Exploring the Protective Role of Perceived Social Support on Physical Health in the Retirement
Transition

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Abstract

New Zealand has an ageing population which will pose a number of economic challenges as the population structure changes. This has prompted a need to find ways to help people age healthily and successfully into later life to reduce the costs associated with poor health and dependence. The transition to retirement is focused on in this study as a key period of time when numerous contextual factors undergo change and adjustment that may impact on later health outcomes. One change in the retirement transition is often the reorganisation of social relationships, and in accord with previous research it was hypothesised that perceptions of available social support would play a protective role on physical health for middle-to-older age adults as they make the transition from paid employment to retirement. This longitudinal study used data obtained from the 2006, 2008 and 2010 waves of the New Zealand Health, Work and Retirement Study. The participants were a representative sample of middle to older age New Zealanders who provided responses to a postal survey in each wave of data collection (N = 1834). Hierarchical regression analysis was employed to explore the relationship between retirement, social support, social network type and health outcomes. Regression analysis revealed that retirees experience slightly poorer health than workers and that this relationship cannot be accounted for by age or health status prior to retirement. Contrary to predictions, social support prior to retirement and changes in social support during the retirement transition did not explain this relationship. Further to this, social support only had a weak and unstable impact on health regardless of employment status. However, when examining the different types of social support, Social Integration was found to be important to health. Social Integration had a small positive direct effect on health for both retirees and workers, but particularly so for retirees as demonstrated by a significant interaction. Further investigation of the impact of Social Integration on health during the transition to retirement is suggested as a useful direction for future research.

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Table of Contents

List of Tables and Figures

Tables

Figures

1. Introduction: Retirement and Physical Health

New Zealand is one of many countries around the world with an ageing population that will soon present a range of economic challenges. The number of people aged 65 and over is projected to increase significantly as the large birth cohorts from the 1950s and 1960s move into this age bracket (Dunstan & Thomson, 2006). From the late 2030s it is projected that the 65+ group will make up over a quarter of New Zealand's population, compared with 12% in 2005 (Khawaja & Thomson, 2000). It is thought that New Zealand will not be able to sustain the costs of supporting those over 65 as the structure of the population changes. Costs will increase for the government as they support increasing numbers of people with pensions and healthcare costs associated with later life. Also, because life expectancy has steadily increased in New Zealand, the government is providing these services for longer than they have before. This problem is further compounded as people are having fewer children and consequently it has been predicted there are going to be less people in the workforce to support these increasing costs (Khawaja & Thomson, 2000).

1.1 Retirement

The projected change in the structure of the population has generated interest in strategies that will help the government manage the costs of an ageing population. Although there is no mandatory retirement age in New Zealand, the age of eligibility for the superannuation pension is 65 years old. One proposed strategy to help address the economic burden of an ageing population is to raise the age of eligibility, thereby keeping people contributing to the economy for longer. However, it is important to consider the potential health impact that delaying retirement may have (Johnston & Lee, 2009). A popular conceptualisation of retirement is as a transition associated with a number of negative changes that bring about illness and death (Brown, 2008; Ekerdt, Baden, Bosse, & Dibbs, 1983); for example the international best-selling book *Avoid Retirement and Stay Alive* (Bogan & Davies, 2011). Delaying retirement may also delay the potential negative effect on health, reducing the associated healthcare costs. However, retirement may also be a time in which individuals experience numerous health benefits. Should this be the case, raising the age of eligibility to receive a pension may prolong the negative effects of working, resulting in poorer health and increased healthcare expenditure. Therefore, the impact that the transition from work to retirement has on health has been of interest from an economic perspective.

It is also of economic benefit to the New Zealand government to keep those in this age bracket as healthy and independent as possible to avoid the costs involved with ill health and rest-home

care. A recent article by The Dominion Post, the capital city's newspaper, clearly demonstrated the economic incentive for keeping people healthy enough to remain independent in their own homes (Patterson, 2012). It compared the cost of providing home-based support to relatively healthy, independent elderly versus rest-home care to those who are no longer able to take care of themselves. It was estimated that home-based support is around $6000 a year, whereas the cost of rest-home care is about $43,500 a year (Patterson, 2012), illustrating why attention has been focused on finding ways to help people age successfully and healthily into later life to avoid the costs associated with an unwell, dependent older population. Researchers such as Rowe and Kahn (1987) have also expressed interest in investigating what life factors contribute to successful ageing of many older people. They warn against assuming that declines in health can be attributed solely to the natural ageing process and state that other modifiable influences such as health behaviours, social and psychological factors have been underestimated as moderators of health in later life.

1.2. Retirement and Health Outcomes

Research on the impact of retirement on physical health outcomes has produced mixed results, with studies finding that retirement triggers ill health (e.g. Bamia, Trichopoulou, & Trichopoulou, 2008; Behncke, 2012; Dave, Rashad, & Spasojevic, 2008), benefits health (e.g. Coe & Zamarro, 2011) or has no impact at all (e.g. Johnston & Lee, 2009; Mein, Martikainen, Hemingway, Stansfeld, & Marmot, 2003). This lack of consistency of results is possibly due to methodological limitations and variation in study designs, conceptualisations of retirement and measurements of health (Behncke, 2012). However, the body of literature indicates that retirement does indeed have a negative impact on health for some people. For example, Behncke (2012) investigated the effect of retirement on health using data collected from 1439 individuals in three waves of the English Longitudinal Study of Ageing (ELSA). This well-designed study utilized instrumental variable methods and controlled for a range of confounding factors to examine the causal role of retirement on physical health. Behncke (2012) found that retirement had a negative effect on both objective and subjective measures of health; retirees were at increased risk of being diagnosed with a chronic condition (particularly cardiovascular disease (CVD) and cancer), developing the metabolic syndrome that is a risk factor to developing CVD and cancer, experiencing difficulties with activities of daily living, and were more likely to report subjective poor health.

Other researchers have also found retirement to lead to a range of negative health outcomes. Dave et al (2008) found retirement to lead to a 5-14% increase in difficulties with daily activities and mobility and a 4-6% increase in illness. Tuomi, Jarvinen, Eskelinen, Ilmarinen and Klockars (1991) found there to be an increase in musculoskeletal and cardiovascular

diseases in retired men and Bamia et al (2008) found that retirees had a 51% increased risk of mortality compared to those who continued working. Interestingly, these negative effects of retirement on physical health were found across a number of different countries; England (Behncke, 2012), the USA (Dave et al., 2008), Greece (Bamia et al., 2008), and Finland (Tuomi et al., 1991) which each have their own policies and incentives around retirement.

An important assumption to acknowledge that these researchers make is that health declines in older age are the result of more than just the biological ageing process. However, health does decline as people reach older age and a significant challenge to these researchers is to separate out declines in health that can be attributed to the natural ageing process and other demographic, psychological, social, health, retirement and job characteristics that may impact on health. Although very few of these researchers explicitly acknowledged the effects of the biological ageing process, most controlled for age and compared retirees to workers to investigate whether declines in health were more likely to occur in those who retired or generally occurred as people grew older (Bamia et al., 2008; Behncke, 2012; Dave et al., 2008; Midanik, Soghikian, Ransom, & Tekawa, 1995).

Other studies have produced the opposite result that retirement has a beneficial impact on health. Westerlund et al (2009) and Coe and Zamarro (2011) both found that self-rated health improved after retirement and Westerlund et al (2009) further found that this beneficial effect was maintained even 7 years after retirement. Retirement has also been found to promote health behaviours that may lead to improved health status. For example, Midanik, Sognikian, Ransom and Tekawa (1995) found that retirees were more likely to experience lower stress, engage in exercise more regularly and that women were less likely to report problems with alcohol consumption.

One potential reason for the inconsistency in results concerning the impact of retirement on physical health may be the method of controlling for confounding variables that also affect the decision to retire and later health outcomes. Behncke (2012) suggested in a recent paper that studies which control for demographic, psychological, retirement, health and job characteristics tend to find that retirement negatively impacts health, whereas studies that use instrumental variables, such as reaching retirement age, tend to find that retirement has no impact or a positive impact on health.

Health changes in response to retirement may also happen some time after the transition rather than in the short-term. Mein et al (2003) found that retirement had no impact on physical health after a 36-month follow-up, but studies that have longer follow-ups seem to find that there is no effect in the wave soon after retirement, but that there is an effect in later waves. For example,

Dave et al (2008) only found a significant effect in the later waves of data collection when using a sample of those considered healthy at baseline.

1.3. Heterogeneity of Health Outcomes in Retirement

The diversity of findings within the research highlight an important issue around using aggregated scores and making inferences that retirement is categorically harmful or beneficial to physical health (Minkler, 1985; Shapiro & Yarborough-Hayes, 2008; van Solinge, 2007). The experience of retirement has been argued to be widely variable for individuals and can be either a negative or positive experience depending on the circumstances in which it occurs (van Solinge, 2007). For instance, retirement may be associated with negative changes leading to poor health when it is involuntary, the individual experiences a considerable loss of social network members or the job was important to that individual's self-esteem and feelings of competence. Westerlund et al (2009) demonstrated that although the overall finding was that retirement improved self-rated health, those with a high occupational grade, high satisfaction in the job and low demands had no improvement in health. Conversely, the transition to retirement may be associated with positive changes if it provides relief from the stress of a job or an individual has more time to spend with loved ones or engaging in health behaviours such as physical exercise.

One example of a study illustrating the significant heterogeneity in health outcomes after retirement was by van Solinge (2007) who noted that although her overall results indicated that retirement was beneficial to health, there was in fact considerable diversity within the data set. Although subjective health appeared to improve slightly overall after retirement, in fact 25% experienced improvements and 19% experienced deteriorations in health. Prevalence of serious health problems appeared not to change when examining the aggregate scores, but on closer inspection, 15% experienced improvements and 15% experienced declines. A particularly important circumstance may be the individual's preference for retirement or work; van Solinge (2007) found that those who retired for any involuntary reason (while controlling for those who retired involuntarily because of health reasons) were more likely to experience declines in health. Similarly, Alpass et al (2007) found that matched and positively mismatched (meaning they are working more than they would like or would prefer to be retired) individuals had significantly better general and mental health than the negatively mismatched group (people who were retired but wanted to be working or who were not working as much as they would like). These statistics highlight the heterogeneity of health changes after the transition to retirement and the importance of considering the context and circumstances under which retirement occurs when examining the effect on health. As Shapiro and Yarborough-Hayes (2008) stated, whether retirement is a desired transition and an individual has been able to

anticipate and plan for it, has a significant impact on whether it ultimately harms, benefits or has no effect on health. Shapiro and Yarborough-Hayes (2008) make the salient point that both retirement and paid work can offer satisfaction and health benefits, depending on the context.

It is important to note that a significant challenge to researchers in establishing the causal impact of retirement on physical health is that the results are potentially explained by the reverse; those with poorer health are more likely to retire, producing the apparent decline in health after retirement. For instance, Gorman, Scobie and Towers (2012) found that physical health was a determinant in exiting the work force for men and the presence of some chronic conditions was associated with a lower likelihood of participating in work. Researchers such as Behncke (2012) and Dave et al (2008) have attempted to control for this by including a rich set of other variables that could potentially confound this relationship, using instrumental variable methods, longitudinal designs and running additional analyses with only those who were apparently healthy before retirement. Considering that studies have still found that retirement has an impact on health while utilising methods to control for reverse causation suggests that retirement plays a causal role in the changes in health in mid to later life in initially healthy individuals.

1.4. Summary

The retirement and physical health literature leads to the question, what changes occur in the transition from work to retirement that lead to an improvement or decline in health? Within the research investigating factors that promote healthy ageing there has been increasing recognition that declines in health during older age are not solely attributable to the biological ageing process; psychosocial and behavioural factors also play a significant role (Alpass et al., 2007; Berkman, Glass, Brissette, & Seeman, 2000). This is evidenced by the diversity in the health of retirees, with many enjoying excellent health (Rowe & Kahn, 1987). As chronic conditions that develop over many years are now the leading cause of death in New Zealand, it has also been important to focus attention on the psychosocial and behavioural factors that contribute to the development of these diseases at the earlier stage of midlife. Considering that declines in health are thought to be the result of more than just the biological ageing process, what are the psychosocial factors that are apparent in the transition to retirement that have an impact on health? The transition to retirement is a phase in which there is considerable upheaval, change and adjustment in many aspects of life. One of the most significant changes during the retirement transition is the often substantial change in one's social network. Retirement often brings about a reorganisation of the social network as opportunities for contact and engagement decline in some relationships and increase in others. Previous research has shown that a lack of satisfying and supportive relationships with others is a significant risk factor to physical health

(Holt-Lunstad, Smith, & Layton, 2010; Uchino, 2004). It is therefore proposed that social support is an important influential factor to consider when investigating changes in health after the transition to retirement.

2. Social Support

2.1. Definition of Social Support

Defining 'social support' has proven to not be as simple as it first appears; it has been conceptualised and measured in many ways across the social support literature. Clarifying the association between social support and health has proven to be difficult as the lack of consensus on a definition has led to a diverse array of measures; the research is often investigating overlapping or related, but conceptually different constructs. The body of social support literature highlights that there are two especially important distinctions to make; firstly the distinction between the quantity and quality of social support, and secondly the conceptual difference between perceived and received support. It is important to make these distinctions as each appears to be consistently associated in its own unique way with measures of physical health (Uchino, 2004) .

2.2. Definition of Structural and Functional Support

Structural support is also known as quantitative support and refers to the more objective aspects of an individual's support network; the existence of social ties and the connections among them (Berkman et al., 2000). There are a number of characteristics of structural support that have been of interest to researchers and how these are associated with measures of health. For example, quantity of ties, frequency of contact with network members, geographical proximity to social ties, marital status, density (how close network members are to one another), homogeneity of network members, existence of specific social ties, formal and informal group membership, strong and weak ties and obligatory and voluntary relationships (Berkman et al., 2000; House & Kahn, 1985; Sarason, Sarason, & Pierce, 1990). Functional support or qualitative support on the other hand concerns what is given and received through interactions with those social ties. It is the subjective experience of how relationships are perceived and experienced and the functions that are provided in this exchange (Uchino, 2004).

2.3. Relationship Between Structural and Functional Support

Although the existence of structural support is often associated with the experience of functional support, it is important not to assume that the two terms are interchangeable and indications of their differing associations with health support the need to distinguish between these two concepts (Uchino, 2004). Berkman et al (2000) proposed a 'cascading causal model' to theorise how structural and functional social support are connected. Berkman et al (2000) positioned social networks at the 'mezzo' level that flows through to a range of psychosocial mechanisms, one of which is social support, at the 'micro' level. Berkman et al (2000) proposed that the

presence of a network of social ties provides opportunities for the experience of functional social support, however not all relationships are necessarily supportive.

In fact, an individual may have significant structural support, but in fact not feel that they experience functional support. For example, Seeman and Berkman (1988) found that neither the size of one's social network nor the geographical proximity of social ties was significantly associated with the perceived adequacy of both instrumental and emotional support, indicating that structural support does not necessarily promise the outcome of functional support. Similarly, Ashida and Heaney (2008) also found that network size and density of social ties was not associated with perceived availability of social support, although having more network members with whom they were in frequent contact was.

Likewise, other individuals may have very few social ties and yet feel that they have quite satisfactory functional support. For example, a qualitative study conducted by Cloutier-Fisher, Kobayashi and Smith (2011) challenged the assumption that small social networks are harmful. They identified 28 people categorized as low on quantitative support and interviewed them about their satisfaction with their experience of social support. The participants overwhelmingly reported being happy and content with their relatively small networks as it suited their personal preferences and they felt that their social network would be able to provide support if needed.

Further, it is also important to challenge the assumption that social ties either provide social support or are neutral; social ties can also be significant sources of stress and burden, demonstrating again that their mere presence does not necessarily lead to the perception or experience of social support (Uchino, 2004). For instance, Cloutier-Fisher et al (2011) found that a number of participants felt liberated when their spouse passed away due to the controlling and abusive nature of their marriage. Croezen, Haveman-Nies, Alvarado, Van't Veer and De Groot (2009) also showed that across their Dutch sample of over 22,000 participants, those who were caregivers for a sick partner or other person appeared to experience significant stress and burden as shown by relatively poorer physical and mental health outcomes.

As has been demonstrated, the presence of a social network does not necessarily mean that those ties are supportive and may in fact be sources of burden and stress. For this reason, it is proposed that functional social support is more relevant to investigating the potentially protective effect of social support on physical health.

2.4. Definition of Perceived and Received Support

The second important conceptual difference to acknowledge within the scope of functional social support is between the perception of available or anticipated support and the actual

receipt of that support. Although the two concepts are somewhat related, they are also quite different as perceptions of available support often do not correspond to received support (Uchino, 2009). Uchino (2009) defines perceived support as a general cognitive representation of whether support would be available if it were needed. Actual or received support on the other hand refers to the concrete experience and actual receipt of support when it is called upon, often during times of stress.

2.5. Conceptual Differences between Perceived and Received Support

Dunkel-Schetter and Bennett (1990) considered the differences between the perception of available support and actual received support by examining the correlations between the two constructs in eight studies. Correlations ranged from virtually no relationship (r = 0.1) (Sandler & Barrera Jr, 1984) to a moderate association (r = .46) (L. H. Cohen, McGowan, Fooskas, & Rose, 1984), depending on the measures of support used, indicating that although they are somewhat related they certainly appear to be conceptually different. Further support for this conceptual difference was provided by a more recent meta-analysis conducted by Haber, Cohen, Lucas, and Baltes (2007). They found that across 23 studies the correlation between perceived and received support was r = .35, supporting the evidence of a conceptual separation between the two. Haber et al (2007) concluded that the formation of a perception of available support appears to be generated by multiple factors.

The literature that examines and speculates on the reasons behind the differences between perceived and received support is extensive and not always in agreement. Consequently, this is a brief overview of a number of potential reasons why perceptions of support appear to be only somewhat related to received support. One view proposed by Hobfoll (2009) is that perceived support is largely a judgment created from the accumulation of real-life experiences beginning in infancy and continuing throughout life involving social support. As people move into new phases of life, change circumstances or environment or life events occur, our general expectations of social support may be confirmed, prove incorrect, or exceeded depending on the event or circumstances that test it (Hobfoll, 2009). For example, people may over-estimate the support they would receive in the face of a major negative life event like bereavement or underestimate the support that would be received during a positive event like the birth of a baby (Dunkel-Schetter & Bennett, 1990). Hobfoll (2009) proposes that the general perception of support is adjusted and modified in response to whether our expectations were met or not. He explains the apparent difference observed between received and perceived support as comparing single micro events of received support with an entire catalogue of events; perceived support is always going to appear to be more powerful because it summarizes across all social interactions,

events and individuals whereas received support often refers to very specific incidents of support.

An entirely different viewpoint of why the perception of available support often does not match received support considers perceived support to be heavily influenced by early childhood; conceptualizing it as more of a personality trait (Sarason, Pierce, & Sarason, 1990). Uchino (2004) proposed that perception of social support is quite possibly influenced by stable expectations or schema about the reliability and trustworthiness of relationships that were formed from early childhood experiences. Sarason et al (1990) and Berkman et al (2000) similarly endorse this theory, proposing that Bowlby's (1969, 1973, 1980) well-known theory of attachment is relevant to perceived support. According to this view the experience of attachment in childhood provides a working model of how we view ourselves and others in relationships, which shapes our relationships as we move through life into adulthood and consequently impacts on cognitive representations of social support in later life. Other factors hypothesized to influence perceived support that have not been as well-researched include characteristics of the perceiver and support providers and the social and cultural context (Sarason, Pierce, et al., 1990).

These views of perceived support position it as a fairly stable construct over time, particularly the view that links perception of social support to early attachment. This is supported by Krause (1999) who found that perceived support was significantly more stable over time than social contact or received support; 67.3% of the elderly participants had the same perceived social support scores at three-year follow-up as they did at baseline compared to only 27.6% of those with the same received support score. This presents a challenge when creating measures that are both capable of detecting changes in perceived support over time and also possess test-retest reliability (Cutrona, Russell, & Rose, 1986) .

Perceived support is of particular interest as it has been shown to be more consistently protective of health compared to received support (Uchino, 2004). Perceived support may also be more relevant than received support in those approaching and transitioning to retirement, as they perhaps have not yet reached the stage of declining health when experiences of received support become more salient.

2.6. Multidimensional Models of Functional Support

The construct of functional social support continues to become more complex when it is considered that there are many types of support that we experience in our relationships with other people. Although social support is arguably multidimensional, early research often treated social support as a unidimensional construct or researchers aggregated measures of social

support so that the effects of different types of social support was concealed (Cutrona & Russell, 1990). It is important to note that many researchers have created their own conceptualization of social support and consequently there are countless models of social support in the literature; whether the model was explicit or implied through the choice of measurement (House & Kahn, 1985). Measures have ranged from simply the presence or absence of a confidant or single item measures of satisfaction with family and friends (Bosse, Aldwin, Levenson, Spiro, & Mroczek, 1993) to Krause's (1999) 41-item measure. Many have also adapted measures to suit their particular research question or have used fewer items as it is less time-consuming. Occasionally some researchers do not even describe how they conceptualized or measured social support. The issue that arises is that a lack of a multidimensional model and suitable measure of social support can mean that the specific types of support influencing health outcomes may be obscured.

However, as the social support research advanced in the 1970s and 1980s a number of theorists constructed multidimensional models of social support (Cobb, 1979; S. Cohen, Mermelstein, Kamarck, & Hoberman, 1985; House, 1981; Kahn, 1979; Weiss, 1974). Hypotheses were built on the reasoning that perhaps certain forms of social support are more significant or beneficial during particular circumstances or events; thus multidimensional models of social support became essential for effectively investigating research questions (Cutrona & Russell, 1990).

Cutrona and Russell (1990) examined a number of the popular models of social support (Cobb, 1979; S. Cohen et al., 1985; Kahn, 1979; Schaefer, Coyne, & Lazarus, 1981; Weiss, 1974) and concluded that there is considerable overlap between many of the dimensions. They state that five basic dimensions of social support can be derived from many of the multidimensional models available; emotional support, social integration or network support, esteem support, tangible aid and informational support. Cutrona and Russell (1990) suggest that many models are some variation on these five basic core dimensions, usually just varying in name. For example, the dimension of tangible aid is very similar to reliable alliance (Weiss, 1974), material support (Cobb, 1979), aid (Kahn, 1979) and tangible support (S. Cohen et al., 1985) as labelled by these other researchers.

It is important to use a model which covers all available types of social support in order to determine which types of support produce the effects on health and wellbeing. One noteworthy model that captures these five basic dimensions as well as one other unique dimension is Robert Weiss' (1974) six provisions of social support.

Weiss (1974) labelled the six provisions as attachment, social integration, opportunity for nurturance, reassurance of worth, reliable alliance and guidance. Weiss (1974) hypothesized that different types of relationships provide each of these six social provisions, all of which are

needed to maintain wellbeing and that a deficit in any provision may result in a condition of distress. He describes attachment as a sense of security and place, where a person experiences emotional closeness. Attachment is thought to most often be provided by a spouse and a lack of this provision can result in emotional loneliness. Social integration refers to a feeling of social belonging through interacting with others with common interests and who provide opportunities for social activities and companionship. This provision is most often provided by friends and a deficit can result in a sense of social loneliness. Reassurance of worth is thought to be experienced as feeling one's competence and skills are acknowledged and valued and this is most often provided by work colleagues. A lack of this provision can result in low self-regard. The fourth provision is reliable alliance and this is described as a feeling of unconditional support and that there is someone to turn to in times of stress. Reliable alliance is most often provided by family and a deficit in this provision can result in feeling vulnerable or abandoned. Guidance refers to the provision of information and advice and is usually provided by a teacher, mentor or other authoritative figure. A lack of guidance can result in feeling uncertain or anxious (Weiss, 1974).

These five provisions clearly reflect the five basic dimensions that Cutrona and Russell (1990) believe underlie the majority of multidimensional social support models; attachment is the same as emotional support, social integration reflects social integration or network support, reassurance of worth is the same as esteem support, reliable alliance is similar to tangible aid and guidance appears to be the same as informational support.

Weiss' (1974) sixth provision, named opportunity for nurturance, is relatively unique in that it describes the feeling of being needed by another through the provision of support, rather than being the recipient of support. This is often provided by children and brings a sense of meaning to life, and a lack of this provision can result in a sense of meaninglessness.

Weiss (1974) proposed that although each provision is most likely to be provided by a particular type of relationship, some provisions may be provided by other relationships. For example, although opportunity for nurturance is thought to be provided by children, it could also be provided and experienced in relationships with grandchildren or a spouse. Weiss (1974) also suggested that the importance of each provision depends on the stage in an individual's life, personality and life circumstances. The important point is that wellbeing is dependent on the knowledge that all six social provisions would be able to be gained from the relationships in one's life if and when needed (Weiss, 1974). This clearly relates to perceived support rather than received support; although certain social provisions may not be needed at a particular stage of life, in particular circumstances or because of individual social preferences, it is beneficial to our wellbeing to perceive that if they were needed, they could be gained (Uchino, 2009).

There are three main reasons for the attention shown here to Weiss' (1974) definition of social support. One is that it reflects the demonstrated understanding that relationships with others can serve multiple functions and consequently, a multidimensional model is required. Second, different kinds of stressful events or transitions such as retirement might require particular components of support to promote coping. Cutrona and Russell (1987) illustrated this point in a sample of new mothers; they found that the provision of guidance predicted lower levels of depression when the baby was newborn and the mother was not under high levels of stress. Once the baby was eight weeks old however, the provision of social integration predicted lower levels of depression. Third, the more types of social support that are included in the model, the better able researchers are to speculate on mechanisms of how social support might affect health (Cutrona & Russell, 1987). Assessing various types of social support assists in identifying the specific components of support that are most predictive of health outcomes (Cutrona et al., 1986). As Weiss' (1974) model is quite broad and captures the main dimensions of other models it is believed to be the best model for looking at what types of social support influence physical health during retirement.

3. Social Support and Physical Health

Social support has been widely researched as a psychosocial factor that significantly impacts on health. The process of interest in this study is whether social support has a causal role in protecting initially healthy individuals from poor health. This section will first provide an overview of research that consistently indicates that social relationships are beneficial to health. Then the focus on general health status as the outcome will be justified as the most appropriate outcome measure for a middle to older aged sample. It will then go on to describe the particular relevance of functional support and the perceived availability of support to health in those who are approaching retirement age. Lastly, an overview will be given of the types of perceived functional support that have been implicated in the research so far as important to health in middle to older age.

Over time, the leading causes of death have changed from infectious illnesses to chronic diseases that develop over a much longer period of time, such as heart disease and cancer (House, Landis, & Umberson, 1988). This change has prompted interest in the wide variety of biomedical, psychological and social factors that influence the development of such illnesses. Despite the diversity of ways that social support has been conceptualized and measured, the body of literature investigating social support consistently indicates that having a social network and engaging with these social relationships is beneficial to health (Berkman, 2000; Holt-Lunstad et al., 2010; Uchino, 2004).

3.1. Social Relationships and Impact on Health

Mortality has been the most common health outcome to study (Murray & Chen, 1992), clearly demonstrating the ultimate impact that social support has on health. An early review by House et al (1988) looked at the findings of 5 prospective epidemiological studies examining the extent and characteristics of social ties and mortality after a number of years. Their conclusion was that across the studies there was 'remarkable consistency' in the finding that a lack of social relationships predicts mortality, even when controlling for a range of other known risk factors to health. The prospective design of the studies reviewed lends weight to the theory that social relationships have a causal influence on health, preceding illness rather than following it.

In more recent years a number of reviews and meta-analyses have been published as the literature accumulates that further support the finding that social relationships are important to health. Berkman (2000) reviewed the findings of 15 studies that looked at mortality and social networks or support; 8 of which were prospective studies. Across the studies it was apparent to Berkman (2000) that a lack of social relationships or support increased the risk of mortality. Uchino (2004) reviewed eighty or so studies and found that about 80% of the studies found an

association between either structural or functional social support and lower mortality rates across a range of diseases. The studies showed that on average, people low in support have a 2-3x greater risk of mortality compared to those high in support (Uchino, 2004). Finally, a recent meta-analysis by Holt-Lunstad et al (2010) found that when considering 148 studies of either structural or functional support and mortality, those with adequate social relationships had a 50% increase in odds of survival compared to those with poor or insufficient relationships. These findings were not moderated by age, sex, initial health status, follow-up period or cause of death. A strength of this meta-analysis was that 60% of the samples included were community samples who were likely to have large numbers of relatively healthy individuals (Holt-Lunstad et al., 2010). The healthier the sample is at baseline, the more support there is for a causal inference that social support precedes changes in health that led to mortality.

These remarkable findings suggest that social relationships deserve the attention of researchers and those designing health interventions and policies that aim to reduce risk of illness and mortality. A lack of social relationships and support is a risk factor to health with a similar magnitude to other well-known risk factors. House et al (1988) stated that a lack of social relationships rivals risk factors like smoking, blood pressure, obesity and inadequate physical activity. Holt-Lunstad et al (2010) also demonstrated that the magnitude of the effect of social relationships on mortality was comparable to quitting smoking and in fact exceeded other known risk factors like obesity and physical activity. Although social relationships do not currently receive the same attention as these other risk factors in health intervention (Holt-Lunstad et al., 2010), the research suggests that it would be a worthwhile factor to address when attempting to promote the maintenance of health and wellbeing through the transition from work to retirement and into older age.

3.2. General Health Status

Remarkably, relatively few prospective studies have used general health status as the outcome in the social support literature. However, focusing on general health rather than mortality as the outcome has a number of advantages when examining the maintenance of wellbeing in those transitioning to retirement. First, it could be argued that NZ has already achieved increased life expectancy and the next challenge is how to stay as well as possible in the later years of life; although life expectancy has increased it does not necessarily mean these years are spent in a state of being 'healthy' (Alpass et al., 2007). Using health rather than mortality as the outcome allows an examination of the quality of health in the years before and after retirement and how it may be protected or harmed by one's social relationships. As those approaching retirement tend to be younger and healthier than the samples used in the mortality literature described above, it is more appropriate to focus on changes in health as people move into retirement as there will be

a relatively low mortality rate in this age-bracket. For instance, Lachman and Agrigoroaei (2010) investigated social support as one of three protective factors to health in a relatively younger sample. They chose to measure functional health with a comprehensive physical health measure and found that higher levels of social support were associated with maintenance of functional health after a 9-10 year follow-up, at which time the sample was aged between 32 and 84 (average age of 55).

Second, focusing on health and illness status as the outcome is perhaps more likely to detect the influence that social support has on physical health; social support may have a relatively broad influence on health rather than disease-specific (Heaney & Israel, 2008) which would not be captured if the outcome was a specific illness or mortality. Many illnesses also have quite low base rates, particularly in middle to older-age samples, so it can be difficult to detect the influence of social support if only looking at the incidence of diagnosed specific illnesses (Uchino, 2004). Although the literature examining social support and general health status is limited, one good example of a study illustrating the effect of social support on general health was conducted by Cutrona et al (1986). They measured social support and physical health in a sample of 50 older persons (average age of 70) and followed them up 6 months later. The strengths of this study were the multidimensional measure of social support and a thorough measure of physical health; a symptoms checklist, functional abilities checklist, subjective rating of health and a list of illnesses experienced in the last 6 months. Cutrona et al (1986) found social support to be a significant predictor of health status, demonstrating the importance of using a comprehensive measure of health to detect the association between social support and health change, even in a relatively small sample.

Two notable limitations within the social support and health literature should be addressed to strengthen this body of research. Some researchers use a single item measure of health with a small rating scale to measure health (for example, Fiori & Jager, 2012; Moon, Park, & Cho, 2010; Okamoto & Tanaka, 2004), making the measure vulnerable to bias such as socially desirable responding or individual illness perspectives. The common use of cross-sectional studies in this area also poses the problem that it cannot be used to strengthen the evidence of a causal role of social support; it leaves open the possibility that the reason a lack of social support appears to be detrimental to health is because those who have poor health may be more likely to perceive that less social support is available to them.

3.3. Impact of Social Support on General Health in Initially Healthy Individuals

As stated earlier, the process of interest in this study is the protective role that social support may have on the general health status of initially healthy individuals. Within the social support

literature there is a considerable amount of research that focuses on the effect that social support has on outcomes in the context of particular illnesses (see Barth, Schneider, & Von Känel, 2010; Berkman, 2000; Uchino, 2004). One issue that becomes apparent is that the process of mobilizing support in response to illness may confound the separate causal process that is of interest here when research samples include both healthy and ill participants. The two best solutions to help focus research on the process of the influence of social support in healthy people are to use a longitudinal design and a community population. The use of a large community population maximises the number of healthy participants available at study entry and the longitudinal design is able to indicate the temporal ordering of social support and changes in health.

3.4. Structural versus Functional Support and Health

Both functional and structural aspects of social support have been shown to impact on physical health (Uchino, 2004). Although there is considerably less research that examines functional support, it has been argued to be more central to how social relationships are thought to influence health. As posited by Berkman et al's (2000) model, structural support is the larger context in which functional support is provided.

Support for this theoretical standpoint is illustrated by a number of studies that have examined both structural and functional support and demonstrated the importance of functional support for health outcomes. Blazer (1982) found that impaired functional support was a significant risk factor for mortality in a representative community sample of people over the age of 65. Interestingly, functional support had a higher predictive value of mortality than the structural measure of roles and attachments or the frequency of interaction with these ties. Ryan and Willits (2007) also found that it was the quality of the relationships with a spouse, children and extended family members that was significantly related to personal wellbeing in a sample of older married parents, whereas the quantity of social ties was not related to physical or psychological health.

Studies that find structural support predicts health outcomes or mortality may in fact reflect the mediational role that functional support may play between networks and health. One recent study investigated social support as a mediator between social networks and health; consistent with Berkman et al's (2000) model, Thanakwang and Soonthorndhada (2011) found that family ties did not directly influence health-promoting behaviours, but rather social support mediated the relationship between social networks and health-promoting behaviour which in turn had a strong influence on healthy ageing. Barth et al (2010) conducted a meta-analysis of the research investigating low social support and either the development or prognosis of coronary heart

disease. Although there were only 5 studies investigating social support and the incidence of myocardial infarction (only 3 of which looked at functional support) they found that 2 of the 3 functional support studies found evidence for the significant negative impact of low functional support on the incidence of myocardial infarction (MI), whereas neither of the structural support studies showed any impact on the prevalence of MI.

Further research is required to build evidence of the causal influence functional support has on the incidence of poor health outcomes. For instance, Holt-Lunstad et al (2010) found that when they only considered the functional studies in their meta-analysis, there was not a significant association with mortality. This is possibly because of the relatively smaller number of studies examining functional support; of the 148 studies included in the meta-analysis conducted by Holt-Lunstad et al (2010) only 24 focused exclusively on functional support. Uchino (2004) also noted that of the 80 studies included in his review, the majority examined structural aspects of social support rather than functional. As discussed previously, there is also considerable diversity in what is considered to be functional support and the types of support it is composed of (Cutrona & Russell, 1990). Because of the smaller number of studies in combination with the diverse array of conceptualizations and measurement of functional support, this has likely led to a somewhat weaker set of results.

3.5. Perceived versus Received Support and Health

Research suggests that the perception of available functional social support is particularly beneficial to health. Reviews of the literature claim perceived support to be associated with a beneficial effect on health more consistently than received support (Dunkel-Schetter & Bennett, 1990; Uchino, 2009). A second important reason for looking at perceived rather than received support is that at the transition to retirement, perceived support is likely to be more relevant as people in this age bracket would be less likely to need received support but can probably imagine requiring support in the future. For example, Blazer (1982) found that perceived social support (conceptualized as the availability of belonging, effective interaction, intimacy and dependability) predicted mortality with a relative risk of 3.40 at 30-month follow-up in a sample of people aged over 65 years. Blazer (1982) speculated that perceived social support may have been particularly beneficial for those who are approaching later life as they may be anticipating the ageing process and an increased need for support.

The outcomes of studies examining the receipt of functional support and health have been found to show more variability. In Uchino's (2004) review, he notes that studies examining received support had varying associations with health outcomes, with 'about half' of the studies examining received support finding it to be associated with a higher rate of mortality. Uchino (2004) observed that the receipt of tangible support in particular appears to be associated with

higher mortality. This finding cannot be explained as those who experience illness requiring more social support as most of the studies controlled for initial health status. Reasons suggested for the more variable impact of received support are that actually receiving support might decrease self-esteem and create feelings of being a burden, particularly in a society where autonomy and independence is valued, or that the support provided may not be helpful even when it is well-meaning (Uchino, 2004). Therefore, it would appear that perceived support is more important to health and is perhaps even more so among middle to older aged people.

3.6. Types of Functional Support and Health

Considering that it has been established that social relationships influence health and that theoretical and empirical evidence has suggested that the perception of available functional support is particularly beneficial to health, a further important area of investigation has been to determine the specific types of perceived support that benefit health.

Emotional support is one of the most commonly studied aspects of support; Uchino (2004) emphasized the importance of emotional support to health stating that about 70% of the studies examining emotional support and health found it to predict lower mortality rates. For instance, Berkman, Leo-Summers and Horwitz (1992) found that people who lacked emotional support (as measured by the single item "can you count on anyone to provide you with emotional support?" prior to the onset of illness) were over 3-times more likely to die in the 6-month period after having a heart attack than those who had high emotional support. Orth-Gomer, Rosengren and Wilhelmsen (1993) found that emotional support and social integration was related to lower incidence of both fatal and nonfatal cardiac events after 6-year follow-up in a sample of middle-aged men. Similarly, Hanson, Isacsson, Janzon and Lindell (1989) found the availability of emotional support predicted all-cause mortality after an approximately 5 year follow-up. Those with the lowest availability of emotional support were 2.5 times more likely to die than those with the highest availability of emotional support.

The use of broader multidimensional models of functional support such as Weiss' (1974) model of Social Provisions has specified other types of social support that may be important to health. Lyyra and Heikkinen (2006) had the interesting finding that four non-assistance related provisions of social support were related to mortality rates in Finnish participants who were 80 years old at baseline and followed up for 10 years; reassurance of worth, opportunity for nurturance, social integration and attachment. This finding was only found with female participants, however this could be because there were relatively few men in the sample; 31% of the men were living alone compared to 70% of the women and 70% men were married, whereas 59% of the women were widowed. After controlling for confounding factors, women in the lowest tertile of the non-assistance related social provisions were at 2.14 fold greater risk of

death than women in the highest tertile (Lyyra & Heikkinen, 2006). Cutrona et al (1986) found that two of these provisions, reassurance of worth and opportunity for nurturance, also predicted physical health in a slightly younger sample (average age of 70) after a 6-month follow-up.

There are two apparent reasons why these studies found various aspects of social support to be important to health. Some of these studies utilized relatively limited models, such as conceptualising social support as only emotional and instrumental support. The use of broad multidimensional models of social support is arguably more effective to identify the types of support that are important to health. Second, it could also be argued that characteristics of the sample may have influenced the types of support that are most important to health. Different life stages may benefit more from particular types of support and the use of multidimensional models of functional support can assist in 'diagnosing' the specific types of support that are most important to health at certain ages (Cutrona & Russell, 1987).

3.7. Summary

Social relationships have been established as a factor important to health, as shown by comprehensive reviews of prospective research linking a lack of social relationships and support to increased risk of mortality. Although general health status has been a less common health outcome than mortality or specific illness in the current body of literature, it is arguably the most appropriate health outcome when investigating the impact of social support in a relatively healthier population who are approaching retirement. Theoretical and empirical evidence also suggest that functional support and the perception of the availability of this support may be more important to health than structural and received support. Although limited models of perceived functional support have suggested that emotional support is particularly important, research utilizing broader models of support indicates that other types of support such as recognition of competence and feeling needed by another may be important to health in older people.

4. Retirement and Social Support

It is important to identify the elements of social relationships that are important to physical health that may be subject to change in retirement. The transition from work to retirement is of particular interest because the social changes that occur during this transition may trigger the changes in health that only become apparent later on in life. However, there is very limited research available that looks specifically at how perceptions of available social support change in the transition from employment to retirement. Research has tended to focus more generally on social relationships in older age and from this it can be concluded that social relationships undergo significant change as people enter the later stages of life.

A number of cultural and social factors may influence changes that occur in social ties as people grow older. New Zealand has predominantly individualistic Western cultural norms where adults tend to live separately and not necessarily in close geographical proximity to their adult children. Brown (2008) proposed that in Western culture, valued and fulfilling work is quite central to an individual's identity, perhaps specifically to men's identity as they are traditionally in the workforce for longer than women. This loss of regular contact with children and work colleagues around retirement age may lead to the perception that there is less social support available after retirement. However, people may also find that they have more time available to engage with friends, family, spouses and acquaintances through social activities and perhaps perceive an increase in available support.

4.1. Changes in Social Networks in Retirement

The loss of regular contact with work colleagues is one obvious change that likely occurs with retirement. Bosse, Aldwin, Levenson, Workman-Daniels and Ekerdt (1990) found that 50.4% of their sample of men named co-workers as friends, suggesting that co-workers are an important potential source of social support that may be lost in retirement. Research also suggests that a relatively common change in social network in later life, particularly for women, is the loss of a spouse. Population data has shown that about a third of New Zealand women aged 65 to 74 are widowed, which is considerably higher than men as women have longer life expectancies and there is a trend for women to marry slightly older men (Khawaja & Thomson, 2000).

Research to date appears to indicate that overall, social networks decrease in number of ties and frequency of contact in later life. Due, Holstein, Lund, Modvig and Avlund (1999) found that when comparing samples of 25, 50, 60 and 70 year olds that frequency of contact with social ties was lower in the older age groups. Bosse et al (1993) examined change in social support for retirees and workers and found that structural support (as measured by network size and frequency of contact) decreased over a 3-year period in a sample of 40-86 year old men.

However, this study finding must be interpreted with caution as retirement was conceptualised to include those who were 'retired but working full-time' and 'retired but working part-time'. Field and Minkler (1988) followed a relatively small married sample of parents over the age of 60 for ten years and found that while family ties tended to remain stable, involvement with contacts beyond the family declined. These family-oriented social networks among older people have also been suggested to be linked to worse health outcomes; Wenger (1997) used quantitative and qualitative data to identify 'types' of social networks and found that networks characterized by family ties were more likely to experience dementia or incontinence, low morale and inadequate care. Litwin and Shiovitz-Ezra (2010) also found that family-based networks were associated with worse functional health and lower wellbeing scores than other network types in an American sample.

4.2. Changes in Functional Support in Retirement

This research leads to the question of whether the apparent decline in social network size and frequency of contact is reflected in a corresponding decline in functional support. Consistent with Berkman et al's (2000) model discussed previously it appears that the loss of some social ties in older age does not necessarily lead to a decrease in the perception of available support. For example, Seeman and Berkman (1988) looked at the structural and functional support of those over the age of 65 and found that structural support did not necessarily determine the perceived availability of support; 50% of those who reported no face-to-face contact with kids, close friends, relatives or a spouse still reported that both instrumental and emotional support were available. Due et al (1999) also found that despite differences in social networks, perceptions of social support were more consistent across the different age groups. Cornman, Lynch, Goldman, Weinstein and Lin (2004) similarly found that changes in network composition had little impact on perceptions of available support.

Research that has examined how functional support changes in later life has produced mixed results. Cornman et al (2004) found that perceived social support as measured by emotional and instrumental support increased over 10 years in a sample of 60+ year olds in Taiwan. Bosse et al (1993) on the other hand found that number of confidants and the perception that one could rely on family and friends in a crisis did not significantly change over the 3-year study period. Due et al (1999) also found that emotional support did not significantly differ across different age groups in their cross-sectional study. However, Due et al (1999) did find that perceptions of available instrumental support were lower in the older age groups and Shaw, Krause, Liang and Bennett (2007) also found that perceived availability of emotional, tangible and informational support decreased over a 10-year period in a sample of 65+ year olds.

4.3. Limitations in Research

Two main reasons have been identified that may explain the lack of consistency in these findings. First, these apparently contradictory results are perhaps due to a number of methodological limitations inherent in the relatively limited literature available. As mentioned previously, the measurement of retirement varies across studies with some researchers categorizing retirement as retired from a career but perhaps still engaged in paid employment which may confound the results (e.g. Bosse et al., 1993; Bosse et al., 1990). Measurements of social support are also often limited to instrumental and emotional support and do not capture other aspects of support that change in older age. Many studies utilized a cross-sectional design which is unable to determine whether differences between groups are true age differences or differences between the cohorts. Finally, the findings of some studies are likely to be specific to the population studied; for instance, Bosse et al (1993) only looked at how social support changed after retirement in a sample of men and their results may not generalize to women. Similarly, Cornman et al's (2004) findings that social support increased in older age may be due to the cultural context where in Taiwan the impetus for care of parents traditionally lies with their children. The majority of these studies also used samples of those in older age, the average age of participants sometimes in their 70s (e.g. Krause, 1999; Shaw et al., 2007). This age group is more likely to already be mobilizing support in response to declines in health and may be more inclined to respond to questions of perceived support with the thought of the support they actually receive. As previously demonstrated, the perception of available support is thought to have a unique impact on health and is perhaps best investigated before the stages of life when support is mobilized in response to need. The research in this area again highlights the importance of longitudinal studies and broader models of social support to capture the social changes that take place as people age. There has also been an absence of research that focuses specifically on how social support changes in the transition to retirement as it can be theorized that this is a time when changes in the perception of available support may activate changes in physical health.

4.4. Heterogeneity of Changes in Social Networks and Support in Retirement

A second reason for the inconsistency of results may be the heterogeneity of changes in social support that underlie the aggregate scores. Minkler (1985) stressed that those who retire are a large and considerably heterogenous group and there is likely to be significant variation among individuals as to how social support changes. This point is supported by Krause (1999) who examined changes in social support across three years in a sample of adults over the age of 65 and found that there was significant individual variation in changes in social support. An examination of aggregate scores appeared to show that contact with family and friends

decreased over time and the amount of emotional, tangible and informational support received increased. However, when looking at the individual level data, Krause (1999) concluded the aggregate scores were masking considerable diversity. For example, a decrease in contact with kin was true for 39.6% of the sample, but 36.5% reported an increase; hence the slight trend showing a decrease overall. At the aggregate level anticipated support appeared not to change over time, but in fact it increased 16.5% and decreased for 16.2% of the sample (Krause, 1999). Interestingly, Shaw et al (2007) and Cornman et al(Cornman et al., 2004) also noted that their analysis suggested that there was substantial variation in the way in which support changes in later life.

4.5. Summary

To summarize, the shift from paid employment to retirement is an important life transition in which to examine how social support may change and consequently impact on physical health. There is very limited research available that focuses on how social support changes during the retirement transition. However, some researchers have focused more generally on change in social support as people enter later life. This research suggests that although there appears to be a trend of a decrease in the size and frequency of contact with the social network with age, this does not necessarily mean there is a change in the functional support perceived to be available. At present, the findings of studies examining how functional support changes in later life are inconsistent and it was suggested this may be the result of a number of methodological limitations in this small body of literature, including substantial individual variation that may underlie aggregate scores. There is a need to investigate with a longitudinal design the changes in different dimensions of functional social support that occur for some people after retirement as this may have a significant impact on physical health that may not become apparent until later on in life.

4.6. Justification of Present Study and Research Questions

New Zealand has an ageing population that will require increasing healthcare and residential care funding as more people move into the older age bracket (Khawaja & Thomson, 2000). There is considerable interest in the determinants of health that are present at middle to older age in efforts to keep people as healthy and independent for as long as possible to minimize the costs associated with ill health. Retirement was identified as a life transition in which many changes occur that may impact on health outcomes.

A review of the research revealed that retirement does not categorically harm or benefit health; rather there is significant variation in health outcomes after retirement and this is likely influenced by the context and circumstances under which retirement takes place (Minkler, 1985;

Shapiro & Yarborough-Hayes, 2008; van Solinge, 2007). It was proposed that one important contextual factor in the retirement transition that may play a protective role of physical health is the experience of supportive relationships. This study will address *1. Does health change after retirement, taking into account age and health before retirement, compared to same age people who continue working?* and *2. Does health, job characteristics, expectations around retirement or sociodemographic variables moderate the relationship between retirement and health?*

The concept of social support was first clarified as numerous definitions and measurements exist in the literature. The perceived availability of functional support was identified as particularly important to health outcomes in accordance with Berkman et al's (2000) model and selected as the focus for this study. The importance of a broad multidimensional model of functional support, such as Weiss' (1974) model of Social Provisions, was also stressed in order to detect the elements of social support that are important to health.

A review of the social support literature consistently indicated that social relationships are important to health and that a lack of social support is a risk factor of similar magnitude to other well-known risk factors such as smoking (Holt-Lunstad et al., 2010; Uchino, 2004). Empirical evidence was reviewed that indicated functional support and the perceived availability of it are indeed important to health. Emotional support in particular, is thought to be important to health; however this research is limited by the use of narrow models of social support. Although mortality is the most common health outcome measure used in this body of research, it was argued that general health status is a more sensitive measure and likely to be more appropriate for detecting changes in health in those transitioning to retirement. Therefore, the relevant question to ask in this study is *3. Is health related to perceived social support?*

Very limited research is available that examines how social support changes during the retirement transition and consequently, the impact this may have on health. However, research that focuses more generally on changes in social relationships as people age suggests that a decline in social ties and frequency of contact occurs (Due et al., 1999; Field & Minkler, 1988). This trend is not evident in research that examines how the perceived availability of functional support changes as people age; findings are limited and inconsistent. One reason for this may be the considerable diversity demonstrated by a number of researchers in how the perceived availability of support changes as people grow older, highlighting that people do not age in a homogenous way (Krause, 1999). The related questions of interest are *4. Do social network types change after retirement? 5. Does perceived social support change after retirement?* and *6. Does health, job characteristics or sociodemographic variables moderate the relationship between retirement and social support?*

This inquiry then leads to the final four questions regarding social support and the impact it may have on physical health in the retirement transition; *7. Is social network type and perceived social support related to changes in health after retirement? 8. Do changes in perceived support in the retirement transition predict changes in health after retirement? 9. Does perceived social support moderate the relationship between retirement and health?* and finally, *10. Do particular types of functional support moderate the relationship between retirement and health?*

5. Method

5.1. Introduction

The data for this study was collected as part of the Health, Work and Retirement Survey (HWR) run by researchers at Massey University. The HWR survey has been administered in three waves of data collection and is nearing completion of a fourth wave; the Health Research Council funded two waves of data collection in 2006 and 2008 and the third and fourth waves in 2010 and 2012 are funded by the Foundation for Research, Science and Technology (now called the Ministry for Science and Innovation). The third wave of data collection was part of the larger New Zealand Longitudinal Study of Ageing (NZLSA) which included the HWR sample as well as additional samples and was run by Massey University in collaboration with the Family Centre Social Policy Research Unit. This study utilised the data collected in 2006 (Wave 1), 2008 (Wave 2) and 2010 (Wave 3).

5.2. Participants

Participants aged 55-70 were selected from the New Zealand electoral roll using random probability sampling procedures. In New Zealand it is mandatory for all people eligible to vote in government elections (over 18 years old) to be enrolled. From the electoral roll, 5260 people from the general population were randomly selected and a further 7780 people who identified themselves as Māori were randomly selected and invited to participate (13,040 people in total). The over-sampling of Māori was conducted to ensure adequate numbers to address research questions concerning Māori. 551 people were excluded for reasons of deceased, institutionalized or they could not be contacted, leaving 12,489 potential participants. According to Gorman et al (2012), of the general population sample, 61% (N = 3104) completed the survey and of the Māori sample, 48% (N =3553) completed the survey, yielding a total of 6657 participants in Wave 1.

Wave 1 - 2006

The sample in Wave 1 consisted of 46.3% who identified as NZ European, 46.8% identified as Māori, 0.8% as Pacific Islander, 1.2% as Asian, 2.5% as Other and 2.4% were coded as Missing. There were slightly more females (53.4%) than males (44.9%) (Missing = 1.7%), in the sample. Age groups were relatively evenly distributed across the sample; 36.4% were aged 55-59, 28.6% aged 60-64 and 25.9% aged 65-70 (Missing = 9.1%). Regarding employment status, 40.2% worked full-time (including self-employment), 19.9% worked part-time, 19.5% were retired and the remainder identified their status as homemaker, student, unemployed, not in

the workforce or unknown. According to Gorman et al. (2012), 3111 of the Wave 1 participants consented to participating in the longitudinal study.

Wave 2 – 2008

In Wave 2, 2473 of the 3111 that consented to participating in the longitudinal study completed the questionnaire. In Wave 2, 25% were aged 55-59, 34.1% aged 60-64 and 38.2% were 65 and over. Slightly fewer people were working full-time at 35.1%, 20.9% were working part-time, 20.5% were retired and the remainder were homemakers, students, unable to work due to health or disability, unemployed or unknown. According to Gorman et al (2012), those who participated in Wave 2 were more likely to be working, in better health, less likely to smoke and more likely to drink alcohol than those who dropped out of the study.

Wave 3 – 2010

Although Wave 3 included additional samples gained as part of the NZLSA, only the participants who were part of the HWR study will be described here due to the focus on those who participated in every wave of the survey, as relevant to the research questions of this study. Of the 2473 people who participated in Wave 2, 1834 completed and returned the survey in Wave 3. The sample had 46.5% males and 52.8% females and was older again with 11.5% aged 55-59, 34.9% aged 60-64 and 53% aged 65 and over (0.7% missing). Fewer people were working full-time (29.1%) and more people were working part-time (21.9%) or had retired (34.5%) by Wave 3, with the remainder selecting homemaker, student, unable to work due to health or disability, unemployed, other or missing. According to Gorman et al (2012), Māori who participated in Wave 3 were more likely to have a partner, be non-smokers and in better health than those who dropped out after Wave 2. Non-Māori who continued in the study were more likely to be educated, non-smokers, female and more frequent drinkers than those who dropped out after Wave 2.

5.3. Measures

The HWR questionnaire includes a wide range of questions on individual and household demographics, work participation, retirement factors, social participation, independence factors and health factors (Alpass et al., 2007). A number of measures from the HWR survey were used to address the research questions of this study:

General Health Status

General health status was measured using the Australian and New Zealand version of the SF-36 Version 2 (SF36v2) and the shortened version, the SF12v2 in Wave 3 (Ware, Kosinski, &

Dewey, 2000). It is a widely used, reliable and validated measure of general health status in population-based research. The advantage of using the SF12v2 in Wave 3 was that the smaller number of items reduces participant burden without a loss of explanatory power (Gorman et al., 2012). The SF36v2 and SF12v2 are measures of general health status that target 8 domains of physical and mental health and produce a Physical Component Summary Score (PCS) and Mental Component Summary Score (MCS).

In order to compare health across the 3 waves, the SF36v2 scores in Waves 1 and 2 were re-scored to their SF12v2 versions. The 4 domains captured by the PCS are General Health (a general perception of overall health), Physical Functioning (degree of health-related functional limitation), Role Physical (the degree that physical health affects daily activities) and Bodily Pain (the degree of bodily pain experienced). The other 4 domains compose the MCS; Mental Health, Role Emotional (degree that emotional health affects daily life), Social Functioning (degree health limits social functioning) and Vitality (level of perceived energy). The scores for each of these domains are standardised with a mean of 50 and a range of 0-100 and weighted so that scores can be interpreted in the same direction; lower scores indicate poorer health status.

Z-scores are calculated by subtracting the domain means for the HWR sample from each individual's domain score and then dividing by the corresponding standard deviation. To calculate the PCS and MCS scores, the z-scores are weighted by domain factor score coefficients derived from the 2008 NZ Health Survey and summed. The domain factor score coefficients are different for the MCS and PCS scores.

As this study is primarily interested in questions concerning changes in physical health, only the Physical Health Component Summary (PCS) of the SF12v2 was used in data analysis, unless stated otherwise. In their evaluation of the reliability and validity of the SF12v2, Cheak-Zamora, Wyrwich and McBride (2009) found that like the SF36v2, the PCS of the SF12v2 demonstrated high reliability and validity and was highly correlated with other measures of general health. Cronbach's alpha for the PCS of the SF12v2 in this sample was $\alpha = .71$ which indicates acceptable internal consistency. Means and Standard Deviations for Health at Time 1 and Time 3 are presented in Table 1.

Health Changes Scores

Changes in health were measured by subtracting SF12v2 PCS scores at Time 3 from SF12v2 PCS at Time 1 and are referred to as Health Change Scores.

Social Support

Social Support was measured using the Social Provisions Scale (SPS) (Cutrona & Russell, 1987). The SPS incorporates the major elements of most conceptualisations of functional social support and is a reliable and valid instrument for detecting changes in social support and the effects it may have on health (Cutrona & Russell, 1987).

The scale is composed of 24 statements which measure six social provisions; Attachment, Social Integration, Reassurance of Worth, Reliable Alliance, Guidance and Opportunity for Nurturance (a detailed description of each is provided in the earlier literature review). Each provision is measured by two negatively-worded and two positively-worded statements. Responses are recorded on a 4-point scale from 'strongly disagree' to 'strongly agree'. After reversing the negative item responses a score is summed for each individual provision (0-16) and a total score formed by summing the 6 individual scores (0-96); higher scores indicate higher perceptions of available social support. Factor analysis has supported that the SPS represents 6 distinct types of support as well as being representative of an overall level of support available to the person (Cutrona & Russell, 1987). In a pilot study, Cutrona et al (1986) demonstrated the validity of the SPS in predicting the health of older adults. Internal reliability of the SPS in this sample was excellent, $\alpha = .92$. Means and Standard Deviations for Social Support in Waves 1, 2 and 3 are also presented in Table 1.

Table 1
Means and Standard Deviations for Health and Social Support

Measure	Possible range of scores	Full sample ($N = 1834$)	Working at Time 1 ($N = 1195$)	Working at Time 1 and Retired at Time 3 ($N = 221$)
Health T1	0-100	$M = 49.75$ ($SD = 10.00$)	$M = 52.00$ ($SD = 8.38$)	$M = 50.10$ ($SD = 9.28$)
Health T2	0-100	$M = 48.64$ ($SD = 10.15$)	$M = 50.54$ ($SD = 8.86$)	$M = 48.25$ ($SD = 9.60$)
Health T3	0-100	$M = 48.72$ ($SD = 10.94$)	$M = 50.77$ ($SD = 9.70$)	$M = 48.03$ ($SD = 10.83$)
Social Support T1	0-96	$M = 80.06$ ($SD = 9.84$)	$M = 80.58$ ($SD = 10.00$)	$M = 79.42$ ($SD = 9.93$)
Social Support T2	0-96	$M = 78.28$ ($SD = 9.10$)	$M = 78.83$ ($SD = 9.07$)	$M = 78.54$ ($SD = 8.82$)
Social Support T3	0-96	$M = 79.63$ ($SD = 9.91$)	$M = 80.45$ ($SD = 9.62$)	$M = 80.49$ ($SD = 9.26$)

Social Support Change Scores

Changes in social support were measured by subtracting the SPS total score at Time 3 from the SPS total score at Time 1 and were labelled Social Support Change Scores in the analyses.

Social Network Type

Social network type was assessed by the Practitioner Assessment of Network Type (PANT) (Wenger & Tucker, 2002). This 8-item instrument categorises respondents into one of 5 network types; Local Family Dependent (characterised by close family ties, but few other ties), Locally Integrated (characterised by numerous close ties with neighbours, local friends and family), Local Self-Contained (main contact is neighbours but may have infrequent contact with a family member or other distant ties), Wider Community Focused (characterised by many friends and contact with distant relatives, but an absence of family living locally) and Private Restricted (characterised by little involvement with the community, and few friends or family).

The items assess the proximity of relatives (distances were changed from miles to kilometres to reflect the measurement system in New Zealand), the frequency of interaction with social ties and participation in community groups to obtain presence or absence scores on levels of the five network types. For each network type, scores range from 0-8 and the highest scores are used to categorise an individual. However, an individual may score highly on more than one type, leading to an inconclusive or borderline result. Both the continuous or categorical scores may be used and for the purposes of statistical analysis in this study, the continuous scores were used. Internal consistency was calculated as $\alpha = .54$ for the current sample.

PANT is particularly appropriate to this study as it was developed to be used with older adults (50+ years) and the network types have been shown to be associated with different physical health statuses (Wenger & Tucker, 2002).

Employment Status

To assess Employment Status, a dichotomous variable was created from an item in the questionnaire regarding 'Current Working Status'. An individual was categorised as Retired (coded 2) if they responded 'Retired, no paid work' or as Working (coded 1) if they responded 'Full-time paid employment, including self-employment (35+ hours a week)' or 'Part-time paid employment, including self-employment (less than 35 hours per week)'. Individuals who responded 'Full-time homemaker', 'Full-time student', 'Unable to work due to health or disability' or 'Unemployed or seeking work' were excluded. This conceptualisation of Employment Status is consistent with the conceptualisation of retirement in this study as the withdrawal from all paid employment.

Socioeconomic Status

Socioeconomic status was measured using the Economic Living Standards Index Short-Form (ELSI-SF) (Jensen, Spittal, Crichton, Sathiyandra, & Krishnan, 2002). This 25-item instrument was developed in New Zealand to measure economic standard of living as reflected in a person's consumption and personal possessions. There are 4 components that the scale assesses; 8 items assessing ownership restrictions (economic limitations on possessions), 6 items assessing social participation restrictions (limitations on social participation as a result of income), 8 items assessing economising (reducing spending on daily activities and needs) and 3 items assessing how people perceive their standard of living. Each response option is coded with a value which is summed to provide a total score that can range from 0-31. A score of less than 10 is assigned as 10 (to truncate outliers), then 10 is subtracted from respondents' total score so that those with the lowest standards of living have a score of 0. The interpretation of scores is described by Jensen, Spittal and Krishnan (2005) and range from 'severe hardship' (a score 0-8) to 'fairly comfortable' (score of 17-20) to 'very good' (29-31) at the high end of the scale. The ELSI-SF has been found to correlate highly with the full ELSI and to possess good reliability in previous research ($\alpha = .88$) (Jensen et al., 2005) and in the current sample, $\alpha = .81$. ELSI scores from Time 1 (2006) only were used for analysis.

Physical Activity

Physical Activity was assessed using a single item, "If you add up all the times you spent in each activity in the LAST 7 DAYS, how much time did you spend ALTOGETHER doing each type of activity?" The respondent indicates how many hours and minutes they engage in a) briskly walking, b) moderate physical activity and c) vigorous physical activity (a definition is given for each). The hours and minutes are summed to provide a total number of minutes an individual is engaged in physical activity in the last week. The continuous scores were dichotomized into low Physical Activity (coded 0) and high Physical Activity (coded 1) by splitting the sample at the median. Physical Activity scores at Time 1 (2006) were used for analysis.

Partner Status

To assess Partner Status a dichotomous variable was created, Partnered (coded 2) or Not Partnered (coded 1), using the item "Which of these statements is true about your legal marital status?" Responses indicating that the individual was 'Legally married', 'In a civil union', 'Defacto or partnered relationship' were coded as Partnered. Responses indicating the participant is 'Permanently separated', 'Divorced', 'Widowed' or has 'Never been legally married' were coded as Not Partnered. If the respondent had been married more than once, they

were asked to answer the item based on their most recent marriage. Partner Status at Time 1 (2006) was employed to address the relevant research questions.

Expectations of Retirement

To measure expectations of retirement, the Retirement Expectation Inventory (REI) was used (Gee & Baillie, 1999). The REI is a 14-item measure developed using a sample of pre-retirement workers and targets 4 modes of experiencing retirement that were previously identified by Hornstein and Wapner (1985) and Hanson and Wapner (K. Hanson & Wapner, 1994); Transition to Rest (retirement is a time to relax and slow down to a quieter, more restful life), New Beginning (retirement is a positive new phase of life with time and freedom to enjoy interests and pursue goals), Continuity (retirement is not a major event and does not involve significant change) and Imposed Disruption (retirement is perceived negatively as meaningless and frustrating). Transition to Rest and New Beginning are assessed by 3 items each and Continuity and Imposed Disruption are assessed by 4 items each. Participants respond on a 5-point scale that ranges from 'strongly disagree' to 'strongly agree'. Scores for Transition to Rest and New Beginning range from 3-15 and scores for Continuity and Imposed Disruption range from 4-20. The scores for the 4 expectation categories are used as separate variables as there is not a continuous construct underlying the REI. REI scores at Time 1 (2006) were used for the relevant analyses. A confirmatory factor analysis by Gee and Baillie (1999) supported the existence of 4 modes of experiencing retirement and indicated good reliability of the REI. Internal reliability in the current sample ranges from questionable to excellent for the 4 types of retirement expectations; Transition to Rest $\alpha = .66$, New Beginning $\alpha = .69$, Continuity $\alpha = .75$ and Imposed Disruption $\alpha = .82$.

Work Social Support

Social support at work was measured with a 5-item instrument developed by Unden, Orth-Gomer and Elofsson (1991) that reflects the conceptualisation of social support at work as a good working environment, high quality relationships between workers and good group cohesion. During the development of the scale, these broad dimensions of social support were chosen by the authors as they were thought to be relevant across a range of different occupations. Respondents rate the extent they agree with the 5 items on a 4-point scale ranging from 'strongly disagree' to 'strongly agree'. Scores are summed, and then divided by 5 to obtain a mean score in the range of 1-4, with higher scores indicating good social support. Unden et al (1991) and Evans and Steptoe (2001) found the measure to be associated with physical health outcomes in workers and Evans and Steptoe (2001) reported the scale was reliable with a Cronbach's alpha of $\alpha = .76$. Cronbach's alpha in the current sample was $\alpha = .88$, indicating

good internal reliability. Work Social Support at Time 1 (2006) was used for the relevant analyses.

Age

A range of background information was collected as part of the HWR survey, including Age in years, which was relevant to the research questions of this study.

5.4. Procedure

A 5-stage posting schedule as described by Dillman (2000) was employed to maximise response rate in each wave of data collection. Participants were first sent a letter of introduction informing them about the HWR study and their random selection from the New Zealand electoral roll. One week later, an information sheet, the questionnaire and a freepost envelope was sent. A reminder postcard was then sent two weeks late thanking those who had completed and returned the questionnaire and requesting non-responders to participate. Another copy of the questionnaire was sent out to non-responders at three and five weeks after this time, requesting their participation. A consent form was included for participants to sign if they were interested in participating in the longitudinal study.

Completed questionnaires were stored in a secure facility and only able to be accessed by research team members. Participant data and personal details were entered and stored in secure SPSS and Microsoft Excel files respectively, and were also only available to research team members. All sampling and survey procedures were approved by the Massey University Human Ethics Committee.

5.5. Data Analysis

A longitudinal design was utilised by limiting all analyses to those who participated in every wave of the HWR (N = 1834). To compensate for the oversampling of Māori and any response biases due to gender, age or ethnicity, a post-stratified weighting variable, based on population estimates for those aged 55-70 in the 2001 census (Estimated National Ethnic Population by Age and Sex at 30 June, 1996, 2001 and 2006, 2001), was applied to all analyses. This was done so that the results of this study more accurately reflect the general population.

All analyses were conducted using SPSS software version 20. To investigate changes in health after retirement, in comparison with those who continue working, a combination of a hierarchical multiple regression analysis (MRA) and independent and paired-sample *t* tests were used. The effects of age and initial health status at Time 1 were entered as control variables in this analysis and all following analyses addressing health outcomes. Pearson's *r* correlations and

a hierarchical MRA were employed to explore potential moderators of the relationship between retirement and health. To address whether health was related to social support, regardless of employment status, a hierarchical MRA was used. Paired sample *t* tests were then used to test whether social network type or perceptions of available social support change as the sample transitioned from paid employment to retirement. Pearson's *r* correlations and hierarchical MRA were employed to test potential moderators of the relationship between retirement and social support. A hierarchical MRA was then used to address whether social network type or social support at Time 1 was related to *changes* in health after retirement. A Pearson's *r* correlation was then calculated to investigate whether *changes* in social support were associated with *changes* in health in the retirement transition. Finally, two hierarchical MRAs were used to address firstly, whether social support moderates the relationship between retirement and health, and secondly, whether a particular type of social support is important to health. An alpha level of .05 was used for all statistical analyses.

Missing data was found to be an issue for some variables. To address this, multiple imputation was used and analyses were conducted with both the original and imputed data sets. As the findings were the same with both data sets, the results based on the original data set are reported throughout, except for two questions. For Question 4, both the results relating to the original and imputed data sets are reported and to achieve a satisfactory ratio of independent variables to cases for analysis in Question 7, results based on the imputed data set are reported.

Prior to conducting the analyses, a number of assumptions were checked and two issues were identified. First, a non-normal distribution was found to be a concern for some variables. Health, at both Time 1 and Time 3, and Mental Health at Time 1 (Question 6) were moderately negatively skewed due to this particular sample experiencing relatively good health. Social Support was also moderately negatively skewed at Time 1, Time 2 and Time 3 as the sample reported relatively good perceptions of Social Support on average. The subscales of the Social Support variable and Work Social Support (Question 6) were similarly distributed. Socioeconomic Status was moderately negatively skewed indicating generally good living standards in the sample. Physical Activity (Question 2) was severely positively skewed as the result of a spike of people who do zero minutes of activity each week. Finally, the expectation of retirement as an Imposed Disruption (Question 2) was moderately positively skewed indicating that the sample generally scored low on this dimension. Shapiro-Wilk values were significant for each of these variables.

To address this issue, square root and logarithm 10 transformations were attempted but failed to achieve normality. Physical Activity (Question 2) was changed into a dichotomous variable by splitting the sample at the median score due to the severe skew of the distribution.

A second concern was the presence of multivariate outliers in all analyses, as indicated by Mahalanobis distance. Regression analyses conducted with the outliers as a dummy-coded dependent variable revealed that cases identified as outliers were more likely to be retired, older, in poorer health, perceive less social support available, not have a partner, have lower economic living standards, engage in less physical activity, expect retirement to be an imposed disruption and be less likely to view retirement as a transition to rest. After inspecting the data and determining these outliers were not the result of data entry errors, this was addressed in some analyses by deleting the cases identified as the most extreme outliers. Although this reduced the influence of the outliers, Mahalanobis distance continued to exceed the critical value in all analyses. In the remaining analyses all cases were left in the data set due to no improvement in Mahalanobis distance, new outliers emerging and a considerably reduced number of retirees.

Other statistical assumptions relevant to these analyses were also checked and found to not be a concern.

As a result of these issues and chosen solutions the results may be attenuated due to the reduced power of the analyses and the results may not apply to those cases characterised as multivariate outliers.

6. Results

6.1. Question 1

To address the first question, "Does health change after retirement, taking into account age and health before retirement, compared to same age people who continue working?" *t* tests, and hierarchical MRA were used.

First, to explore how employment status may impact on health outcomes, an independent samples *t* test was used to compare the health status of those who retired ($N = 190$) and those who continued working ($N = 761$) at Time 3. The sample was first limited to those who were working either full or part-time at Time 1. As Levene's test was significant, equal variances could not be assumed and results corresponding to this are reported. The *t* test was statistically significant, with those who retire ($M = 48.03$, $SD = 10.83$) experiencing a 4.31 unit, CI [2.88, 5.73) lower health status than those who continue working ($M = 52.34$, $SD = 8.45$), $t(249.35) = 5.11$, *p*<.001.

Second, a paired samples *t* test was then used to address whether health changes after retirement. The sample consisted of those who were working at Time 1 then retired at Time 3 ($N = 179$). It was found that health declined from working at Time 1 ($M = 50.00$, $SD = 9.55$) to retirement at Time 3 ($M = 48.07$, $SD = 10.91$). This was a small, but statistically significant difference; on average a 1.92 unit, CI [.60, 3.25) decrease in health after retirement, $t(178) = 2.86$, *p* =.005.

Thirdly, a hierarchical multiple regression analysis (MRA) was used to test whether Employment Status predicted later health outcomes, after controlling for the effects of Age and Health at Time 1. Age, Health at Time 1 and Employment Status at Time 3 were the Independent Variables (IVs) and Health at Time 3 was the Dependent Variable (DV).

The data set was again limited to those who were working either full-time or part-time at Time 1 ($N = 900$, Missing = 295).

Significant Pearson's *r* correlations reported in Table 2 indicated that, as expected, Health at Time 1 and Time 3 was strongly positively correlated and Age was weakly negatively correlated with Health at Time 1 and Health at Time 3. Employment Status at Time 3 was found to be weakly negatively correlated with Health at Time 1 and Health at Time 3 and moderately positively correlated with Age, suggesting that retirement is associated with poorer health and older age.

Table 2

Correlations Between Health Time 1, Health Time 3, Age and Employment Status

Measure	Health T1	Health T3	Age	Employment Status T3
Health T1	1			
Health T3	.608***	1		
Age	-.146***	-.197***	1	
Employment Status T3	-.149***	-.189***	.395***	1

Note ***p<.001

On Step 1 of the hierarchical MRA, Age and Health at Time 1 accounted for a significant 36.4% of the variance in Health at Time 3, $R^2 = .364$, $F(2, 897)= 256.34$, $p< .001$. On Step 2, Employment Status at Time 3 was added to the regression equation and accounted for an additional significant 0.4% of the variance in Health at Time 3, $R^2\Delta = .004$, $F\Delta (1, 896)= 5.79$, $p = .02$. In combination, the 3 predictor variables explained 36.8% of the variance in Health at Time 3, $R^2 = .368$, adjusted $R^2 = .366$, $F(3, 899) = 173.74$, $p< .001$. This indicates that after controlling for Age and Initial Health Status, Employment Status has a small impact on general health outcomes.

Unstandardized (*B*) and standardized (β) regression coefficients, and squared semi-partial (or 'part') correlations (sr^2) for each predictor on each step of the hierarchical MRA are reported in Table 3.

Table 3

Summary of Hierarchical Regression Analysis for Variables Predicting Health at Time 3 (N = 900)

Predictors	Model 1			Model 2		
	B	β	sr^2	*B*	β	sr^2
Age	-.238***	-.108***	.011***	-.178**	-.080**	.005**
Health T1	.640***	.574***	.319***	.634***	.569***	.310***
Employment Status T3				-1.597*	-.070*	.004*
R		.603***			.606*	
R^2		.364***			.368*	
Adjusted R^2		.362***			.366*	

Note *p<.05, **p<.01, ***p<.001

As can be seen from Table 3, Health at Time 1 was the strongest predictor of Health at Time 3 (sr^2 = .310), with Age (sr^2 = .005) and Employment Status at Time 3 (sr^2 = .004) explaining a small, but significant amount of additional variance.

This very small effect of Employment Status on Health was unstable across the regression analyses attempted with transformed variables, missing data imputed and outliers removed, suggesting that this result needs to be interpreted with some caution.

6.2. Question 2

To further explore the finding that Employment Status may have an impact on health outcomes, a hierarchical MRA was used to address Question 2, "Does health, job satisfaction, expectations around retirement or sociodemographic variables moderate the relationship between retirement and health?"

The data set remained limited to those who participated in every wave of the survey and who were working either full-time or part-time at Time 1 (N = 836, Missing = 359). First, a bivariate correlation matrix was produced to explore the association of Health at Time 3 with the theorised moderating variables. As can be shown in Table 4, significant Pearson's r correlations indicated that Health at Time 3 was strongly positively correlated with Health at Time 1, weakly positively correlated with Socioeconomic Status, Physical Activity and Partner Status and weakly negatively correlated with Transition to Rest, Imposed Disruption, Employment Status at Time 3 and Age. These 8 variables were selected as IVs to be entered into the regression model. All continuous variables were centred prior to creating interaction terms to reduce multicollinearity.

Age and Health at Time 1 were entered on Step 1 of the MRA and accounted for a significant 36.5% of the variance in Health at Time 3, R^2 = .365, $F(2,833)$ = 239.62, p< .001. Employment Status at Time 3 was then added at Step 2 and accounted for a significant 0.4% of the variance in Health at Time 3, $R^2\Delta$ = .004, $F\Delta(1, 832)$ = 4.70, p = .031. At Step 3, Physical Activity, Transition to Rest, Imposed Disruption, SES and Partner Status were added and accounted for an additional significant 1.3% of variance in Health at Time 3, $R^2\Delta$ = .013, $F\Delta$ (5, 827) = 3.37, p = .005. On Step 4, the five interactions terms between Employment Status at Time 3 and the five variables; Physical Activity, Transition to Rest, Imposed Disruption, SES and Partner Status were added and did not account for any significant additional variance. In combination, the 13 predictor variables explained 38.4% of the variance in Health at Time 3, R^2 = .384, adjusted R^2 = .375, $F(13, 822)$ = 39.49, p< .001. By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large (f^2 = .62). The unique contribution of each predictor at each step of the MRA is reported in Table 5.

Table 4

Correlations Between Health at Time 3 and Theorised Moderators

Measure	Health T3	Health T1	Smoking	J.S	T.T.R	N.B	Cont	I.D	SES	Alcohol	P.A	Partner	E.S	Gender	Age
Health T3	1														
Health T1	.608***	1													
Smoking	.051	-.006	1												
J.S	.015	-.037	-.027	1											
T.T.R	-.097**	-.088**	.009	-.131**	1										
N.B	.046	.006	.062*	.050	.178***	1									
Cont	-.029	-.036	-.018	.174***	-.091**	.072*	1								
I.D	-.135***	-.087**	-.151***	-.091*	.049	-.366***	-.102**	1							
SES	.213***	.213***	.172***	.268***	-.081**	.093**	.070*	-.194***	1						
Alcohol	.035	.065*	-.122***	-.081	.050	-.040	-.028	.028	.124***	1					
P.A	.078*	.125***	.076**	-.045	-.064*	.064*	-.001	-.139***	.066*	.000	1				
Partner	.096**	.099**	.109***	-.002	-.020	.040	-.028	-.085**	.194***	.079**	.032	1			
E.S	-.189***	-.149***	.049	-.046	.031	.049	.014	-.048	.006	-.025	-.066*	.013	1		
Gender	.031	.002	.022	.020	.021	.125***	.038	-.053	-.107***	-.317***	.017	-.174***	-.001	1	
Age	-.197***	-.146***	.028	.108*	-.047	-.032	.073*	.086*	.023	-.062*	-.101***	-.037	.395***	-.051	1

Note *p<.05, **p<.01, ***p<.001. Smoking = Smoking Status, J.S = Job Satisfaction, T.T.R = Transition to Rest, N.B = New Beginning, Cont = Continuity, I.D = Imposed Disruption, SES = Socioeconomic Status, Alcohol = Alcohol Consumption, P. A = Physical Activity, Partner = Partner Status, E.S = Employment Status

Table 5

Summary of Hierarchical Regression Analysis Testing Moderators of Health at Time 3 (N = 836)

Variable	Model 1			Model 2			Model 3			Model 4		
	B	β	sr^2	B	β	sr^2	B	β	sr^2	B	β	sr^2
Health T1	.646***	.583***	.329***	.640***	.577***	.320***	.620***	.560***	.282***	.628***	.566***	.281***
Age	-.194**	-.088**	.007**	-.140*	-.063*	.003*	-.139*	-.063*	.003*	-.138*	-.063*	.003*
Employment Status T3				-1.48*	-.065*	.003*	-1.69*	-.074*	.005*	-3.70	-.163	.001
Physical Activity							-1.33	-.046	.002	-4.35	-.152	.002
Transition to Rest							-.174	-.042	.002	-.134	-.033	.000
Imposed Disruption							-.197*	-.063*	.004*	-.599*	-.192*	.003*
SES							.102*	.062*	.003*	.143	.086	.001
Partner Status							.192	.009	.000	.007	.000	.000
EmpStat x T.T.R										-.039	-.012	.000
EmpStat x I.D										.333	.136	.002
EmpStat x SES										-.032	-.024	.000
EmpStat x P.A										2.39	.139	.001
EmpStat x Partner										.125	.012	.000
R		.604***			.607***			.618***			.620***	
R^2		.365***			.369***			.381***			.384***	
Adjusted R^2		.364***			.366***			.375***			.375***	

Note *p<.05, **p<.01, ***p<.001. SES = Socioeconomic Status, Partner = Partner Status, T.T.R = Transition to Rest, I.D = Imposed Disruption, P.A = Physical Activity

41

As shown in Table 5, Health at Time 1 was the strongest predictor in the final model (sr^2 = .281) and Age (sr^2 = .003) and Imposed Disruption (sr^2 = .003) accounted for small but significant amounts of additional variance in Health at Time 3. It can also be seen that Employment Status becomes insignificant in the final model and none of the interactions accounted for any additional variance.

6.3. Question 3

To address the third question "Is health related to perceived social support?" a hierarchical MRA was employed. The sample included all those who participated in every wave of the survey, regardless of their employment status (N = 1410, Missing = 358). Social Support at Time 2 was selected as an IV rather than Social Support at Time 1 as it had less missing data, a slightly more normal distribution and proved to be more stable in the MRA.

As shown in Table 6, significant Pearson's r correlations indicated Social Support at Time 2 was weakly positively correlated with Health at Time 3. Similar to previous analyses, Health at Time 1 was strongly positively correlated with Health at Time 3 and Age was weakly negatively correlated with Health at Time 3.

Table 6
Correlations Between Health Time 1, Health Time 3, Age and Social Support

Variable	Health T3	Health T1	Age	Social Support T2
Health T3	1	.654***	-.189***	.140***
Health T1		1	-.127***	.097***
Age			1	-.066**
Social Support T2				1

Note **p<.01, ***p<.001

On Step 1 of the MRA, Health at Time 1 and Age accounted for a significant 38.4% of the variance in Health at Time 3, R^2 = .384, $F(2, 1413)$= 441.07, $p<.001$. On Step 2, Social Support at Time 2 was added to the model and accounted for a significant 0.5% of the variance in Health at Time 3, $R^2\Delta$ = .390, adjusted R^2 = .389, $F(3, 1412)$ = 300.73, $p<.001$. In combination, the 3 predictor variables accounted for 39% of the variance in Health at Time 3, R^2 = .390, adjusted R^2 = .389, $F(3, 1412)$ = 300.73, $p<.001$.

A summary of the MRA, including the B, β and sr^2 values for each predictor at each step of the analysis is provided in Table 7.

Table 7
Summary of Hierarchical Regression Analysis for Social Support Predicting Health at Time 3
(N = 1416)

Measures	Model 1			Model 2		
	B	β	sr^2	B	β	sr^2
Health T1	.720***	.594***	.346***	.713***	.588***	.338***
Age	-.257***	-.114***	.013***	-.246***	-.109***	.012***
Social Support				.087***	.075***	.005***
R		.620***			.624***	
R^2		.384***			.390***	
Adjusted R^2		.383***			.389***	

Note ***p<.001

As shown in Table 7, in the final model, Health at Time 1 ($sr^2 = .338$) was the main predictor of Health at Time 3 and Age ($sr^2 = .012$) and Social Support at Time 2 ($sr^2 = .005$) explained very small, but significant amounts of additional variance as well.

6.4. Question 4

To address Question 4 "Do social network types change after retirement?" paired sample t tests were used. The sample was limited to those who were working either full-time or part-time at Time 1 and who were retired at Time 3 ($N = 158$, Missing = 63). To first gain a visual comparison of the Social Network Types at Time 1 and Time 3, two pie charts were created using the categorical data. As shown in Figures 1 and 2, it appears there was little change in Social Network Type from Time 1 to Time 3 apart from fewer missing cases in Time 3 (Missing = 22) compared to Time 1 (Missing = 51).

Paired sample t tests were then used to determine whether it could be confirmed there was no change in Social Network Type after retirement. Of the 5 Network types, only the Wider Community Focused type was significantly different, $t(157) = -1.98$, $p = .05$, with more people categorised as this type once retired at Time 3 ($M = 3.87$, $SD = 1.61$) than when working at Time 1 ($M = 3.65$, $SD = 1.59$). As this finding only just reached significance, the same

Wenger Network Assessment Score Wave 1

Legend:
- ☐ Inconclusive
- ◪ Boarderline
- ⊞ Local family dependent
- ◪ Locally integrated
- ▥ Local self-contained
- ◪ Wider community focused
- ▦ Private restricted
- ◺ Missing

4.98%
23.08%
18.55%
3.17%
4.52%
19.00%
16.29%
10.41%
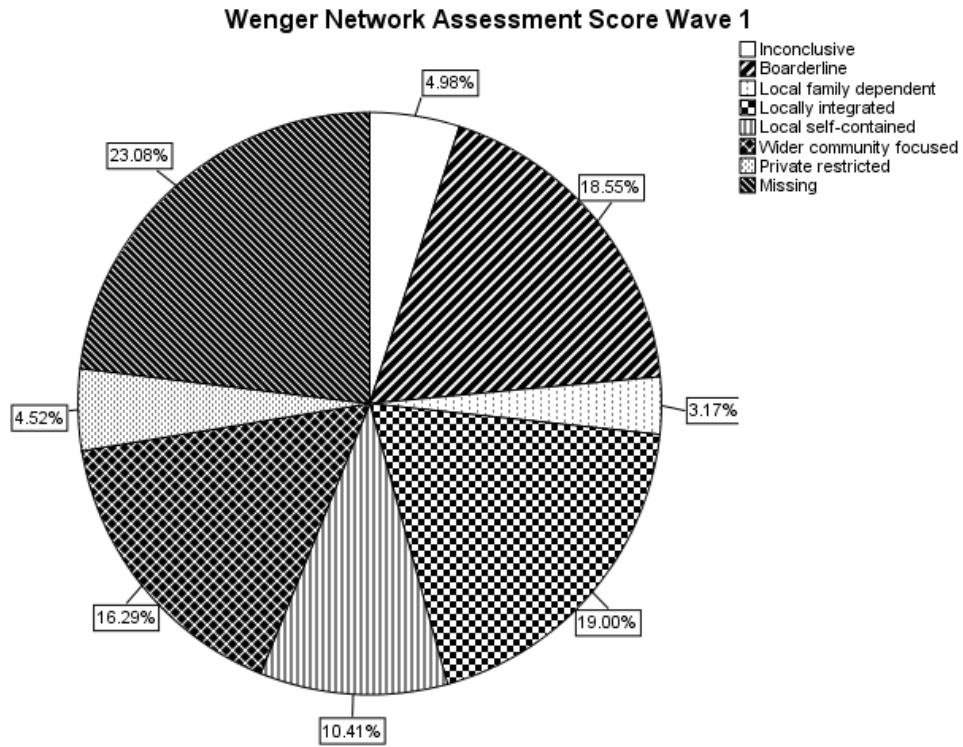
Figure 1: Social Network Type at Time 1 (N = 170)

Wenger Network Assessment Score Wave 3

Legend:
- ☐ Inconclusive
- ◪ Borderline
- ⊞ Local family dependent
- ◪ Locally integrated
- ▥ Local self-contained
- ◪ Wider community focused
- ▦ Private restricted
- ◺ Missing

9.95%
2.26%
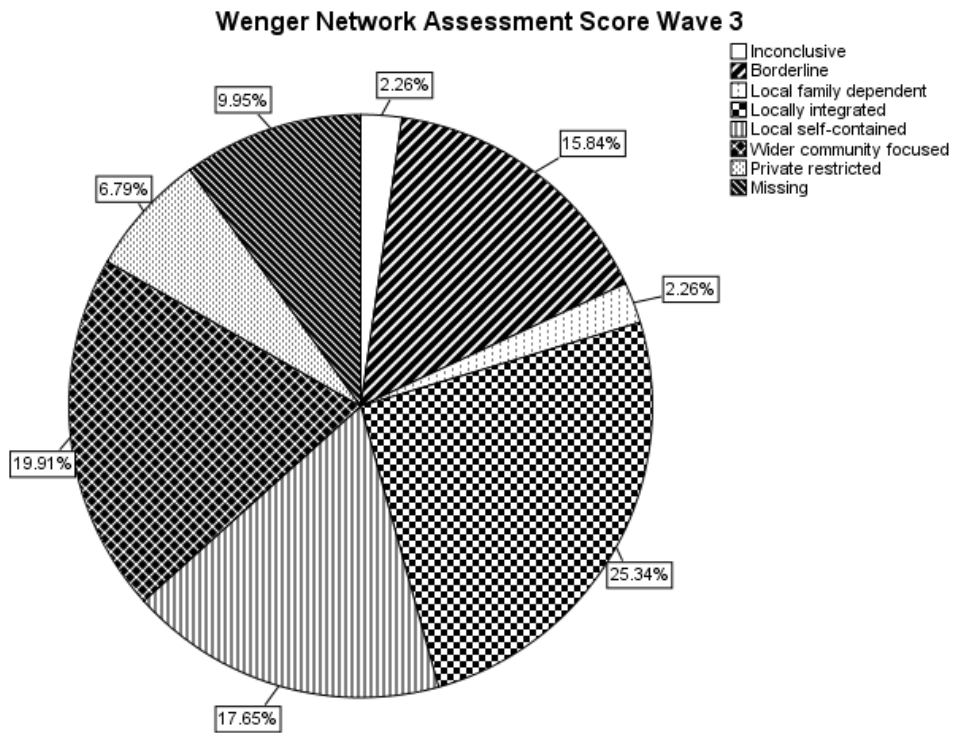15.84%
6.79%
2.26%
19.91%
25.34%
17.65%

Figure 2: Social Network Type at Time 3 (N = 199)

44

analysis was repeated with the imputed data set, which resulted in no significant differences between any of the network types from Time 1 to Time 3.

6.5. Question 5

A paired samples *t* test was also used to address the next question "Does perceived social support change after retirement?" The sample remained limited to those who were Working at Time 1 and Retired at Time 3 ($N = 184$, Missing $= 37$), then Social Support was compared between Time 1 ($M = 80.35$, $SD = 9.50$) and Time 3 ($M = 80.32$, $SD = 9.36$). This difference was not statistically significant $t(183) = .06$, $p = .95$, demonstrating that Social Support did not change after retirement in this sample.

6.6. Question 6

A hierarchical MRA was used to address Question 6 "Does health, job characteristics or sociodemographic variables moderate the relationship between retirement and social support?"

The sample was limited to those who were working either full-time or part-time at Time 1 ($N = 623$, Missing $= 560$). First, a correlation matrix was produced to explore the association of Social Support at Time 3 with a number of theorised moderating variables. As shown in Table 8, Work Social Support, Partner Status and Health at Time 1 were weakly positively correlated and Mental Health was moderately positively correlated with Social Support at Time 3. These 4 variables and Employment Status at Time 3 were chosen as predictor variables for the regression model.

On Step 1 of the MRA, Health at Time 1, Mental Health, Partner Status, Work Social Support and Employment Status accounted for a significant 15.7% of the variance in Social Support at Time 3, $R^2 = .157$, $F(5, 602) = 22.49$, $p<.001$. On Step 2, four interaction terms between Employment Status and Health at Time 1, Mental Health, Partner Status and Work Social Support were entered, accounting for an additional non-significant 0.6% of the variance in Social Support at Time 3. In combination, the 5 predictor variables and the 4 interaction terms accounted for a significant 16.3% of the variance in Social Support at Time 3, $R^2 = .163$, adjusted $R^2 = .150$, $F(9,598) = 12.94$, $p<.001$.

A summary of each variable at each step of the MRA is provided in Table 9. In the final model the only significant predictor of Social Support at Time 3 was Work Social Support ($sr^2 = .009$). Health at Time 1 was also very close to significance ($sr^2 = .005$, $p =.051$) and could be considered as having a small borderline impact on Social Support at Time 3.

Table 8

Correlations Between Social Support Time 3 and Theorised Moderators

Variable	Social Support T3	Work Social Support	Partner Status	E.S. T3	Age	Gender	Health T1	Mental Health
S.S T3	1	.253***	.170***	-.009	-.032	-.001	.088**	.305***
Work S.S		1	.026	-.076*	.041	.023	-.005	.215***
Partner Status			1	.013	-.037	-.174***	.099**	.072*
E.S. T3				1	.395***	-.001	-.149***	-.032
Age					1	-.051	-.146***	.078**
Gender						1	.002	-.044
Health T1							1	.045
Mental Health								1

Note *p<.05, **p<.01, ***p<.001. S.S T3 = Social Support Time 3 E.S. T3 = Employment Status Time 3, Work S.S1 = Work Social Support

Table 9

Summary of Hierarchical Regression Analysis Testing Moderators of Social Support at Time 3 (N = 608)

Measures	Model 1			Model 2		
	B	β	sr^2	B	β	sr^2
Health T1	.050	.041	.002	.287*	.234*	.005*
M.H	.304***	.237***	.054***	.280	.219	.003
W.S.S	4.431***	.223***	.048***	6.568**	.330**	.009**
E.S. T3	.169	.007	.000	-4.192	-.165	.001
Partner	3.383***	.155***	.023***	.684	.031	.000
E.S x Health T1				-.199	-.206	.004
E.S x M.H				.021	.019	.000
E.S x W.S.S				-1.878	-.115	.001
E.S x Partner				2.376	.219	.001
R		.397***			.404***	
R^2		.157***			.163***	
Adjusted R^2		.150***			.150***	

Note *p<.051, **p<.01, p<.001. E.S T3 = Employment Status Time 3, M.H = Mental Health, W.S.S = Work Social Support, Partner = Partner Status

6.7. Question 7

To address Question 7 "Is social network type and perceived social support related to changes in health after retirement?" a hierarchical MRA was used. The sample was first limited to those who were working either full-time or part-time at Time 1 and were retired at Time 3 ($N = 216$).

A correlation matrix was produced to explore the association of the predictor variables and Health Change Scores. As can be seen in Table 10, the pooled results show that the significant correlations with Health Change Scores was a weak, negative relationship with Health at Time 1 and Local Family Dependent Type, indicating that higher Health at Time 1 is associated with lower Health Change (or vice versa) and lower Local Family Dependent Type scores.

On Step 1 of the MRA, Age and Health at Time 1 accounted for a significant 6.6% of the variance in changes in Health, $R^2 = .066$, $F(2,213)= 7.563$, $p< .001$. On Step 2, Social Support and the five Social Network Types were added to the model and accounted for a significant additional 7% of the variance in changes in Health, $R^2\Delta = .070$, $F\Delta (6, 207)= 2.792$, $p =.049$. In

Table 10

Correlations Between Health Change Scores, Social Network Type and Social Support

Measure	Health Change	Age	Health T1	L.F.D	L.I	L.S.C	W.C.F	P.R	Social Support
Health Change	1	.012	-.255***	-.217*	-.056	-.011	.145	.118	.011
Age		1	-.111	-.113	.108	-.159*	.099	-.092	-.129
Health T1			1	.036	.007	-.058	-.001	.005	.140*
L.F.D				1	.054	.077	-.434***	-.209*	-.029
L.I					1	-.329***	-.181*	-.783***	.197*
L.S.C						1	-.433***	.027	-.230***
W.C.F							1	.212**	.220*
P.R								1	-.131
Social Support									1

Note *p<.05, **p<.01, ***p<.001. L.F.D = Local Family Dependent, L.I = Locally Integrated, L.S.C = Local Self-Contained, W.C.F = Wider Community Focused, P.R = Private Restricted

48

combination, the 8 predictor variables explained 13.6% of the variance in changes in Health, R^2 = .136, adjusted R^2 = .102, $F(8, 207)= 4.073$, $p<.001$.

A summary of the MRA and the contribution of each predictor at each step is presented in Table 11.

Table 11

Summary of Hierarchical Regression Analysis for Variables Predicting Changes in Health (N = 216)

Predictors	Model 1			Model 2		
	B	β	sr^2	*B*	β	sr^2
Age	-.041	-.016	.000	-.059	-.024	.001
Health T1	-.257***	-.257***	.065***	-.253***	-.253***	.061***
L.F.D				-.961	-.149	.015
L.I				.559	.103	.002
L.S.C				.349	.057	.002
W.C.F				.485	.086	.004
P.R				.869	.149	.006
Social Support				.032	.035	.001
R		.256***			.368***	
R^2		.066***			.136***	
Adjusted R^2		.057***			.102***	

As shown in Table 11, the only significant predictor of changes in Health in the final model is Health at Time 1 (sr^2 = .061), indicating that poorer health at Time 1 predicts greater change in Health from Time 1 to Time 3 in retirees.

6.8. Question 8

To address Question 8 "Do changes in perceived support in the retirement transition predict changes in health after retirement?" Pearson's *r* correlation was calculated.

The sample was again limited to those who were working either full or part-time at Time 1 and who were retired at Time 3 (N = 153, Missing = 68).

No significant correlation was found between change in Social Support from Time 1 to Time 3 and change in Health from Time 1 to Time 3, $r(151) = -.024$, $p = .76$.

6.9. Question 9

To address Question 9, "Does perceived social support moderate the relationship between retirement and health?" a hierarchical MRA was employed.

The data set was limited to those who were working either part-time or full-time at Time 1 ($N = 844$, Missing = 331).

Pearson's r correlation indicated that Social Support at Time 1 was weakly, but significantly positively correlated with Health at Time 3 ($r = .088$, $p = .005$). Correlations between Health at Time 3 and Health at Time 1, Employment Status Time 3 and Age are shown in Table 2.

On Step 1 of the MRA, Health at Time 1 and Age accounted for a significant 37.8% of the variance in Health at Time 3, $R^2 = .378$, $F(2, 841)= 255.64$, $p<.001$. On Step 2, Employment Status was added to the regression and accounted for a significant 0.4% of the variance in Health T3, $R^2\Delta = .004$, $F\Delta (1, 840)= 5.56$, $p = .019$. Social Support was added at Step 3 and accounted for a non-significant 0.3% of the variance in Health Time 3. Lastly, the interaction term Employment Status x Social Support was added at Step 4 and accounted for no significant additional variance in Health Time 3. In combination, the 5 predictor variables explained 38.5% of the variance in Health at Time 3, $R^2 = .385$, adjusted $R^2 = .381$, $F(5, 838)= 104.83$, $p<.001$.

A summary of the MRA and the unique contributions of each predictor at each step of the analysis is provided in Table 12, where it is apparent the only significant predictors of Health at Time 3 were Health at Time 1 ($sr^2 = .326$), Age ($sr^2 = .004$) and Employment Status ($sr^2 = .004$). Social Support had no main effect on Health at Time 3 nor did it moderate the relationship between retirement and health.

6.9.1. Question 10

Although total Social Support scores did not moderate the relationship between retirement and health, it is possible that these aggregated scores masked an effect of a specific type of support on health. Therefore, another hierarchical MRA was used to address Question 10 "Do particular types of functional support moderate the relationship between retirement and health?" ($N = 844$, Missing = 331)

Significant Pearson's r correlations reported in Table 13 indicated that Health at Time 3 was weakly positively correlated with Reliable Alliance, Attachment, Guidance, Social Integration and Reassurance of Worth.

Table 12

Summary of Hierarchical Regression Analysis Testing Moderating Effect of Social Support on Health at Time 3 (N = 844)

Variable	Model 1			Model 2			Model 3			Model 4		
	B	β	sr^2	B	β	sr^2	B	β	sr^2	B	β	sr^2
Health T1	.705***	.588***	.334***	.700***	.584***	.327***	.700***	.584***	.327***	.700***	.584***	.326***
Age	-.219***	-.099***	.010***	-.159*	-.072*	.004*	-.154*	-.070*	.004*	-.153*	-.069*	.004*
E.S T3				-1.605*	-.070*	.004*	-1.580*	-.069*	.004*	-1.586*	-.069*	.004*
Social Support							.048	.051	.003	.025	.027	.000
E.S x SS										.019	.025	.000
R		.615***			.618***			.620***			.620***	
R^2		.378***			.382***			.385***			.385***	
Adjusted R^2		.377***			.380***			.382***			.381***	

Note *p<.05, **p<.01, ***p<.001. E.S T3 = Employment Status Time 3, SS = Social Support

Table 13

Correlations Between Health at Time 3 and the Social Provisions Subscales

Measure	Health T3	Health T1	Reliable Alliance	Attachment	Guidance	Opportunity for Nurturance	Social Integration	Reassurance of Worth	Age	Employment Status
Health T3	1	.608***	.063*	.101***	.118***	.012	.068*	.082**	-.197***	-.189***
Health T1		1	.013	.035	.065*	-.017	.049	.037	-.146***	-.149***
Reliable Alliance			1	.682***	.718***	.405***	.659***	.554***	-.070*	-.065*
Attachment				1	.748***	.458***	.666***	.579***	-.058*	-.031
Guidance					1	.381***	.666***	.583***	-.064*	-.071*
Opportunity for Nurturance						1	.483***	.375***	-.049	-.048
Social Integration							1	.606***	-.033	-.025
Reassurance of Worth								1	-.014	-.041
Age									1	.395***
Employment Status										1

Note *p<.05, **p<.01, ***p<.001

52

On Step 1 of the MRA, Age and Health at Time 1 accounted for a significant 37.9% of the variance in Health at Time 3, $R^2 = .379$, $F(2, 861) = 262.53$, $p<.001$. On Step 2, Employment Status was added to the regression equation and accounted for an additional significant 0.5% of the variance in Health at Time 3, $R^2 = .005$, $F(1,860) = 6.95$, $p = .009$. On Step 3, the six types of Social Support were entered into the model and accounted for an additional significant 1% of the variance in Health at Time 3, $R^2 = .010$, $F(6, 854) = 2.40$, $p = .026$. Finally, on Step 4 the six interaction terms between Employment Status Time 3 and each of the Social Support subscales was added to the regression equation and accounted for a non-significant 0.8% of the variance in Health at Time 3. In combination, the 15 predictor variables explained 40.2% of the variance in Health at Time 3, $R^2 = .402$, adjusted $R^2 = .391$, $F(15, 848) = 37.95$, $p<.001$.

The B, β and sr^2 values for each predictor at each step of the model is provided in Table 14.

As shown in Table 14, in the final model there were 5 significant predictors of Health at Time 3. As before, Health at Time 1 ($sr^2 = .314$), Age ($sr^2 = .004$) and Employment Status ($sr^2 = .003$) were significant. In addition, a significant main effect was found for Social Integration ($sr^2 = .004$) and the interaction Employment Status x Social Integration ($sr^2 = .007$).

The subscale Social Integration was then divided into high and low scorers (split by the median) to examine these significant findings further. The means in Table 15 show that after accounting for the effects of Health at Time 1, Age and Employment Status, higher Social Integration scores at Time 1 predicted higher Health scores at Time 3, regardless of employment status.

Figure 3 presents a line graph showing Health at Time 3 scores for Retirees and Non-Retirees at high and low levels of Social Integration. This small, but significant interaction suggests that higher levels of Social Integration are particularly beneficial to Health at Time 3 for those who are Retired.

Table 14

Summary of Hierarchical Regression Analysis Testing Moderating Effect of Social Provisions Subscales on Health at Time 3 (N = 864)

Predictors	Model 1			Model 2			Model 3			Model 4		
	B	β	sr^2	B	β	sr^2	B	β	sr^2	B	β	sr^2
Health T1	.662***	.586***	.329***	.654***	.579***	.319***	.648***	.574***	.310***	.656***	.581***	.314***
Age	-.233***	-.104***	.010***	-.164*	-.073*	.004*	-.162*	-.072*	.004*	-.159*	-.071*	.004*
E.S T3				-1.783*	-.078**	.005**	-1.715*	-.075*	.005*	-1.510*	-.066*	.003*
R.A							-.188	-.038	.001	-.391	-.079	.000
Attach							.279	.069	.002	-.079	-.019	.000
Guid							.201	.048	.001	-.486	-.117	.000
O.F.N							-.119	-.029	.001	-.126	-.031	.000
S.I							-.255	-.054	.001	1.645*	.351*	.004*
R.O.W							.343*	.072*	.003*	-.206	-.043	.000
Emp x R.A										.175	.045	.000
Emp x Att										.264	.082	.000
Emp x Guid										.593	.187	.001
Emp x O.F.N										.018	.006	.000
Emp x S.I										-1.610**	-.431**	.007**
Emp x R.O.W										.472	.126	.001
R	.615***			.620***			.628***			.634***		
R^2	.379***			.384***			.394***			.402***		
Adj R^2	.377***			.382***			.388***			.391***		

Note *p<.05, **p<.01, ***p<.001. E.S T3 = Employment Status Time 3, R.A = Reliable Alliance, Attach = Attachment, Guid = Guidance, O.F.N = Opportunity for Nurturance, S.I = Social Integration, R.O.W = Reassurance of Worth

54

Table 15

Means and Standard Deviations for Health at Time 3 for Retirees and Workers at High and Low Social Integration

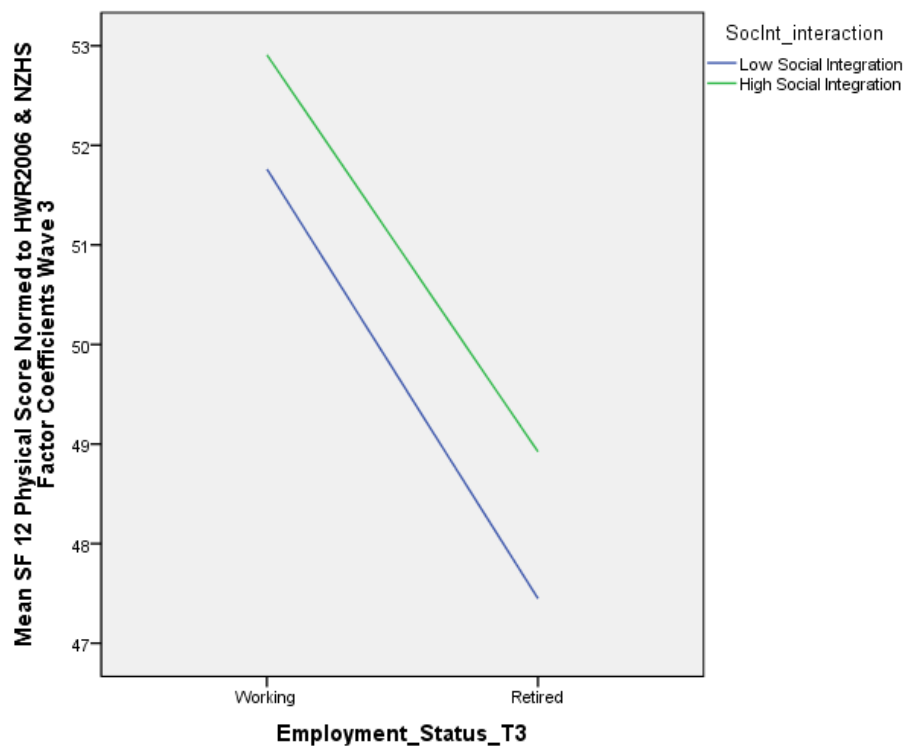| Health Time 3	Social Integration		
	Low *M (SD)*	High *M (SD)*	Total *M (SD)*
Retired	47.45 (11.39)	48.92 (10.06)	48.03 (10.83)
Working	51.76 (8.55)	52.91 (8.38)	52.34 (8.44)
Total	50.02 (9.99)	51.59 (9.36)	
N	482	460	942

Figure 3. Mean Low and High Social Integration Scores for Retirees and Workers

55

7. Discussion

7.1. Introduction

The main question this study addressed was whether social support is important to health during the transition to retirement. It was more specifically hypothesised that social support would play a protective role on health in initially healthy individuals, with those who perceive greater availability of social support experiencing better health outcomes.

7.1.1. Retirement and Changes in Physical Health

The results show that on average, retirees have slightly poorer health than workers. This relationship cannot be accounted for by age or health status prior to retirement. Retirees experienced a small, but significant, decrease in health status after their exit from the workforce and had poorer health status at Time 3 compared to those who continued working. This initial finding needs to be interpreted with some caution as it was unstable across analyses and employment status only accounted for 0.4% of the variance in later health outcomes.

However, the poorer health of retirees compared to workers reflects the negative effect of retirement on health found by other researchers such as Bamia et al (2008), Behncke (2012), Dave et al (2008) and Tuomi et al (1991) who also found stronger effects. This may be due to the reduced power of the statistical analysis, as discussed in the method section. In addition, it may be that changes in health after retirement are gradual, rather than more immediately obvious, resulting in a small impact on health outcomes that may become more pronounced with longer follow-up periods. Some of these researchers (for example, Bamia et al., 2008) used mortality as the outcome measure after long follow-up intervals, demonstrating the ultimate impact that retirement may have on health. Dave et al (2008) found that when only using those participants who were healthy at baseline, any negative health effects that occurred shortly after retirement were no longer significant, whereas after a longer follow-up period became significant. Dave et al (2008) concluded that large immediate effects on health after retirement are more likely to indicate that those with subclinical levels of illness self-selected into retirement and that negative health effects that accumulate over time are more likely to be attributed to the effects of retirement. Therefore, the relatively weak effect of employment status on health in this study may be as a result of an insufficient period of time to observe changes in health that occur in initially healthy people, which tend to accumulate over time.

It is noteworthy to observe the relationship between retirement and poorer health found by previous research in the New Zealand context where retirement is not compulsory, although the superannuation pension becomes available from the age of 65 onwards. As evidenced by the

small number of retirees in this sample, many people continue working to some degree past this age. An additional possible explanation for the relatively weak association between retirement and health is that this relationship is specific to the nature of retirement in New Zealand. Therefore, it is worth exploring what it is about the context of retirement in New Zealand that could explain the slightly poorer health that retirees experience compared to workers.

Interestingly, age was found to have relatively little impact on later health outcomes, accounting for only 0.5% of the variance in Health at Time 3. This finding provides some evidence for views such as Rowe and Kahn's (1987) that declines in health are the result of more than just the natural ageing process and justifies the research questions that followed addressing other life factors that may impact on health in mid-to-late life.

7.1.2. Contextual Factors in the Retirement Transition and Health Outcomes

It was stated after reviewing the literature that it cannot be said that retirement is categorically beneficial or harmful to health; it has been observed that there is considerable variation in the transition to retirement and a number of factors may contribute to how people experience retirement. Therefore Question 2 further explored the relationship found between employment status and health by investigating moderators of this relationship.

After controlling for the effects of age and initial health status, the theorised predictors of health outcomes; physical activity, the expectation of retirement as a transition to rest, socioeconomic status and one's partner status were found not to moderate the relationship between retirement and health, nor did they have a direct impact on health. However, the expectation of retirement as an Imposed Disruption at Time 1 was found to have a small, but significant impact on Health at Time 3. This indicates that expecting retirement to be an unwanted and meaningless disruption predicts poorer health later on. However, it makes theoretical sense that the expectation of retirement as an Imposed Disruption would negatively affect health in retirees and so it was unexpected that this was also true for workers. As the interaction between employment status and Imposed Disruption was not significant, it demonstrates that the expectation of retirement as an Imposed Disruption has a slightly negative impact on later health status regardless of whether one is working or retired. This curious finding is perhaps spurious, particularly considering the very small effect size in the final model. It is also possible the analysis lacked enough power to detect the moderating effect of the expectation of retirement as an Imposed Disruption. However, after checking the mean health scores of retirees and workers crossed with high and low Imposed Disruption this does not appear to be the case.

7.1.3. Social Support and Health Outcomes

It was hypothesised that changes in health after retirement could be partially explained by changes in social support, which was shown to be a factor found to impact on health in previous research. This hypothesis was first explored with the entire sample regardless of their employment status. Results indicated that after controlling for the effects of age and initial health status, the perception of available social support had a very small, but significant impact on later health outcomes. The use of a longitudinal design and a large community population assisted in focusing on the hypothesised protective role that social support may play in health outcomes for initially healthy individuals, but the results indicate this role is very minor. Although this finding is in the same direction as previous research which has found that the perception of available social support is important to health outcomes, it was smaller than expected, with the studies reviewed earlier indicating social support has a more substantial impact on health with comparable follow-up periods. It is possible the analysis did not have adequate power due to the skewed distribution of both the health and social support variables, resulting in the inability to detect a stronger association between social support and health.

7.1.4. Changes in Social Network Type and Social Support in the Retirement Transition

Next it was asked whether social network type changed after people left the workforce and entered retirement and it was found social network type did not change. This was unexpected as previous research has indicated that the size of one's social network and frequency of contact with social ties decrease as people age (Bosse et al., 1993; Due et al., 1999; Field & Minkler, 1988) and it was theorised that some change must occur in social networks when people exit the workforce. The poor internal reliability of the PANT measure of Social Network Type in this sample perhaps resulted in attenuated findings that did not detect changes that occurred in Social Network Type.

The results from Question 5 demonstrated that perceived social support also did not change after the transition to retirement. This finding is consistent with previous research which indicates perceptions of social support can be relatively consistent in later life, even when changes in social networks occur (for example, Cornman et al., 2004; Seeman & Berkman, 1988) (although social network type did not change in this sample of retirees). It is important to acknowledge when interpreting this finding that although the sample was limited to those who were working in 2006 and retired in 2010, an indication of exactly when people retired was not included in the analysis. Therefore, it is quite possible that within this sample there may be a number of people who had been retired for a very short period of time when data was collected in 2010. Should this sample include a number of very recent retirees, it is perhaps unsurprising that social network types or perceptions of available social support did not change.

Alternatively, it is possible these two findings indicate that relationships formed in the workplace are not central to people's social networks or are important sources of available social support in this sample of retirees.

7.1.5. Moderators of Perceptions of Social Support

Although the results of Question 5 indicated that perceived social support did not change after retirement, it is possible this finding masked the diversity of changes in social support that do occur, so it was then asked "Does health, job characteristics or sociodemographic variables moderate the relationship between retirement and social support?" The question held the assumption that there was perhaps a relationship between retirement and social support that was not detected in the previous t test. However, the results of the hierarchical regression analysis confirmed that employment status had no direct effect on social support and predictably, none of the theorised factors (Health at Time 1, Mental Health, Work Social Support and Partner Status) were moderators either.

Regardless of employment status, social support at work at Time 1 did have a slight impact on perceptions of available social support, accounting for a significant 0.9% of the variance in perceptions of social support at Time 3. Specifically, higher levels of social support at work were associated with the perception of greater available social support later on, whether they had retired by this time or continued working. This was somewhat surprising as it was thought that for retirees it could be predicted that higher work social support when working at Time 1 would lead to lower perceived social support when this source of social support was lost after exiting the workplace. However, this finding does support the conceptual difference between structural and functional support proposed by Berkman et al's (2000) cascading causal model, illustrating that an assumed structural change does not necessarily result in a change in perceptions of available support. The findings of the t tests that social network type and perceived social support did not change after retirement and the additional findings of the hierarchical regression analysis investigating the relationship between retirement and social support, indicate that retirement has no impact on perceptions of available social support in this sample.

Physical health at Time 1 also showed marginal significance as a direct effect on perceptions of social support (accounting for 0.5% of the variance), with greater health associated with the perception of better social support for both retirees and workers. This relationship is theoretically logical as it is likely that better physical health facilitates the ability to engage and interact socially which leads to the perception of more social support.

7.1.6. Social Network Type, Social Support and Changes in Health

The focus then shifted the four main questions in this study; first, whether social network type and social support at Time 1 was related to *changes* in health after retirement, and secondly whether *changes* in perceived social support in the transition to retirement were related to *changes* in health from Time 1 to Time 3. It was found that neither social network type nor perceived availability of social support when retirees were still working at Time 1 was associated with changes in health from Time 1 to Time 3, when they were retired. In the final model, the only predictor of changes in health was baseline health status; the healthier retirees were at baseline, the less that change in health occurred.

7.1.7. Association Between Changes in Social Support and Changes in Health

Although the results of the previous *t* test indicated that perceived social support did not change after participants retired, it is still plausible that changes in perceived social support that occur in the retirement transition may be associated with changes in health in the retirement transition. However, the results of Question 8 indicated that there was no association between *changes* in perceived support and *changes* in health among those who were working at Time 1 and were retired by Time 3.

7.1.8. Moderating Effect of Social Support in the Relationship Between Retirement and Health

Question 9 addressed whether social support moderates the relationship between retirement and health. It was found that perceived social support had no direct effect on health, nor did it moderate the relationship between retirement and health. This finding is somewhat inconsistent with the results of Question 3 which indicated that social support had a small impact on later health outcomes, when employment status was not included in the analysis. Although the relationship between social support and health found here was very small, it was expected that a direct effect of social support on later health outcomes would be detected in those who were working at Time 1 and either working or retired at Time 3 (N = 1195) to reflect the significant relationship between social support and health found in the full sample (N = 1834). This suggests that the impact of social support on later health outcomes is possibly unstable or that social support does not have any impact on health in this slightly more limited sample.

Although it was found in Question 1 that the health of retirees declined as they moved from paid employment to retirement and that they experienced a poorer health status than those who continued working, the results of Questions 7, 8 and 9 show that this relationship cannot be explained by one's social network type or perceptions of available social support prior to

retirement, nor by any changes that occurred in perceptions of social support as people transitioned into retirement. Further to this, the tentative findings of Question 3 indicate that social support is of only very slight importance to health outcomes in middle-to-older age adults regardless of their employment status. Based on the results to this point, it could be concluded that social support is not a determinant of health, or is a very minor one, in middle-to-older age adults in New Zealand.

However, it is important to interpret these results while considering the characteristics of the study sample. To compare how health, social support and social network types changed over time, only those who participated in all three waves of data collection were used. However, as previously mentioned, those who participated in the study were more likely to be working, in better health, less likely to smoke, more likely to have a partner and be better educated than those who dropped out of the study, which resulted in a relatively small number of retirees (221 retirees out of a sample of 1195). The comparatively good health and functioning of this sample was also evident in the non-normal distribution of a number of variables, indicating that overall, the sample had good health, high perceptions of social support, higher socioeconomic status and they tended not to have negative expectations of retirement. Therefore, there were relatively few people in the sample who had the characteristics that the research questions were addressing. Unfortunately, the people who this study was interested in tended to appear as multivariate outliers due to their small numbers and uncommon scores; they were found to be more likely to be retired, older, in poorer health, perceive less social support, be less likely to have a partner, poorer, less physically active and have more negative expectations of retirement. In a number of analyses, the cases identified as the most extreme multivariate outliers were deleted to reduce their influence; however this resulted in deleting those for whom the research questions were the most relevant. Consequently, it is perhaps unsurprising that social support in the retirement transition was generally not found to have an impact on health outcomes, or that any significant effects found were weaker than expected, in this relatively healthy and well-functioning sample. Considering this limitation, it was interesting to detect that a particular type of social support may be important to health, and particularly so for retirees, in Question 10.

7.1.9. Social Integration and Health Outcomes in Retirement

A hierarchical multiple regression analysis was repeated, but examined the different types of social support using the six subscales of the Social Provisions Scale, rather than using the total score. The subscale Social Integration was found to have a small direct benefit to health for both workers and retirees (accounting for 0.4% of the variance in Health at Time 3), but particularly for retirees as shown by the significant interaction with employment status (accounting for 0.7% of the variance in Health at Time 3). Weiss (1974) proposed that the importance of each social

provision depends upon the life circumstances an individual is experiencing and this finding indicates that Social Integration is potentially a type of social support that is of benefit to health outcomes in the transition to retirement. Social Integration is defined by Weiss (1974) and Cutrona and Russell (1987) as a type of support usually acquired from friends that provides a feeling of belonging to a group that shares similar interests and concerns; it provides opportunities for social events, engagement and activities. Without Social Integration, people can experience social loneliness and life feels dull. The finding that Social Integration appears to be important to the health reflects findings of previous research; Lyyra and Heikkinen (2006) found that greater perceived availability of Social Integration, as measured by the Social Provisions Scale, predicted reduced risk of mortality among 80 year-old women in Finland. Lyyra and Heikkinen (2006) propose that Social Integration may benefit health as the sense of belonging to a group with shared interests may give people a meaningful role and improve self-esteem. Orth-Gomer et al (1993) also explored the role of Social Integration and health in a longitudinal study and found that the proportion of men with low Social Integration scores was almost twice as large among those who experienced a CHD event than those who had not. Their results also suggested that Social Integration was more instrumental in the reduced risk of a CHD event than Attachment, leading Orth-Gomer et al (1993) to speculate that Social Integration supports one's sense of self-worth and provides stability in life, ultimately benefitting health.

Other studies have utilised what appears to be a very similar construct but is often labelled 'social engagement' or 'social participation', to explore the impact on health in older adults. Although the labels and measures of 'social integration', 'social participation', 'social engagement' or 'social activities' vary somewhat, they share the concept of social interaction in voluntary social activities. For example, Berkman et al (2000) define 'social engagement' separately from 'social support' but conceptualised it as participation in social activities that influences health by defining and reinforcing meaningful social roles and providing a sense of attachment to one's community.

Social Integration and these similar constructs have been found to be associated with better health and wellbeing in older adults; for example, Golden, Conroy & Lawlor (2009) found Social Engagement (measured as attendance at religious and other meetings and contact with friends and neighbours) to be associated with a reduced prevalence of depression, Generalised Anxiety Disorder (GAD), cognitive impairment, physical impairment and higher scores on three quality of life measures. A cluster analysis conducted by Croezen et al (2009) found that the best health in their sample was experienced by the 'productive cluster' who were characterised as engaged in regular visiting, hobbies and voluntary work. Further evidence suggesting the importance of Social Integration under the broader umbrella of social relationships was

demonstrated by Cherry et al (2013) who found that after controlling for age, sex and education, both social support and social activities (measured as the number of club or organisation memberships and number of hours spent in activities outside the home) significantly predicted both objective and subjective health in a wide range of age groups. Interestingly, social activities proved to be more important to health than social support. Everard, Lach, Fisher and Baum (2000) also found in their cross-sectional study that maintenance of social activities (travelling, entertaining, attending parties or church) was associated with greater health, as measured by the SF-12, whereas social support was not related to health in the sample of older adults (mean age of 73 years old).

The findings of Golden et al (2009) and those of this study suggest that in older age, perhaps friends are more important to health than family as they are sources of the type of social support that has a beneficial effect on health. It has been theorised these relationships and the support they provide may be particularly beneficial in older age as friendships are entered into voluntarily and engagement with them is often enjoyable and rewarding (Maier & Klumb, 2005). Friends and companions may also benefit health through a shared interest and participation in health-promoting behaviours such as physical or cognitive exercise. Time spent with family or spouses can involve feelings of obligation or burden, caregiving, loss of autonomy or conflict which may explain why Social Integration and related constructs appear to be more instrumental than other types of social support in protecting health. Interestingly, the correlations in Table 10 show that in this sample, the network type most strongly associated with perceived social support was the Wider Community Focused type, which is characterised by the presence of many friends, some contact with distant relatives and an absence of family living locally. Maier and Klumb (2005) also demonstrated the importance of friends in their study; after controlling for a range of confounding variables they found that engaging in social activities with friends (rather than with family, their spouse or alone) was the only social context associated with survival. Specifically, the risk of mortality was reduced by 28% (Maier & Klumb, 2005).

Other researchers have proposed that the impact Social Integration appears to have on health may be reciprocal whereby Social Integration helps to protect health and in turn, continued good health enables an individual to continue participating socially (Mendes de Leon, 2005). This complex relationship was suggested by the findings of Bennett (2005) who found that while social engagement (measured as a range of activities such as voting, attending church, taking holidays and so on) at Time 1 predicted subjective health at Time 2, objective health at Time 2 also predicted social engagement at Time 3. Bennett (2005) similarly concluded that the relationship is likely to be reciprocal as good health is often required to engage socially.

The research reviewed here concerning social integration, participation, engagement or activities has used a variety of conceptualisations and measures of a similar concept. Measures include the more objective aspects of participating socially, such as actual engagement in various activities over a period of time, frequency of contact with friends or number of club or organisational memberships. These objective aspects of social participation provide the opportunity for people to perceive the availability of a sense of belonging to a group with whom they can share their interests and concerns, which is reflected in measures such as the Social Provisions Scale and it was the subjective perception of social support that was hypothesised to be important to health. Although the results of the hierarchical multiple regression analysis showing that Social Integration is beneficial to health outcomes for both workers and retirees, but particularly so for retirees, was only a slight effect it is noteworthy for the reason that it reflects the findings of other studies and was found despite a number of limitations in the analysis.

7.2. Directions for Future Research

Due to the limitations of this study and the small effect sizes found, no practical implications can be reasonably proposed. However, the finding that Social Integration may be important to health and particularly in the transition to retirement is suggested as a useful direction for future research. As demonstrated in previous research and the present study, interacting with others with common interests and having the opportunity for social activities and companionship have been indicated to be a key element of social support that may influence health outcomes in older age. Future research may focus on whether the perceived availability of Social Integration is as important to health in middle-to-older age as these studies using more structural measures of Social Integration have found. As pointed out in the literature review, although objective or structural measures of social relationships are often related to the subjective support provided by that relationship, the presence of a social structure does not necessarily translate to the experience of social support (Berkman et al., 2000). As suggested by the results of this study, further analysis could explore whether perceived Social Integration has a protective role on health particularly in the retirement transition. To investigate the impact that perceived availability of Social Integration may have on health outcomes, a measurement instrument that concentrates more specifically on Social Integration and perhaps combines both the objective aspects and subjective perception of its availability would be useful to more carefully explore this potential relationship. A sample that are working in middle age, possess good health at baseline and have been retired for a number of years in later waves of data collection would be ideal to obtain adequate numbers of retirees and capture the diversity of health outcomes in retirement. This would also focus any future research on the protective effect that Social Integration may have on health in initially healthy individuals, considering that reverse

causation where health status determines the ability to interact socially is also a highly likely relationship.

7.3. Strengths of the Study

Although there were a number of limitations in this study, it also had a range of strengths. A large community sample was used that maximised the number of initially healthy participants in the first wave of data collection. The longitudinal design helped to determine the temporal ordering of the relationships; whether retirement and social support had an impact on later health rather than the reverse causal explanation that health status influences the decision to retire and perceptions of social support. Participants who indicated they retired due to health or disability were also excluded from the analysis. This allowed the study to concentrate on the hypothesised protective role that social support was thought to play as the participants moved into retirement. Age and initial health status were controlled in all relevant analyses to investigate whether social support had an influence on health, over and above the changes in health that occur as part of the natural ageing process or on-going poor health. Finally, both those who continued working and those who retired were included in the relevant analyses as a further control to determine whether changes in health occurred regardless of employment status (likely indicating the health changes associated with ageing) or particularly for workers or retirees.

The use of a broad measure of perceived social support allowed this study to investigate the types of support that are important to health as people transition into retirement and the measure of general health status was consistent with the purpose of this study to contribute to knowledge of the predictors of good health in older age and was appropriate for detecting changes in health in a middle-to-older age sample.

7.4. Conclusion

In summary, this study provided evidence that there is some change in health in retirement, but failed to find the explanatory variables. Three potential directions could be taken based on this outcome.

Future research may wish to re-examine the role of social support on health outcomes in the retirement transition after a longer delay; it is possible the impact social support has on health may only become apparent after longer follow-up periods, particularly considering that large numbers of people in this sample were still working and enjoying good health and satisfactory social support.

Alternatively, other aspects of social relationships may be explored to determine the 'active ingredient' of social ties that produces the beneficial impact on health found in other studies. Berkman et al (2000) propose that social networks may impact on health through a number of pathways; alternatives to consider besides social support include social influence (providing social norms for health behaviours) and access to health related resources and services.

This study did find that Social Integration is important to health, particularly for retirees. The final recommended direction for future research would be to confirm that Social Integration is important to health in middle-to-older age adults, and especially so for retirees. Although it was a small finding it is worth pursuing in future research as Social Integration is likely to be particularly suited to intervention compared to other types of social support. The voluntary nature of friendships, groups and social activities where a sense of belonging, enjoyment and companionship can be experienced, provides people with a greater degree of control in actively pursuing and gaining this type of social support. Other types of support are often acquired through obligatory relationships (such as Weiss'(1974) Attachment or Reliable Alliance) and if it is perceived that support is not available, it can be difficult to exit these relationships and attempt to gain them from other sources. Should the importance of Social Integration be confirmed in future studies, it would be a worthwhile focus for the development of interventions designed to facilitate the maintenance of good health through the transition to retirement, and in turn enable continued participation in meaningful social roles.

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