as drivers, air traffic controllers, whose occupations have serious consequences if alertness and concentration is hindered. This concern is highlighted in a study of 1,000 train drivers where eleven percent admitted to falling asleep whilst on most night trips (Akerstedt).

Akerstedt (1988) estimates the prevalence of sleepiness in shift work may be that three quarters of the total population experiences it on every night shift. One fifth of these people experience sleepiness severely enough to cause them to fall asleep.

The causes of the apparent high state of sleepiness in the night shift is attributed to interruptions in circadian rhythms as mentioned above and to general sleep loss. Puhek (1990) estimates that while day workers average approximately seven and a half hours of sleep, night shift workers average four to six hours of sleep and experience the highest rate of sleep disturbances. This sleep loss occurs because there is often very little sleep prior to the first night shift in sequence. This means that almost twenty four hours may be spent awake before the first day sleep is taken, where subsequent day sleeps available are often harder to achieve both in quality and quantity.

It is hypothesised that the truncation of sleep prior to the night shift may contribute significantly to sleepiness at night. This is compounded by the fact that internal functions operating at night, are telling the body to sleep. Carskadon and Dement (1982) have demonstrated that restriction of normal sleep to five hours will cause significantly increased subjective sleepiness after the first night of restriction and further increased sleepiness after the second night shift. This can possibly be explained by Folkard and Barton's (1993) suggestion that the sleep required before a night shift is often not obtainable because of the influence of the biological clock. They further reinforce that our biological clocks dictate the night hours as being the ones with which to obtain sleep, attempting to sleep outside of that time enters what they describe as the 'forbidden zone' for sleep onset. Even after considering the many reasons why sleep during the day is difficult, such as noise and light, Folkard and Barton's (1993) study showed that changes in sleep duration in the daytime could be largely accounted for purely in terms of the circadian rhythm or body clock. This therefore indicates that as Akerstedt (1988) suggested, the circadian rhythm is far from flexible.

Alternatively, Wilkinson (1992) notes that studies on sleep deprivation suggest that the loss of a whole night of sleep will have a relatively modest effect on working efficiency, leaving tasks unimpaired. However shiftwork rosters usually involve a series of assigned night shifts. It is the effect of continuous sleep deprivation that studies are

yet to identify, after influences of individual differences are accounted for. This would be valuable information as individuals differ in the degree to which sleep loss impairs their performance at work. As such, it is a vital component of current and future studies.

2.4.3 Napping

The incidence and effect of napping is also an important variable to consider when assessing sleep loss in shiftworkers. The utility of napping has received mixed assessments in shiftwork literature. Akerstedt and Torsvall (1985) suggest that there is a relationship between napping and sleep loss, although other studies indicate no evidence that a nap might serve as a replacement for a short main sleep (Radosevic-Vidacek, Vidacek, Kaliterna, & Prizmic, 1995). Akerstedt (1988) offers napping as a strategy to alleviate sleepiness especially during the night shift. Snyder (1995) observes that napping is a tactic often recommended to shiftworkers as it is believed to decrease fatigue and other sleep related disorders and thus increase general shiftwork tolerance. Research on cockpit crews and pilots have suggested that taking a nap in the cockpit has increased the alertness of flight crew on long haul transmeridian flights (Dinges et al., 1991). Other research however, has found that frequent napping among regular shiftworkers leads to inhibited sleep quality during the shiftworkers main sleep period (Tepas, 1993). These findings may question whether or not the incidence of napping is of any concern. Alternatively the incidence of napping may indicate that sleep deprivation is a fundamentally dangerous problem faced by many shiftworkers (Tilley, Wilkinson, Warren, Watson,& Drud, 1982).

Clearly, the occurrence of napping is yet to be fully explained in terms of its assistance with sleep loss. Individual differences in habitual sleep need may determine the value of napping.

2.4.4 Chronic Fatigue

Fatigue of a chronic nature is frequently reported by shiftworkers. This fatigue may also inhibit other areas of their lives (Monk & Folkard, 1992). Akerstedt (1988) reported that studies of sleepiness have suggested that shiftworkers report more fatigue than day workers. It is proposed that some people suffer from permanent tiredness, even on rest days, while others have limitless energy (Barton et al., 1990). This may be

attributed to a number of factors both physiological and social. It is suggested that a mis-match between the demands of shiftwork and an individual's circadian type and preference for morning as opposed to night activity may contribute to higher levels of fatigue and lack of alertness (Iskra-Golec, Marek, & Noworol, 1995). This finding may possibly explain some of the variation in how different individuals are effected by working shifts.

2.4.5 Physical and Psychological Ill-Health

Shiftwork and in particular night work can have a negative impact on the health and well-being of workers (Akertsedt, 1988; Costa, 1996). The many studies into the health effects of shiftwork illustrate a consensus amongst researchers that the night shift is the only shift type that induces sufficient conflict between the sleep-wake cycle and other physiological circadian rhythms to produce negative health effects (Bohle, 1990). There is strong evidence that most shiftworkers, who therefore are assumed to do regular night work, report chronically impaired subjective health and well-being and that there is also a wide variation in the extent of these effects across individuals (Harma, 1993).

Included in such negative consequences are the above mentioned disturbances to normal circadian rhythms of the psycho-physiological functions and sleep-wake cycles. Moreover the deterioration of health that can be manifested in disturbances to sleeping and eating patterns is of particular concern as it is unclear as to which aspect of the shift is causing this deterioration. Research has indicated that the effects of disturbance to sleeping habits and eating habits outside of the body's natural circadian pattern of these functions have lead to a high prevalence of gastrointestinal and cardiovascular problems in shiftworkers (Costa, 1996).

2.4.5a Physical Health

Various researchers have consistently highlighted the prevalence of two major heath problems reported by shiftworkers. These are gastrointestinal and digestive ailments, such as colitis and peptic ulcers and cardiovascular disorders including hypertension and varying types of heart disease (Cervinka, 1993; Costa, 1996; Kogi, 1996; Monk & Folkard, 1992).

Digestive problems are commonly reported by shiftworkers (Lennernas, Hambraeus, & Akerstedt, 1993). Unlike the debate over the impact of shiftwork on heart disease, there appears to be considerable agreement among researchers that shiftwork most definitely has detrimental affects on digestive functions (Costa, Apostoli, D'Andrea, & Gaffuri, 1981; Monk & Folkard, 1992). Costa et al. (1981) report that sixty seven percent of three-shift workers and twenty three percent of night workers discontinued working night shifts as a result of chronic digestive problems.

Digestive disorders are rated the second most common problem faced by shiftworkers, after sleep disturbance (Rutenfranz et al., 1977 cited in Monk & Folkard, 1992). Although it is considered shiftwork does not affect food intake to a great extent (Lennernas et al., 1993), the timing of food intake is considered the most likely contributor to digestive problems. If circadian rhythm disturbance is considered the first major problem faced by shiftworkers, digestion is logically the second as the digestive processes are determined by the circadian rhythm (Monk & Folkard, 1992). Abnormal sleep and wake times mean food consumption may occur outside of the ideal food consumption times dictated by the circadian rhythm. The acknowledgment of the relationship between shiftwork and digestive problems have prompted education efforts to inform shiftworkers of the most desirable eating habits in order to minimise digestive problems (Gander, 1996). In particular, the intake of stimulants such as caffeine and nicotine have been significantly related to digestive problems (Wedderburn & Scholorios, 1993).

Costa (1996) points out that within shiftwork literature there is uncertainty amongst researchers as to the effects of shiftwork on cardiovascular disease. Waterhouse (1992 cited in Barton et al., 1995a) cites research which found the risk of heart disease is forty percent higher in shiftworkers compared to day workers even when other factors such as smoking are taken into account. Other research has partially implicated cardiovascular disease as having a higher incidence in shiftworkers as compared to day workers (Knutsson, Akerstedt, & Orth-Gomer, 1986).

Alternatively Harrington (1978 cited in Barton et al., 1995a) examined studies of shiftworkers and found no clear causal relationship between shiftwork and higher incidence of cardiovascular disease. Monk and Folkard (1992) also highlight the debate regarding shiftwork as a risk factor for cardiovascular disease. It appears the impact of shiftwork on heart disease is still unclear and the proposition for a causal relationship is not fully substantiated.

The impact of shiftwork on the menstrual cycle has also received attention in shiftwork research. Studies have shown shiftwork to be significantly related to considerable disturbance of the menstrual cycle and hormonal activity (Charles & Brown, 1981). This disturbance may potentially lead to difficulties in the female reproductive function (Costa, 1996).

2.4.5 b Psychological Health

Costa (1996) notes the focus on the potential psychological consequences of shiftwork has continued since the time of the two World Wars. The continued prevalence of neuro-psychic complaints such as anxiety and depression among shiftworkers illustrates what Costa (1996) describes as only a couple of the "high human costs" (p. 9) associated with shiftwork. Studies into the potential effect of shiftwork on psychological illnesses such as anxiety and depression, indicate that shiftwork, and in particular night work, do have a significant impact on psychological well-being (Bohle & Tilley, 1989).

Bohle et al. (1989) suggest the night shift is significantly responsible for depressive symptoms. Costa et al. (1981) conducted a study of textile workers and found that seventy two percent of shiftworkers gave up night work due to neurotic problems. Such neurotic problems were found to be five times more common in three-shift workers. This ratio increased to sixteen times more likely in permanent night workers than in day workers. The morning shift may also pose a problem as individuals are required to wake up early meaning a reduction in 'paradoxic' sleep. This type of sleep is obtained during the hours of approximately 3am - 6am and is considered essential for emotional well-being. A shortage of this sleep may contribute to anxiety and depression (Costa, 1996).

Research conducted by Moog (1987) also indicates that shiftwork represents a major risk factor leading to psychological disturbances. However, more recent research indicates that many researchers are cautious about attributing shiftwork as a risk factor to depressive symptoms, as a number of situational and individual factors may also confound the prevalence of these problems (Kaliterna, Vidacek, Prizmic, & Radosevic-Vidacek, 1995).

Researchers have attempted to explain the prevalence of depressive disorders in shiftworkers. For example Barton et al. (1995b) propose that like a number of other potential problems resulting from shiftwork, such as social disturbance, the impact of shiftwork schedules are indirect. For example the impact of shiftwork on mental health

is considered indirect through the effect of shift schedules on sleep patterns (Skipper, Jung, & Coffey, 1990; Smith, Spelten, & Norman, 1995).

Alternatively, Monk and Folkard (1992) suggest that the disturbance of circadian rhythms and physiological problems resulting from shiftwork, directly manifest in depressive symptoms or episodes. Studies of circadian disturbance often take place in departments of psychiatry, as a link between depression and dysfunction of circadian rhythms has been recognised (Monk & Folkard, 1992). It is evident that shiftwork may lead indirectly to an increase in neurotic and depressive type symptoms as well as decrease in well- being (Meers, Maasen, & Verhaegen, 1978).

Given these findings, it is still uncertain if shiftwork may be considered a risk factor in depression due to the indirect nature of its effect. Further research may contribute to a clearer understanding of the prevalence of depressive disorders in shiftworkers. The effect of social support and coping strategies is said to moderate the impact of shiftwork on the psychological well-being of shiftworkers (Schmieder & Smith, 1996). This will be discussed in a later section.

2.4.6 Social and Domestic Disruption

The outcomes of shiftwork discussed so far illustrate that the effects of shiftwork do not remain confined to specific areas of an individual's life. The reality is that shiftwork may affect not only the biological functions of individuals but also the complex relations between work life, family and social life. Research has illustrated that family dynamics, sleeping habits and work demands are closely linked together (Kundi, Koller, Cervinka, & Haider, 1981).

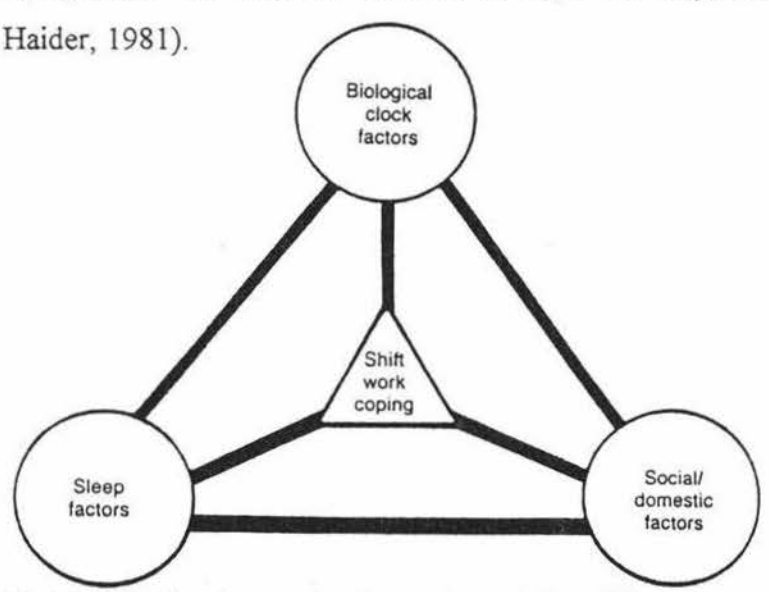

Figure 2. Model of the three interactive factors determining shiftwork strain (Monk,1988)

Figure 2 (Monk, 1988) illustrates the interactive nature of the effects of shiftwork. Among these are social and domestic factors. This illustrates that these two spheres of life are constantly interacting and influencing other areas.

The interaction of work life and family life has received greater acknowledgment in the last few decades. Kanter (1977) urged attention to be paid to the concepts of work and family as overlapping entities which are not mutually exclusive.

Attention to the interplay of work, family and social life has been the focus of numerous studies which have highlighted the impact of shiftwork and job stresses on the family and social life of shiftworkers (Banks, 1980; Hughes & Galinsky, 1994; Schonfelder & Knauth, 1993). Neglected family and social lives are one of the most common complaints cited by shiftworkers (Smith & Folkard, 1993). Research has indicated that there are a number of roles within the family that may be detrimentally affected by the demands of shiftworkers (Monk & Folkard, 1992).

Female shiftworkers often bear the role of care-giver within the family unit. Researchers are concerned with the way in which shiftwork may impact on the provision of care to children and the strain the care-giver may experience as a result of shiftwork. Often there is an expectation to fulfil household duties over and above meeting the demands of shiftwork (Monk & Folkard, 1992). This occurrence, as explained by Gadbois (1981), may be a result of societal norms which emphasise the 'caring' role of women, and as such may create more problems for female shiftworkers than do any biological differences.

While it is acknowledged that males do experience difficulties balancing work and family demands, these difficulties tend to be more pronounced for females. Research suggests that women shoulder the majority of family responsibilities even after a full day or shifts work (Cowan & Cowan, 1988; Hochschild, 1989). Duxbury and Higgins (1991) emphasise female's responsibilities to children, partners and domestic commitments do not cease when they obtain paid employment outside of the home. This tendency has been described as the "second shift" or "double shift". These traditional sex roles see women start work again once they get home (Hewitt, 1993). Research has indicated that females experience more stress, anxiety, and work-family conflict in an attempt to meet the demands of their jobs and the work required of them in the home (Duxbury & Higgins, 1991). Attention to these findings will no doubt continue to be the subject of future research, which can be justified if estimates regarding the increasing

number of working mothers are accurate. For example, Sullivan (1992) highlights forecasts which estimate by the year 2000, women will constitute forty seven percent of the work force in America. It would be reasonable to surmise this may also be the trend in New Zealand.

As well as experiencing difficulties fulfilling the role of care-giver, shiftworkers often report strained inter-personal and sexual relations with partners. Smith and Folkard (1993) highlight the lack of studies on the social effects of shiftwork from the viewpoint of the partners of shiftworkers. Cook (1954 in Reinberg, Vieux, & Andlauer, 1981) in regard to the social consequences of shiftwork, stated the effect of shiftwork on married life to be "the least studied of all the human consequences of shiftwork"(p. 299). This notion was echoed by Wedderburn and Robson (1990 cited in Smith & Folkard, 1993) who asserted " partners are not often included in surveys of shiftworkers, but they are certainly affected by their partner's odd hours; and their reaction to this is not surprisingly important" (p. 299). Given these findings on partners dissatisfaction of shiftwork, the statistics on divorce rates of shiftworkers is not surprising. Monk & Folkard (1993) reported a fifty percent increase in divorces in shiftworkers and especially those working night shifts. These findings on divorce rates and dissatisfaction experienced by partners of shiftworkers may indicate the need for joint planning of shift schedules by partners (Kogi & Thurman, 1993).

Interpersonal problems are not confined to the domestic and family arenas. Due to the anti-social hours associated with shiftwork, many individuals experience great difficulty in pursuing activities and hobbies (Fischer, de C. Moreno & de L. Fernandez, 1993). Barton et al. (1995a) and Herbert (1983) suggest individuals may experience feelings of alienation as social events are organised around the standard nine-to-five work pattern. Shiftworkers also tend to engage in more solitary activities than do day workers (Staines & Pleck, 1984b). Individuals on rotating or irregular shift schedules may also experience severe difficulty in managing to adapt their leisure activities to these patterns (Herbert, 1983). Maintaining solid friendships is also a potential problem for individuals on irregular or rotating shifts. Research has suggested that shiftworkers on rotating shifts tend to have fewer friends than day workers or workers on fixed shift schedules. Those who are able to form solid friendships are often friends with other shiftworkers (Herbert, 1983).

Identifying the underlying causes of the detrimental impact shiftwork may have on social and domestic life has been the focus of many studies (Bussing, 1996; Staines &

Pleck, 1984a). The major cause of difficulty is the conflict between the positioning of the shiftworkers' work and rest times, and those times usually spent with family, friends and partners. This conflict often contributes to the fatigue the shiftworker is already experiencing due to disrupted sleep times. The likely fatigue and irritability experienced by the shiftworker as a result of sleep disturbance, may also contribute to strained family interactions. Impoverished family time and social interaction is often a result of the difficulties associated with obtaining quality sleep during day hours (Smith & Folkard, 1993).

If a thorough understanding of the social and domestic effect of shiftwork is to be achieved, future studies will need to take a holistic approach to understanding family and social interactions. It is argued that the social impact of non-standard work hours cannot be adequately studied by simply focussing on the shiftworker alone. The impact of different shift schedules must be examined in the context of the shiftworker's entire domestic and social spheres (Smith & Folkard, 1993).

2.4.7 Job Satisfaction

Job satisfaction may be defined as the positive or negative attitudes held by individuals towards their jobs (Greenberg & Baron, 1995). A distinction is made between intrinsic and extrinsic job satisfaction. Intrinsic job satisfaction refers to an individuals autonomy to choose how the work is undertaken or planned and their level of responsibility. Extrinsic satisfaction refers to the working conditions and work hours and the level of personal control over these issues (Barton et al., 1995a).

Norbeck (1985) notes that job satisfaction has been studied extensively and identified as being closely linked to occupational stress and levels of physical and emotional well-being. Because of the considerable impact poor job satisfaction may have on both the individual and the organisation, job satisfaction is one of the most studied concepts in organisational research (Agho, 1993).

The potential negative physical, psychological, social and domestic effects of shiftwork may be a source of decreased job satisfaction for shiftworkers. More recent studies demonstrate that shiftworkers typically experience lower job satisfaction than day workers (Kundi et al., 1981). This finding may contribute to the increased emphasis on the work attitudes of shiftworkers because of the hypothesised link between poor job

satisfaction and the formation of health problems in shiftworkers (Dirkx, 1993; Kundi et al., 1981).

For shiftworkers the choice and perceived control over the arrangement of the shift structure appears to be a major determinant of overall job satisfaction (Barton, 1994; Orpen, 1994). Personal control and individual choice has been identified as a strong moderator of increased acceptability and tolerance of shift systems (Barton et al., 1993). The degree of autonomy individuals' experience has also been linked to intrinsic job satisfaction (Ostroff, 1992). A study of nurses reflected this finding and indicated that decreased job satisfaction occurred when there was little work autonomy and when their work objectives and personal professional standards were undermined (Seymour & Buscherhof, 1991).

Although Pierce and Dunham (1992) point out that relatively little research has been conducted on shift schedules and employee job satisfaction, the structure of the shift schedule is a likely major determinant of intrinsic job satisfaction of shiftworkers (Zedeck, Jackson, & Summers, 1983). In recent years there has been an increased emphasis on identifying the best shift systems (Kogi & di Martino, 1995). The pressure to instil greater flexibility into shiftwork arrangements has come from business demands which call for greater competitiveness. Shiftworkers have also requested more consideration of the social impact of irregular work hours (Kogi, 1995). The impact of shiftwork hours on social and family commitments appears to be a source of dissatisfaction for individuals (Kundi et al., 1981). These findings therefore suggest that many factors contribute to job satisfaction.

Other research has suggested that employees experience decreased job satisfaction with rotating shifts as opposed to fixed schedules (Akerstedt & Torsvall, 1978; Jamal, 1981). Krausz and Koslowsky (1995) found that nurses working on rotating shifts experienced lower job satisfaction and expressed a greater willingness to leave than those nurses on fixed shifts. This has been partially attributed to the increased risk of burnout and other health problems often resulting from rotating shifts. Rotating shifts may also lead to decreased job satisfaction as such schedules impede the ease of planning family and social contacts (Jamal, 1981).

2.5 Potential Effects of Shiftwork: Organisational Outcomes

2.5.1 Turnover

It is acknowledged that many organisational factors such as productivity, performance, and organisational commitment may be affected by individual intolerance to shiftwork (Monk & Embrey, 1981 cited in Monk & Folkard, 1992). Organisational turnover is a factor of shiftwork which deserves more attention in research in order to understand the diverse effect shiftwork may have on organisational effectiveness.

As such, organisations place considerable emphasis on understanding the contributing factors of turnover for a number of reasons. The costs associated with recruitment in terms of financial input and training are one such reason (Eberhardt, Pooyan, & Moser, 1995). Research has therefore attempted to identify the aspects of shiftwork which precede an individual's desire to leave an organisation. The possible reasons why individuals leave organisations are potentially endless (Jamal, 1981; Zedeck et al., 1983). Research on turnover tends to focus on organisational concepts such as organisational commitment and job satisfaction. Although organisational commitment is not addressed specifically in this study, research often considers the impact of organisational commitment and job satisfaction as interactive (Bluedorn, 1982; Tett & Meyer, 1993). Research on nurses and job satisfaction draws a clear link between job satisfaction and turnover (McCloskey, 1974; Munro, 1983). Job satisfaction has been identified by some researchers as the strongest factor explaining turnover intention (Eberhardt et al., 1995).

The structure of the shift system is a major contributing factor to turnover intention (Zedeck et al., 1983). This was highlighted by Krauz and Koslowsky (1995) who suggest that as with job satisfaction, rotating schedules are less popular and may therefore contribute to intention to leave the organisation. The extent to which individuals are able to choose their preferred shift pattern was found to moderate their job satisfaction and therefore intention to leave (Zedeck et al., 1983).

Health complaints of shiftworkers appear to contribute somewhat to turnover intention, although the extent to which health problems precede turnover has been a topic of debate in shiftwork literature for some time (Koller, Kundi, & Cervinka, 1978). It is hypothesised that the health status of shiftworkers may be jeopardised by the impact shiftwork has on facets of family and social life. The potential for shiftworkers to

experience psychological stress as a result of impoverished family and social time may manifest in a number of psychological and physiological complaints. The lowered job satisfaction resulting from these factors may therefore contribute to the shiftworker's contemplation of leaving the organisation (Koller et al., 1978; Zedeck et al., 1983).

Eberhardt et al, (1995) identified age to be the strongest of all individual difference variables which indicated intention to leave. In their study Eberhardt et al found that younger nurses were more likely to express intention to leave when their job satisfaction was low.

2.6 Potential Effects of Shiftwork: Moderator Variables

Certain individual difference characteristics have been shown to have a moderating effect on the potential negative impact of shiftwork. These moderating variables have been classified into three categories (Barton et al., 1995a). These categories are;

1. individual differences including gender, marital status and age, habitual sleep need
2. personality - circadian type and ability to overcome drowsiness
3. the use of coping strategies.

2.6.1 Individual Differences

2.6.1a Gender

Research on the effect of gender on shiftwork tolerance is scarce. However, gender related effects of shiftwork have received more attention in recent years.

Studies addressing gender differences in shiftwork illustrate a disagreement amongst researchers as to whether any gender differences exist at all (Singer & Levens, 1990). Beermann and Nachreiner (1995) found no gender related effects between females and males and therefore concluded that gender did not act as a moderator of the potential effects of shiftwork.

Research on gender differences in shiftwork typically focus on the demands of domestic life to explain any differences in the outcomes of shiftwork for males and females (Dekker & Tepas, 1990). Therefore any differences are explained in terms of

social and domestic factors rather than any differences in the biological attributes of males and females (Gadbois, 1981). Charles and Brown (1981) conclude that although in general women and men experience the same effects of shiftwork, women are more likely to be responsible for domestic duties and that this 'double shift' may threaten the overall well-being of female shiftworkers. This is consistent with other research which suggests that women may experience lowered well-being as a result of lack of sleep resulting from the double burden of work and domestic responsibilities (Fong & Amatea, 1992; Gadbois, 1981). This can be problematic considering on average females require approximately ninety minutes more sleep than males (Monk & Folkard, 1992). Further research into this will no doubt be required to assess the impact of the domestic and social roles of male and female shiftworkers today.

2.6.1b Marital Status

The limited literature on marital status and shiftwork illustrates conflicting views as to the success of marriages of shiftworkers (Snyder, 1995). A considerable proportion of literature reinforces the notion that divorce rates among shiftworkers greatly exceed the norm. It is proposed partners of shiftworkers blame the shiftworker for disruptions to family life and personal relationships (Smith & Folkard, 1993)

Contrary to these findings a significant number of studies highlight the benefits of a partner as an important moderator of the effects of shiftwork (Beermann, Rutenfranz, & Nachreiner, 1990). The social support provided by a partner is known to moderate the impact of many occupational stressors (Landsbergis, Schnall, Deitz, Friedman, & Pickering, 1992). For example Barnett and Marshall (1992) highlight the finding that married men in comparison to single men, live longer, have fewer hospital days, exhibit lower rates of depression and substance abuse. It is possible that the ultimate factor determining the success of partner support may be the partners view of the demands of the shiftwork schedule and the extent to which their views are considered (Tepas, 1993).

2.6.1c Age

Shiftwork researchers pay particular attention to age as a moderating variable to the effects of shiftwork. This is because of the changes in quality of sleep patterns and

overall health which occur as a function of age. Parkes (1994) found age to be negatively related to both the quality and duration of sleep. This is consistent with a number of other studies which suggest that adjustment to shiftwork tends to become more difficult with increasing age. In particular, evidence suggests that from approximately age fifty, shiftwork may impose very severe strains (Monk, 1989). Akerstedt and Torsvall (1981) had similar findings, suggesting that with respect to individual factors, age was the major predictor of sleep length and quality especially in the night shift. The main contributing factor explaining this tendency is that age related changes in circadian rhythms may be involved, as a high correlation was found between 'diurnal type' and age. This suggests that with increased age the tendency toward 'morningness'(a preference for morning activity) increases.

Harma (1996) also adds that although there is a paucity of longitudinal studies on ageing, shiftworkers over 40-45 years of age seem to sleep worse after night shifts, but not after morning shifts. Explanation also possibly lies in the increased de-synchronisation of the circadian systems with age, making it more sensitive to disturbances of the sleep/wake cycle. This then manifests in the inability to achieve sleep in the early part of the day, a specific requirement for individuals working night shifts (Akerstedt & Torsvall, 1981).

Further research found that older shiftworkers reported poorer sleep and greater use of sleeping pills than younger shiftworkers. Furthermore within a particular age group, those with longer prior experience to shiftwork report more interrupted sleep patterns and experience more health problems (Foret, Bensimon, Benoit, & Vieux, 1981). These findings suggest that the cumulative exposure to shiftwork acts as a strong predictor of sleep duration, although not necessarily sleep quality and overall health and that this predictiveness increases when considered with age (Parkes, 1994).

Harma (1996) notes that the need for sleep may decrease with age which could explain some of the differences found in sleep length between older and younger shiftworkers. Consistent with these findings, Frese and Okonek's (1984) earlier study found that employees who left shiftwork solely for health reasons had longer experience of working shifts than those who left for other reasons.

2.6.1d Habitual Sleep Need

The number of hours sleep required by an individual is referred to as habitual sleep need. Habitual sleep need may act as a potential predictor of individual tolerance to shiftwork. For example Monk and Folkard (1992) suggest that individuals' who need nine hours sleep find shiftwork almost impossible to cope with. Individuals who can get by with five hours sleep find adjustment to shiftwork easier.

2.6.2 Personality

The aspects of personality which receive the most focus in shiftwork research are morningness, circadian type and neuroticism. While research often studies these constructs separately, in reality they are highly interrelated and their relative effect is influenced by the presence of other moderator variables and characteristics (Iskra-Golec et al., 1995).

2.6.2a Morningness

The construct 'morningness' is defined as a preference for morning activity as opposed to night time activity (Smith et al., 1989). Morningness is often referred to in layman's terms as either a 'lark'(morning type) or an 'owl' (evening type). These concepts are particularly important in determining the tolerance of early shifts or night shifts (Regestein & Monk, 1991). Studies to date suggest morningness is associated with poor adjustment to shiftwork and that this adjustment is very poor on the night shift (Akerstedt, 1988). Tolerance to night work is an important factor for shiftworkers as most shift work includes a quantity of night shift. The morningness construct has been identified by certain researchers as one of the most reliable predictors of night shift tolerance (Harma, Hakola, & Laitinen, 1993).

2.6.2b Circadian Type

Individual circadian rhythm differences are believed to predict tolerance to shiftwork (Smith, Brown, Di Milia, & Wragg, 1993). The two dimensions of circadian

type considered to predict shiftwork tolerance are 'flexibility of sleeping habits' and 'vigorousness'. Flexibility of sleeping habits refers to the ability to sleep at unusual times. Vigorousness refers to the ability to overcome drowsiness which may result from erratic changes in sleep patterns (Iskra-Golec et al., 1995). Studies focusing on the impact of these variables found that individuals who were rigid in sleeping habits and languid in overcoming drowsiness exhibited more manifest anxiety. These characteristics were also more prevalent in individuals who experienced nervous or digestive problems than those individuals without these symptoms (Costa et al., 1989). Flexibility and vigorousness were found in nurses who had more positive attitudes towards their shiftwork schedule (Iskra-Golec et al.). These studies suggest the measurement of flexibility and vigorousness may be used successfully in determining those individuals best suited to shiftwork and may therefore be a valid personnel selection device (Smith et al., 1993).

2.6.2c Neuroticism and Extraversion

Studies aimed at understanding individual circadian differences and shiftwork tolerance take into consideration the impact of neuroticism and extraversion. Research has identified neuroticism as having a profound impact on sleep (Akerstedt & Torsvall, 1981). These studies have related neuroticism, introversion and other measures of anxiety to not only sleep problems but also to other psychological disorders and adaptational difficulties (Adams, Folkard & Young, 1986; Parkes, 1994).

Certain field studies investigating sleep disturbance among shiftworkers have also related these disturbances to general dissatisfaction about work conditions and the quality of domestic life (Lavie et al., 1989). Results from such studies hypothesise that the 'negative affectivity' characteristic of neurotic individuals may be a major contributing factor underlying a variety of subjective complaints, including sleep problems. Folkard et al. (1979) illustrated that neurotic individuals tended to be less flexible in sleeping habits, for example keeping to the same bedtime and waketime irrespective of the needs of the situation. For example these individuals would go to bed and wake up at the same times even if on holiday. The inflexibility of such individuals is clearly not conducive to the requirements of working shifts. Further to this it is suggested that neurotic introverts are less able to cope with shiftwork or jet lag or

changes in daylight saving than neurotic extrovert types. Singer and Levens (1990) also found that extroverted individuals demonstrated greater adjustment to shiftwork. These findings therefore justify the need for individual differences in neuroticism and extraversion to be taken into account in when identifying individuals likely to tolerate shiftwork (Akerstedt & Torsvall, 1981; Costa 1993).

2.6.3 Coping Strategies

Coping behaviour as defined by Lazarus (1991) "consists of cognitive and behavioural efforts to manage specific external or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 112). Despite the obvious importance of coping strategies for shiftworkers, relatively little research has been devoted to determining the actual coping strategies used by shiftworkers (Dewe & Guest, 1990). The difficulties inherent in measuring coping strategies used by shiftworkers is considered accountable for the lack of research on coping and shiftwork (Fleming, Baum, & Singer, 1984).

Nonetheless, a considerable amount of literature has been produced in recent years offering shiftworkers strategies which may alleviate some of the negative outcomes of shiftwork (Monk & Folkard, 1992). Wedderburn (1993) suggests that over the years shiftworkers have no doubt accumulated a variety of ways with which to cope with the pressures of shiftwork even without expert advice. Of greater concern to researchers and health clinicians is the extent to which shiftworkers actually utilise effective coping strategies, as coping influences physical and mental health (Ptacek, Smith, & Dodge, 1994).

More recently the emphasis has been on the use of cognitive and behavioural strategies of coping by shiftworkers. Barton et al. (1995a) differentiate between engagement and disengagement strategies. Engagement refers to a pro-active approach to coping with stressful events. Disengagement refers to the avoidance of establishing effective and healthy coping strategies.

Research focused on the engagement/disengagement dichotomy have considered individual difference variables such as gender in an attempt to understand the dimensions of the coping process (Ptacek, Smith, & Zanas, 1992). However, studies measuring gender differences in coping have produced mixed results. Females are typically described as using emotion-focused coping methods which involve attempting to

regulate the emotional responses elicited by the stressor. This method of coping may involve becoming depressed and avoiding the situation, although women are more likely to seek social support. Males are often found to engage in problem-focused coping which involves cognitive and behavioural attempts to alter a stressful situation. Contrary to this research suggests that males also engage in avoidance type behaviour such as using drugs and alcohol (Ptacek et al., 1994).

It is clear that gender related differences in coping are yet to be fully understood. Processes of socialisation have also been used to explain gender differences in coping. This theory holds that females and males are socialised to deal with stressful events in different ways. For example, females are encouraged to seek emotional support, while males are not encouraged to do so. This concept of sex role orientation is also used to explain gender differences in coping strategies (Ptacek et al., 1994). These findings illustrate the need to further understand gender differences in the coping strategies of shiftworkers given the potential negative psychological and physical outcomes of shiftwork.

2.7 Shiftwork Research: Methodology and Measurement

An overarching theme in the study of shiftwork illustrates the need for the development of standardised measures with which to assess the potential impact of shiftwork on individuals (Barton et al., 1995a; Costa et al., 1990). The rectification of this issue has been a major concern in recent years (Costa et al., 1990).

Shiftwork can be considered, at the best of times, a difficult phenomenon to study. The issue of standardisation of methodology and instruments is considered to be a central problem with shiftwork research if comparability, and compatibility, of findings is to be achieved. It is the apparent lack of standardised measures in the field of shiftwork research which questions the validity of such comparisons (Barton et al., 1995a). Not only is the ability for findings to be generalised questioned, so to is the validity and reliability of the findings. This may also lead to concerns about the utility of such findings.

As shiftwork research can be considered an international and inter-cultural field of study, results from research must therefore be comparable across research groups, countries, cultures and occupations. In order to do this it is considered necessary that the methods and tools used by different researchers or research groups in different

countries should be standardised in order to compare results on comparable research questions (Barton et al., 1995a; Nachreiner, 1990).

The problems regarding methodology in shiftwork research has been of concern to many researchers. Bohle (1990) claimed that unfortunately, "serious methodological weaknesses" (p. 57) have made research on shiftwork difficult to interpret. This is apparent in prior studies which have often been cross-sectional thereby making it impossible to decide whether differences in the 'independent' variables, such as neuroticism, are a cause or an effect of differences in adaptation to shiftwork schedules (Monk & Folkard, 1985 in Bohle, 1990). These methodological problems with shiftwork research have also made it difficult to interpret the health complaints of shiftworkers. The lack of longitudinal studies is considered to contribute to the inconclusiveness of findings and reinforces the need for more longitudinal studies using adequate samples (Nachreiner, Lubeck-Ploger, & Grzech-Sukalo, 1995; Kaliterna, Vidacek, Prizmic, & Radosevic-Vidacek, 1995).

Bohle (1990) also highlights that studies which have used adequate control groups are scarce. This is important because the work scheduling of shiftworkers is superimposed upon many other characteristics of the workplace which may also have a potentially detrimental effect on employees. It is therefore necessary to conduct studies on subjects who do the same job, but on varying work schedules.

The concerns presented here highlight the need for instruments in shiftwork research which possess sound psychometric qualities. The use of such tools may enable comparisons between research populations to be made and therefore uncover any notable differences between individuals in different countries and cultures. Results from studies around the world will contribute to a wider universal understanding of the potential effects of shiftwork. The authors of the Standard Shiftwork Index (Barton et al., 1992) cite these issues as the justification for the urgent requirement of standardised instruments for measuring shiftwork effects.

2.8 The Standard Shiftwork Index (SSI)

2.8.1 Authors

The authors of the SSI are some of the most prominent and experienced researchers in the field of shiftwork research. The shiftwork research team is made up of

members of the MRC/ESRC Social and Applied Psychology Unit of Sheffield University, namely; Jane Barton, Lawrence Smith, and Evelien Spelten; Simon Folkard and Peter Totterdell from the Body Rhythms and Shiftwork Centre, University of Wales Swansea; and also Giovanni Costa, from the Institute of Occupational Medicine, University of Verona, Italy.

2.8.2 Rationale

The rationale of the SSI was based on the theoretical framework developed by Folkard (1993) as shown in Figure 1, as well as the extensive world-wide research conducted on shiftwork.

The authors of the SSI acknowledge that for some individuals shiftwork holds a positive and beneficial place in their lives. This can be attributed to a number of factors including the suitableness of shiftwork to child-care responsibilities, and on certain occasions higher rates of pay for the unconventional hours of work (Barton et al., 1995a).

However, the authors of the SSI highlight the substantial research which has identified a wide range of problems faced by shiftworkers (Waterhouse, Folkard, & Minors, 1992). This diverse range of potential problems is argued by Barton et al., (1995a) as being fundamentally attributable to an intolerance of disturbances to the naturally occurring physiological sleep pattern of humans. This occurs because shiftwork and especially night work, requires individuals to remain awake while their diurnal body clock, or circadian rhythm, is preparing them for sleep, or alternatively requires them to sleep when the body is in a phase of physiological wakefulness. This disturbance to the circadian rhythm has been found to act as a catalyst to other physiological and psychological problems, as well as disruption to social and domestic life (Barton et al., 1995a).

The widespread occurrence of such problems prompted them to develop a measurement instrument which could be used to identify the negative aspects of different types of shift systems. Such an instrument may also help to identify those types of individuals that would be most suited to shiftwork. Barton et al. (1990) suggest that many of the negative aspects of shiftwork have serious ramifications for individuals as well as organisations. To further understand the different effects of shiftwork, comparisons across shift systems are required.

Making such comparisons would require a standardised instrument with international norms (Anastasi, 1988). Barton et al. (1995a) reiterate the scarcity of well-controlled studies using standardised measures or psychometrically sound instruments. They were concerned that studies using non-standardised instruments limit such comparisons and hindered the achievement of accurate information regarding the identification of the 'best' forms of shift systems (Monk & Folkard, 1992). It was considered that a shiftwork measure with sound psychometric qualities, will contribute to allowing such comparisons across shift systems to be made (Barton et al., 1995).

Folkard (1992) suggested that such a measure would also enable researchers to examine the severity of the diverse range of problems in shiftworkers whose shift systems are systematically different from each other. This will then enable researchers to isolate the relative importance of the various features of shift systems, thus identifying the most problematic ones.

The SSI was also created to facilitate quality world-wide research on shiftwork. It was the authors intention that researchers all around the world could use the SSI scales in different occupational groups. Results from such studies could therefore contribute to a set of 'normative' data based on different occupational groups. This may then allow cross-study comparisons to be made (Barton et al., 1995a).

The SSI consists of a battery of self-report questionnaires. The authors of the SSI included a number of different inventories which would reflect the apparent detrimental aspects of shiftwork. The inventories were chosen for inclusion on the basis of their sound psychometric qualities and their sensitivity to the effects of different shift systems on large groups of individuals (Barton et al., 1995a).

The questionnaires included in the test battery cover the four major areas that shiftwork may have detrimental effects on individuals, namely sleep patterns, physical and psychological health, social and domestic life and job satisfaction. The first section of the SSI asks demographic questions as well as questions referring to the type of shifts worked and the arrangement of these shifts or rosters.

The SSI has been used in many shiftwork studies by researchers in Italy, France, Poland, Germany, Belgium, Australia and China (Barton et al., 1995a). It is hoped that this thesis on shiftworkers in New Zealand may contribute to the global understanding of shiftwork.

2.8.3 The U.K Study

The initial development of the SSI involved a pilot study comprising nurses and industrial workers (Barton et al.,1995a). The nursing sample was made up of shiftworkers who worked a range of shift systems. The nurses originated from some of the larger general hospitals in the U.K. The industrial sample, was predominantly male, came from a range of different occupations within the power, chemical and steel industries and the police force. Table 1 illustrates the demographic characteristics of the U.K sample.

Table 1

Demographic information of the U.K study sample (Barton et al., 1995a)

	Nurses (n=1532)	Industrial / Service (n=332)
Gender		
Female	1406	23
Male	114	308
Not known	12	1
	%	*%*
Martial status		
Married / de facto	66.4	55.5
Widowed / Divorced	5.7	4.8
Single	27.7	9.6
Mean age	33.2	39.2
Mean number of years in shiftwork	11.8	15.9

Table 1 illustrates that the majority of the nurses were female, 85% compared to 6.9% of the industrial workers. The majority of the industrial workers were either married or in a de factor relationship, 85% compared to 66.4% of the nurses. The industrial workers had spent considerably more years in shiftwork 15.9 years compared to 11.8 years for the nursing sample.

Table 2

Statistics associated with the distribution of scores for the U.K study (Barton et al., 1995a)

	M	SD	α Nursing (n=1532)	α Industrial (n=332)
Psychological well-being	12.2	5.2	.89	.88
Cognitive anxiety	12.5	5.2	.85	.86
Somatic anxiety	13.2	4.5	.72	.80
Neuroticism	12.8	3.1	.66	.73
Extraversion	17.5	3.1	.74	.75
Chronic fatigue	25.0	7.6	.92	.93
Digestive problems	14.0	4.6	.84	.86
Cardiovascular problems	10.3	2.7	.71	.76
Sleep disturbance between				
Early shifts	18.0	4.1	.74	.83
Late shifts	15.0	3.6	.73	.79
Night shifts	19.0	5.1	.85	.83
Rest days	13.0	3.6	.78	.76
Social disruption	3.1	1.2	--	--
Domestic disruption	2.7	1.2	--	--
Non-domestic disruption	2.5	1.2	--	--
General Job Satisfaction	23.3	5.9	.77	.76
Morningness	34.6	6.4	.85	.86
Flexibility	26.0	5.5	.79	.79
Languidity	31.6	6.5	.79	.73
Coping				
Engagement	48.4	11.7	.88	.85
Disengagement	30.4	10.8	.89	.90

Note. As Social and Domestic disruption are single item variables, no alpha coefficients are computed.

Table 2 shows the statistics associated with the distribution of scores for the U.K study. Means, standard deviation and alpha coefficients values for each of the individuals measures of the SSI are illustrated. The alpha coefficients ranged from .66 - .92 for the nursing sample and .73 - .93 for the industrial sample.

The correlation matrix for the U.K study is illustrated by Table 3. The correlation coefficients and levels of significance for each of the relationships between the moderator and outcome variables are shown. The range of the correlations is -.43 to .42.

Table 3

Correlation matrix showing the relationships between moderators and outcomes for the U.K sample (Barton et al., 1995a p. 21)

VARIABLE	Extraversion	Morningness	Flexibility	Languidity	Engagement	Disengagement
Psychological well-being	-.1**	-.14**	-.20**	.22**	.08**	.42**
Chronic Fatigue	-.24**	-.27**	-.30**	.38**	.01	.30**
Cognitive anxiety	-.16**	-.13**	-.19**	.24**	.10**	.40**
Somatic anxiety	-.14**	-.16**	-.19**	.27**	.12**	.30**
Neuroticism	-.15**	-.20**	-.23**	.35**	.23**	.40**
Digestive problems	-.06**	-.12**	-.17**	.21**	.07**	.25**
Cardiovascular problems	-.12**	-.10**	-.09**	.13**	.02	.26**
General Job Satisfaction	.11**	0	.01	.17	.13**	.01
Social Disruption	0	-.10**	-.22**	.19**	.04	.16**
Domestic disruption	.01	-.01	-.09**	.13**	.07**	.15**
Non- domestic disruption	-.05*	-.06*	-.11**	.14**	.06*	.14**
Sleep disturbance between: Early shifts	-.07*	-.34**	-.08**	.31**	.04	.21**
Late shifts	-.07*	-.07*	-.15**	.10**	.02	.23**
Night shifts	-.13**	.07**	-.43**	.11**	.13**	.24**
Rest days	-.08**	-.08**	.06**	.01	.01	.18**

* $p < .05$, ** $p < .01$

2.9 Research Justification

To date research on shiftwork in New Zealand is relatively scarce despite the many industries using shiftwork as the basis of their work schedules. Such industries and occupations include the medical domain, telecommunications and armed forces for example. Furthermore shiftwork studies within the television industry in New Zealand and globally appear to be non existent. The organisation of which the present study was based would benefit from such studies, as the Operations Division alone consists of approximately ninety percent shiftworkers.

Governmental departments are yet to actively collect any detailed information regarding the prevalence of shiftwork in New Zealand. Enquires made to Statistics New Zealand, the Labour Department's Occupational Safety and Health division and the Accident Compensation Corporation indicated that statistics on shiftwork or national occupational injury statistics in this country were not collected. Referral to the New Zealand Census and the Labour Force Survey also made no mention of shiftwork practices in New Zealand. The lack of attention to the extensive utilisation of shiftwork systems and the consequences of shiftwork by governmental or private agencies is disturbing given the prevalence of shiftwork in this country.

For researchers the absence of reliable statistics on shiftwork makes it impossible to make accurate assessments of how New Zealand compares to other countries in terms of shiftwork (Wren, 1997). Data from this research will therefore contribute to a set of normative data based on different occupational groups, being constructed by the authors of the SSI (Barton et al., 1995a). This will also allow an assessment of the SSI within the New Zealand context and specifically the research population which makes up this study.

It is considered that the results from this study will also be valuable to the organisation and shiftworkers who took part in the research. Information obtained from this study will allow recommendations to be made to the organisation regarding the dynamics of their shiftworkers and the design of shift schedules.

Two main points make up the justification for this research. The first issue is to establish the portability of the SSI to the New Zealand context and in particular the television production industry. Secondly, justification for this research rests on the

considerable potential impact shiftwork may have on individuals as illustrated by the large international body of literature on shiftwork. This impact is becoming increasingly important because of a global trend which indicates an increase in shiftwork practices. The likely increase in shiftwork globally serves as an indicator of what is also likely to occur in New Zealand. Pierce & Dunham (1992) cite one-fourth of the American work force is involved in shiftwork schedules. This global trend indicates the need for effective shiftwork practices and strategies in New Zealand. Such strategies will empower individuals and organisations to cope with the rapid technological changes the new millennium will more than likely bring.

2.10 Thesis Objectives

The present study therefore aims to replicate the use of the SSI with a New Zealand sample of shiftworkers. These aims and objectives are outlined as follows:

1. To compare the results of the SSI on a New Zealand sample of television production shiftworkers with those of the U.K sample, which consisted of nurses and industrial workers.

2. To assess the impact of shiftwork on the present sample of employees working in the television production industry. Assessment would be in terms of the outcome and moderator variables of shiftwork. The outcome variables are psychological well-being, cognitive and somatic anxiety, neuroticism, chronic fatigue, digestive problems, cardiovascular problems, social and domestic disruption and sleep disturbance on each shift. The moderator variables are extraversion, morningness, flexibility, languidity, coping strategies; engagement and disengagement.

3. To determine if there are any significant differences between the demographic variables (age, gender, marital status, tenure, and regularity of the shift system) and the moderator variables and outcome variables including turnover intention.

CHAPTER THREE

Research Design and Methodology

3. Introduction

This chapter reports information pertaining to the research design and methodology of the study. It includes the rationale for the research location, description of the sample, the procedures and the measuring instrument.

3.1 Study Area

The study took place within an organisation of the television production industry located in Auckland. The television production industry requires employees to perform their work practices within very erratic schedules. These schedules are often outside of the 'normal' structure of shift schedules in terms of shift duration and location. Shiftworkers in this industry are also required to travel to other locations both within New Zealand, as well as overseas.

3.2 The Sample

The total research population comprised 175 shiftworkers from one organisation. Sixty-three questionnaires were returned from sixteen females and forty-seven males, giving a response rate of 36%.

The benefit of reminder letters was reinforced in the present study. Mangione (1995) suggests that reminders of varying forms are probably the single most important technique to yield high response rates. Prior to the reminder letter (Appendix A3) being sent out the response rate was 19%. Following a reminder to supervisors and managers and another reminder letter being distributed this increased to 36%. Given the relatively small sample it was decided that one reminder to supervisors and one written reminder letter to shiftwork employees would be sufficient.

Table 4

Demographic information of study sample (n = 63)

	frequency	%
Gender		
Male	47	75
Female	16	25
Marital Status		
Married / De Facto	41	65
Separated / Divorced	7	11
Single	15	24
Mean Age	39	
Mean number of years in shiftwork	29	

Table 4 shows that the majority of the sample (75%) are males and are married or living with a partner (65%). The mean age of the sample is 39 and the mean number of years the sample has worked shifts is 29.

3.3 Survey Procedures

The first step in conducting the present study was to gain access to the shiftworkers within the organisation. Once permission was granted by the organisation, the second step was to obtain ethical approval. Approval for the research was granted by the Human Ethics Committee of Massey University. Following ethical approval, the questionnaires were distributed. A total of 175 questionnaires were distributed to all shiftworkers of the organisation. The questionnaires were distributed via the internal mail system within the organisation. The items sent included the following:

- a copy of the questionnaire (Appendix A1)

- a copy of a memo from the Head of Operations of the organisation. The purpose of the memo was to ensure potential participants that the organisation endorsed the research.
- a copy of the Information Sheet (Appendix A2) which outlined the rationale of the study, the participants rights if they decided to take part and the nature of their involvement.

- a self-addressed Freepost A4 envelope for the participant to return the questionnaire to the researcher at the University, as it is considered more professional that the respondent need not fold the questionnaire to fit it into the envelope (Mangione, 1995).

The reminder procedures used in the present study took two forms. Approximately two weeks after the questionnaire was distributed, a memo was sent to all shiftworker supervisors and managers via the e-mail network at the organisation. This was a request for them to remind their staff to fill in the questionnaire if they had volunteered to participate. Issues of confidentiality and anonymity were reiterated. A reminder letter (Appendix A3) was also sent out to all shiftworkers who received the initial questionnaire.

3.4 Measurement Instrument

The Standard Shiftwork Index (SSI) (Barton et al., 1992) was the measuring instrument used in the present study. The opportunity to conduct research with the SSI came from Professor Simon Folkard, one of the authors of the SSI. Professor Folkard invited research students at Massey University to use the SSI in their research, provided that the source was acknowledged and results from the study were forwarded to him. This would facilitate the gathering of an international set of data on the SSI.

3.5 Questionnaire Origin and Development

This section outlines the origin and development of the SSI and the psychometric properties of each of the scales. This information is derived from the Standard Shiftwork Index Manual (Barton et al., 1992). This section also outlines how the scales are categorised to address the research questions and to investigate current potential problems faced by shiftworkers, as discussed in the introduction section.

As indicated in Chapter Two, the SSI was developed in response to a general lack of reliable and valid measures to assess individual tolerance to shiftwork. The general agreement is that shiftwork can have potentially detrimental consequences on individuals, but also that certain shift systems, or features of shift systems are particularly harmful. Standardised measures for the appraisal of such an impact were nonexistent. Furthermore the lack of well-controlled studies that were able to examine the impact of different types of systems in comparable groups of workers, highlighted the need for a more universal measure. Without such a measure decisions regarding the best types of shift systems could not be supported empirically, leading to uninformed and inaccurate judgements (Barton et al., 1995a).

The scales which make up the SSI were included because they were considered by the authors as the most appropriate measures to reflect those issues deemed pertinent within shiftwork research (Barton et al., 1995a). These measures were also considered theoretically relevant to Folkard's (1993) (Figure 1) framework. Other criteria for inclusion in the SSI were that the scales were reasonably short, easy to administer and possessed sound psychometric properties (Barton et al., 1995a).

The scales which make up the SSI are separated into three broad categories. These categories are *outcomes;* actual problems individuals experience, *moderators;* differences between individuals which may moderate the impact of shiftwork, and *general shiftwork statistics;* including features of shift systems, work context information, and biographical details.

3.5.1 The U.K Study

The initial scale development of the SSI took place using two different occupational groups working on a range of shift systems. Firstly, a group of nurses and

midwives working in the larger general hospital of England and Wales, and secondly a group of predominantly male, industrial and services workers from a range of occupations including air traffic control, chemical industries, the power industry, the steel industry, the police force and the post office, all in the United Kingdom. Participation was voluntary and yielded a 42.3% response rate. The authors of the SSI claim the utility of this instrument and the nature of it's design allows the reliable use of the scales across occupations (Barton et al., 1995a).

3.6 Questionnaire Format and Content

This section describes the layout and organisation of the questionnaire. As recommended by Mangione (1995) it is necessary to consider the aesthetic presentation of any questionnaire as this will contribute to a view of professionalism and competency by the respondent. Furthermore this may contribute to an increased response rate and therefore improved quality of the data.

The covering page of the questionnaire booklet included the name of the researcher and the University. It was considered important to reiterate that the research was for the purpose of fulfilling the masterate requirements for the researcher, and that the research initiative did not stem from within the organisation. Reassurance regarding confidentiality and anonymity were highlighted.

The questionnaire format was made up of five sections. It was with permission granted by the authors of the SSI that an identical reproduction of the original SSI questionnaire was made. Section 1 comprised questions related to general biographical information, namely, the respondents domestic situation and details about the type of shifts they work and job satisfaction. Section 2 consisted of questions referring to sleep and fatigue. Section 3 comprised questions relating to health and well-being. Section 4 consisted of questions referring to the respondents social and domestic situation. Section 5 asked respondents about coping and the types of strategies they used to assist them. Section 6 consisted of questions which refer to the type of person the respondent is, ending at question 6.3. Question 6.4 was added by the researcher in order to investigate the potential impact of shiftwork on turnover intention.

3.7 Psychometric Properties of the SSI Scales

This section outlines the scales which make up the SSI. These scales are separated into outcome variables and moderator variables. A full description of the individual scales and scoring information can be obtained by referral to the SSI Manual (Barton et al.,1990). All scoring for the individual scales was conducted in accordance with the SSI Manual.

3.7.1 Outcome Variables

3.7.1a General Job Satisfaction

This scale forms part of the Job Diagnostic Survey (Hackman & Oldham, 1975). It includes a five item overall measure of the degree to which an employee is satisfied and content with their job. Items are scored on a seven point Likert scale. Lower scores indicate higher job satisfaction. Barton et al. (1995a) reported alpha coefficients of .78 for the nursing sample and .83 for the industrial sample.

3.7.1b Sleep Questionnaire

This measure was constructed by the authors of the SSI. It aims to identify sleep habits and disturbance to sleep patterns according to which shift is worked. The scale has two sections. The first section is concerned with sleep habits including timing and duration of sleeps at different times of the day. The second section consists of eight items measuring sleep quality and difficulties with each of the shifts worked and rest days. Scoring is on a five point Likert scale. A total score is computed; a higher score indicating more difficulty. The alpha coefficients of the U.K study range between .73-.85 for the nursing sample and .76 - .83 for the industrial sample (Barton et al., 1995a).

3.7.1c Chronic Fatigue Questionnaire

The SSI measure of chronic fatigue was specifically constructed by the authors at Sheffield University and was partially based on existing fatigue scales such as the acute and chronic fatigue scales developed by Verhaegen, Maasen, & Meers (1981). The questionnaire contains ten items, five of which are positively oriented to index feelings of vigour and energy - the opposite of fatigue. The remaining five measure general feelings of tiredness and lack of energy. Items are scored on a five point Likert scale. A single total score is computed. A higher score indicates greater chronic fatigue. This measure yields high alpha coefficients between .92 for the nursing sample and .93 for the industrial sample (Barton et al., 1995a).

3.7.1d Physical Health Questionnaire

This scale is constructed in two parts. The first part comprises a scale developed by Barton et al (1995a) which contained items selected from existing health measures including the Inventory of Subjective Health (Dirken, 1967), General Health Questionnaire (Goldberg, 1972) and the Health Survey (Spence, Helmreich, & Pred, 1987). The questionnaire contains two sub-scales with eight questions each, measuring cardiovascular and gastrointestinal disorders, both known to have high a incidence in shiftworkers. Items are scored on a 4 point Likert scale. Higher scores are indicative of more frequent experience of symptoms. Alpha coefficients for the digestive scale were reported as .84 for the nursing sample and .86 for the industrial sample. Alpha coefficients for the cardiovascular scale were .71 for the nursing sample and .76 for the industrial sample (Barton et al., 1995a).

The second part of this scale contains a checklist of medical conditions suffered and medications taken before starting shiftwork, since starting shiftwork, or never. Participants indicate their answer by ticking the appropriate column or columns. Three questions referring to cigarette, caffeine and alcohol consumption are included. Participants indicate the amount per item consumed per day or week. Two questions relating to menstrual cycle are included and are scored on a 4 point Likert scale. The checklist of conditions and medications as well as questions referring to consumption of

alcohol, caffeine, cigarettes and menstrual cycle were treated as individual items and are not included in the scoring of the overall scale. Alpha coefficients are not reported.

3.7.1e General Health Questionnaire (GHQ)

The GHQ (Goldberg, 1972) is a self-administered screening test for detecting minor psychiatric disorders in the general population and gives a single measure of mental health. It covers recent levels of self-confidence, depression, sleep loss and problem solving. The 12 item version of the GHQ was chosen for inclusion in the SSI and was therefore used in the present study. Subjects were asked to think about their health over the past few weeks and answer the questions accordingly. A 4 point Likert scale is provided with a higher score indicating poorer mental health. This measure yields alpha coefficients of 0.88 for the industrial sample and .89 for the nursing sample (Barton et al., 1995a).

3.7.1f Cognitive-Somatic Anxiety Questionnaire - (CSAQ)

The CSAQ was sourced from Schwartz, Davidson, & Goleman, (1978) for inclusion in the SSI. This instrument measures trait (usual) anxiety and consists of 14 descriptions of anxiety; 7 with a cognitive orientation eg. 'imagine terrifying scenes', and 7 with a somatic orientation eg. 'I feel tense in my stomach'. Items are scored on a 5 point Likert scale. Higher scores are associated with higher levels of cognitive and somatic anxiety. Alpha coefficients of the CSAQ as reported by Barton et al. (1995) are .85 for the nursing sample and .86 for the industrial sample on the cognitive anxiety scale. The somatic anxiety scale coefficients were .72 for the nursing sample and .80 for the industrial sample (Barton et al., 1995a).

3.7.1g Social and Domestic Survey

This scale was constructed by the authors of the SSI and is based on The Quality of Life Survey, Section 4 (Wallace, 1990) and The Impairment of Social Activities Scale of the 1974 Survey (Nachreiner, 1975 cited in Barton et al, 1992). The questionnaire consists of three general questions used as independent, global measures of the extent

shiftwork contributes to social, domestic and non-domestic disruption. A five point Likert scale was provided. Higher scores are associated with higher disturbance. Alpha coefficients of this scale for the nursing and industrial sample were not reported at the time of the U.K study conducted by Barton et al, (1995a).

3.7.2 Moderator Variables

3.7.2a Coping Questionnaire

This questionnaire was constructed specifically for the SSI by Spelten et al. (1993a). It is based on the Coping Strategies Inventory (CSI) (Tobin, Holrooyd, & Reynolds, 1984) and The Ways of Coping Questionnaire (Lazarus & Folkman, 1988). It uses the tertiary scales of the CSI; engagement and disengagement and comprises 32 items covering 8 basic coping strategies. The participant is asked to indicate to what extent these 8 strategies are used with regard to four problem areas concerning shiftwork; sleep, social life, domestic life, and work. The questionnaire contains a 5 point Likert scale. Two scores per area are produced; one for engagement and one for disengagement. Higher scores indicate more frequent use of each strategy. Alpha coefficients for the engagement scale were .88 for the nursing sample and .85 for the industrial sample. The disengagement scale alpha coefficients were .89 for the nursing sample and .90 for the industrial sample (Barton et al., 1995a).

3.7.2b Composite Morningness Questionnaire (CMQ)

The CMQ is a measure of the construct morningness which indicates preference for morning or evening activities. This scale was constructed by Smith, Reilly, and Midkiff (1989) and is based on existing published scales by Horne and Ostberg (1976) and Torsvall and Akerstedt (1980). Thirteen items make up the scale. Respondents indicate their answer from a choice of four or five options per question. The response options vary depending on the question. Higher scores indicate a preference for morning activity as opposed to evening activity. A score of overall morningness type is achieved. The alpha coefficient of the full scale is .87 indicating high internal consistency reliability

(Smith et al., 1989). Alpha coefficients of .85 for the nursing sample and 0.86 for the industrial sample were reported by Barton et al. (1995a).

3.7.2c Circadian Type Inventory (CTI)

The CTI was developed from the Circadian Type Questionnaire (CTQ) developed by Folkard, Monk, & Lobban, 1979). The CTI consists of 30 items to determine levels of flexibility of sleeping habits. The items form two subscales; languidity and flexibility. A 5 point Likert scale is provided for scoring. Total scores are computed for languidity and flexibility. On both factors, high scores indicate a tendency towards the first of the two labels describing the dimension, for example; languid types or flexible types. The reported alpha coefficients are for Factor 1; languidiness / vigorousness, .73 for the industrial sample and .79 for the nursing sample. Factor 2 ; flexibility / rigidity alpha coefficients were .79 for both nursing and industrial samples (Barton et al., 1995a).

3.7.2d Eysenck Personality Inventory (EPI)

The 12 item EPI is a development of the 57 item Eysenck Personality Inventory (EPI), (Eysenck & Eysenck, 1964). The 12 item EPI included in the SSI measures two major dimensions of personality; extraversion and neuroticism with 6 items on each. Items are scored on a 4 point Likert scale. The two subscales are scored separately, achieving a score on each trait. Higher scores on each sub-scale indicate higher levels of neuroticism and extraversion. The pilot study for the SSI reported internal consistency coefficients for the neuroticism scale as .66 for the nursing sample and .73 for the industrial sample. The extraversion scale reported alpha coefficients of .74 for the nursing sample and .75 for the industrial sample (Barton et al., 1995a).

3.8 Deleted Questions

Due to the majority of respondents' failure to answer Question 2.2 regarding napping habits, it was decided it would be deleted from the analysis. Question 4.1 was not analysed as there was no data for over one third of the sample. Although this item

was left in the original format of the questionnaire, Barton et al. (1995a) explain that factor analysis was not possible due to individuals expressing the items as not applicable.

3.9 Data Analysis

Descriptive and inferential statistical analyses were conducted using SAS (Statistical Analysis System). The Means procedure was used to generate simple descriptive statistics of the sample. This data was obtained from general questions in the first section of the questionnaire which were not part of any of the specific measures which made up the rest of the questionnaire.

The Pearson Product Moment Correlation was used for all correlational analysis. The analysis of variance was conducted using Tukey's HSD six-way ANOVA.

Content analysis was applied to the three open-ended questions (Dey, 1993). Data obtained from these sections were formed into sub-categories and reported as such in the text.

CHAPTER FOUR

Results

4. Introduction

The purpose of this chapter is to present the results pertaining to the objectives of the study. To reiterate, the main objective was to assess the portability of the SSI to a New Zealand sample of shiftworkers. The other objectives involved the assessment of the current sample on the basis of their results on the SSI, as well as identify any significant differences within the group based on their demographic characteristics. A further objective was to assess the relationship between moderator and outcome variables, demographic characteristics and their intention to leave the organisation.

Therefore this chapter presents the results of qualitative data derived from the open and closed-ended questions in the questionnaire. Findings are presented in tables with supporting statements highlighting the main significant themes and findings.

4.1 Data Analysis

This section presents the analytical techniques applied to the different sections of the questionnaire following the appropriate preparation of the data for analysis.

4.1.1 Cleaning the Data

The process of cleaning and checking the data involved a few vital steps. Firstly a check for out-of-range responses was conducted. This involved checking the minimum and maximum values possible for each item. Verification of the data was then conducted to check the accuracy of data input. A check of consistency and accuracy was made by double-checking every fifth questionnaire (Mangione, 1995).

4.1.2 Dealing with Missing Values

The number of missing values was small with approximately one third of the items having only 2 or 3 missing values. Due to the small total sample size (n = 63) and the potential loss of valuable data, missing values were estimated with the mean of the entire sample (Tabachnick & Fidell, 1989). Missing values were dealt with in this way as some variables would have had very small sample sizes if missing values were deleted from the analysis.

4.1.3 Analytical Techniques

Statistical analysis of the data was conducted using SAS (Statistical Analysis System). Analytical techniques used included the Pearson Product Moment Correlation for the correlation analysis and ANOVA and Tukey's HSD for the means analysis.

Content Analysis refers to the process of identifying themes and categories from the data. Categories begin with broad themes and are then refined into sub-categories with more specific themes (Dey, 1993). The open-ended items in the questionnaire were analysed using this method of categorising common themes and tendencies and then arranging into sub-categories (May, 1997). The main themes are presented in the text in tabular form.

4.2 General Shiftwork Statistics

This section presents the results from the general questions relating to shift structure and demographic information of the respondents. The responses to the open-ended questions typically referred to demographical information, shift system characteristics and opinions of shiftwork.

Table 5

Personal Health Characteristics of the sample

	frequency	%		frequency	%
Respondents who have not experienced each symptom (n=59-60):					
Chronic back pain	41	69	Cystitis	57	97
Gastritis, duodenitis	52	87	Kidney stones	59	98
Gastric ulcer	56	93	Eczema	50	83
Gall stones	57	95	Chronic anxiety	55	92
Colitis	59	98	Depression	50	83
Sinusitis, tonsillitis	42	70	Arthritis	59	98
Bronchial asthma	50	83	Haemorrhoids	50	85
Angina	59	98	Varicose veins	60	100
Severe heart attach	60	100	Anaemia	53	88
High Blood pressure	51	84	Headaches	38	63
Cardiac arrhythmias	60	100	Diabetes	60	100
Hypercholesterolaemia	60	100			
Menstrual cycle regularity (n=11)					
Before starting shiftwork:			Since starting shiftwork:		
Fairly irregular	3	27	Fairly irregular	4	36
Fairly regular	6	55	Fairly regular	6	55
Extremely regular	2	18	Extremely regular	1	9

Table 5 shows that overall the majority of the sample have not experienced any of the symptoms listed. Headaches (37%), chronic back pain (31%) and sinusitis / tonsillitis (30%) are the three most reported symptoms although these symptoms are experienced by the minority rather than majority of the sample. Menstrual cycle regularity appeared parallel both before and since starting shiftwork.

Table 6

Respondent's use of medications

	frequency	%
Respondents who have not taken each medication (n=59-60):		
Tranquillisers	58	98
Sleeping Tablets	57	97
Anti-depressants	55	92
Antacids	50	85
Antispasmodics	58	98
Laxatives	55	93
Drugs to control high blood pressure	59	98
Diuretics	60	100
Heart medicines	60	100
Vasodilators	60	100
Bronchodilators	54	90
Vitamins, tonics	31	52
Pain killers	43	72
Steroids	57	95
Anti-inflammatory	52	87
Hormones	58	98

Note. Respondents reported only those medications they had taken for more than three months.

Table 6 illustrates that the overall use of medications over a three month period is considerable low. However, almost half of the sample use vitamins and tonics (48%).

Table 7

Habitual Sleep Need of Respondents

Number of hours required (n=63)	Frequency	%
< 5 hours	0	0
5 hours	1	2
6 hours	5	8
7 hours	9	14
8 hours	31	49
9 hours	15	24
10 hours	2	3

Table 7 shows that the majority of the sample (76%) require 8-10 hours sleep per 24 hours.

Table 8

Respondent's consumption of stimulants

	minimum	maximum	mean	SD
Before starting shiftwork (n=56-59):				
Cigarettes (weekly)	0	150	15	38
Alcohol (weekly)	0	60	5	9
Caffeine products (daily)	0	11	3	2
Since starting shiftwork (n=59-60):				
Cigarettes (weekly)	0	200	15	43
Alcohol (weekly)	0	60	6	9
Caffeine products (daily)	0	10	5	3

Note. Amounts are expressed in units. One unit refers to either 1 cigarette; 1 glass of alcohol; 1 glass / cup of caffeine product.

Table 8 illustrates that overall there are no significant differences in the consumption of cigarettes or alcohol since starting shiftwork. The average consumption of caffeine products increased by two units per day after starting shiftwork.

Table 9

Social and Domestic Data

	frequency	%
Partner's work hours (n=38)		
part-time	10	26
full-time	28	74
Partner's work pattern (n=36)		
daytime - no shifts	28	78
rotating shifts with nights	5	14
rotating shifts without nights	3	8
Partner's feelings on respondents shiftwork (n=45)		
extremely / fairly un-supportive	12	27
quite indifferent	6	13
fairly / extremely supportive	27	60
Number of shiftworkers with dependants (n=63)		
0-5 years	8	N/A
6-12 years	15	
13-18 years	7	
19-24 years	10	
25-60 years	45	
>60 years	2	
Respondents required to look after children (n=59)	18	31
Weekends off per month (n=60)		
0	13	22
1 weekend	22	37
2 weekends	22	37
3 weekends	1	1
4 weekends	2	3

Note. As respondents were able to comment on more than one category, percentages are not reported for the number of dependents.

Table 9 illustrates the social and domestic data of the respondents. The sample size variations across items resulted from certain items not being applicable to all respondents. This table shows that the majority of shiftworker's partners work full time (74%), work during the day without shifts (78%). Overall partners are quite supportive of the respondent's shiftwork (60%) although some are un-supportive (27%). 31% of shiftworkers have dependents they are required to look after. The majority of shiftworkers' children are aged 6-12 years (15) and adults 25-60 years (45).

Table 10

Employment Patterns

	frequency	%		frequency	%
Total years employed (n=58)			Years in present shift system (n=62)		
0-5 years	8	14	0-5 years	24	39
6-10 years	7	12	6-10 years	13	21
11-15 years	11	19	11-15 years	8	13
16-20 years	11	19	16-20 years	8	13
21-25 years	6	10	21-25 years	3	5
26-30 years	9	16	26-30 years	5	7
31-35 years	3	5	31-35 years	1	2
36-40 years	3	5			
Years altogether in shiftwork (n=61)			Hours worked per week excluding overtime (n=62)		
0-5 years	17	28	35-40 hours	49	79
6-10 years	6	10	41-45 hours	9	14
11-15 years	9	15	46-50 hours	1	2
16-20 years	11	18	50 hours or more	3	5
21-25 years	7	11			
26-30 years	7	11	Hours of un-paid overtime per week (n=58)		
31-35 years	3	5	nil	37	64
36-40 years	1	2	1-5 hours	21	36
Hour of paid overtime per week (n=61)			Respondents with a second job (n=61)		
nil	23	38	yes	5	8
1-5 hours	26	43	no	56	92
5-10 hours	8	13			
11-15 hours	2	3			
15-20 hours	2	3			

Table 10 illustrates the employment characteristics of the sample. Years of employment is quite evenly spread across the sample with the range 11-20 years being most common (38%). Twenty eight percent of respondents have worked shifts for less than 5 years and the majority (39%) have been in their current shift system for less than 5 years and work 35-40 hours per week (79%). Paid overtime of up to five hours per week is undertaken by the majority of respondents (43%) and unpaid overtime of up to 5 hours per week is

undertaken by 36% of the sample. The majority of the sample (92%) are not employed in a second job.

Table 11
Shift System Structure

	frequency	%
Number of night shifts per year(n=45)		
1-50	20	45
51-100	8	18
101-150	14	31
151-200	1	2
201-250	0	0
251-300	1	2
301-350	1	2
Organisation of night shift (n=56)		
Irregular	19	34
Permanent night shift	2	4
Single block per year	3	5
Occasional blocks per year	3	5
Block of nights per month	6	11
1 or 2 nights per week	20	36
3 or 4 nights per week	3	5

Note. Sample sizes vary as not all respondents work the night shift.

Table 11 shows that the majority of shiftworkers work less than 50 nights per year (45%). A small proportion work more than 150 nights per year (6%). Arrangement of these shifts is 1-2 nights per week (36%) for the majority, although a large proportion of the sample (34%) report their night shift structure as irregular.

Table 12
Perceived control and flexibility of Shift System

	frequency	%		frequency	%
Extent of control over shifts (n=61)			Control of start and finish times (n=61)		
None	13	21	None	38	62
Not very much	24	39	Not very much	15	25
A fair amount	18	30	A fair amount	5	8
Quite a lot	5	8	Quite a lot	2	3
Complete 1	2		Complete 1	2	
Usual advance notice of roster (n=63)			Required to change roster (n=63)		
1-5 days	4	6	Almost never	2	3
6-9 days	15	24	Rarely	10	16
10-14 days	42	67	Sometimes	28	44
15-20 days	2	3	Frequently	20	32
			Almost always	3	5
Frequency of swapping shifts (n=62)			Request specific shifts (n=63)		
Almost never	11	18	Almost never	13	20
Rarely	22	35	Rarely	19	30
Sometimes	27	44	Sometimes	25	40
Frequently	2	3	Frequently	5	8
			Almost always	1	2

Table 12 shows that the majority of respondents perceive little or no control over determination of the shift structure (60%) compared to those who perceive quite a lot of control (10%). The majority perceive none or very little control over start and finish times (87%), in comparison to respondents who perceive quite considerable control (13%). The majority of shiftworkers receive 10-14 days prior notice of shifts (67%). The requirement for shiftworkers to swap shifts occurs on a relatively frequent basis (76%). Requests for specific shifts are rare for the majority (51%), although such requests sometimes occur from 40% of the sample. Ten percent make frequent requests for specific shifts.

Table 13
Travel to work

	frequency	%
Method of travel to work (n=63)		
private transport	50	79
public and private transport	10	16
walk	3	5
Degree of safety threatened for each shift		
Morning shift (n=60)		
Never or seldom feel unsafe	57	92
Often feel unsafe	3	5
Afternoon shift (n=56)		
Never or seldom feel unsafe	54	87
Often feel unsafe	2	3
Night shift (n=55)		
Never or seldom feel unsafe	45	71
Often feel unsafe	10	16

Table 13 illustrates methods of travel to work and perceptions of safety for each shift. Sample sizes vary as some individuals do not normally work all three shifts. The majority of shiftworkers travel to work via private transport (79%). Concerns about safety while travelling to and from work, although not excessive, are greatest on the night shift (16%).

Table 14

Ratings of workload compared to others performing similar job.

	frequency	%	frequency	%	frequency	%
	Morning shift		Afternoon shift		Night shift	
Physical Workload	(n=56)		(n=53)		(n=48)	
Extremely light	11	20	12	23	10	21
Quite light	7	12	9	17	7	14
About the same	27	48	23	43	23	48
Quite heavy	11	20	9	17	7	15
Extremely heavy	0	0	0	0	1	2
Mental Workload	(n=57)		(n=54)		(n=49)	
Extremely light	0	0	0	0	0	0
Quite light	1	2	3	6	1	2
About the same	27	47	22	40	23	47
Quite heavy	27	47	26	48	18	37
Extremely heavy	2	4	3	6	7	14
Time Pressures	(n=57)		(n=54)		(n=49)	
Extremely light	0	0	0	0	0	0
Quite light	4	7	5	9	3	6
About the same	19	33	14	26	16	33
Quite heavy	21	37	25	46	21	43
Extremely heavy	13	23	10	19	9	18
Emotional Stress	(n=55)		(n=53)		(n=46)	
Extremely light	0	0	0	0	0	0
Quite light	5	9	2	4	2	4
About the same	32	58	26	49	22	48
Quite heavy	12	22	19	36	15	33
Extremely heavy	6	11	6	11	7	15

Table 14 illustrates respondent's ratings of aspects of their work load compared to their perceptions of other individuals performing similar jobs. Sample size variation occurred as a result of missing data and some respondents not working a particular shift. Physical workload is quite consistent across the three shifts and tended to be viewed as lighter than that for other employees (32% morning shift, 40% afternoon shift, 45% night shift). Mental workload was viewed as quite to extremely heavy across morning (51%), afternoon (54%) and night shifts (51%). Time pressures were perceived as quite to

extremely heavy for morning (60%), afternoon (65%) and night shifts (61%). Emotional stress was also reported as being quite to extremely heavy on morning (33%), afternoon (47%) and night shifts (48%).

Table 15
Shift System Rotation

	frequency	%
Maximum number of shifts of any kind worked between days off (n=60)		
1-5 shifts	6	10
6-9 shifts	17	28
10-15 shifts	37	62
Days off in succession (n=63)		
1 day	18	29
2 days	41	65
3 days	3	5
4 days	1	1
Changing from one shift to another		
Morning shift followed by (n=53)		
Morning	5	9
Afternoon	14	27
Night	4	8
Day off	1	2
Day shift	5	9
Anything	24	45
Afternoon shift followed by (n=50)		
Morning	4	8
Afternoon	1	2
Night	6	12
Day off	8	16
Day shift	5	10
Anything	26	52
Night shift followed by (n=44)		
Morning	4	9
Afternoon	3	7
Night	1	2
Day off	10	23
Day shift	3	7
Anything	23	52
Day off followed by (n=47)		
Morning	11	23
Afternoon	0	0
Night	2	4
Day off	1	2
Day shift	1	2
Anything	32	69
How regular is your shift system (n=63)		
Regular	6	10
Irregular	39	62
Flexible	18	29

Table 15 illustrates the respondent's shift system rotation. Sample sizes vary because respondents stated the question was not applicable to them as their shift system was irregular (62%). The majority of the sample had worked 10-15 days before a day off in the previous month (62%) and two days off in succession was most common (65%). Overall, changes from one shift type to another do not follow a strict pattern. For example the response choice 'anything' was rated the highest by respondents on different shifts; Morning (45%), Afternoon (52%), Night (52%) and Day Off (69%).

Table 16
Respondent's Reasons for working shifts

	frequency	%	frequency	%
Part of the job (n=62)			Only job available (n=57)	
Not a reason	1	2	38	67
Not a reason / partly a reason	2	3	5	8
Partly a reason	4	7	6	11
Partly / very much a reason	7	11	4	7
Very much a reason	48	77	4	7
More convenient for domestic commitments (n=58)			Higher rates of pay (n=57)	
Not a reason	31	54	27	48
Not a reason / partly a reason	10	17	6	10
Partly a reason	9	16	8	14
Partly / very much a reason	6	10	10	18
Very much a reason	2	3	6	10

Table 16 illustrates that for the majority of the sample the nature of their job explained why they undertook shiftwork (88%) and not because it was the only job available (14%). The majority of respondents (71%) said that domestic convenience was not a major reason for undertaking shiftwork, while a small proportion said it was (13%). Higher rates of pay were a reason for 42% of the sample compared to 72% who said it was not a reason for undertaking shiftwork.

Table 17

Opinions of Shiftwork, the Organisation and Turnover Intention

	frequency	%		frequency	%
Intention to give up shiftwork in preference of conventional day work (n=62)			Do the advantages of shiftwork outweigh the disadvantages? (n=62)		
Definitely not	7	11	Definitely not	8	13
Probably not	18	29	Probably not	15	24
Maybe	17	27	Maybe	14	22
Probably yes	12	19	Probably yes	19	31
Definitely yes	8	13	Definitely yes	6	10
Respondents perception of the extent of problems with organisation of shifts, staffing and implementation of management decisions (n=63)			Do respondents have difficulty coping with problems with organisation of shifts, staffing and Implementation of management decisions (n=63)		
Not at all	1	2	No	7	11
Not at all / somewhat	9	14	No / sometimes	18	29
Somewhat	24	38	Sometimes	26	41
Somewhat/ very much	13	21	Sometimes / yes	5	8
Very much so	16	25	Yes	7	11
Current intention to leave the organisation (n=63)					
Definitely not	12	19			
Probably not	25	40			
Maybe	13	21			
Probably yes	10	16			
Definitely yes	3	4			

As seen in Table 17 respondents have mixed intentions to give up shiftwork in preference of day work. Forty percent said they probably or definitely would not compared to 32% who said they probably or definitely would. Similarly, most respondents (41%) said the advantages of shiftwork did or probably did outweigh the disadvantages, compared to 37% who said they probably or definitely did not. Eighty four percent of respondents perceived there was at least some problems in the managements staffing and planning of shift structures. Sixty percent of the respondents said that at least sometimes they found these problems difficult to cope with. Current intentions to leave the organisation was rated as probably or definitely not by the majority of the sample (59%), although 20% said they probably or definitely did intend to leave.

4.3 Content Analysis

The questionnaire contained four general questions with an open-ended response format. These questions referred to the respondent's feelings regarding the advantages and disadvantages of their shift system. Similarly, respondents were provided the opportunity to add any further information regarding their sleep and fatigue. The last part of the questionnaire asked the respondent to express any other experiences of shiftwork not already covered by the questionnaire.

Table 18
Perceived advantages of current shift system (n = 60)

	frequency	%
Domestic and personal factors: Rostered time off during business hours for personal and/or domestic matters, ie banking	40	67
Shift Structure: flexibility of working hours	35	58
Job Characteristics: Autonomy of work practice, variety of work	30	50
Commuting: avoid traffic, less travel time, ease of parking	18	30
Rewards, Remuneration: travel in NZ and overseas, higher pay rates extra leave	28	47
No advantages	2	3

Note. Due to multiple responses, frequencies and percentages do not reflect the total sample size.

As illustrated by Table 18, sixty respondents made multiple responses regarding the advantages of their shift system. The ability to assume personal and domestic tasks was the most common advantage expressed by respondents (67%). Other commonly perceived advantages included flexibility of working hours (58%), autonomy of work practice (50%) and various types of reward and remuneration advantages (47%). The ease of commuting and parking was cited as advantageous by 30% of the sample. No advantages were perceived by 3% of respondents.

Table 19
Perceived disadvantages of current shift system (n =60)

	frequency	%
Social and Domestic Outcomes	51	85
Restricted personal, family and social life		
Sleep Disturbance		
Disruptions to sleep patterns and fatigue	34	57
Shift Structure		
Irregular hours - difficult to arrange activities outside of work	16	27
Roster inflexibility; short notice of changes	15	25
Working on weekends	11	18
Early starts / late finishes	6	10
Working 10 - 12 days before day off	2	3
Commuting		
Public transport and parking problems	3	5
Rewards		
No extra remuneration for working shifts	1	2

Note: Due to multiple responses, frequencies and percentages do not reflect the total sample size.

Table 19 illustrates the three main disadvantages of the shift system as being disruptions to family and social spheres (85%), sleep disturbance and fatigue (57%) and aspects of the shift structure, such as the inability to effectively organise events due to roster irregularity (27%).

Table 20

Additional comments on sleep and fatigue (n = 26)

	frequency	%
Sleep and fatigue problems resulting from shift irregularity and rostered closely together	21	80
Experience of fluctuating energy levels	2	8
Sleep difficult with increasing age	1	4
Rarely have two days off consecutively	1	4
Travel to and from film locations exhausting	1	4

Table 20 illustrates that the majority of respondents (n=26) who commented on the sleep and fatigue section focused on difficulties associated with sleep and the structure of the shift system (80%).

Table 21

Additional overall comments regarding shiftwork (n = 17)

	frequency	%
Reiteration of detrimental general sleep, health and lifestyle outcomes of shiftwork	11	65
The management's lack of understanding or concern about problems faced by shiftworkers	4	24
Dissatisfaction with irregular nature of shift patterns	2	11

Note. The full set of responses are available from the author on request.

Table 21 shows the main themes of the comments made to this question (n=17). Experiences of negative health and lifestyle outcomes of shiftwork were expressed by the majority of this group of respondents (65%). References to the managerial inadequacies of the organisation were also made (24%). The irregular nature of the shift system was also reiterated (11%).

4.4 Descriptive Statistics

This section outlines the descriptive statistics of each of the outcome and moderator variables for the current sample. The alpha coefficients for each of the sub-scales for the current sample are also illustrated.

Table 22
Statistics associated with the distribution of scores for current sample

	M	SD	n	α
Psychological well-being	25.0	4.1	63	.77
Cognitive anxiety	14.0	6.0	62	.87
Somatic anxiety	14.4	5.0	63	.77
Neuroticism	12.7	2.8	63	.59
Extraversion	15.8	3.2	62	.76
Chronic fatigue	28.6	7.7	62	.94
Digestive problems	14.1	4.8	63	.85
Cardiovascular problems	11.1	3.0	63	.73
Sleep disturbance between				
Early shifts	20.7	4.7	56	.76
Late shifts	18.0	3.6	55	.68
Night shifts	21.3	4.3	49	.74
Rest days	17.2	3.6	57	.63
Social disruption	3.3	1.2	63	-
Domestic disruption	2.7	1.0	63	-
Non-domestic disruption	2.4	1.1	63	-
General job satisfaction	16.7	6.0	63	.56
Morningness	34.4	8.0	63	.91
Flexibility	24.6	5.1	63	.77
Languidity	33.1	6.3	63	.76
Coping				
Engagement	41.8	10.4	63	.90
Disengagement	32.3	11.0	63	.90

Note. As Social and Domestic disruption are single item variables, no alpha coefficients are computed.

Table 22 shows the mean and standard deviation and alpha coefficients of each of the outcome and moderator variables of the sample. Sample sizes vary for some items as not all respondents work a particular shift or they failed to answer the question. Table 21 shows that for the present sample the with alpha coefficients ranged from .56 - .91. The smallest alpha coefficient was .56 for General Job Satisfaction. These results indicate that overall the items are highly related, indicating a high level of internal consistency.

4.4.1 Composite Scores

Not applicable codes were present in the scoring of some variables. Respondents who had a not applicable score on a variable did not have a composite score and were not included in the analysis. This explains the lower sample size on some variables.

Composite scores were computed by summing the constituent variables for each participant. Missing values ranged between 1-4 for approximately one third of the sample. However, the majority of the items had sample sizes greater than sixty which is acceptable with a total sample size of sixty three.

4.5 Inferential Statistics

This section details the results of the individual measurement tools included in the SSI and the analytical procedures used to obtain information about the sample on these measures.

4.5.1 Correlation Matrix showing Relationships Between Outcomes and Moderator Variables

Table 23 illustrates the correlation coefficients and level of significance for the relationships between the outcome and moderator measures for the present sample. The overall range of coefficients is -.31 to .43. Ten correlations are significant at $\alpha = .01$. These correlations are disengagement with psychological well-being; languidity and disengagement with chronic fatigue; engagement and disengagement with cognitive anxiety; languidity and disengagement with somatic anxiety; languidity, engagement and disengagement with neuroticism. Thirteen correlations are significant at $\alpha = .05$. These are flexibility with psychological well-being; morningness and flexibility with chronic fatigue; flexibility and languidity with cognitive anxiety; flexibility with neuroticism; morningness with digestive problems; flexibility with cardiovascular problems; morningness with general job satisfaction; engagement with domestic disruption; morningness with early shift sleep disturbance; flexibility and disengagement with night shift sleep disturbance.

Table 23

Correlation matrix showing the relationships between moderators and outcomes for the television production sample

VARIABLE	Extraversion	Morningness	Flexibility	Languidity	Engagement	Disengagement
Psychological well-being	-.04	.16	-.30*	-.04	.13	.43**
Chronic Fatigue	-.20	-.27*	-.27*	.43**	.09	.39**
Cognitive anxiety	-.09	-.10	-.31*	.27*	.33**	.37**
Somatic anxiety	-.10	-.19	-.22	.40**	.19	.37**
Neuroticism	-.10	-.24	-.29*	.41**	.33**	.43**
Digestive problems	-.02	-.25*	-.03	.22	-.06	.18
Cardiovascular problems	-.18	.03	-.27*	.18	-.05	.04
General Job Satisfaction	-.23	-.31*	0	.17	.06	.25
Social Disruption	.17	-.06	-.13	.09	-.06	.16
Domestic disruption	.16	.01	.15	-.17	-.31*	.05
Non- domestic disruption	.01	-.07	-.13	0	-.08	.10
Sleep disturbance between: Early shifts	-.01	-.27*	.08	.18	-.12	.05
Late shifts	.10	.10	-.23	.02	.06	.01
Night shifts	-.21	-.17	-.30*	.27	.15	.35*
Rest days	-.03	.02	-.01	-.06	.01	.03

Note. Sample sizes are between 62-63 for the variables excluding sleep. Disturbance of sleep sample sizes are between 49-57.

*$p < .05$, **$p < .01$

Table 24

Correlation matrix showing relationship between' intention to leave' and outcome variables (n = 63).

	Intention to leave		Intention to leave
Psychological well-being	.25	Sleep disturbance between:	
Chronic Fatigue	.37**	Early shift	.22
Cognitive Anxiety	.21	Late shifts	.26
Somatic Anxiety	.33**	Night shifts	.13
Neuroticism	.26*	Rest days	.13
Digestive Problems	.27*		
Cardiovascular Problems	.17		
General Job Satisfaction	.53**		
Social Disruption	.25*		
Domestic Disruption	.04		

Note. The scoring of the General Job Satisfaction scale indicates higher scores are associated with more job dissatisfaction. This therefore produces a positive correlation with intention to leave.

* $p < .05$, ** $p < .01$

As shown in Table 24, intention to leave is positively related to all of the outcome variables. Intention to leave is significantly related to Neuroticism (.26), Digestive problems (.27) and Social Disruption (.25) at an alpha level of .05. Chronic Fatigue (.37), Somatic Anxiety (.33) and General Job Satisfaction (.53) are significantly related to intention to leave at an alpha level of .01. The strongest correlation is between intention to leave and General Job Satisfaction.

Table 25

Correlation matrix between 'intention to leave' and moderator variables (n = 63).

	Intention to leave
Extraversion	.05
Morningness	-.09
Flexibility	-.04
Languidity	.04
Engagement	.09
Disengagement	.26*

* $p < .05$

Table 25 shows the correlation coefficients between respondents' intention to leave and the moderator variables. The only significant correlation is disengagement and intention to leave (.26).

4.6 Statistical Significance

Table 26

Probability values for U.K sample and the present sample

	p	U.K sample (n = 1864)	Television production sample (n = 63)
Outcome Variables 1-11	$p < .01$	53	10
	$p < .05$	3	10
	$p > .05$	10	46
Sleep disturbance			
	$p < .01$	16	0
	$p < .05$	4	3
	$p > .05$	4	21

Table 26 illustrates that an analysis of statistical significance between the two samples indicates that there are considerably more variables which are not significant at .01 or .05 for the present sample compared to the pilot sample. These results can be attributable to the vast differences in sample size for the pilot sample (n=1864) and the present sample (n=63). An analysis of effect size (Cohen, 1992) is more appropriate in this case as this analysis is independent of sample size.

4.6.1 Effect Size

Effect size (Cohen, 1992) was not provided for the U.K sample. An analysis of effect size is based on the absolute values of the correlations. Table 26 was constructed from the correlation matrix (see Table 22) of the U.K sample (Barton et al., 1995a).

Table 27

Effect size values for U.K study and the present sample

Effect size	U.K sample	Television production sample
$r < .1$	22	22
$.1 \leqslant r < .3$	38	31
$.3 \leqslant r < .5$	6	13
$r \geqslant .5$	0	0
Sleep disturbance		
$r < .1$	17	12
$.1 \leqslant r < .3$	4	10
$.3 \leqslant r < .5$	3	2
$r \geqslant .5$	0	0

Note. Effect size values for the correlations are based on absolute values.

Table 27 illustrates effect sizes according to definitions provided by Cohen (1992). Overall, similar effect sizes are present in both samples. The results illustrate that the present sample are very different to those of the U.K sample in terms of statistical significance. However, the two samples appear very similar when compared using a metric not influenced by sample size.

4.6.2 Comparison of correlation matrix for U.K sample and present sample

Table 3 shows the correlations between the outcome and moderator variables for the U.K sample and Table 23 shows the same correlations for the current sample. A comparison of these tables shows that twenty seven percent of the correlations had changed direction. However of these correlations that had changed direction, only three were significant at the .01 level. These correlations were General Job Satisfaction and Extraversion; Morningness and Psychological Well-being; and Languidity and Domestic Disruption. Overall the differences between the U.K sample and the present sample are very minor, indicating that the two samples exhibited approximately the same outcomes overall.

4.6.3 Assessment of Significant Differences in Demographic Characteristics

Table 28

Analysis of Variance Results for Gender and Engagement

Source	df	R-Square	F Value	Pr > F
Gender	1	.35	7.74	.0079

Table 28 shows the results of an ANOVA with 6 independent variables conducted using Tukey's HSD. The purpose was to identify any significant differences between the outcome and moderator variables in terms of certain demographic variables including the types of shift systems undertaken by the current sample. The significance level was set at .01 due to the large number of comparisons (126) and to reduce the incidence of Type 1 errors. The only significant difference for the present sample was between males and females in the engagement scores, where the mean score for females was 47.5 (SD=9) and the mean for males was 42 (SD=10.2). There were no other significant demographic differences in the outcome and moderator variables therefore indicating the homogeneous nature of the sample.

CHAPTER FIVE

Discussion

5. Introduction

The purpose of this chapter is to assess the results of the research in terms of the research objectives. Comparisons will be made between the results of this study and the U.K study. Findings from the study will also be assessed in terms of the general findings in shiftwork literature to date.

5.1 Objective One - Assessing the Portability of the SSI

The first objective of the study was to compare the results of the SSI for the present sample to those of the U.K sample. This would indicate if shiftworkers in different industries and countries experience the same potential outcomes of shiftwork. Making such a comparison would also assess the generalisability of the SSI as a shiftwork measurement tool. Barton et al. (1995a) claim that the SSI could be used world-wide and cross-culturally to assess the impact of shiftwork on individuals. Therefore a primary objective of this research was to establish the degree of portability of the SSI to the New Zealand context and specifically to employees in the television production industry. Comparisons were made between the current sample of television production shiftworkers and the U.K nursing and industrial sample.

5.1.1 Comparison of alpha levels of the SSI Scales.

A comparison of internal consistency of the SSI scales obtained by the U.K sample and the present sample was made. Overall, the alpha coefficients for both the U.K sample (Table 3) and the television sample (Table 23) are similar. Alpha coefficients for the nursing sample of the U.K study range from .66 - .92 and from.73 - .93 for the industrial workers. Alpha coefficients for the television production sample range .56-.94. The lowest alpha coefficients of each sample was for the outcome variable general job satisfaction. Sixty seven percent of coefficients for the present sample were greater than .75. Similarly, sixty seven percent of coefficients for the

nursing sample were greater than .75 and 89% for the industrial sample were greater than .75. Levels of standard deviation for each of the items were also similar in both samples. These results show that the level of internal consistency of the SSI scales for the present sample were similar to those reported by the U.K sample. This then supports the portability of the SSI to the present sample.

5.1.2 Comparison of the mean scores on outcome and moderator variables of the present sample and the U.K sample.

A comparison of the overall mean scores on each of the outcome and moderator variables was also made between the U.K sample (Table 3) and the present sample (Table 23). The mean scores which appeared to be significantly different were for the variables psychological well-being, general job satisfaction, and engagement.

The range of possible scores for the outcome variable psychological well-being was 12-48. The U.K study yielded a mean of 12.2 on this variable indicating extremely good psychological well-being in that sample. However, the present sample yielded a mean of 25.0 indicating that the present sample experienced average levels of poor psychological health. This finding may be explained in terms of the organisational change occurring at the time the present sample participated in the study. As suggested by Bohle et al. (1989), organisational factors may influence levels of psychological well-being. At the time of participating in the study, the organisation where the respondents were employees, was undergoing major restructuring and the possibility of job losses were imminent. This organisational change may well have been a source of stress for the respondents as an uncertain future may have been a reality for them. This potentially stressful situation may explain the higher level of psychological distress in the present sample.

While the present sample yielded higher levels of psychological ill-health than the U.K sample, the present sample's score on general job satisfaction indicated they were more satisfied than the U.K sample. The range of possible scores for general job satisfaction was 5-35, with a lower score indicative of more job satisfaction. The mean score for the U.K sample was 23.3 and the mean score for the present sample was 16.7. The present sample were therefore only reasonably satisfied with their job which may also be a result of the uncertainty of their work environment as it undergoes restructuring.

There were also average differences in the engagement scores between the U.K sample and the present sample. Engagement scores range 16-80 with a high score indicating the use of engagement strategies. The U.K sample yielded an engagement mean score of 48.4 and the present sample yielded an engagement score of 41.8. These results show that neither sample utilised pro-active, problem focused strategies to any great extent.

The present sample may at the time of participating in the questionnaire, have yet to come to terms with the reality of major organisational change. The level of confidence in the management's decisions was also low with 84% reporting that they saw problems with managerial planning. This considerable lack of faith in the management and the possibility of an uncertain future, may also explain why disengagement or the use of avoidance behaviour for coping was significantly related to their intention to leave the organisation (Table 25). This finding reiterates the need for further emphasis in future research on the coping strategies actually used by shiftworkers.

It is unquestionable that other factors may also explain the differences in the scores on these variables between the two samples. For example, cultural, social and climatic differences between the samples also require acknowledgment when making comparisons between samples in different geographical locations. The effects of these differences may be an interesting and valid focus of future research initiatives.

Nonetheless, given the discrepancies in psychological health, job satisfaction and engagement strategies it is apparent that overall similar results have been found in both samples. This therefore indicate that the SSI was a useful tool and could be used for an accurate assessment of the present sample. Discrepancies in psychological health, job satisfaction and engagement strategies may be somewhat attributable to the level of organisational change the present sample were a part of.

5.1.3 Comparison of significant correlations and Effect Size

An analysis of statistical significance (Table 26) suggests that the correlations for the present sample (10) contain considerably fewer significant correlations ($p < .01$) than those correlations yielded by the U.K study (69). This analysis of significance is dependent on sample size. As the two samples vary considerably in sample size it is

necessary to compare the two samples on the basis of an analysis which is independent of sample size.

Although often the topic of debate, many researchers subsequently avoid power analyses. Statistical power (Sedlmeier & Gigerenzer, 1989) and effect size (Cohen, 1992) are appropriate analyses for the present sample. Cohen's analysis of power (probability of correctly rejecting a false null hypothesis) and effect size more accurately demonstrates the practical significance of the results for the present sample as this analysis is independent of sample size. Effect size is an important statistical procedure as it controls or minimises the probability of Type 1 and 2 errors. If all other factors are held constant, the greater the effect size, the greater the power (Sedlmeier & Gigerenzer, 1989). This means that the greater the power the greater the confidence in generalising the results (Howell, 1992). Table 27 illustrates that overall both samples present similar effect sizes. Both samples yielded 22 correlations with an effect size of less than .1 indicating no relationship between those variables. The U.K sample had 38 small effects compared to 31 for the present study. The present study yielded more medium effects (13) than did the U.K study (6). Neither sample yielded any large effects. Therefore on the basis of a power analysis it may be concluded that the present sample yielded correlations of approximately the same level of power as did the larger U.K sample. This illustrates the portability of the SSI to the current sample as the results of the two samples are, overall, similar.

5.1.4 Comparison of direction of correlations between outcome and moderator variables for the present and U.K sample.

Analysis of the correlations of the current sample (Table 23) and the U.K sample (Table 3) indicates that 24 out of 90 correlations had different signs. Because the correlations were considerably close to zero any change in sign is not considered significant as such a change may have occurred as a result of the vast difference in the size of each sample, or by chance.

Significant differences between the two samples were identified in terms of those correlations which were at least small correlations ($r \geq .1$) in both samples and also had different signs. On this basis, three correlations were identified as being significantly different between the two samples. These were Job Satisfaction / Extraversion, Psychological Well-being / Morningness and Domestic Disruption / Languidity.

General job satisfaction and extraversion show a positive correlation for the U.K sample (.11, p <.01) and a negative correlation for the current sample (-.23). As explained in Chapter 4, the scoring of the general job satisfaction scale indicates that higher scores are associated with higher levels of job dissatisfaction. Given the scoring of this variable, the construct general job satisfaction may have been more aptly named general job dissatisfaction.

On the basis of the definition of job satisfaction in the SSI, the U.K sample yielded a positive relationship between job satisfaction and extraversion. In other words, higher levels of job dissatisfaction was related to extraversion. This is contrary to research which demonstrated that extroverted individuals tend to find adjustment to shiftwork easier (Singer & Levens, 1990). Prior studies have shown extraverted types are found to experience less health complaints and are typically evening types as opposed to morning types. Therefore an extraverted individual with a preference for evening activity may find adjustment to shiftwork easier (Akerstedt, 1988). The overall ease of adjustment to shiftwork may then contribute to job satisfaction. The results for the U.K sample however, indicated that greater dissatisfaction is related to higher the levels of extraversion.

However, for the present sample a negative correlation was found between general job satisfaction and extraversion. While there are many factors which contribute to job satisfaction, the negative correlation between job satisfaction and extraversion is consistent with research on extraverted types and adjustment to shiftwork. As discussed research suggests that extraverted types find adjustment to shiftwork easier (Akerstedt, 1988) and may therefore experience less job dissatisfaction as a result. The results for the present sample indicate that the greater the level of extraversion, the less job dissatisfaction.

Psychological well-being and morningness yielded a negative correlation for the U.K sample (-.14, p<.01) and a positive relationship in the current sample (.16). Although this positive relationship is not strong, it appears to be consistent with research on morningness which indicates the difficulties of adjustment to shiftwork and how this may then impact on psychological well-being. The mean score on the morningness dimension for the current sample (Table 22) falls between the categories of 'intermediate type - morning type'. Individuals who are morning types may therefore experience difficulty in working evening or night shifts, which may contribute to psychological stress or anxiety. This finding may help to explain the detrimental

psychological impact often found in individuals who must work the evening or night shifts (Bohle et al., 1989). Therefore the current sample who tend to be morning types, may well experience psychological problems working evening or night shifts. In other words, the greater the preference for morning activity, the greater the potential experience of psychological ill-health.

Domestic disruption and the circadian type languidity, yielded a positive relationship for the U.K sample (.13, $p<.01$) and a negative relationship for the current sample (-.17). The rationale behind the negative relationship of these variables is likely to be less direct and obvious. Research indicating the link between domestic commitments, work demands and sleeping habits (Kundi et al., 1981), may explain the negative relationship between domestic disruption and languidity. As languidity refers to the inability to overcome drowsiness or lethargy (Iskra-Golec et al., 1995), it is possible that individuals who experience these languid symptoms may also experience difficulty in managing domestic duties especially if they are tired from working shifts. If languid individuals are unable to cope with the lethargy often associated with shiftwork, this may then escalate and cause further disruption to not only domestic commitments, but potentially to a number of other personal and professionals demands.

These findings further reinforce the multi-dimensional nature of the outcomes of shiftwork. Seldom is one finding or outcome of shiftwork research able to be explained without considering the other outcomes.

5.2 Objective Two - Determining the impact of shiftwork on the television sample.

The second objective of the present study was to establish and assess the impact of shiftwork on the present sample of television production shiftworkers. This assessment would be made on the basis of the respondents' results on the SSI. Assessment was made in terms of the potential physiological, psychological and social outcomes of shiftwork. Individual characteristics thought to modify the impact of shiftwork were also addressed. The first part of this section discusses the results of the general shiftwork statistics and results of open-ended questions. The second part addresses the respondents results on the individual measures.

5.2.1 General Shiftwork Statistics

5.2.1a Health Characteristics

Overall, the experience of severe health complaints was quite low for this sample. The two most commonly reported symptoms were headaches and chronic back pain. These findings may be explained by the fact that 62% (Table 15) of the sample had worked 10-15 shifts before a day off and 43% (Table 10) had undertaken paid overtime of up to five hours per week. The lack of recuperation time between shifts may contribute to the experience of these and other symptoms.

The relatively low level of health complaints may be influenced by a number of factors. The mean number of years in shiftwork (39) for the entire sample may mean that individuals have been able to adjust to shiftwork over time and have become more 'hardy' to the potential negative outcomes of shiftwork (Barton et al., 1995a). Another possible influence is the type of industry the sample is employed in. If individuals perceive a difficulty in finding alternative employment in that field they may decide to try to make adjustments in their life which are more conducive to the demands of shiftwork. Reducing the tension between the demands of shiftwork and the other areas of their life may mean working shifts is more tolerable leading to fewer experiences of the negative effects of shiftwork.

In a similar vein, research has shown that female shiftworkers experience more menstrual problems (Costa, 1996; Skipper et al., 1990), although this was not the case for the present sample. The impact of shiftwork on the menstrual cycle of the female participants was virtually non existent prior to starting shiftwork and since starting shiftwork. The extremely small sample size (n=11) may however impact on this finding.

Contrary to past research (Cervinka, 1993; Costa, 1996; Kogi; 1996) the prevalence of gastrointestinal and cardiovascular problems was also very low for this sample. The consumption of foods and stimulants known to contribute to gastrointestinal and digestive problems (Gander, 1996) did not increase significantly after the respondents started shiftwork.

As with the relatively low experience of health complaints, long term medication use was also minimal. The lack of recuperation time between shifts may also explain the use of vitamins and tonics, which were the most commonly used medication (52%).

Similarly, the prevalence of headaches and chronic back pain may explain the modest high use of pain killers in the current sample (72%).

5.2.1b Sleep Characteristics

Due to the lack of accuracy of respondents scoring of the sleep questions, a full analysis of the sleep habits of the sample was not possible. This may be indicative of the erratic nature of their shift schedules which may have made recalling specific sleep / wake times and start and finish times difficult. Results pertaining to habitual sleep need indicated that the majority of the sample required eight hours sleep every twenty four hours. The greatest degree of sleep disturbance (Table 22) or difficulty experienced was during rostered night shifts (20.7) and the least disturbance was for rest days (17.2). Sleep disturbance was also cited as the second main disadvantage of shiftwork by 57% of the sample (Table 19). These findings are consistent with research (Wilkinson, 1992) which has shown the night shift to be associated with the most sleep disturbance.

5.2.1c Social and Domestic Characteristics

The majority of the sample reported that they had partners (60%). Of this group 74 % said that their partners worked full time, made up of mainly daytime shifts only (78%). Overall most (60%) of the partners were supportive of the respondent's shiftwork. Those respondents with children were mostly in the age group 6-12 years. Thirty one percent were also required in some way to care for their children. These statistics may explain the fact that 71% of the sample said that the convenience of domestic arrangements was not a reason why they worked shifts. Similarly, 85% of the sample reported that disturbance to social and domestic life was the most significant disadvantage of shiftwork and 37% reported having only one or two weekends off in the previous month (Table 9). This is consistent with research which shows the complex interplay of social, family and work life (Kundi et al., 1981). As research has identified (Hughes & Galinsky, 1994; Schonfelder & Knauth, 1993) neglected family and social roles are one of the most common complaints of shiftworkers. This sample was no exception.

The most commonly reported advantage of shiftwork was the free time available during the day to fulfil personal or domestic matters such as banking, shopping and so

forth (67%). Factors relating to the shift structure such as the flexibility of working hours (58%) and the autonomy of work practice (50%) were also considered advantageous. Given that disruption to social and domestic life was cited as a common disadvantage, 47% did highlight travel around New Zealand and the world, higher pay rates and extra leave (47%) as advantages of their shift system.

5.2.1d Perceptions of the Shift System

The most obvious characteristic of the shift system is the irregular nature of the shift structure, as described by 62% of the sample. While the night shift was undertaken by approximately two thirds of the sample, the organisation of these nights was typically irregular also, with the majority (97%) receiving less than two weeks notice of their roster. Respondents reported having minimal control over the shifts worked (60%) thereby potentially contributing to their dissatisfaction (27%) with the difficulties in arranging social engagements (Table 19). The level of personal control over the arrangement of work hours has been shown to affect satisfaction with the shift structure and the job overall (Barton, 1994). This is interesting considering that 67% of the sample said that their reason for undertaking shiftwork was not because it was the only job available (Table 16).

5.2.1e Turnover Intention

The impact of the potential psychological, physiological and social effects of shiftwork on individual's intention to leave the organisation was also investigated. The relationship between individuals experiences of the outcome variables and their intention to leave the organisation are shown in Table 24. General job satisfaction has a positive relationship (.53, p <.01) to intention to leave. The greater the level of job dissatisfaction experienced the greater the individual's intention to leave the organisation. The mean (16.7) for the sample (range of scores 5-35) indicates that the respondents report average levels of job satisfaction. This finding is interesting when considered alongside the fact that the majority (41%) of respondents said that the advantages of shiftwork did or probably did outweigh the disadvantages. Even given the level of dissatisfaction the majority (59%) of the sample said they did not intend leaving the organisation (Table 17). This apparent polarity may be indicative of the difficulties these

shiftworkers may perceive in finding another job within the same industry. The organisation the current sample work for is also undergoing major restructuring and this may explain the moderate job satisfaction as individuals are concerned about the uncertainty of their future with the organisation.

The overall average level of job satisfaction possibly suggests that although this sample may experience some of the negative aspects of shiftwork, they do not intend to leave the organisation if they perceive a difficulty in finding alternative employment within the same industry. This could also suggest that in some way these shiftworkers may have adapted to the difficulties of shiftwork or become more "hardy" (Wedderburn, 1995) to the negative outcomes of shiftwork as their alternatives are limited.

Chronic fatigue (.37, $p < .01$) and somatic anxiety (.33, $p < .01$) were also found to be positively correlated to intention to leave the organisation. Numerous studies have indeed indicated that fatigue and anxiety is commonly reported by shiftworkers (Costa, 1996) and may therefore contribute to an individual's decision to leave shiftwork.

A correlation analysis between moderator variables and intention to leave (Table 24) also showed that the only moderator variable significantly related to intention to leave was disengagement (.26, $p < .05$). The inability or lack of willingness to engage in coping strategies may well influence an individual's desire to leave the organisation. Disengagement may reflect a lack of interest in the organisation, which is feasible if they intended to leave the organisation. It is also possible that if individuals experience difficulty with dealing with the vast array of health and other potential problems of shiftwork, they may be more inclined to consider leaving the organisation.

However, the provision of adequate education to shiftworkers (Wedderburn, 1993) on how to cope with shiftwork may also impact on turnover intention. If individuals learn effective ways of dealing with the potential negative outcomes of shiftwork, their tolerance of the physiological, social and psychological demands of shiftwork may be increased.

5.2.2 The Overall Impact of Shiftwork on the Sample.

An analysis of the respondent's scores on individual measures of the SSI provides an overall profile of the impact of shiftwork on the present sample. In terms of psychological well-being, the present sample experienced moderate levels of psychological ill-health. As discussed earlier this may be attributable to the restructuring

which had begun to take place in the organisation. At the time of participating in the research, respondent's colleagues were being made redundant and this may have been a source of stress to those remaining in the organisation. Fears about the future of their own jobs may also contribute to psychological distress.

However, given this potentially stressful situation, the level of cognitive and somatic anxiety reported was overall, extremely low. On a score range of 14-70 the mean scores were 14.0 for cognitive anxiety and 14.4 for somatic anxiety. In other words this sample on the whole did not experience many of the symptoms of anxiety even given their average level of psychological well-being. In terms of the neuroticism / extraversion, lower scores on each dimension indicate higher levels of each construct. The sample scored extremely highly on both dimensions . On a range of 12-48 the mean score for neuroticism was 12.7 and the mean score for extraversion was 15.8. Results from the present study (Table 23) showed that cognitive anxiety was significantly related to engagement type coping (.33, $p < .01$).

Overall levels of chronic fatigue were also moderate. The high levels of neuroticism and extraversion may also have some impact on the levels of fatigue experienced. The sample scored 28.6 on a range of 10-50, with high scores indicating more chronic fatigue. In general these results are reasonably consistent with past research which has almost conclusively shown shiftwork to be strongly associated with chronic fatigue (Barton et al., 1990).

Studies have also identified a link between chronic fatigue and the morningness dimension (Iskra-Golec et al., 1995). Such research has shown that individuals who are morning types may experience more chronic fatigue due to the body's inability to adjust to shiftwork. In terms of the present study (Table 23) and the U.K study (Table 3), these two constructs are negatively rather than positively related. Interpretation of past research indicates that a greater level of either chronic fatigue or morningness should produce a greater level of the other. The overall morningness score of the sample indicates respondents are 'intermediate types' (Smith et al., 1989). This may suggest that the sample does not exhibit strong tendencies toward either morning or evening activity, but are rather a combination of the two traits. The relationship between these two constructs for the current sample (-.27, $p < .05$) and the U.K sample (-.27, $p < .01$) indicate that the there is a negative relationship between the two constructs. The negative relationship between these two items for the present sample may be because the sample scored 'intermediate type' on the morningness dimension and therefore not

strongly associated with a preference for either morning or evening activity. The age of the sample may also have influenced this result. Morningness is known to increase with individuals over approximately 50 years and as the mean age of the sample is 39 this may have influenced the overall morningness score (Harma, 1996). It is difficult to identify exactly why this sample and the U.K sample did not yield a positive relationship between chronic fatigue and morningness as past research has suggested. This finding may further reiterate the need for more longitudinal studies using the Composite Scale of Morningness, as recommended by Greenwood (1994).

As mentioned previously, the sample's experience of digestive and cardiovascular symptoms was quite low. The overall range of scores for both problems was 8-32 with a higher score indicating poorer physical health. The mean scores were 14.1 for digestive problems and 11.1 for cardiovascular problems. These findings are complementary to the overall health characteristics of the sample (Table 5), which indicated the sample's moderately high physiological tolerance to shiftwork. It is clear that, as suggested by Harma (1993), the potential effects of shiftwork on physiological health can vary widely across individuals as well as across different samples.

While disturbances to health were modest, sleep disturbance was however quite high for the present sample. The range of scores for sleep disturbance was 4-24, with a high score indicating greater sleep disturbance. The mean scores were 20.7 for early shifts, 18.0 for late shifts, 21.3 for night shifts and 17.2 for days off. The level of sleep disturbance is consistent with research which has shown the night shift to be associated with the most disturbance (Barton et al., 1995a). The overall high levels of sleep disturbance experienced by the present sample may be a result of their extremely erratic shift system (Table 15) and illustrate the disturbance that erratic shift schedules have been shown to produce (Monk & Folkard, 1992). The high scores on sleep disturbance reinforce the fact that 57% of the sample said disturbance to sleep patterns was a major disadvantage of their shift schedule.

Social and domestic disruption were also reported by 85% of the sample as being a major disadvantage of their shift system. The score range was 1-5 for social, domestic and non-domestic disruption. Mean scores for these items were 3.3 for social disruption, 2.7 for domestic disruption and 2.4 for non-domestic disruption. Correspondingly, social disruption was considered the greatest by the sample and as such was also significantly related (.25, $p< .05$) to their intention to leave the organisation (Table 24). This result is consistent with Smith and Folkard's (1993) finding which holds that neglected social and

domestic lives are one of the most commonly reported complaints by shiftworkers. The fact that 87% of respondents said that they had little or no control over the start and finish times of their shifts, may impact on the level of social and domestic disturbance. However, given these average scores on social and domestic disruption and the low overall level of control, 29% (Table 16) said convenience of domestic commitments was partly a reason for working shifts. Similarly, despite these difficulties 63% of the sample (Table 17) said that the advantages of shiftwork did somewhat outweigh the negatives.

This finding may be influenced by the sample's methods of coping. Overall the majority of the sample use engagement strategies rather than disengagement strategies as a means of coping. Score ranges for both dimensions were 16-80, with a high score indicating higher levels of each dimension. The mean scores were 41.8 for engagement and 32.3 for disengagement. Although research in the area of coping strategies and shiftwork is relatively scarce, Boumans and Landeweerd (1992) suggest that research has consistently shown that the impact of social support is an important moderator of stressful situations. This may suggest that those individuals who actively engage in pro-active coping strategies are more likely to cope better with shiftwork. Using this rationale, the greater use of engagement strategies in the present sample may have impacted on the finding that 40% would probably or definitely not give up shiftwork in preference of day work.

The degree of flexibility of sleeping habits or circadian type is also known to influence the impact of shiftwork (Costa et al., 1989). The present sample scored 24.6 for flexibility on a range of 8-40 and 33.1 for languidity on a score range of 10-50. High scores on both indicate high levels of each dimension. However, respondent's scores on both dimensions are overall average, with no distinct tendency towards either dimension. This is interesting considering that the overall health outcomes of the sample are quite minimal. The moderately high level of sleep disturbance reported by the sample may be a result of the overall average level of flexibility of sleeping habits and ability to overcome drowsiness.

5.3 Objective Three - Assessment of Individual Differences within the Sample.

The third objective of the study was to identify if there were any significant differences in terms of the demographic characteristics of the sample and scores on the

outcome and moderator variables (Table 28). The demographic characteristics of interest were gender, marital status, age, tenure, number of dependents to look after and the regularity of the shift system. This analysis found that engagement scores between males and females were significantly different. The females were found to be significantly different in terms of engagement and therefore utilise more effective coping behaviours than the males in the sample. Research into the area of gender and coping has not shown conclusively any strong gender differences in coping (Ptacek et al., 1992). However a strong focus on socialisation has attempted to explain such gender differences. As suggested by Ptacek et al. females are encouraged to seek social support, while males tend not to be. This focus on females rather than males to be more pro-active in seeking assistance, may explain why the females in this sample scored significantly higher on engagement as a coping behaviour, than the males. This is interesting given the sample consisted of 75% males and 25% females.

5.4 Items Not Suitable For Analysis

One of the limitations of applying the SSI to the current sample is worthy of attention in the discussion section. This limitation refers to the difficulty the majority of respondents illustrated in answering certain questions. This limitation serves as an interesting discussion point as it involves a considerable amount of missing data or not applicable responses. The failure to answer an item may be a good predictor of the behaviour of the group in terms of the theme of the question (Tabachnick & Fidell, 1989).

The items respondents had difficulty with were primarily those which asked them to report the times they would typically fall asleep and wake up in between different shifts (Question 2.1). Respondents were asked to report these times in 24h time. Over one third of the sample did not answer this question accurately. Therefore there would be little confidence in the results of any analysis conducted from this data.

A similar difficulty existed when attempting to answer items referring to the start and finish times of each different shift (Question 1.18, 1.41). Missing data or not applicable codes came from over one third of the sample. This difficulty may be indicative of the erratic nature of the shift schedules reported by 62% of the sample.

The item referring to napping habits (Question 2.2) was attempted by only a few of the respondents. This may indicate that respondents may have had difficulty in

recalling napping times. However it may also indicate that the present sample do not take naps. Napping appears to be a controversial issue as researchers do not agree about whether napping is of benefit to shiftworkers (Akerstedt, 1988; Snyder, 1995).

These problems act to reinforce the difficulty in measuring behaviour using a self-report technique (Dunham, 1988). Such difficulties may however indicate the usefulness of missing data and indicate the limitations of the questionnaire (Tabachnick & Fidell, 1989).

CHAPTER SIX

Conclusions and Recommendations

6. Introduction

The aim of this chapter is to highlight and assimilate the main findings and themes of the research. The limitations of the present study will also be discussed and future research directions identified. Recommendations to the organisations will be made on the basis of the results of the study in order that the organisation and the shiftworkers themselves, may benefit from the information derived from this research.

6.1 Conclusions of the Study

The three most pertinent conclusions derived from the study, focus on the main objectives of the research.

One of the main objectives was to assess the extent to which the SSI was portable to the present sample of television production shiftworkers in New Zealand. The degree of portability is endorsed by a number of factors.

Both the present sample and the U.K sample yielded similar alpha coefficients. The majority of alpha levels were in the moderately high to high range for both samples, indicating comparable levels of internal consistency. The directions of the correlations were also similar for both samples. The majority of correlations which had different signs were considerably close to zero and as such a change in sign is not critical as the correlations were very small. Any change in sign may have occurred as a result of the vastly different sample sizes.

Statistical power levels for both samples were also similar when compared using a metric not influenced by sample size. The vast differences in the sample size are irrelevant when using an effect size analysis. Comparing the two samples on the basis of effect size indicates they are very similar. Both samples yielded mainly moderate levels of effect size. Neither sample yielded any large effects. The portability is further reinforced by the similar levels of statistical power, high internal consistency and similar relationships between outcome and moderator variables yielded from the present study.

Some differences between the U.K sample and present sample were found. These main differences were on the correlation between job satisfaction and extraversion;

psychological well-being and morningness; and domestic disruption and languidity. The differences between the two samples on these dimensions may be influenced by many factors. The most obvious would be the different geographical locations each of the samples belong to. The ratio of males and females per sample may also potentially influence these differences between the sample. In terms of the mean scores on the SSI measures there were also some notable differences between the two samples. The mean item scores which appeared substantial different were scores on psychological well-being, general job satisfaction, and engagement. The main differences between the two samples, such as general job satisfaction, psychological well-being and engagement, may be attributable in part to the major organisational restructuring occurring within the organisation at the time of the study. It is difficult to establish the exact consequences of such a considerable change in the infrastructure and culture of the organisation. It is acknowledged that these events may have manifested in terms of the participants experience of shiftwork.

However, in general the outcomes of the SSI from the current sample were consistent with those of the U.K study. This therefore indicates that the SSI could accurately measure the same constructs in both samples, yielding significantly similar results.

Shiftwork research in general tends to be characterised by a continual emphasis on the negative outcomes of shiftwork. This may potentially bias researchers toward only addressing the detrimental aspects of shiftwork. However, with reference to the present study, a number of positive outcomes were reported and as such deserve recognition.

The impact of shiftwork on the present sample may be categorised in terms of Barton (1994) and Folkard's (1993) classification of the consequences of shiftwork. The impact of shiftwork on health was one of the more positive outcomes for the sample. The respondents reported a low level of ongoing health complaints and very limited long term use of medications. Gastrointestinal and cardiovascular complaints which have been notoriously common in shiftworkers, was extremely low for this sample. The sample yielded a moderate level of psychological disturbance which may also be attributable to the restructuring environment. However, even given the major organisational change, the sample yielded a noticeably low level of anxiety.

Sleep disturbance did appear to have quite a serious detrimental impact on the sample, although this didn't seem to contribute to poorer health outcomes. Consistent

with past findings, the night shift appeared to produce the most severe disturbances to sleep and days off the least. The erratic organisation of the shift system may well impact of the sleep problems experienced by the sample.

Social and domestic disturbance was the most serious complaint reported by respondents. Coupled with sleep problems, the erratic nature of the shift structure may have made planning social and domestic activities very difficult considering that the majority of respondents usually received less than two weeks notice of their roster.

Gender differences in coping was the only significant difference within the sample although a large proportion of the sample comprised of males. Females appeared to use engagement strategies as a way of coping with shiftwork. The seeking of social support is inherent to the engagement mode of coping and was hypothesised as a result of gender socialisation which encourages females to be more expressive and seek out social support.

Nevertheless, it was encouraging to identify that the majority of the sample felt that the advantages of shiftwork did potentially outweigh the negatives, although a large proportion would possibly give up shiftwork in preference of day work. This may be a reflection of the social and domestic difficulties the majority of the sample experienced. However, respondents felt there was a degree of flexibility in their shift system and they were able to attend to personal matters during business hours.

6.2 Recommendations

Results from this study highlight that the impact of shiftwork on social and domestic life and sleep problems are areas which are in need of attention. Consideration of these issues is vital in order to maintain a productive and satisfied work force and to retain employees and reduce turnover.

Attention to gender differences in coping are also recommended. As highlighted by the study, males in the sample tended to avoid the use of effective coping strategies. This may be a result of a lack of awareness as to the most effective methods of coping.

It is therefore reiterated that some form of Employee Assistance Program may be of benefit to employees who do not appear to be utilising effective coping strategies. For example, such programs may contribute to the reduction of the high level of social and domestic disruption experienced by participants as well as other potential negative outcomes of shiftwork.

The need to allow employees to participate in the development of workplace initiatives is reinforced in order to instil a level of personal control in a rapidly changing organisation. Maintaining effective communication networks is also recommended so that employees are informed on a timely basis, those decisions which impact directly on their work life. Continued attention to establishing flexibility in working time arrangements may also help to minimise the detrimental impact of shiftwork, particularly in the social and domestic domains.

6.3 Limitations of the Study

The nature of self-report measures such as the SSI, need to be acknowledged in order to conduct research which produces valid and reliable data. The impact of response biases, difficulties inherent in the recall of events and information, must be considered to ensure the highest level of integrity in the research process.

Limitations specific to the SSI centred around the reporting of sleep behaviour. The continued use of the SSI would require this to be addressed. The result of this was the inability to justify further analysis of the data and therefore inhibits the production of any reliable and meaningful information. As a result it is not possible to rely on the results of such analyses and therefore 'waste' what is potentially highly valuable information.

6.4 Future Research Considerations

The impact of organisational restructuring, turnover intention and the impact of shiftwork on employees may be a valid topic of future research. At the conclusion of the organisational restructuring, a comparative study to administer the questionnaire to the sample again may be of value. Such a study may identify the impact of shiftwork once the new, more stable structure of the organisation was in place.

The need for more longitudinal studies is also reiterated so that the long term impact of shiftwork is identified. It is also advised that other industries within New Zealand continue to adopt measures to identify the outcomes of shiftwork, so that the negative implications may be minimised and the productivity and satisfaction of shiftworkers maximised.

Shiftwork is an escalating world-wide mode of work scheduling. An emphasis on continual improvement of shiftwork arrangements and design may potentially benefit both the organisation and the shiftwork employees. Immediate and continued attention to the impact of this form of workplace design is imperative, with no room for complacency.

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APPENDICES

MASSEY
UNIVERSITY

A L B A N Y

DEPARTMENT OF PSYCHOLOGY

STANDARD SHIFTWORK INDEX

QUESTIONNAIRE

This research is part of the Masters Degree of Teresa Goddard, a post-graduate student of Massey University Albany. The research aims to evaluate the potential problems which employees may experience as a result of working shifts. There is no "axe to grind" within an organisation; the primary aim being to help to identify the types of potential problems experienced by individual shiftworkers.

Please note that any information you provide in the questionnaire will be treated with the strictest confidence and will not be divulged to anyone. No individual will be identified in connection with any of the research findings. The primary concern is obtaining information from *groups* of shiftworkers.

Throughout this questionnaire the terms "Morning", "Afternoon", and "Night" shifts are used. Please ignore the fact that these terms may differ from the ones used in your organisation. For example, you may call your "Morning" shift an "Early" one, while your "Afternoon" shift may be referred to as a "Late", "Evening" or "Swing" shift.

It is possible that completing this questionnaire may draw your attention to problems you experience as a result of shiftwork. If you are worried that these are serious it is advised you contact your GP (see back page).

Thank you for filling in this questionnaire.

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1. Your General Biographical Information

Please answer the following questions as accurately as possible. Please note that the information you give will be treated in strictest confidence.

1.1 Today's Date: _____

1.2 Age: _____

1.3 Sex: Female Male
(circle one)

Your Domestic Situation

1.4 Are you: *(tick one)*

(a) Married/Living with a partner _____
(b) Separated/Divorced _____
(c) Widowed _____
(d) Single _____

1.5 On average, how many hours per week does your partner work in paid employment? _____ hours

1.6 What is your partner's usual work pattern?
(tick one)

(a) Daytime - no shifts _____
(b) Rotating shifts with nights _____
(c) Rotating shifts without nights _____
(d) Permanent nights _____
(e) Other ..... _____
(please specify)

	Extremely unsupp-ortive	Fairly unsupp-ortive	Quite indiff-erent	Fairly support-ive	Extremely support-ive
1.7 How does your partner feel about **you** working shifts? *(Circle one)*	1	2	3	4	5

1.8 How many persons in your household are in each of the following age groups (excluding yourself)?

(a) 0 to 5 years _____
(b) 6 to 12 years _____
(c) 13 to 18 years _____
(d) 19 to 24 years _____
(e) 25 to 60 years _____
(f) 60 years + _____

1.9 How many of these need looking after by you? _____

1.10 How long have you worked altogether? _____ years

1.11 How long have you worked in your **present** shift system? _____ years _____ months

1.12 How long **altogether** have you been working shifts? _____ years _____ months

1.13 On average, how many hours do you work each week excluding overtime? _____ hours _____ minutes

1.14 On average, how many hours **paid** overtime do you work each week? _____ hours _____ minutes

1.15 On average, how many hours unpaid overtime do you work each week, (e.g. over-run of shifts)? _____ hours _____ minutes

1.16 Do you have a second paid job in addition to your main one? *(tick one)* _____ yes _____ no

1.17 If you have taken a career break (or breaks), how long was this for in total? _____ years _____ months

Your Shift Details

1.18 For each of the shifts that **you normally work**, at what time do they start and finish? (Please use 24h time, e.g. 21:30 or clearly indicate "am" or "pm").

		START	FINISH
(a)	Morning (or early) shift	_____	_____
(b)	Afternoon (or late, evening or swing) shift	_____	_____
(c)	Half-day shift	_____	_____
(d)	Night shift	_____	_____
(e)	Other ..... *(please specify)*	_____	_____

1.19 On average, how long does it take you to travel to and from work?

		TO WORK	FROM WORK
(a)	Morning Shift	_____ mins	_____ mins
(b)	Afternoon Shift	_____ mins	_____ mins
(c)	Night Shift	_____ mins	_____ mins
(d)	Other ..... *(please specify)*	_____ mins	_____ mins

1.20 How do you normally travel to work? *(tick one)*

(a) By public transport _____

(b) By private transport _____

(c) By a combination of public and private _____

(d) By company transport _____

(e) By foot _____

1.21 Do you ever feel unsafe when travelling to and from work on the following shifts? *(circle one for each)*

		Almost never	Quite seldom	Quite often	Almost always
(a)	Morning	1	2	3	4
(b)	Afternoon	1	2	3	4
(c)	Night	1	2	3	4
(d)	Other ..... *(please specify)*	1	2	3	4

1.22 For each of the shifts that **you normally work**, on average how many successive shifts of **the same kind** do you normally work before changing to another shift or having some days off?

		NUMBER
(a)	Number of successive morning shifts	_____
(b)	Number of successive afternoon shifts	_____
(c)	Number of successive night shifts	_____
(d)	Total number of successive shifts (of any kind) before days off	_____
(e)	Other ..... *(please specify)*	_____

1.23 What is the maximum number of shifts of any kind you have worked **between** days off in the past month? _____

1.24 On average, how many days off in succession do you normally have? _____

1.25 In general, when changing from one type of shift to another, what type of shift is each shift or day off followed by?

(a) Morning shifts are normally followed by: _____

(b) Afternoon shifts are normally followed by: _____

(c) Night shifts are normally followed by: _____

(d) Other ..... are normally followed by: _____

(e) Days off are normally followed by: _____

1.26 On average how many nights do you work per year? _____

1.27 How are these night shifts organised?
(please tick the <u>one</u> which best describes your night work)

(a) permanent nightshift _____
(b) a single block of night duty per year _____
(c) occasional blocks of night duty per year _____
(d) a block of nights each month _____
(e) one or two nights each week _____
(f) any other? *(please specify)* _____

1.28 On average how many weekends do you have off per 28 days? _____

1.29 How regular is the shift system you work?
(please tick one)

(a) **REGULAR** i.e. a fixed roster which is repeated when the cycle of shifts finishes, even if occasional variations occur to meet special requests. _____

(b) **IRREGULAR** i.e. the duty roster does not cycle or repeat in any regular manner and individual preferences are not taken into account. _____

(c) **FLEXIBLE** i.e. where the individuals concerned are consulted about their preferred duty hours before the duty roster is drawn up. _____

1.30 If your shift system is **regular**, over how many weeks does the cycle run before it is repeated? _____

	None	Not very much	A fair amount	Quite a lot	Complete
1.31 To what extent do you feel you have control over the specific shifts that you work?	1	2	3	4	5
1.32 To what extent do you feel you have control of the specific start and finish times of the shifts you work?	1	2	3	4	5

1.33 How much advance notice of your roster are you normally given?

_____ weeks _____ days

1.34 For each of the following, please indicate how often you:
(please circle one number for each)

	Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a) Are required to change your roster at short notice	1	2	3	4	5
(b) Swop shifts with colleagues	1	2	3	4	5
(c) Make a request to work specific shifts	1	2	3	4	5

1.35 Use the numbers 1 - 5 to rate **your** workload in comparison to the **average** workload of other people performing a similar job in other parts of your organisation:

Where: 1 = Extremely light
2 = Quite light
3 = About the same
4 = Quite heavy
5 = Extremely heavy
(Insert one number for each type of workload on each shift)

		Morning	Afternoon	Night
(a)	Physical workload	_____	_____	_____
(b)	Mental workload	_____	_____	_____
(c)	Time pressures	_____	_____	_____
(d)	Emotional stress	_____	_____	_____

1.36 What are your main reasons for working shifts?
(please circle one number for each)

		Not a reason for me		Partly a reason for me		Very much a reason for me
(a)	It is part of the job	1	2	3	4	5
(b)	It was the only job available	1	2	3	4	5
(c)	More convenient for my domestic responsibilities	1	2	3	4	5
(d)	Higher rates of pay	1	2	3	4	5
(e)	Other ..... *(please give your reasons)*	1	2	3	4	5

1.37 All other things being equal, would you prefer to give up working shifts and get a day-time job without shifts?
(circle one)

Definitely not	Probably not	Maybe	Probably yes	Definitely yes
1	2	3	4	5

1.38 What are the three main advantages of your shift system for you?

(a) _____

(b) _____

(c) _____

1.39 What are the three main disadvantages of your shift system for you?

(a) _____

(b) _____

(c) _____

1.40 Do you feel that overall the advantages of your shift system outweigh the disadvantages?

Definitely not	Probably not	May be	Probably yes	Definitely yes
1	2	3	4	5

1.41 If you were entirely free to choose the start and finish times of your shifts, what times would you choose?

		START	FINISH
(a)	Morning shift	_____	_____
(b)	Afternoon shift	_____	_____
(c)	Night shift	_____	_____
(d)	Other ..... *(please specify)*	_____	_____

1.42 The following questions relate to **general job satisfaction**, and **not** to your satisfaction with your shift system. Please circle the appropriate answer for each question.

		Disagree strongly	Disagree	Disagree slightly	Neutral	Agree slightly	Agree	Agree strongly
(a)	Generally speaking, I am very satisfied with this job	1	2	3	4	5	6	7
(b)	I frequently think of quitting this job	1	2	3	4	5	6	7
(c)	I am generally satisfied with the kind of work I do in this job	1	2	3	4	5	6	7
(d)	Most people on this job are very satisfied with the job	1	2	3	4	5	6	7
(e)	People on this job often think of quitting	1	2	3	4	5	6	7

2. Your Sleep and Fatigue

2.1 At what time do you normally fall asleep and wake up at the following points within your shift system? **Please note that, depending on your shift system, some of the sleeps listed may be the same as one another. If so, please indicate this by writing "same as e"; "same as g", etc.** Please use 24h time (e.g. 22:30) or clearly indicate "am" or "pm".

		FALL ASLEEP	WAKE UP
EARLY SHIFT			
(a)	Before your first morning shift	_____	_____
(b)	Between two successive morning shifts	_____	_____
(c)	After your last morning shift	_____	_____
LATE SHIFT			
(d)	Before your first afternoon shift	_____	_____
(e)	Between two successive afternoon shifts	_____	_____
(f)	After your last afternoon shift	_____	_____
NIGHT SHIFT			
(g)	Before your first night shift	_____	_____
(h)	Between two successive night shifts	_____	_____
(i)	After your last night shift	_____	_____
DAY OFF			
(j)	Before your first day off	_____	_____
(k)	Between two successive days off	_____	_____
(l)	After your last day off	_____	_____

2.2 If you normally take a nap/naps in addition to your main sleep, either at work or at home, at what time do you take it/them?

(a)	On morning shifts	from	_____	to	_____	and	from _____	to _____
(b)	On afternoon shifts	from	_____	to	_____	and	from _____	to _____
(c)	On night shifts	from	_____	to	_____	and	from _____	to _____
(d)	On days off	from	_____	to	_____	and	from _____	to _____

2.3 How many hours sleep do you feel you usually need per day, irrespective of which shift you are on?

_____ hours _____ minutes

2.4 How do you feel about the amount of sleep you normally get? *(Circle one number for each)*

		Nowhere near enough	Could do with a lot more	Could do with a bit more	Get the right amount	Get plenty
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.5 How well do you normally sleep? *(Circle one number for each)*

		Extre-mely badly	Quite badly	Moder-ately well	Quite well	Extre-mely well
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.6 How rested do you normally feel after sleep? *(Circle one number for each)*

		Definite-ly not rested	Not very rested	Moder-ately rested	Quite rested	Extre-mely rested
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.7 Do you ever wake up earlier than you intended? *(Circle one number for each)*

		Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.8 Do you have difficulty in falling asleep? *(Circle one number for each)*

		Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.9 Do you take sleeping pills? *(Circle one number for each)*

		Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.10 Do you use alcohol to help you to sleep? *(Circle one number for each)*

		Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a)	Between successive morning shifts	1	2	3	4	5
(b)	Between successive afternoon shifts	1	2	3	4	5
(c)	Between successive night shifts	1	2	3	4	5
(d)	Between successive days off	1	2	3	4	5

2.11 Do you ever feel tired on: *(Circle one number for each)*

		Almost never	Rarely	Some-times	Frequ-ently	Almost always
(a)	Morning shifts	1	2	3	4	5
(b)	Afternoon shifts	1	2	3	4	5
(c)	Night shifts	1	2	3	4	5
(d)	Days off	1	2	3	4	5

2.12 The following items relate to how tired or energetic **you generally feel**, irrespective of whether you have had enough sleep or have been working very hard. Some people appear to "suffer" from permanent tiredness, even on rest days and holidays, while others seem to have limitless energy. Please indicate the degree to which the following statements apply to your own normal feelings. *(Circle one number for each).*

		Not at all		**Some-what**		**Very much so**
(a)	I generally feel I have plenty of energy	1	2	3	4	5
(b)	I usually feel drained	1	2	3	4	5
(c)	I-generally feel quite active	1	2	3	4	5
(d)	I feel tired most of the time	1	2	3	4	5
(e)	I generally feel full of vigour	1	2	3	4	5
(f)	I usually feel rather lethargic	1	2	3	4	5
(g)	I generally feel alert	1	2	3	4	5
(h)	I often feel exhausted	1	2	3	4	5
(i)	I usually feel lively	1	2	3	4	5
(j)	I feel weary much of the time	1	2	3	4	5

2.13 Do you have any other comments or observations relating to your sleep and fatigue that have not been covered in the above section? If so, please try to describe them here:-

.....

.....

.....

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.....

3. Your Health and Well-Being

3.1 Please indicate how frequently you experience the following, by circling the appropriate number:

		Almost never	Quite seldom	Quite often	Almost always
(a)	How often is your appetite disturbed?	1	2	3	4
(b)	How often do you have to watch what you eat to avoid stomach upsets?	1	2	3	4
(c)	How often do you feel nauseous?	1	2	3	4
(d)	How often do you suffer from heartburn or stomach-ache?	1	2	3	4
(e)	How often do you complain of digestion difficulties?	1	2	3	4
(f)	How often do you suffer from bloated stomach or flatulence?	1	2	3	4
(g)	How often do you suffer from pain in your abdomen?	1	2	3	4
(h)	How often do you suffer from constipation or diarrhoea?	1	2	3	4
(i)	How often do you suffer from heart palpitations?	1	2	3	4
(j)	How often do you suffer from aches and pains in your chest?	1	2	3	4
(k)	How often do you suffer from dizziness?	1	2	3	4
(l)	How often do you suffer from sudden rushes of blood to your head?	1	2	3	4
(m)	Do you suffer from shortness of breath when climbing the stairs normally?	1	2	3	4
(n)	How often have you been told that you have high blood pressure?	1	2	3	4
(o)	Have you ever been aware of your heart beating irregularly?	1	2	3	4
(p)	Do you suffer from swollen feet?	1	2	3	4
(q)	How often do you feel "tight" in your chest?	1	2	3	4
(r)	Do you feel you have put on too much weight since beginning shiftwork?	1	2	3	4
(s)	Do you feel you have lost too much weight since beginning shiftwork?	1	2	3	4

3.2 Have you suffered from any of the following (diagnosed by your doctor)?

		Before starting shiftwork	Since starting shiftwork	Never
(a)	Chronic back pain	.....	.....	.....
(b)	Gastritis, duodenitis	.....	.....	.....
(c)	Gastric or duodenal ulcer	.....	.....	.....
(d)	Gall stones	.....	.....	.....
(e)	Colitis	.....	.....	.....
(f)	Sinusitis, tonsillitis	.....	.....	.....
(g)	Bronchial asthma	.....	.....	.....
(h)	Angina	.....	.....	.....
(i)	Severe heart attack (myocardial infarction)	.....	.....	.....
(j)	High blood pressure	.....	.....	.....
(k)	Cardiac arrhythmias	.....	.....	.....
(l)	Hypercholesterolaemia	.....	.....	.....
(m)	Diabetes	.....	.....	.....
(n)	Cystitis	.....	.....	.....
(o)	Kidney stones	.....	.....	.....
(p)	Eczema	.....	.....	.....
(q)	Chronic anxiety	.....	.....	.....
(r)	Depression	.....	.....	.....
(s)	Arthritis	.....	.....	.....
(t)	Haemorrhoids	.....	.....	.....
(u)	Varicose veins	.....	.....	.....
(v)	Anaemia	.....	.....	.....
(w)	Headaches	.....	.....	.....
(x)	Others	.....	.....	.....
	.....	.....	.....	.....

3.3 Have you taken any of the following medications for prolonged periods (more than three months)?

		Before starting shiftwork	Since starting shifwork	Never
(a)	Tranquillizers	.....	.....	.....
(b)	Sleeping tablets	.....	.....	.....
(c)	Anti-depressants	.....	.....	.....
(d)	Antacids	.....	.....	.....
(e)	Antispasmodics	.....	.....	.....
(f)	Laxatives	.....	.....	.....

		Before starting shiftwork	Since starting shifwork	Never
(g)	Drugs to control high blood pressure	.....	.....	.....
(h)	Diuretics	.....	.....	.....
(i)	Heart medicines	.....	.....	.....
(j)	Vasodilators	.....	.....	.....
(k)	Bronchodilators	.....	.....	.....
(l)	Vitamins, tonics	.....	.....	.....
(m)	Pain killers	.....	.....	.....
(n)	Steroids	.....	.....	.....
(o)	Anti-inflammatory medicines	.....	.....	.....
(p)	Hormones (except contraceptive pills)	.....	.....	.....
(q)	Others	.....	.....	.....
	.....	.....	.....	.....

		Before starting shiftwork	Since starting shiftwork
3.4	On average, how many cigarettes have you smoked per week?	.....	.....
3.5	On average, how many units of alcohol have you drunk per week? (e.g. 1 unit = 1/2 pint lager/ bitter **or** 1 glass of wine **or** 1 measure of spirit)	.....	.....
3.6	On average, how many cups of caffeinated coffee/ tea/cola have you drunk each day?	.....	.....

3.7 If appropriate, and you are not taking a birth control pill, has your menstrual cycle been:

		Extremely irregular	Fairly irregular	Fairly regular	Extremely regular
(a)	Before starting shiftwork	1	2	3	4
(b)	Since starting shiftwork	1	2	3	4

3.8 The following questions deal with **how you have felt in general over the past few weeks.** Please circle the most appropriate answer for each question. Remember to concentrate on present and recent complaints, not those that you have had in the distant past.

Have you recently:

(a)	been able to concentrate on what you are doing?	Better than usual	Same as usual	Less than usual	Much less than usual
(b)	lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
(c)	felt that you are playing a useful part in things?	More so than usual	Same as usual	Less than usual	Much less than usual
(d)	felt capable of making decisions about things?	More so than usual	Same as usual	Less than usual	Much less than usual
(e)	felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
(f)	felt you could not overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
(g)	been able to enjoy your normal day to day activities?	More so than usual	Same as usual	Less than usual	Much less than usual
(h)	been able to face up to your problems?	More so than usual	Same as usual	Less than usual	Much less than usual
(i)	been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
(j)	been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
(k)	been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
(l)	been feeling reasonably happy all things considered?	More so than usual	About the same	Less so than usual	Much less than usual

3.9 Below are listed some descriptions of **symptoms of anxiety.**

Please indicate the degree to which you **generally** or typically experience the symptom when **you are feeling anxious.**

		Not at all		**Some-what**		**Very much so**
(a)	I perspire	1	2	3	4	5
(b)	My heart beats faster	1	2	3	4	5
(c)	I worry too much over something that doesn't really matter	1	2	3	4	5
(d)	I feel jittery in my body	1	2	2	4	5
(e)	I imagine terrifying scenes	1	2	3	4	5
(f)	I get diarrhoea	1	2	3	4	5
(g)	I can't keep anxiety provoking pictures out of my mind	1	2	3	4	5
(h)	I feel tense in my stomach	1	2	3	4	5
(i)	Some unimportant thought runs through my mind and bothers me	1	2	3	4	5
(j)	I nervously pace	1	2	3	4	5
(k)	I feel like I am losing out on things because I can't make up my mind soon enough	1	2	3	4	5
(l)	I feel physically immobilised	1	2	3	4	5
(m)	I can't keep anxiety provoking thoughts out of my mind	1	2	3	4	5
(n)	I find it difficult to concentrate because of uncontrollable thoughts	1	2	3	4	5

4. Your Social and Domestic Situation

4.1 Are you satisfied with the amount of time your shift system leaves you for:

		Not at all		Some-what		Very much
(a)	individual hobbies and/or sport activities	1	2	3	4	5
(b)	group/team hobbies or sport activities	1	2	3	4	5
(c)	your partner	1	2	3	4	5
(d)	your close family	1	2	3	4	5
(e)	friends and relations	1	2	3	4	5
(f)	cultural events (cinema, theatre, concert) /evenings out	1	2	3	4	5
(g)	joining social organisations	1	2	3	4	5
(h)	adult education classes	1	2	3	4	5
(i)	your children	1	2	3	4	5
(j)	going to bank or post office	1	2	3	4	5
(k)	going to dentist/doctor/chemist	1	2	3	4	5
(l)	having a tradesman do some work on your house	1	2	3	4	5
(m)	shopping (daily goods)	1	2	3	4	5
(n)	shopping (clothes, furniture, etc)	1	2	3	4	5
(o)	week-end outings	1	2	3	4	5
(p)	family outings	1	2	3	4	5
(q)	yourself	1	2	3	4	5
(r)	domestic tasks	1	2	3	4	5
(s)	religious activities	1	2	3	4	5

4.2 In general how much does your shift system interfere with the sort of things you **would like to do** in your leisure time (e.g. sport activities, hobbies, etc.)? 1 2 3 4 5

4.3 In general how much does your shift system interfere with the **domestic things you have to do** in your time off work (e.g. domestic tasks, looking after children, etc.)? 1 2 3 4 5

4.4 In general how much does your shift system interfere with the **non-domestic things you have to do** in your time off work (e.g. going to doctor, library, bank, hairdresser, etc.)? 1 2 3 4 5

4.5 Can you now please circle the letter of those items in question 4.1 (above i.e. a - s) that are of very little concern to you or that do not apply.

5. Coping

Shiftwork affects many people in a variety of ways, for example in terms of their social and domestic life. Consequently shiftworkers tend to cope with the effects of shiftwork in different ways and to different degrees. Below is a list of 8 different strategies people can use to cope with problems they experience.

In relation to the different problem areas stated below, please **indicate the extent** to which you use (or have used) **each** of the coping strategies listed.

The problem areas relate to:

your **social life**	e.g. going out, visiting friends, etc.
your **domestic life**	e.g. domestic tasks, jobs around the house, childcare, etc.
the **sleep** you get	e.g. problems falling asleep, disturbed sleep, etc.
your **job**	e.g. organisation of work, job performance, etc.

It might help to actually think of an event concerning each of the areas. For sleep an example could be: difficulty with sleeping during the day, because of light and noise.

For example, to what extent do you:

- work on solving the problems in this situation, e.g. darken room. If you don't do that at all you circle 1.
- re-organise the way you look at the situation, e.g. think that it is only three more nightshifts. If you do that quite a bit you circle 4.

		Not used	Used a little	Used some-what	Used quite a bit	Used a great deal
5.1	To what extent do you use the following strategies when you have problems with your **social life** caused by working shifts?					
(a)	I work on solving the problems in the situation	1	2	3	4	5
(b)	I re-organize the way I look at the situation, so things don't look so bad	1	2	3	4	5
(c)	I let my emotions out	1	2	3	4	5
(d)	I talk to someone about how I am feeling	1	2	3	4	5
(e)	I avoid thinking or doing anything about the situation	1	2	3	4	5
(f)	I wish the situation would go away or somehow be over with	1	2	3	4	5
(g)	I criticize myself for what is happening	1	2	3	4	5
(h)	I spend more time alone	1	2	3	4	5

		Not used	Used a little	Used some-what	Used quite a bit	Used a great deal
5.2	To what extent do you use the following strategies when you have problems with your **domestic life** caused by working shifts?					
(a)	I work on solving the problems in the situation	1	2	3	4	5
(b)	I re-organize the way I look at the situation, so things don't look so bad	1	2	3	4	5
(c)	I let my emotions out	1	2	3	4	5
(d)	I talk to some-one about how I am feeling	1	2	3	4	5
(e)	I avoid thinking or doing anything about the situation	1	2	3	4	5
(f)	I wish the situation would go away or somehow be over with	1	2	3	4	5
(g)	I criticize myself for what is happening	1	2	3	4	5
(h)	I spend more time alone	1	2	3	4	5
5.3	To what extent do you use the following strategies when you have problems with **your sleep** caused by working shifts?					
(a)	I work on solving the problems in the situation	1	2	3	4	5
(b)	I re-organize the way I look at the situation, so things do not look so bad	1	2	3	4	5
(c)	I let my emotions out	1	2	3	4	5
(d)	I talk to some-one about how I am feeling	1	2	3	4	5
(e)	I avoid thinking or doing anything about the situation	1	2	3	4	5
(f)	I wish the situation would go away or somehow be over with	1	2	3	4	5
(g)	I criticize myself for what is happening	1	2	3	4	5
(h)	I spend more time alone	1	2	3	4	5

		Not used	Used a little	Used some-what	Used quite a bit	Used a great deal
5.4	To what extent do you use the following strategies when you have problems with the way you perform **your work** caused by working shifts?					
(a)	I work on solving the problems in the situation	1	2	3	4	5
(b)	I re-organize the way I look at the situation, so things do not look so bad	1	2	3	4	5
(c)	I let my emotions out	1	2	3	4	5
(d)	I talk to some-one about how I am feeling	1	2	3	4	5
(e)	I avoid thinking or doing anything about the situation	1	2	3	4	5
(f)	I wish the situation would go away or somehow be over with	1	2	3	4	5
(g)	I criticize myself for what is happening	1	2	3	4	5
(h)	I spend more time alone	1	2	3	4	5

		Never		Somewhat		Always
5.5	In general, to what extent does working shifts cause you problems with:					
(a)	sleep	1	2	3	4	5
(b)	social life	1	2	3	4	5
(c)	domestic life	1	2	3	4	5
(d)	work performance	1	2	3	4	5

5.6 To what extent **do you think** there are **organisational** problems at your work (e.g. the way your work is organised, staffing is arranged, or management decisions are implemented)?

Not at all		Somewhat		Very much so
1	2	3	4	5

5.7 Do you find it difficult to cope with these problems?

No		Sometimes		Yes
1	2	3	4	5

6. The type of person you are

6.1 Please *tick* the response for *each* item that best describes *you*.

(a)	Considering only your own "feeling best" rhythm, at what time would you get up if you were entirely free to plan your day?	05.00 - 06.30 a.m. 06.30 - 07.45 a.m. 07.45 - 09.45 a.m. 09.45 - 11.00 a.m. 11.00 a.m. - 12.00 (noon)	____ ____ ____ ____ ____
(b)	Considering only your own "feeling best" rhythm, at what time would you go to bed if you were entirely free to plan your evening?	08.00 - 09.00 p.m. 09.00 - 10.15 p.m. 10.15 p.m. - 12.30 a.m. 12.30 - 01.45 a.m. 01.45 - 3.00 a.m.	____ ____ ____ ____ ____
(c)	Assuming normal circumstance, how easy do you find getting up in the morning?	Not at all easy Slightly easy Fairly easy Very easy	____ ____ ____ ____
(d)	How alert do you feel during the first half hour after having awakened in the morning?	Not at all alert Slightly alert Fairly alert Very alert	____ ____ ____ ____
(e)	During the first half hour after having awakened in the morning, how tired do you feel?	Very tired Fairly tired Fairly refreshed Very refreshed	____ ____ ____ ____
(f)	You have decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is 7.00 - 8.00 a.m. Bearing in mind nothing else but your own "feeling best" rhythm, how do you think you would perform?	Would be in good form Would be in reasonable form Would find it difficult Would find it very difficult	____ ____ ____ ____
(g)	At what time in the evening do you feel tired and, as a result, in need of sleep?	08.00 - 09.00 p.m. 09.00 - 10.15 p.m. 10.15 p.m. - 12.30 a.m. 12.30 - 01.45 a.m. 01.45 - 03.00 a.m.	____ ____ ____ ____ ____
(h)	You wish to be at your peak performance for a test which you know is going to be mentally exhausting and lasting for two hours. You are entirely free to plan your day, and considering only your own "feeling best" rhythm, which ONE of the four testing times would you choose?	08.00 - 10.00 a.m. 11.00 a.m. - 1.00 p.m. 03.00 - 05.00 p.m. 07.00 - 09.00 p.m.	____ ____ ____ ____

(i)	One hears about "morning" and "evening" types of people. Which ONE of these types do you consider yourself to be?	Definitely a morning type More a morning than an evening type More an evening than a morning type Definitely an evening type	____ ____ ____ ____
(j)	When would you prefer to rise (provided you have a full day's work - 8 hours) if you were totally free to arrange your time?	Before 06.30 a.m. 06.30 a.m. - 07.30 a.m. 07.30 - 08.30 a.m. 08.30 a.m. or later	____ ____ ____ ____
(k)	If you always had to rise at 06.00 a.m., what do you think it would be like?	Very difficult and unpleasant Rather difficult and unpleasant A little unpleasant but no great problem Easy and not unpleasant	____ ____ ____ ____
(l)	How long a time does it usually take before you "recover your senses" in the morning after rising from a night's sleep?	0-10 minutes 11-20 minutes 21-40 minutes More than 40 minutes	____ ____ ____ ____
(m)	Please indicate to what extent you are a morning or evening *active* individual?	Pronounced morning active (morning alert and evening tired) To some extent, morning active To some extent, evening active Pronounced evening active (morning tired and evening alert)	____ ____ ____ ____

6.2 The following questions are concerned with your daily habits and preferences. Please indicate what you prefer to do, or can do, and not what you may be forced to do by your present work schedule or routine.

Please work through the questions as quickly as possible. It is your immediate reaction to the questions that we are interested in, rather than a carefully deliberated answer. There are no "right" or "wrong" answers to any of the questions. For each question we simply want you to indicate which of the five alternatives best describes you, or your preferences, by circling the appropriate number.

		Almost Never	**Seldom**	**Some-times**	**Usually**	**Almost Always**
(a)	Do you tend to need more sleep than other people?	1	2	3	4	5
(b)	If you are feeling drowsy can you easily overcome it if you have something to do?	1	2	3	4	5
(c)	Do you find it fairly easy to get to sleep whenever you want to?	1	2	3	4	5
(d)	Can you miss out a night's sleep without too much difficulty?	1	2	3	4	5
(e)	Do you find it difficult to "wake-up" properly if you are awoken at an unusual time?	1	2	3	4	5

		Almost Never	Seldom	Some-times	Usually	Almost Always
(f)	If you had to do a certain job in the middle of the night do you think you could do it almost as easily as at a more normal time of day?	1	2	3	4	5
(g)	Do you find it easy to "sleep in" in the morning if you got to bed very late the previous night?	1	2	3	4	5
(h)	If you go to bed very late do you need to sleep in the following morning?	1	2	3	4	5
(i)	Can you easily keep alert in boring situations?	1	2	3	4	5
(j)	Are you fairly unaware as to what time it is?	1	2	3	4	5
(k)	If you are tired do you have difficulty keeping awake even though you need to?	1	2	3	4	5
(l)	Do you enjoy working at unusual times of day or night?	1	2	3	4	5
(m)	Do you feel sleepy for a while after waking in the morning?	1	2	3	4	5
(n)	Do you get up later than normal when you are on holiday?	1	2	3	4	5
(o)	If you have a lot to do can you stay up late to finish it off without feeling too tired?	1	2	3	4	5
(p)	Does the time of day have a large effect on your mood and abilities?	1	2	3	4	5
(q)	Do you find it as easy to work late at night as earlier in the day?	1	2	3	4	5
(r)	If you have to get up very early one morning do you tend to feel tired all day?	1	2	3	4	5
(s)	Do you "nod-off" if you are listening to, or watching, a boring programme?	1	2	3	4	5
(t)	Can you easily go to sleep earlier than normal to "catch up" on lost sleep, e.g. after several late nights?	1	2	3	4	5
(u)	Do you have no strong preference as to when you sleep?	1	2	3	4	5
(v)	Can you manage with only a few hours sleep each night for several days in a row without too much difficulty?	1	2	3	4	5
(w)	Do you find it fairly difficult to overcome tiredness even in a challenging situation?	1	2	3	4	5
(x)	Would you be just as happy to do something in the middle of the night as during the day?	1	2	3	4	5
(y)	Do you rely on an alarm clock, or someone else, to wake you up in the morning?	1	2	3	4	5
(z)	Do you get to sleep fairly quickly when you have gone to bed earlier than normal?	1	2	3	4	5

		Almost Never	Seldom	Some-times	Usually	Almost Always
(a')	Do you go to parties, or have evenings out with friends, if you have to get up early the following morning?	1	2	3	4	5
(b')	Do you need a cup of coffee or tea to wake up properly after you have been asleep?	1	2	3	4	5
(c')	Are there particular times of day when you would avoid doing certain jobs if you could?	1	2	3	4	5
(d')	If you could do so, would you rather wait for half-an-hour or so after waking in the morning before eating a large breakfast?	1	2	3	4	5

6.3 Here are some questions regarding the way you behave, feel and act. Try to decide which response option represents your usual way of acting or feeling. There are no right or wrong answers to any of the questions: your immediate reaction is what we want. Please check that you have answered all the questions. *(Circle one number for each).*

		Almost never	Quite seldom	Quite often	Almost always
(a)	Do you like plenty of excitement and bustle around you?	1	2	3	4
(b)	Does your mood go up and down?	1	2	3	4
(c)	Are you rather lively?	1	2	3	4
(d)	Do you feel 'just miserable' for no good reason?	1	2	3	4
(e)	Do you like mixing with people?	1	2	3	4
(f)	When you get annoyed do you need some-one friendly to talk to?	1	2	3	4
(g)	Would you call yourself happy-go-lucky?	1	2	3	4
(h)	Are you troubled about feelings of guilt?	1	2	3	4
(i)	Can you let yourself go and enjoy yourself a lot at a lively party?	1	2	3	4
(j)	Would you call yourself tense or 'highly strung'?	1	2	3	4
(k)	Do you like practical jokes?	1	2	3	4
(l)	Do you suffer from sleeplessness?	1	2	3	4

6.4 Please rate your current intention to leave the organisation.

Definitely not	Probably not	Maybe	Probably yes	Definitely yes
1	2	3	4	5

Do you have any other comments or observations relating to your experience as a shiftworker that have not been covered in this questionnaire? If so, please try to describe them here:

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GENERAL INFORMATION

Some people experience severe health, sleep or emotional problems as a result of working shifts. It is possible that completing this questionnaire may have drawn your attention to problems you experience as a result of shiftwork and/or other factors. If you feel that talking to someone might help with these problems it is advised strongly that you contact your GP. If they cannot help you they should be able to put you in contact with someone who can.

Can you please check that you have answered all the questions,

but please do not alter any of your answers.

Thank you for filling in this

questionnaire.

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A L B A N Y

DEPARTMENT OF PSYCHOLOGY

SHIFTWORK RESEARCH

Information Sheet

Shiftwork is a requirement of many occupations today and the television production industry, as you know, is no exception. My name is Teresa Goddard and I am a Master's research student in the Faculty of Social Sciences of Massey University, Albany. My area of interest is Health Psychology, particularly in the workplace. There has been a considerable amount of research dedicated to shiftwork and the potential impact it may have on individuals, but as yet there has been little research conducted in New Zealand.

I would therefore like to invite you to take part in my study of shiftwork and to express your experiences of working shifts. In doing so you contribute to a wider understanding of how shiftwork may effect employees. Your contribution is therefore very valuable as it enables a representative view of how employees at (*name of organisation*) feel about and are effects, if at all, by shiftwork. Your contribution also aids the understanding of the potential impact of shiftwork on employees in general.

Participation in the study would involve answering a questionnaire which asks you about your experiences of shiftwork. The questionnaire would require approximately 30-45 minutes of your time to complete.

Participating in the study is completely voluntary and you have the right to decline to take part or withdraw from the study at any time. It is assumed that filling in the questionnaire implies consent. You have the right to decline to answer any particular questions. You may also choose to not answer a question and/or part of a question. You are assured of anonymity and confidentiality. All information gathered will be confidential to myself and my supervisor, Dr. Hillary Bennett. Information will be stored in a locked room at the University and information no longer required for the purpose of the research will be destroyed.

All answers and comments made by you in the questionnaire will be grouped. Individual responses will not be reported, therefore there is no way your particular answers can be identified. A summary of the grouped research findings will be made available at the conclusion of the study.

If you require further explanation of the research and your part in it, please feel free to contact myself or my supervisor, Dr. Hillary Bennett at the University on 443-9365.

Thanking you in anticipation

Teresa Goddard
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Department of Psychology

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MASSEY
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A L B A N Y

DEPARTMENT OF PSYCHOLOGY

2 July 1997

Dear Shiftworker

Re: Shiftwork Questionnaire

Approximately four weeks ago I sent you and all other shiftworkers a questionnaire about shiftwork asking you to express your experiences as a shiftworker at (*name of organisation*).

If you have completed and returned the questionnaire I would like to take this opportunity to thank you for your contributions and for taking the time to answer the questionnaire.

It is very important that all questionnaires are returned to me so that I have sufficient numbers for the results to reflect a representative and balanced view of shiftworkers at (*name of organisation*). I realise that it can be difficult to find the time to fill out surveys, but ask that you could complete the questionnaire as soon as possible, if you have not already done so, and return it to me at the University in the pre-paid envelope supplied with the questionnaire.

Although participation is voluntary, everyone's contribution is very valuable to this study. I would like to remind you that information provided will be treated with the strictest confidence and no individual's comments and answers can be identified.

If you require another questionnaire or have any further questions please feel free to contact myself or my supervisor, Dr. Hillary Bennett at the University on 443-9365.

Thank you for your assistance.

Yours sincerely

Teresa Goddard
M.A Research Student

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