The Indirect Effects of Work-Related Antecedents to Retirement on Retirement Adjustment Quality via Change in Social Resources: A Resource-Based Dynamic Perspective

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Abstract

The present investigation sought to address the paucity of longitudinal retirement adjustment research in relation to the social resources of retirees, and how change in these resources may affect the degree of retirement adjustment quality they experience. This study was a secondary analysis with an observational, repeated measures design conducted on the 2006 and 2014 data waves of the Health, Work, and Retirement (HWR) study (Alpass et al., 2007). From a resource-based dynamic perspective, retirement adjustment can be viewed as a longitudinal process which fluctuates as a function of given resources and changes in such resources (Wang, Henkens, & van Solinge, 2011). Guided by this theoretical framework, the primary focus of this investigation was to examine if change in perceived social support would mediate the relationships between job-related conditions (i.e., job satisfaction and job stress) and post-retirement psychological wellbeing across the period of 2006 – 2014. The sample (n = 435) was drawn from the HWR study's 2006 nationally representative sub-sample of the general New Zealand older adult population. Participants were male and female New Zealanders, aged between 55 – 70 years in 2006, and were of New Zealand European, Māori, Asian, or other ethnicity. Participants were in paid employment at the time of the 2006 data wave, and had entered retirement at the time of the 2014 data wave. Cross-sectional analyses of the 2006 wave were also undertaken to determine whether the theorised relationships between the principal constructs were supported at the cusp of the retirement transition before participants retired. These analyses indicated the relationship between job satisfaction and psychological wellbeing appeared to operate indirectly via perceived social support, as did the relationship between job stress and psychological wellbeing. However, longitudinal mediation analyses did not support the resource-based dynamic model of retirement adjustment. Recommendations for measuring adjustment outcomes and resources at multiple assessment points, measure selection and construct domain sampling, improving capacity for causal inference, and using alternative data analytic strategies are made for future research adopting a resource-based dynamic perspective.

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List of Abbreviations, Acronyms, Initialisms, and Symbols

2SLS	Two-stage least squares regression
a	Path from predictor variable to mediating variable
ab	Unstandardised regression coefficient of the indirect effect
ANZSCO	Australian and New Zealand Standard Classification of Occupations
APA	American Psychological Association
b	Path from mediating variable to dependent variable
b	Unstandardised regression coefficient
BCa CI	Bias-corrected bootstrap confidence interval
c	Total effect path
c'	Direct effect path
CES-D	Centre for Epidemiological Studies Depression Scale
CLT	Central Limit Theorem
DV	Dependent variable
DW	Durbin-Watson statistic
ELSI-SF	Economic Standard of Living Index – Short Form
F	F-test statistic
$\boldsymbol{H_A}$	Research hypothesis
HART	Health and Aging Research Team
HWR	Health, Work, and Retirement

IV	Independent variable
κ^2	Kappa squared
LGM	Latent growth curve modelling
M	Sample median
MCAR	Missing completely at random
MCS	Mental Component Summary score
MSEM	Multi-level structural equation modelling
MV	Mediating variable
n	Sample size
OECD	Organisation for Economic Cooperation and Development
PCS	Physical Component Summary score
P_M	Ratio of the indirect effect to the total effect
R^2	Coefficient of determination squared
R^2_{adj}	R^2 adjusted
SD	Standard deviation
SE	Standard error
SEM	Structural equation modelling
SES	Socioeconomic status
SF-12v2	Medical Outcomes Study Short-Form Health Survey version two
SPS	Social Provisions Scale

SPSS	Statistical Package for the Social Sciences
T1	Time 1 (2006)
T2	Time 2 (2014)
VIF	Variance inflation factor
$\bar{y}$	Sample mean

Chapter One: Introduction

In recent decades, increasing importance has been placed on understanding retirement as a psychological phenomenon. Swiftly ageing populations throughout the world characterised by increased life expectancies, decreased birth rates, and the burgeoning numbers of baby boomer cohort retirees have led to pervasive demographic shifts, and now position retirement as a phenomenon of global significance (Wang, 2013a; Wang & Shultz, 2009; Wheaton & Crimmins, 2013). These present macro-level contextual pressures surrounding the retirement transition process are patently different from those of previous generations (Wang, 2013a), and are associated with widespread changes to labour force participation patterns (e.g., bridge employment, un- and re-retirement options, no mandatory retirement age to necessarily dovetail with the age of pension eligibility) for those both entering and already in retirement (Beehr & Bowling, 2013; Moen, Kim, & Hofmeister, 2001; van Dalen, Henkens, & Wang, 2015; Wheaton & Crimmins, 2013). Moreover, with the increasing heterogeneity of workforce exit patterns, concomitant changes to the nature of the retirement process itself have emerged (Kojola & Moen, 2016; Shultz & Olson, 2013; Shultz & Wang, 2011) as an unprecedented magnitude of retirees are spending longer in retirement than previous cohorts via these variegated post-retirement pathways (Carr & Kail, 2012; van Solinge, 2013; van Solinge & Henkens, 2008).

In response to the changing nature of retirement, increasing attention has duly been directed toward retirees' psychological adjustment to post-retirement life. When construed as a longitudinal developmental process (Curl & Ingram, 2013; Shultz & Olson, 2013) with attendant adjustment challenges, it follows that retirement can present significant difficulties for older adults (Wang, 2013a). To date, much of the substantive body of longitudinal retirement adjustment research concerning the psychological wellbeing of older adults has centred on the influence of retirees' financial and physical resources (Koopmann & Wang, 2016; Wang, Henkens, & van Solinge, 2011). Whereas, considerably less longitudinal research has emphasised the role social resources play in the retirement adjustment process (Matthews & Fisher, 2013; Wang et al., 2011) and associated psychological wellbeing outcomes (Wang & Shi, 2014). Given retirement occurs within the context of shifting social relations (Topa & Alcover, 2015) and how

such relations are central to the successful ageing of older adults (Depp, Vahia, & Jeste, 2010), emergent recommendations from the literature give particular emphasis to the need to examine the social embeddedness of the retirement process and how social resources influence the psychological wellbeing of retirees (Barbosa, Monteiro, & Murta, 2016; Koopmann & Wang, 2016; Wang et al., 2011). The following review provides the contextual background and justification for the present investigation by exploring a synthesis of the extant retirement adjustment literature, commencing with an overview of how retirement is defined.

Definitions of Retirement

Defining the term 'retirement' remains a point of interdisciplinary contention among scholars. Researchers have proffered conceptualisations of retirement so widely varied that no unitary definition of retirement actually exists (Beehr & Bennett, 2007; Shultz & Wang, 2011). In broad terms, this variation in definitions can be reduced to bifurcation in the form of archaic, and arguably inadequate, historical definitions of retirement and more recent conceptualisations of more fitting modernity. The following overview aims to clarify both commonly used classical and contemporary definitions of retirement, explore the changing nature of retirement, and summarise a working definition of retirement for the present investigation.

Classical and contemporary definitions. Traditional definitions of retirement have largely concerned an individual's final withdrawal from the labour force. While some early gerontological investigations conceived of retirement as a point of life 'crisis' characterised by a challenge to personal development in the face of changed life circumstances (van Solinge & Henkens, 2008), many classical definitions have routinely used the reductive notion of an individual's complete cessation of workforce participation (Fouquereau et al., 2005; Moen et al., 2001). Defined as such, the historically normative life transition of retirement (Curl & Ingram, 2013; Dew & Yorgason, 2010) has tended to be construed in this circumscribed sense. Until recently, retirement has commonly been conceptually defined as the end of working life at age 65, followed by a total withdrawal from paid employment, where a retiree's primary income is based on retirement related sources (Curl & Townsend, 2008). Unfortunately, these notions of retirement seldom

accurately capture the phenomenon of retirement, as retirees now often migrate in and out of the labour force in numerous capacities (i.e., by participating in 'un-retirement', re-employment, 're-retirement', bridge employment) (Beehr & Bowling, 2013; Moen et al., 2001). With these historical changes in the nature of the retirement transition, comes an increasing acknowledgement of the potential for retirees to have widely varied retirement transition trajectories and workforce exit patterns.

Contemporary definitions of retirement have moved to reflect the changing nature of the retirement transition. A growing consensus exists surrounding the heterogeneity of retirees' experiences of this major life transition (Beehr & Bowling, 2013; van Solinge, 2013; van Solinge & Henkens, 2008), as traditional linear pathways from employment to retirement are altering in the face of unprecedented demographic, technological, and global economic change (Kojola & Moen, 2016; Shultz & Olson, 2013). The variegated elements of retirement's complex nature are succinctly captured by Haynes, McMichael, and Tyroler (1987, p.204): "the word 'retirement' can refer to a life event, a transition or crisis state, a process, or a social role or status." Similarly, the concepts of the 'roleless role' of retirement (Riley & Riley, 1994), and retirement as a 'status passage' (Smith & Moen, 2004) or 'social death' (Plakans, 1994) have contributed to a broadened understanding of the constituents of the retirement transition. Further, Denton and Spencer (2009) have underscored this definitional diversity by highlighting the numerous criteria used to operationally define retirement; 'absence from the workforce'; 'reduced workload and/or remuneration'; 'workload and/or remuneration below a certain minimum'; 'receiving a retirement pay-out'; 'no longer linked to main employer'; 'late career or job change', and 'self-reported retirement'. Taken together, these developments simultaneously indicate a trend of increasingly nuanced approaches to defining the multi-faceted phenomenon of retirement and the concomitant flux of the field. While there is no unifying definition of 'retirement' at present, a steady accretion of interdisciplinary agreement emphasises the importance of considering retirement as a longitudinal transition, as well as the inter-individual variability of this transition for retirees.

Conceptualising Retirement as a Transitional Process

As early as the 1950s, the processual nature of the retirement transition and the complexity of its attendant adjustment concerns for retirees have been outlined. In 1954, Tibbitts (as cited in Curl & Townsend, 2008) described the course of the retirement process as commencing with a complete or gradual departure from one's primary paid employment role, which concluded with a marked decline in all behavioural engagement with the exception of basic self-care. Later theoretical contributions by Atchley (as cited in Szinovacs & Davey, 2004) proposed a framework of stage-wise adaptation to the retirement process; (1) 'honeymoon'; (2) 'disenchantment'; (3) 'reorientation'; (4) 'stability', and (5) 'termination'. Moreover, Plakans (1994) maintained the retirement process can lead to the 'social death' of retirees, where older adults in retirement may experience near total social dislocation from ongoing society over time as a consequence of disengagement from their previously structured working lives. Such conceptions accord with more recent notions of retirement as a major life-changing processual event (Curl & Ingram, 2013; Fouquereau et al., 2005; Moen et al., 2001; Shultz & Olson, 2013), where different types of transitions can eventuate in the course of retirement (Curl & Townsend, 2008; Damman, Henkens, & Kalmijn, 2013). Again, the evident consensus of retirement as a life course transition consisting of numerous potential trajectories, suggests retirees inevitably face adjustment challenges, particularly those regarding psychological wellbeing. However, before proceeding to a review of the retirement adjustment literature, it is advisable to consider the wider contexts surrounding today's retirees' transitional pathways, and provide a contemporary working definition of retirement.

The Changing Nature of the Retirement Transition

The surrounding contextual pressures of the retirement transition are manifestly removed from those of previous decades. The nature of retirement itself is changing (Kojola & Moen, 2016; Moen et al., 2001), and the transition to retirement has become more protracted and variable (e.g., increased variability in retirement timing, time in retirement, and older adult labour force participation, more flexibility in time and location arrangements, and the emergence of 'unretirement' programmes and 're-retirement') (Alley & Crimmins, 2007; Kohli, 1994; Riley & Riley, 1994; Shultz & Wang, 2011; van Dalen et al., 2015). The heterogeneity of present retirement pathways is contingent on

the wider contexts in which the retirement transition takes place (Szinovacs and Davey, 2004; Wheaton & Crimmins, 2013), and, as these contexts have changed, more diverse labour market exit patterns have been observed than in previous times (Alley & Crimmins, 2007; Carr & Kail, 2012; Henretta, 1994). No longer is there a fixed age at which older adults must leave their principal occupation or career, nor can they assume retirement will occur at the age of pension eligibility (Alley & Crimmins, 2007; Moen et al., 2001; Topa & Alcover, 2015). Similarly, individuals approaching or undergoing the retirement transition must now frequently decide whether or not to engage in paid employment during their retirement (Moen et al., 2001). As a result of lower birth rates, increased longevity, and the steadily increasing retirement of the baby boomer cohort, a never before seen number of older adults will enter retirement, and these retirees will spend longer in retirement than any previous generation.

As the baby boomer cohort shifts into retirement, Western nations will begin to experience demographic change of unprecedented magnitude. Three core characteristics of this global demographic change are decreased birth rates, increased life expectancy, and the incipient increase in retirees who will depend on old-age pensions as their principal income source. On present trends, according to the Organisation for Economic Cooperation and Development (OECD) (2015), the old-age dependency ratio (number of people aged 65 or over for every 100 people of working age [20-64 years]) is projected to increase across the entire OECD as a result of predicted increases in average life expectancy. Hence, the burgeoning global retiree population is set to be supported by an unfavourably disproportionate labour force. Further, average life expectancy projections for the period 2060 – 2065 for men and women aged 65 years are 86.9 years and 90.8 years, respectively (OECD, 2015). Similarly, the European Commission (2015) predicts that, for those retiring at the expected age of 68 for the year 2060, average life expectancy will be 90 years. Additionally, in terms of proportion, 21% of the world's population will be 60 years old or older in 2050 as compared with only 12% in 2013 (United Nations, 2013), an increase of 57% for this population. A clear implication of these ageing population data is that retirees will spend an increased number of years in retirement with attendant costs.

Owing to continuing increased life expectancies, retirees now spend longer in retirement than ever before (Alley & Crimmins, 2007; Barbosa et al., 2016; Fouquereau et al., 2005; Pinquart & Schindler, 2007), making the study of wellbeing in retirement of obvious import. Illustrated by the OECD (2015), in 1970 men and women were expected to spend an average of 11 and 15 years in retirement, respectively; whereas, by contrast, the expected average duration of retirement for men and women in 2014 has increased to 18 and 22 years, respectively. Following from this, van den Bogaard, Henkens, and Kalmijm (2016) indicate an emerging economic dilemma concerning the potential rises in associated healthcare costs as the baby boomer retiree population consolidates its retirement, and governmental efforts establish optimally minimal pension costs. Essentially, expected advantages from prolonging older adults' workforce participation (i.e., raising pension eligibility ages) so as to decrease the expense of pension benefits, could be somewhat diminished by the potential productivity costs and increased healthcare expenditure (van den Bogaard et al., 2016). These potential productivity and health costs are suggested to result as a consequence of older workers spending their final years of employment in suboptimal health due to rising retirement pension eligibility ages. The increased emphasis on understanding the changing nature of the retirement transition in the past three or so decades, signals the importance of investigating factors which will enhance the successful ageing of a retiree population of hitherto unseen size (Hershey & Henkens, 2013; Wang & Shultz, 2009).

In view of the duration retirees now spend in retirement, the study of factors which promote this population's successful ageing is critical. More specifically, the psychological wellbeing of retirees is an important object of study (Wang & Shi, 2014). Psychological wellbeing, defined as "the extent to which…[a] person is generally content with his/her psychological states and enjoys effective psychological functioning" (Wang & Shi, p. 226), is of particular interest as exiting the workforce is a critical life event holding complex, psychological ramifications for both the past and present (Hershey & Henkens, 2013). Much of the extant knowledge of the retirement's psychological dynamics has been generated in the last 20 to 30 years (Shultz & Wang, 2011). Wang and Shi (2014) have demonstrated the expansion of the retirement research field via the PsychINFO database; the 1970s yielded 207 peer-reviewed articles for the key word retirement, rising throughout the 1980s to 535, then to 687 in the 1990s, with a near

threefold increase during the 2000s to reach 2019. Given the study of retirement is of worldwide significance, as evidenced by the pervasive shifts in demography and labour force exit patterns (Wang & Shultz, 2009), it follows that heightened awareness surrounds retirees' adjustment to the retirement transition with respect to successful ageing. Finally, before reviewing the retirement adjustment literature to date, a conceptual definition of retirement of apt sensitivity to the contemporary context surrounding the retirement transition will be established.

Towards a working definition of retirement. Retirement has become too amorphous a concept to be defined by reductive, traditional meanings of retirement commonly premised on an individual's inexorable exit from the workforce within a given age range (Curl & Townsend, 2008; Moen et al., 2001; Rosenkoetter & Garris, 1998). Retirement conceptually evolves as wider societal structures (e.g., workforce participation patterns, demographic, population, sociocultural institutions, and economic structures) alter across time (Damman et al., 2013; Wang & Shi, 2014). The present investigation will adopt the psychological conceptualisation of retirement within the resource-based dynamic perspective as proposed by Wang et al. (2011). Wang and Shi's (2014) definition of retirement will be used for this study:

> Retirement…[is] an individual's exit from the workforce, which accompanies decreased psychological commitment to and behavioural withdrawal from work. This definition allows us to emphasise retirement as both a psychological process in conceptualisation and a life status in empirical operationalization. (p. 211)

Parallel to the changing nature of retirement are research efforts to model how retirees can optimise their adjustment to this major life transition to attain successful ageing outcomes. The following section will review the foremost theoretical orientations applied to the study of retirement adjustment, and assert that a resource-based dynamic perspective has the greatest applicability to the study of retirement adjustment.

Retirement Adjustment

Retirement as a longitudinal adjustment process. In their interdisciplinary review of the retirement literature, Wang and Shultz (2009) indicated a scholarly convergence of retirement as a transitional process across several different conceptualisations. These conceptualisations posit retirement as a decision making process, an adjustment process, a career development stage, and an aspect of human resource management (Shultz & Wang, 2011; Wang & Shultz, 2009). While there is obvious variation in these concepts of retirement, the emerging consensus is that retirement is a processual life transition (Shultz & Wang, 2011) rather than a discrete life event occurring as an individual finally exits the labour force. Considered as a longitudinal adjustment process, retirement can be usefully construed as involving both the retiree's retirement transition (from the state of being employed to the that of being retired) and the developmental trajectory of post-retirement life (Wang & Shi, 2014; Wang & Shultz, 2009). The retirement adjustment process concerns two pivotal developmental challenges; (1) a retiree's adjustment to the altered aspects of their life during the work-retirement transition (van Solinge & Henkens, 2008), and (2) the attainment of satisfactory psychological comfort with life in retirement (Wang & Shultz, 2009). Viewing retirement as a complex process of adjustment rather than a stand-alone life event (Topa & Alcover, 2015) provides opportunities to assess the embedded contextual features of the transition process (e.g., retirement timing, pre-retirement planning, available resources), and obtain comprehensive insights into individual adjustment styles and tendencies, as well as longitudinal changes in these characteristics (Shultz & Wang, 2011). Several theories have been applied to the conceptualisation of retirement adjustment as a psychological phenomenon, and this has eventually resulted in the development of an integrated model of retirement adjustment as a resource-based dynamic process.

Principal theoretical orientations to retirement adjustment – Continuity theory, role theory, and the life course perspective. Numerous attempts have been made to theoretically model psychological experiences related to the transitional process of retirement adjustment. The predominant theories in the retirement research field are continuity theory, role theory, and the life course perspective (Barbosa et al., 2016; Wang & Shultz, 2009). Continuity theory asserts humans aim to maintain consistency in their

life patterns and social relations across time, and strive to minimise experiences of stressful disruption as they accommodate life changing events (Atchley, 1999). A retiree's successful adjustment to retirement life is predicated on the maintenance of an assumed continuity in their self-concept and identity, and, consequently, their broader life patterns in retirement (Atchley, 1999). Thus, difficulties in attaining retirement adjustment are said to result from experiences of significant adversity in maintaining continuity in retirees' general life patterns. In comparison, role theory characterises retirement as a catalyst for an individual to begin the transition from one role to another in the retirement adjustment process. Retirement involves losing or diminishing work-related roles (e.g., work or career roles), and strengthening other roles in the family and community spheres (Riley & Riley, 1994). The adjustment consequences for role transitions in retirement can be either positive or negative for a retiree's wellbeing (Koopmann & Wang, 2016), depending on the congruence of the role transition and the individual retiree's aims and values, as well as the desirability of the transition (Wang, 2007; Wang & Shi, 2014).

The life course perspective has been effectively implemented to ground retirement as a multi-level transition in the context of the lifespan (Wang & Shi, 2014; Wang & Shultz, 2009). It recognises the fluidity of human agency under the influence of wider societal structures and social circumstances, as "changing lives alter developmental trajectories" (Elder, 1998, p.1) partly due to ever-changing socio-historical processes (Wang et al., 2011). Four key organising themes form the substratum of this perspective; (1) the interaction of individual existences and given epochs; (2) the timing of lives; (3) the social embeddedness and interdependence of life, and (4) human agency in making decisions (Elder, 1994). Thus, with respect to retirement adjustment, the individual attributes (e.g., demography, finances, health) and life histories of retirees (e.g., individual life and employment histories) are said to affect their engagement with, and accomplishment of, the retirement transition (Koopmann & Wang, 2016; Wang et al., 2011; Wang & Shi, 2014). Put simply, if the retirement transition is understood to be contextually embedded, then an individual's successful experience of retirement adjustment is partly dependent on the specific context in which their adjustment takes place, as well as their agentic efforts in adapting to these contextual circumstances (Wang et al., 2011). This implies individuals who have developed flexible coping strategies in previous major life

transitions, who are less socially attached to their working environment, and possess the individual resources conducive to facilitating a smooth transition are more likely to engage in the transition with better timing and preparation, and attain successful retirement adjustment outcomes (Koopmann & Wang, 2016; Wang & Shultz, 2009).

Another emphasis of the life course perspective focuses on interdependent life spheres. Interrelations between the work sphere and non-work spheres (e.g., family life, social network relations) create a mutual experiential relevance of bidirectional influence (Koopmann & Wang, 2016). For example, working life affects marital life and vice versa. For retirees, non-life spheres become particularly salient in their adjustment to retirement, as they provide alternative sources of identity and avail opportunities to pursue meaningful activities during the retirement transition (Wang et al., 2011). Moreover, the embedded social resources within interdependent relationships, or 'linked lives' (Elder, 1994), can assist the attainment of successful retirement adjustment (Wang & Shultz, 2009). While the life course perspective articulates a coherent framework for examining multiple retirement adjustment trajectories and inter-individual differences in a range of adjustment indicators, it offers minimal predictive capacity as to how variables, other than retirement timing and family-related variables, influence retirement adjustment (Wang, 2007).

Integrating perspectives for a unified approach to retirement adjustment. One response to the limitations of adopting continuity theory, role theory, and the life course perspective in isolation has been to incorporate complementary facets of the resource perspective. With resources broadly conceptualised as an individual's overall capability to actualise their centrally valued needs (Hobfoll, 2002), the resource perspective maintains that an individual's degree of retirement adjustment is a function of their access to and accrual, loss, or maintenance of various resources. In the context of retirement, resources can be constituted by an individual's physical, cognitive, motivational, emotional, financial, and social capacities (Barbosa et al., 2016; Wang et al., 2011). Additionally, the perspective maintains a useful dynamism holding that resource stocks may fluctuate over time (Hobfoll, 2002). In essence, the greater a retiree's total capability is to satisfy their valued needs, the less adversity in adjusting to the retirement transition

he or she is predicted to experience, and, conversely, diminished resources will result in more difficult retirement adjustment trajectories (Pinquart & Schindler, 2007; Wang et al., 2011).

Wang (2007) explored the longitudinal change patterns of retirees' adjustment to retirement in an attempt to profile trajectories of psychological wellbeing. Using premises from continuity theory, role theory, and the life course perspective to formulate hypotheses of differential trajectories, Wang found three latent growth curve patterns of retirees' psychological wellbeing. Further, as well as suggesting three retiree subtype profiles of retirement adjustment, these three patterns (i.e., the flat line 'maintaining pattern', positive sloped straight line 'recovery pattern', and 'U-shape pattern') conformed to predictions of the three theoretical orientations. Firstly, the maintaining pattern (approximately 72% of participants in both samples) accorded with continuity theory's assertion that individuals who successfully accommodate life changes in the retirement transition maintain a homeostasis in their familiar life patterns. Secondly, the recovery pattern (approximately 4% of participants in both samples) offered support for both role theory and the life course perspective. With respect to role theory, the recovery pattern indicated a gradual increase in psychological wellbeing in the retirement transition consistent with the positive adjustment consequences predicted by role theory. The recovery pattern also illustrated the proposed positive, stable states of psychological wellbeing predicted by the life course perspective after the initial flux of the retirement transition is adjusted to. Finally, the U-shaped pattern (approximately 24% of participants in both samples) was consistent with the predictions of all three theories. The drop in psychological wellbeing which followed the inception of retirement was explicated by the continuity and role theories by way of difficulty maintaining continuity in identity and maintaining life pattern continuity, or the negative psychological experiences associated with role loss (e.g., anxiety, depression). The recovery phase of the pattern was accounted for in terms of the life course perspective's prediction that adjustment to retirement gradually leads to enhanced and more stable states of psychological wellbeing.

Two key features of Wang's findings are consistent with the work of Pinquart and Schindler (2007). Drawn from the German Socioeconomic Panel, Pinquart and

Schindler's (2007) sample of retirees also consisted of three retiree subpopulations with similar proportions and adjustment trajectories to those of Wang (2007). Consistent with the maintaining pattern, approximately 75% of retirees demonstrated only slight fluctuations in their life satisfaction after retirement, while an upward trend similar to the recovery trend was observed in approximately 15% of retirees, and less than 10% exhibited a somewhat parabolic trajectory of adjustment akin to the U-shaped pattern (Pinquart & Schindler, 2007). Concerning the utility of a unified theory of retirement adjustment, it appears that the incumbent theoretical orientations, while receiving some empirical support, only offer partialised accounts of the retirement adjustment process. A combination of all three are required to explicate the heterogeneity evident in the three post-retirement developmental trends discussed here. Consequently, this paucity of a unified theory of retirement adjustment has resulted in the development of the resource-based dynamic model of retirement adjustment.

Resource-based dynamic model of retirement adjustment. From this perspective, retirement adjustment is considered a longitudinal process where the degree of adjustment is subject to fluctuation dependent on changes to retirees' resource stocks (Koopmann & Wang, 2016). It follows that if no significant change in an individual's total resources occurs from the reference point (i.e., the inception of retirement), then they may not experience much change in their levels of wellbeing. However, if a retiree's resources significantly diminish (e.g., via the onset of physical disability, major financial losses), then they may experience an aversive change in their wellbeing. On the other hand, if the retirement transition affords an individual opportunity to increase resource investment in satisfying their centrally valued needs (e.g., more engagement with family and social activities), then improvements in wellbeing may result. The model's sensitivity to change offers an advantage over the previously outlined theories, as it affords a flexibility concerning inter-individual variation in the adjustment process; thus, it can theoretically account for a greater variety of adjustment trajectories, as well as their inherent dynamism (Wang & Shi, 2014). Further, the complexity of the retirement process can best be conceptualised as a multilevel phenomenon with linkages to associated, interrelated structural contexts which influence the retirement adjustment process at the macro-, meso-, and micro-levels (Beehr & Bennett, 2007; Szinovacz, 2013). Thus, the multi-level antecedents of the retirement transition are seen as driving

the underlying mechanism of retirement adjustment (i.e., fluctuations in resource levels), and these are conceptualised via a multi-level framework.

The resource-based dynamic model applies a variant of the established multi-level framework's macro-, meso-, and micro-levels. According to Szinovacz (2013), the macro-level of retirement is held as an institution reflective of socio-cultural norms and values which inform various retiree support systems. Additionally, the meso-level involves diverse organisations which affect retirement processes (e.g., employers, work colleagues, retirement planners), and which maintain policies and cultures relating to retirement age, benefit packages, various other supports for older workers and retirees, as well as specific expectations and images of retirement (Beehr & Bennett, 2007; Szinovacz, 2013). Finally, the micro-level consists of the features of the individual's retirement transition, such as pre-retirement planning, decision making, role and status changes, and adjustment trajectories embedded within immediate family and social contexts (Szinovacz, 2013; Wang & Shi, 2014). By further decomposing the meso- and micro-levels, the resource-based dynamic model emphasises how complex interrelations between potential antecedents to retirement adjustment may influence retiree's transition trajectories. The meso-level comprises both the organisational level (e.g., organisational climate, human resource practices) and the job-level (e.g., job conditions, job attachment), while the micro-level consists of the household (or family) level (e.g., spousal relations, caregiving demands) and the individual level (e.g., health behaviours, psychological resilience) (Wang et al., 2011). Figure 1 illustrates the resource-based dynamic model's representation of the retirement adjustment process. In tandem with a multi-level conceptualisation, the perspective also provides a conceptually compatible definition of retirement adjustment for this framework.

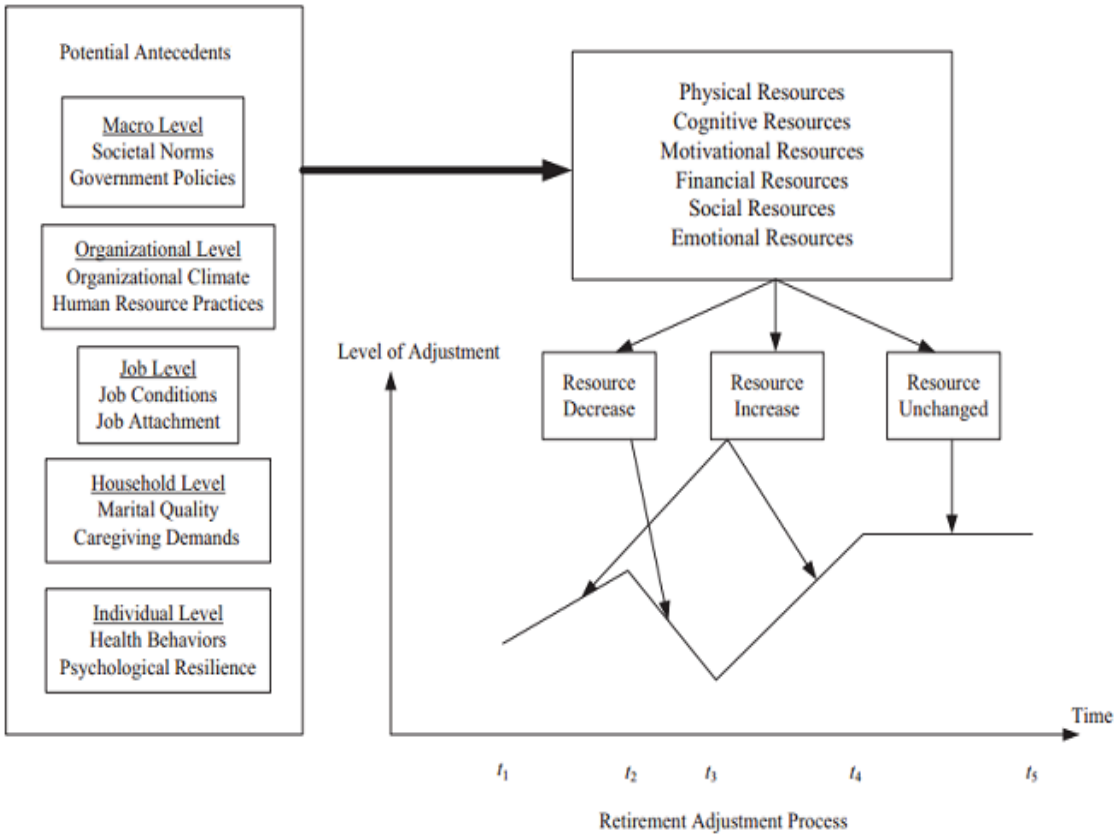

Figure 1. Illustration of the resource-based dynamic model for understanding the retirement adjustment process with examples of potential antecedents (Wang et al., 2011). In accordance with the American Psychological Association (APA) permissions policy, no permission was required to reproduce this figure (American Psychological Association, 2017).

A distinction is drawn between a retiree's 'retirement adjustment process' and their 'adjustment quality' (i.e., level of adjustment). Wang et al. (2011) propose that a retiree's adjustment quality (or level of retirement adjustment) is construed as the degree of "psychological comfort regarding the retirement process" (p.1). The retirement adjustment process, on the other hand, involves an array of multi-level antecedents related to the fluctuation of various resources during the retirement transition, and how these impact the associated wellbeing outcomes. Individual attributes, pre-retirement job-related, family-related, retirement transition-related variables, and post-retirement activities may influence the process of accumulation, maintenance, or loss of retirees' resources (Wang et al., 2011; Wang & Shi, 2014), and, subsequently, how these influence given indices of retirement adjustment (i.e., wellbeing states of interest). Quality of

adjustment is often inferred from indirect indices of wellbeing states (e.g., level of financial or physical resources) (Wang et al., 2011), and, increasingly, by more direct, complementary indices such as subjective evaluations of retirees' adjustment (van Solinge, 2013; van Solinge & Henkens, 2008). The resource-based dynamic model's theoretical framework maps accurately onto the established aggregate of empirical retirement adjustment predictor and outcome variables.

Empirical determinants and outcomes of retirement adjustment. Within the last decade, a collective of virtually exhaustive reviews has begun to converge and delineate an empirically supported body of variously categorised retirement adjustment predictor and outcome variables (e.g., van Solinge, 2013; Wang et al., 2011; Wang & Shi, 2014; Wang & Shultz, 2009). For instance, Table 1 shows Wang et al.'s (2011) organisation of 25 explanatory factors related to retirement adjustment into five groups; individual (e.g., physical and mental health); preretirement work (e.g., job dissatisfaction); family (e.g., spousal work status); retirement transition (e.g., retirement planning, voluntariness of retirement), and post-retirement (e.g., leisure activities, bridge employment). Similarly, van Solinge (2013) structured adjustment predictors by way of four categories; individual attributes (e.g., gender, age); resources (e.g., material and social resources); situational characteristics (e.g., involuntary retirement, work stress), and psychological attributes (e.g., personality traits, motivational dispositions). Despite the utility of such systematic descriptions, until recently there has been limited formal clarification as to the predictive capacity of these factors and their frequency of use (Barbosa et al., 2016).

Table 1. *Summary of Variables Influencing Retirement Adjustment Quality.*

Predictor category	Variable	Effect	Sample empirical studies
Individual attributes	Physical health	+	Dorfman, 1992; S. Kim & Feldman, 2000; van Solinge & Henkens, 2008
	Mental health	+	J. E. Kim & Moen, 2002; Wang, 2007
	Financial status	+	Gall et al., 1997; Pinquart & Schindler, 2007; Quick & Moen; 1998
	Physical health decline	−	J. E. Kim & Moen, 2002; van Solinge & Henkens, 2008; Wang, 2007
Preretirement job-related variables	Work stress	+	Wang, 2007
	Job demands	+	Quick & Moen, 1998; Wang, 2007
	Job challenges	+	van Solinge & Henkens, 2008
	Job dissatisfaction	+	Wang, 2007
	Unemployment before retirement	+	Pinquart & Schindler, 2007
	Work role identity	−	Quick & Moen, 1998; Reitzes & Mutran, 2004
Family-related variables	Marital status (married vs. single/ widowed)	+	Pinquart & Schindler, 2007
	Spouse working status (working vs. not)	−	Wang, 2007
	Marital quality	+	Szinovacz & Davey, 2004; Wang, 2007
	Number of dependent children	−	S. Kim & Feldman, 2000
	Losing a partner during the transition	−	van Solinge & Henkens, 2008
Retirement transition-related variables	Voluntariness of the retirement	+	Reitzes & Mutran, 2004; van Solinge & Henkens, 2005, 2008
	Retirement planning	+	Reitzes & Mutran, 2004; Wang, 2007
	Retiring earlier than expected	−	Quick & Moen, 1998; Wang, 2007
	Retiring for health care reasons	−	Quick & Moen, 1998
	Retiring to do other things	+	Quick & Moen, 1998
	Retiring to receive financial incentives	+	Quick & Moen, 1998
Postretirement activities	Bridge employment	+	S. Kim & Feldman, 2000; Wang, 2007; Zhan, Wang, Liu, & Shultz, 2009
	Volunteer work	+	Dorfman & Douglas, 2005; S. Kim & Feldman, 2000
	Leisure activities	+	Dorfman & Douglas, 2005; S. Kim & Feldman, 2000
	Anxiety associated with social activities	−	van Solinge & Henkens, 2005, 2008

Note. Plus sign (+) denotes positive effect on retirement adjustment quality, and minus (-) denotes negative effect on retirement adjustment quality. Retrieved from Wang et al. (2011). In accordance with the American Psychological Association (APA) permissions policy, no permission was required to reproduce this figure (American Psychological Association, 2017).

To address this concern, Barbosa et al. (2016) systematically reviewed the extant retirement adjustment literature, and, subsequently, classified 807 adjustment predictor variables into 26 categories. These were then further reduced to four ordinal groups on the basis of two criteria; (1) numbers of studies examining each predictor, and (2) the proportion of positive effects these variables had on retirees' adjustment to retirement. These condensed categories are depicted in Table 2. Importantly, while methodological variations precluded the calculation and comparison of effect sizes for the 115 featured studies, the resultant list compiled by the authors provides an empirically based map of explanatory factors relevant to the study of retirement adjustment. Of the four groups, the six variable clusters belonging to group one are of particular importance. Barbosa et al. (2016) showed that these predictors related to these six categories were the most commonly implemented in studies of retirement adjustment, ranked in order of proportion

of positive adjustment results in the studies reviewed; (1) physical health (83%, *n* = 94); (2) finances (80.3%, *n* = 66); (3) psychological health and personality-related attributes (79.4%, *n* = 102); (4) leisure (75%, *n* = 32); (5) retirement voluntariness (69.6%, *n* = 69), and (6) social integration (63.2%, *n* = 57). These six emergent categories both empirically bolster and transpose effectively to the six resource domains maintained by the resource-based dynamic model (i.e., physical, cognitive, motivational, financial, social, emotional), and offer specific insight into the less explored resources relevant to retirement adjustment. In contrast, the empirical landscape of major outcomes associated with adjustment to the retirement process is rather more ambiguous.

Table 2. *Groups of Predictors Organised According to the Number of Studies Showing Positive, Null, and Negative Effects on Retirement Adjustment.*

Group	Predictor	*n*	Positive		Null		Negative	
			%	*n*	%	*n*	%	*n*
1	Physical health	94	83	78	14.9	14	3.2	2
	Finances	66	80.3	53	18.2	12	1.5	1
	Psychological health and personality-related attributes	102	79.4	81	19.6	20	1.0	1
	Leisure	32	75.0	24	21.9	7	3.1	1
	Retirement voluntariness	69	69.6	48	27.5	19	2.9	2
	Social integration	57	63.2	36	33.3	19	3.5	2
2	Retirement preparation	23	56.5	13	34.8	8	8.7	2
	Marital relationship	75	53.3	40	38.7	29	8.0	6
	Postretirement work	23	52.2	12	39.1	9	8.7	2
	Preretirement work conditions	51	51	26	43.1	22	5.9	3
	Spirituality	12	50.0	6	50.0	6	0.0	0
	Retirement length	15	46.7	7	40.0	6	13.3	2
	Parenting	13	46.2	6	38.5	5	15.4	2
	Education	25	44.0	11	52.0	13	4.0	1
3	Goals	3	100.0	3	0.0	0	0.0	0
	Voluntary work	10	80.0	8	20.0	2	0.0	0
	Community resources	8	75.0	6	25.0	2	0.0	0
	Family	9	66.7	6	33.3	3	0.0	0
	Professional identity	5	60.0	3	40.0	2	0.0	0
	Physical activity	8	50.0	4	37.5	3	12.5	1
4	Age	38	23.7	9	57.9	22	18.4	7
	Sex	35	22.9	8	62.9	22	14.3	5
	Living arrangements	7	14.3	1	85.7	6	0.0	0
	Retirement timing	8	12.5	1	62.5	5	25.0	2
	Ethnicity	14	7.1	1	85.7	12	7.1	1
	Others	5	0.0	0	80.0	4	20.0	1

Note. From "Retirement Adjustment Predictors: A Systematic Review," by L. M. Barbosa, B. Monteiro, and S. G. Murta, 2016, *Work, Aging, and Retirement, 00,* p.10. Copyright 2016 by L. M. Barbosa. Reprinted with permission.

Research concerning the psychological wellbeing outcomes of the retirement adjustment process is marked by a heterogeneity of findings, much of which pertains to the individual

level. Retirement adjustment has often been centrally premised on the notion of how the retirement process influences retirees' psychological comfort, operationalised by a variety of indices (e.g., happiness, morale, emotional wellbeing, life and retirement satisfaction, mental health, depression) (van Solinge, 2013) with the field producing inconsistent findings (Wang et al., 2011; Wang & Shultz, 2009). Reported outcomes have ranged from globally negative outcomes concerning retirees' physical health, psychological health (e.g., loneliness, depression, happiness), life satisfaction and attitudes to retirement, to positive impacts on health, stress regulation, and life satisfaction (van Solinge, 2013; Wang & Shultz, 2009). Further, in some studies of retirement and psychological wellbeing, no impact on retirees' indices of adjustment was observed at all (Wang et al., 2011; Wang & Shultz, 2009). Indeed, Barbosa et al.'s (2016) review of the retirement adjustment literature aligned with the above findings, showing the field as replete with positive, negative, and null findings regarding adjustment outcomes (i.e., 19 of the 26 predictor clusters exhibited this trichotomy). Conceptual reconciliation of the variability in these outcomes has begun with the three emergent post-retirement adjustment trajectories proposed by Wang (2007) and has been corroborated by Pinquart and Schindler (2007). Therefore, these findings lend credence to the assertion that retirement transition and adjustment processes are not linear, uniform pathways, and it is reasonable to expect a multiplicity of adjustment pathways resulting from the impact of retirement antecedents, resource access, and fluctuations in such resources.

Evaluations of the extant literature indicate that the majority of studies premised on resource-based orientations have seldom investigated resources other than retirees' individual level health and wealth in relation to psychological wellbeing during adjustment to the retirement transition (Koopmann & Wang, 2016; Wang et al., 2011). This tendency to canalise the research foci has meant that explanatory factors relating to retirees' social resources have received comparatively less attention (Barbosa et al., 2016; Koopmann & Wang, 2016; Wang et al., 2011) despite the self-evident importance social contexts hold for those adjusting to impact of retirement (Elder, 1994; Fouquereau et al., 2005; Szinovacs, 2013; Szinovacz & Davey, 2005; Wang & Shultz, 2009). Underscoring this point, of the six most empirically robust resources identified by Barbosa et al. (2016), 'social integration' (i.e., predictors such as frequency of contact with friends, relevance of friendships, sources of emotional support, participation in social activities, quality of

relations) was the second least studied. A broader focus on micro-level determinants of the individual level retirement process which emphasises the socially integrated dimensions (e.g., familial and spousal relations, social networks) of the transitional context retirees are embedded within is warranted. Social resources located within these interdependent spheres can be conducive to the successful promotion of retirement adjustment (Shultz & Olson, 2013; Wang & Shultz, 2009). Further to the role of 'embeddedness' in the retirement transition context, pre-retirement job-related antecedents are of particular relevance to retirees' social resources and retirement adjustment quality.

Work-related antecedents to retirement have been shown to be associated with the post-retirement adjustment trajectory. More specifically, meso-level work-related predictors such as job and career attitudes (e.g., career attachment, organisational commitment), work role identity, physical and psychological work demands, pre-retirement job dissatisfaction and work stress (Wang et al., 2011; Wang & Shi, 2014; Wang & Shultz, 2009) have been linked to post-retirement outcomes. For example, retirees with higher pre-retirement job satisfaction have been shown to be more likely to engage in career-related bridge employment during retirement (Wang & Shi, 2014). Additionally, older workers with higher levels of physical and psychological demand, or who experience greater dissatisfaction with their job, are more likely to opt for retirement (Wang & Shultz, 2009). Further, retirement adjustment outcomes have been found to be negatively related to work role identity, while job satisfaction, employment challenges, and work-related stress have been shown to be positively related to such outcomes (Shultz & Wang, 2011; Wang & Shultz, 2009). The impact of pre-retirement variables at the job-level are of considerable importance with respect to the retirement adjustment process, and, therefore, warrant investigation as predictors of adjustment outcomes such as psychological wellbeing. The following section will further explore how social resources can serve to facilitate successful ageing with respect to psychological wellbeing during the retirement process.

Social resources and psychological wellbeing. Successful ageing is a multidimensional construct with determinants ranging across biopsychosocial domains

(Depp et al., 2010; Franklin & Tate, 2008). Perhaps the least examined of these domains is the social domain; however, empirical evidence has been established which links the influence of social resources to the attainment of successful ageing in older adults (Sadler & Biggs, 2006). With respect to psychological investigation, the conceptualisation of social relations has been typically divided into (1) the objective measurement of the structural dimensions of social networks (i.e., types and sizes), and (2) the measurement of the subjective quality of social relations (i.e., perceived social support) (Berkman, Glass, Brissette, & Seeman, 2000; Stephens & Noone, 2008). Involvement with multiple social relations and activities has been associated with improved life-satisfaction, as well as enhanced health and function (Bowling & Dieppe, 2005; Charles & Carstensen, 2010). Further, social engagement has also been linked to lower levels of stress related hormones (e.g., cortisol, norepinephrine, urinary epinephrine) (Ryff et al., 2006). Stronger social networks and higher levels of social engagement have also been associated with lower risk of morbidity and mortality, increases in emotional wellbeing, protection against cognitive decline (Charles & Carstensen, 2010; McFadden & Basting, 2010), and the regaining of lost cognition (Charles & Carstensen, 2010). Also, robust social networks have been identified as being protective against dementia (Fratiglioni et al., 2000; Fratiglioni, Paillard-Borg, & Winbald, 2004). Conversely, not all social relations are beneficial, as detrimental social networks have been associated with decreased physical and psychological wellbeing (Charles & Carstensen, 2010). Also, according to Kupperbusch, Levenson, and Ebling (2003), men and women experience differences in the narrowing of their social networks in later life with males said to experience markedly more shrinkage of their networks than females. Older women tend to maintain more social contacts beyond the family than older men do, with older men primarily relying on their partners for social support (Tiikainen & Heikkinen, 2005). As well as the objective structural dimensions of older adults' social networks, research has also focused on the attendant subjective appraisals of these social resources.

The concomitant subjective dimension of an individual's social network involves the perceived supportive quality of their social relations (Berkman et al., 2000; Stephens, Alpass, Towers, & Stevenson, 2011). Psychosocial benefits are associated with perceptions of the provision and receipt of socioemotional support. Perceived social support from friends and family can reinforce a stronger sense of meaning in individuals'

lives, and the providers of such support report experiencing lower levels of negative emotion and higher levels of positive emotion (Charles & Carstensen, 2010). Support exists for the buffering influence of social support, particularly emotional support, against depressive symptomatology (Berkman et al., 2000). Further, perceived social support has been positively associated with both physical and mental health (Cornwell & Waite, 2009), as well as higher levels of life satisfaction (Aquino, Russell, Cutrona, & Altmaier, 1996). Moreover, the perceived adequacy of one's social support, rather than the availability of this resource, appears to be robustly associated with psychological wellbeing (Berkman et al., 2000). Thus, social resources are an integral dimension for the pursuit of successful ageing (Mendes de Leon, 2005), and, their implications for retirees' psychological wellbeing during the retirement transition will be discussed next.

Older adults cite social resources as a central factor of successful ageing (Depp et al., 2010), and these resources are associated with an increased likelihood of positive adaptation to late-life challenges (McFadden & Basting, 2010; Sadler & Biggs, 2006) such as the retirement process. Adjustment to the retirement transition process occurs in the context of fluctuating social relations (Topa & Alcover, 2015); thus, psychological health is to some extent a function of retirees' social interactions and networks (e.g., family and spousal relations, friends) (Depp et al., 2010) as they attempt to adjust to the social consequences of retirement (Damman et al., 2013; van Solinge & Henkens, 2008). Indeed, social support has been shown to mediate the relationships between perceived resource loss and wellbeing (Topa, Jiminez, Valero, & Ovejero, 2016). Additionally, Tiikkainen and Heikkinen (2005) assert that subjective assessments of older adults' social interactions are of particular relevance, as age-related declines in health, functional capacity, and social network size may change the qualitative aspects of social interaction. Congruent with this view, White, Philogene, Fine, and Sinha (2009) found that a low level of perceived social support is a risk factor for poorer health outcomes among older adults. Further, Ryan and Willits (2007) demonstrated that the perceived quality of older adults' familial relations was associated with positive feelings of wellbeing, while social network size had a negligible influence on both physical and psychological health. Similarly, Antonucci, Fuhrer, and Dartigues (1997) found social network size and structure explained less variance in older adults' symptoms of depression than did perceived satisfaction with their social relations. Thus, while it is clear that the subjective

appraisals of retirees' social resources are important to consider in the context of retirement adjustment, in previous times perceived social support has been less frequently investigated than objective indicators such as social network structures (Bowling, 1994). In addition to consideration of the perceptions of social resources, some attention to the familial and partnered contexts in which these appraisals occur is warranted.

Given the family sphere is frequently considered of greatest importance to retirees (Szinovacs & Davey, 2005), most research targeting social resources and retirement has concerned the influence of family members and family-related characteristics on retirement at the individual level (e.g., pre-retirement planning, retirement timing, attitudes to retirement, bridge employment decisions) (Matthews & Fisher, 2013; Shultz & Olson, 2013; Szinovacs, 2013). The family has been shown to be a strongly influential factor in the retirement adjustment (Shultz & Olson, 2013) with respect to a variety of retirement-related phenomena; long and short term cross-spousal effects on self-rated health (e.g., Curl & Townsend, 2014); retirement decision making and retirement satisfaction (e.g., Szinovacs & Davey, 2005), and retirement satisfaction and perceptions of spousal influence on retirement decisions (e.g., Smith & Moen, 2004). Indeed, the interdependence of spousal relationships makes them a particularly salient adjustment resource for retirees (van Solinge, 2013), and, further, the examination of these relationships ought to be pursued as retirees often retire in the context of partnered relationships. As an illustration, more positive attitudes toward retirement are maintained by married older adults than by those who are not (Matthews & Fisher, 2013), divorced retirees are more likely to miss social dimensions of previous employment than are partnered retirees (Damman et al., 2013), married individuals report higher retirement satisfaction than do unmarried retirees (Matthews & Fisher, 2013), and spousal illness, or the loss of a partner, during retirement has a negative impact on retirement satisfaction (van Solinge, 2013). However, research concerning social resources and psychological wellbeing during the retirement adjustment process has lagged behind health and wealth studies of retirees at the individual level (Koopmann & Wang, 2016; Wang et al., 2011). Hence, a growing call for consideration of retirement as a 'couple-level' experience to complement individual level investigations has emerged (Curl & Townsend, 2014; Kim & Moen, 2002; Smith & Moen, 2004; van Solinge, 2013; van Solinge & Henkens, 2005; Wang et al., 2011). Moreover, within the comparably small number of studies addressing

this concern, scarce information has been generated regarding social support networks other than those of the familial and spousal types (van Solinge, 2013). Thus, taken together, it is clear that various aspects of retirees' social resources (e.g., social network dimensions, perceptions of social support, familial and spousal support) are pivotal in attaining successful ageing outcomes across the retirement adjustment process.

To address the paucity of longitudinal research concerning social resources, psychological wellbeing, and the retirement adjustment process, a resource-based dynamic framework (e.g., Wang et al., 2011) can be adopted to investigate the potential mediating influence of change in social resources (i.e., perceived social support) on the relationship between job-related conditions (i.e., job satisfaction and job stress) and retirement adjustment quality (i.e., post-retirement psychological wellbeing) over time. Figure 2 depicts the proposed mediation model. The following section will further detail the rationale and approach of the current study.

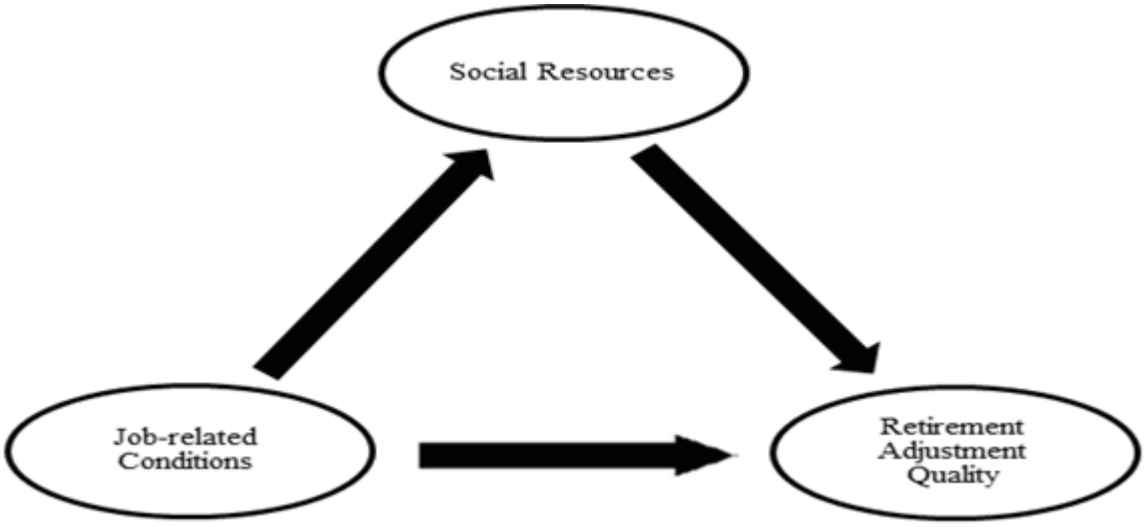

Figure 2. Resource-based dynamic model for testing the potential for mediation of retirees' job-related conditions and their retirement adjustment quality via change in social resources.

Present Investigation

The broad aim of the current study is to address the present paucity of longitudinal retirement adjustment research (Matthews & Fisher, 2013; Shultz & Wang, 2011; van

Solinge, 2013) with respect to social resources and how change in these resources may influence retirees' levels of retirement adjustment quality during retirement. From a resource-based dynamic perspective, retirement adjustment is seen as a longitudinal process which fluctuates as a function of given resources and changes in these resources (Wang et al., 2011). One such resource in the social domain is perceived social support. Guided by Wang et al.'s (2011) resource-based dynamic model, the primary focus of this investigation will be to examine if change in perceived social support across time mediates the relationships between retirees' job satisfaction and their post-retirement psychological wellbeing, as well as their job stress and their post-retirement psychological wellbeing. Data from the Health, Work, and Retirement (HWR) study's (Alpass et al., 2007) 2006 and 2014 data waves will be used to test hypotheses generated by the model. Before proceeding with longitudinal analyses of these data, cross-sectional analyses of the 2006 wave will be conducted to determine whether the theorised relationships between the identified constructs are supported at the cusp of the retirement transition before participants entered retirement.

The two cross-sectional hypotheses pertain to the function of perceived social support as a mediator of the relationships between job satisfaction and psychological wellbeing, and job stress and psychological wellbeing. It is hypothesised that perceived social support will mediate both the relationship between participants' job satisfaction and their psychological wellbeing, and retirees' job stress and their psychological wellbeing.

The two longitudinal hypotheses regard the function of change in perceived social support as a mediator of the relationships between job satisfaction and job stress, and post-retirement psychological wellbeing. Consistent with the notion that changes in retirees' resources influences their retirement adjustment (Wang et al., 2011), hypotheses three and four predict that the respective relationships between retirees' job satisfaction and job stress and their post-retirement psychological wellbeing will be mediated by change in perceived social support over the eight-year duration from 2006 to 2014. A summary of the research hypotheses is outlined below.

Summary of Hypothesis Testing

Cross-sectional hypotheses.

Hypothesis 1.

H_{A1}: Perceived social support will mediate the influence of job satisfaction on psychological wellbeing.

Hypothesis 2.

H_{A2}: Perceived social support will mediate the influence of job stress on psychological wellbeing.

Longitudinal hypotheses.

Hypothesis 3.

H_{A3}: Change in perceived social support will mediate the influence of job satisfaction on post-retirement psychological wellbeing across the period of 2006 to 2014.

Hypothesis 4.

H_{A4}: Change in perceived social support will mediate the influence of job stress on post-retirement psychological wellbeing across the period of 2006 to 2014.

Chapter Two: Method

To test the research hypotheses, data were drawn from the longitudinal data banks of the superordinate Health, Work, and Retirement Study (Alpass et al., 2007). Thus, the project is a secondary analysis of Alpass et al.'s (2007) datasets. As backdrop to the present study, a brief overview of the parent research programme will follow next.

Overview of the Health, Work, and Retirement Study

Since its inception in 2006, the Health, Work, and Retirement (HWR) study (Alpass et al., 2007) has longitudinally investigated the impact of the retirement transition on older adults' independence, health, and wellbeing. Funding for the study was provided by the Health Research Council of New Zealand (HRC05/311) for data collection conducted by Massey University's Health and Aging Research Team (HART) in 2006. The HWR study's 2014 wave was supported by the Ministry of Business Innovation and Employment (MAUX1205; MAUX1403). Ethical approval of the study was granted by the Massey University Human Ethics Committee: Palmerston North 05/90; Southern B 09/70 and 13/30.

Data for the HWR study have been, and continue to be generated and collected, via a postal survey assessing various facets of both physical and mental health, associated psychosocial factors, work, retirement status, attitudes towards work, socioeconomic status (SES), and demographic characteristics. Core measures have been included as part of each data wave for longitudinal analyses, and other assessment measures have been included or excluded in accordance with the requirements of given cross-sectional research aims. The surveys comprise seven domains; (1) health; (2) physical activity; (3) social support; (4) work status and attitudes; (5) retirement status and attitudes; (6) sociodemographic information, and (7) whakapapa and whanaungatanga. Sections of the questionnaire are composed of a selection of referenced measures and items specifically developed for the HWR study.

Data collection. The population of interest for the HWR study was New Zealanders aged between 55 and 70 years. A nationally representative sample (i.e., in terms of age, gender, ethnicity) comprising 13,045 New Zealanders was selected using

the New Zealand Electoral Roll as the sampling frame (Towers, 2007; Towers & Noone, 2007). As electoral roll registration is mandatory in New Zealand, representation is consequently high (e.g., 96% of all New Zealanders over 18 years of age were enrolled in 2007). Thus, the electoral roll afforded a virtually optimal reflection of the population characteristics of the general, typically resident, New Zealand adult population (Towers, 2007) with which to minimise potential frame inefficiencies. Māori were oversampled to maximise recruitment, and to ensure representation by adjusting for an estimated conservative response rate owing to low population representation, 7.6% of the general population aged 55 to 70 years in 2007 (Statistics New Zealand, 2007). Equal probability random sampling was used to select participants from both populations of interest to generate the two sub-samples; a general population sample (n = 5,264), and a Māori sample (n = 7,781). These sub-samples were treated independently, and, individuals in institutions (e.g., prison, nursing homes, or dependent care) were excluded from the study (Towers, 2007).

Target sample size calculations were determined with reference to previous longitudinal health focused, survey based studies, response rates from the HWR 2005 pilot study, and Dillman's (2000) statistical power guidelines for large-scale population postal surveys (Towers, 2007). On the basis of these considerations, expected response rates, and a ten-year study duration of five data collection waves, the HWR study is forecast to yield equal to or greater than 90% power to detect effects of moderate size with a significance criterion of $\alpha = 0.05$, using 15 independent variables (Bornstein, Rothstein, & Cohen, as cited in Towers, 2007).

The HWR study's five wave postal survey schedule was based on Dillman's (2000) Structured Approach to Survey Design, consisting of five researcher-participant contact points over 11 weeks, in order to maximise response rates. The first stage involved a brief letter informing prospective participants of their random selection from the electoral role, and the arrival of the questionnaire in approximately one week. The second stage occurred a week after initial contact where an information pack including the questionnaire and a free-post return envelope was sent, and these were accompanied by a cover letter detailing the premise of the study and who was involved, as well as

participants' rights, and contact details in case they required further information. The questionnaire contained a consent form which participants could complete if they wished to provide their consent to participate in the longitudinal dimension of the study, as well as face-to-face interviews. At week 3, a card was posted to all participants, thanking all those who had responded and encouraging those to do so who had not. The final two stages entailed contact approaches to all non-respondents; a replacement questionnaire was issued at 6 weeks, and a final card was sent at 11 weeks to encourage non-respondents to participate.

Response rates, final sample size, and longitudinal design. Postal surveys for the 2006 HWR data wave were issued to a total general population sub-sample of 5,264 prospective participants, from which 210 individuals were excluded due to their inability to participate in the study (e.g., they were uncontactable, deceased, or had been institutionalised). This further reduced the general sub-sample to n = 5,054 (Towers, 2007). The response rate for this sample was 61.4 % (n = 3,101) (Towers, 2007), and 46.9 % of respondents in the original sample expressed interest in participating in the study's subsequent data collection waves (Allen, 2016). Given the present study's longitudinal focus on retirement adjustment, only data generated by HWR study participants who were in paid employment at 2006 (T1) and had retired by 2014 (T2) were used, providing an eight-year retirement adjustment period. Table 3 depicts the initial response rate and longitudinal retention rates for participants in the general sub-sample who were working at T1 and had retired by T2, and had completed the postal surveys over the course of eight years, as well as the final total sample size for this study (n = 435). These participants represent 8.6% of the originally invited general population sub-sample.

Table 3. *General Population Sub-sample Postal Questionnaire Return Rates and Longitudinal Retention Rates for the HWR Study 2006 and 2014 Waves.*

Category	General Electoral Roll
Total population 55-70 years	609,000
Total general population sub-sample drawn	5,264
Prospective participants excluded	210
Sample invited	5,054
Response rate 2006 wave	3101 (61.4%)
Participants eligible for present investigation	435

Note. * Participants excluded due to inability to make contact, being deceased, living in an institution, or were not in paid employment in 2006 and retired by 2014.

Participant Characteristics

Participants for the present study (n = 435) were in paid employment at T1 (54.3% in full-time work and 46.7% in part-time work) and all were in retirement at T2. Almost half the sample was aged between 60 and 64 years (44.6%), with a third aged between 55 to 59 years (33.3%), and slightly more than a fifth aged 65 to 70 years (22.1%). The gender balance of the sample is approximately equivalent between males (50.3%) and females (49.7%). The majority of the sample (65.5%) ethnically identified as New Zealand European, almost a third identified as Māori (30.3%), and 2.3% of participants identified as either of Asian (0.5%) or 'Other' (1.8%) ethnicity. Over three quarters of the sample had a partner (76.8%) as compared with marginally more than a fifth who did not (22.1%). The most common level of educational attainment was 'post-secondary' (43.0%), followed by 'tertiary' (20.2%), 'no qualification' (19.3%), then 'secondary' (17.5%). The majority of the sample reported experiencing 'good' economic living standards (58.2%), while approximately a third reported a 'comfortable' level (32.9%), and less than 10 percent reported living in 'hardship' (8.3%). Sample composition characteristics are detailed in Table 4.

Table 4. *Description of Sample Characteristics.*

		n	Proportion (%)
Age			
	55 – 59	145	33.33
	60 – 64	194	44.60
	65 – 70	96	22.07
		435	100.0
Gender			
	Male	219	50.34
	Female	216	49.66
		435	100.0
Ethnicity			
	New Zealand European	285	65.52
	Māori	132	30.34
	Asian	2	0.46
	Other	8	1.84
	Missing	8	1.84
		435	100.0
Marital Status			
	Partnered	334	76.78
	Not Partnered	96	22.07
	Missing	5	1.15
		435	100.0
Educational Level			
	No Qualification	84	19.31
	Secondary	76	17.47
	Post-secondary	187	42.99
	Tertiary	88	20.23
		435	100.0
Employment Status			
	Full-time Work	236	54.25
	Part-time Work	199	45.75
		435	100.0
Economic Living Standards			
	Hardship	36	8.28
	Comfortable	143	32.87
	Good	253	58.16
	Missing	3	0.69
		435	100.0

Note. Table values rounded to 2dp as per APA 6th edition.

Measures

The measures implemented in the present investigation featured in the 2006 and 2014 HWR study postal questionnaires. A copy of the 2006 HWR survey has been appended (see Appendix). The following section reviews the operationalisations for the current study's primary constructs of interest, namely, (1) job satisfaction, (2) job stress, (3) perceived social support and (4) retirement adjustment quality, as well as associated sociodemographic, and health variables. The cut-off criterion for acceptable internal consistency in the present investigation was a Cronbach's α coefficient of 0.70.

Sociodemographic variables.

Age. Participants were asked to provide their date of birth, and this, in conjunction with the date on the questionnaire, was used to determine the ages of participants.

Economic standard of living. Economic standard of living was assessed using the Economic Standard of Living Index-Short Form (ELSI-SF). The ELSI-SF is a survey instrument designed to measure people's economic living standards (Jensen, Spittal, & Krishnan, 2005). This is a non-income based evaluation of an individual's economic standard of living pertaining to material aspects of wellbeing, such as a person's consumption, possessions, and activities (e.g., clothing, social participation, economising, access to medical services), rather the financial means which enable them. The 25-item additive index consists of four sub-scales relating to the following; (1) ownership restrictions (seven, 4-point nominal items); (2) social participation restrictions due to cost (seven, 4-point nominal items); (3) economising behaviours (eight, 3-point ordinal items), and (4) self-assessed indicators of living standards (three items). Example items of the four ELSI-SF 'ownership restrictions', 'social participation restrictions', 'economising behaviours', and 'self-assessed living standards' sub-scales are respectively as follows; (1) *'A good pair of shoes'*; (2) *'Have a night out at least once a fortnight'*; (3) *'Stayed in bed longer to save on heating costs'*, and (4) *'Generally, how satisfied are you with your current standard of living?'*.

Sub-scale scores are combined to create a total possible score range of 0 to 30, with higher scores indicating better economic living standards (Jensen et al., 2005). Thus, the ELSI-

SF yields a continuous variable which can also function as a 7-level ordinal variable when scores are stratified by economic living standard ranging from ‘severe hardship’ to ‘very good’. The ELSI-SF has shown good discriminant and convergent validity (Jensen et al., 2005), as well as sound internal consistency: $\alpha = 0.88$ (Jensen et al., 2005), $\alpha = 0.81$ (Stephens, Alpass, & Towers, 2010). Reliability analysis for this study determined the ESLI-SF to have an acceptable Cronbach’s α of 0.76.

Education. Initially, two items were used to determine participants’ educational attainment. An eight-point nominal item was used to determine participants’ highest secondary school qualification. Response options were as follows; (1) ‘No school qualifications’; (2) ‘NZ School Certificate in one or more subjects’; (3) ‘NZ Sixth Form Certificate in one or more subjects’; (4) ‘NZ Higher School Certificate or Higher Leaving Certificate’; (5) ‘NZ University Entrance’; (6) ‘NZ A or B Bursary or University Scholarship’; (7) ‘Other NZ secondary school qualification’, and (8) ‘Overseas secondary school qualification’. A dichotomous item was also used to determine whether or not participants had any other qualifications apart from secondary school qualifications; participants were not to include incomplete qualifications or those which took less than three months’ full-time study to complete. The response format for this item was as follows; (1) ‘Yes (Please print your highest qualification below)’, and ‘No’. Participants responses to these two items were then amalgamated, and their levels of educational attainment categorised for later analyses in the following form; (1) ‘no qualification’; (2) ‘secondary school qualification’; (3) ‘post-secondary qualifications’, or (4) ‘university degree’.

Employment status. The employment status of participants was measured using an eight-point item. Participants were asked to indicate their current work status by selecting from the following options; (1) ‘full-time paid employment’ ($\geq$ 35 hours per week); (2) ‘part-time paid employment’ ($<$ 35 hours per week); (3) ‘retired, no paid work’; (4) ‘full-time student’; (5) ‘unable to work due health or disability related issue’; (6) ‘unemployed’, and (7) ‘other’. Participants in the present study were in either full-time or part-time employment at T1, and were retired at T2.

Ethnicity. An adaptation of the 2006 New Zealand Census ethnic identity item was used to ask which ethnic group participants most identified with. Participants could only choose one of nine ethnic identities; (1) New Zealand European; (2) Māori; (3) Samoan; (4) Cook Island Māori; (5) Niuean; (6) Chinese; (7) Indian; (8) Tongan, and (9) 'Other' (e.g., Dutch, Japanese, Tokelauan).

Gender. Participants were asked to identify as either male or female.

Marital status. Participants were asked to select one option from a list of relationship statuses. The original marital status item used in the 2006 wave of the HWR study was adapted to include same-sex relationships for the subsequent data waves. Data from those participants who identified as being married or in a civil union (either opposite or same sex) were aggregated to form the variable of 'partnered' for the present study. The four other marital statuses were 'divorced/separated', 'widowed', 'single' or 'never married', and these were aggregated as 'not partnered'.

Work-related variables.

Job satisfaction. Job satisfaction was measured using an adaptation of the Job Satisfaction Scale (Warr, Cook, & Wall, 1979), a 15-item measure (comprised of 7-point ordinal Likert scale items) which assesses the degree to which an individual experiences satisfaction with both the intrinsic and extrinsic aspects of their job. Participants are asked to indicate how satisfied or dissatisfied they were with regard to aspects of their job with responses ranging from *'Extremely unsatisfied'* to *'Extremely satisfied'*, with a neutral mid-point response option of *'I'm not sure'*. An example item is as follows: *'The recognition you get for good work'*. The measure has previously demonstrated good internal consistency and factorial validity (Warr et al., 1979). The four items used for the adapted measure were summed to form a total score ranging from 4 to 28. The scale items were the following; *'The recognition you get for good work'*; *'Your opportunity to use your abilities'*; *'Your hours of work'*, and *'The amount of variety in your job'*. Reliability analysis for the adapted Job Satisfaction Scale in this study was sufficient ($\alpha = 0.78$).

Job stress. Job stress was assessed using the Job Stress Index developed by the HART Team for the 2006 wave of the HWR study. The measure consists of 16-items using 6-point ordinal Likert scales. Response options range from *'Strongly disagree'* to *'Strongly agree'* with a neutral mid-point of *'Neither agree nor disagree'*. The adaptation of the Job Stress Index used in this study comprised six items; (1) *'I enjoy my work environment'*; (2) *'If something in my work environment is annoying me then I can get it changed or removed'*; (3) *'I find my job stressful'*; (4) *'I often seem to have a lot of work to do at once'*; (5) *'I work longer hours than most people'*, and (6) *'I have often had physical symptoms [e.g., headaches, high blood pressure] that were a result of the stress of my job'*. These six items were summed to form a total score ranging from 6 to 30. The internal consistency for the adapted Job Stress Index in the present study approached the threshold of acceptability ($\alpha = 0.63$), although, a threshold of $\alpha = 0.60$ may be acceptable in exploratory research (Hair, Black, Babin, & Anderson, 2010). Therefore, while it is methodologically permissible to employ this measure, inferences drawn from the subsequent analyses ought to be tempered with caution.

Occupation. Primary occupation status was assessed with a variant of the 2001 NZ Census question: "If in paid employment: What is your occupation in your main job?" Participants were encouraged to be as specific as possible (e.g., clothing machinist, primary school teacher). Occupations were then classified using version 1.2 of the Australian and New Zealand Standard Classification of Occupations (ANZSCO) protocol (ANZSCO, 2013). Participant responses were then dichotomised for analysis as either 'professional' (e.g., lawyer) or 'non-professional' (e.g., labourer).

Time in retirement. The duration elapsed since participants entered retirement was based on the data wave in which participants first identified as being retired.

Health and social variables.

Physical health. Physical health status was operationalised at T1 and T2 via the Physical Component Summary (PCS) score, a sub-measure of the Medical Outcomes Study Short-Form Health Survey version two (SF-12v2). The SF-12v2 has been developed from its original parent measure (Fleishman, Selim, & Kazis, 2010), the 36-

item Medical Outcomes Study Short-Form Health Survey (SF-36), and the 12-item derivative, the SF-12 (McHorney, Ware, & Raczek, 1993). The twelve items comprising the SF-12v2 Australian and New Zealand form were rated by participants on 5-point and 3-point ordinal Likert scales. All items contributed to the calculation of two factor scores. The PCS has positive weights for items assessing 'physical functioning', 'role physical', and 'pain and general health', while the Mental Component Score (MCS) has positive weights for items assessing 'vitality', 'social functioning', 'relationships and mental health items'. Scoring utilised normative subscale scores for the New Zealand population derived from the 2008 General Social Survey and factor score coefficients derived from the 2006 New Zealand Health Survey (Frieling, David & Chiang, 2013). Examples of the PCS items include the following; *In general, would you say your health is* (1) *Excellent,* (2) *Very good,* (3) *Good,* (4) *Fair,* (5) *Poor*; *During the past four weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?* (1) *Not at all,* (2) *A little bit,* (3) *Moderately,* (4) *Quite a bit,* (5) *Extremely*. Higher scores on the SF-12v2 and PCS reflect better health status (Ware, Kosinski, Turner-Bowker, & Gandek, 2002).

Psychometric evaluation of the SF-12v2 has indicated sound criterion-related, discriminant, concurrent, convergent (Cheak-Zamora, Wyrwich, & McBride, 2009; Lam, Lam, Fong, & Huang, 2013; Montazeri et al., 2011), and construct validity (Cheak-Zamora et al., 2009; Fleishman et al., 2010; Lam et al., 2013). In terms of internal consistency, Cronbach's alpha reliability estimates of the SF-12v2 have been routinely reported as satisfactory to robust in studies of general and clinical populations, (e.g., α = 0.73 to 0.87 (LeBlanc et al., 2007; Ware et al., 2002), α = 0.77 to 0.80 (Ohrbach et al., 2010)). Specifically, the PCS measure has indicated robust reliability across numerous studies, (e.g., α = 0.88 (Cheak-Zamora et al., 2009), α = 0.89 (Draper et al., 2008), α = 0.82 (Lam et al., 2013), α = 0.87 (Montazeri et al., 2011)). The reliability of the PCS was sufficient for use in the present study (α = 0.72).

Perceived social support. Perceived social support was assessed using the Social Provisions Scale (SPS) (Cutrona & Russell, 1987), which was developed on the basis of Weiss' (as cited in Weiss, 1998) identification of six domains of perceived functional

relations in human relationships; (1) ‘attachment’ (sense of emotional closeness and security, typically provided by a partner); (2) ‘social integration’ (belonging to a group of people with common interests and activities, commonly obtained via friends); (3) ‘reassurance of worth’ (acknowledgement of skills and competence, usually obtained from colleagues); (4) ‘reliable alliance’ (assurance of reliance on others for assistance, usually from family members); (5) ‘guidance’ (information and advice), and (6) ‘opportunity for nurturance’ (sense of responsibility for the wellbeing of another) (Cutrona, Russell, & Rose, 1986). Participants were asked to rate the extent to which their present social relationships supplied each of the six provisions by responding to the 24-item additive scale; each provision is captured by four items (two describing presence, and two describing absence). For example, two of the four items used to describe ‘attachment’ are (1) *“I have close relationships that provide me with a sense of emotional security and wellbeing”* and (2) *“I lack a feeling of intimacy with another person”*. Respondents rate their degree of agreement with each statement on a 4-point ordinal scale ranging from *“completely true’* to *“not at all true”*. Negatively worded items are reverse-coded and summed with positively worded items for each social provision sub-scale (ranging from 4-16), and, in turn, all sub-scale totals are summed to give a total social provision score (ranging from 24-96). Higher scores indicate greater perceived social provisions (Cutrona et al., 1986).

The psychometric properties of the SPS have been supported extensively with older adult and elderly populations (Cutrona et al., 1986; Kahn, Hessling, & Russell, 2003; Lyyra & Heikkinen, 2006; Russell & Cutrona, 1991). The overall internal consistency of the SPS has been supported with Cronbach’s α coefficients ranging from 0.83 to 0.92 (Cutrona, 1986; Cutrona et al., 1986; Cutrona & Russell, 1987; Kahn et al., 2003; Lyyra & Heikkinen, 2006; Stephens & Noone, 2008). However, the sub-scales of the SPS have generally demonstrated somewhat lesser reliability ranging from $\alpha = 0.76$ to $\alpha = 0.84$ (e.g., Lyyra & Heikkinen, 2006; Russel & Cutrona, 1991) to internal consistencies approaching acceptability, $\alpha = 0.64$ to $\alpha = 0.76$ (e.g., Cutrona, 1986; Cutrona et al., 1986). The factorial validity of SPS is supported by its six factor structure corresponding to the six theorised social provisions (Cutrona et al., 1986), and the measure has sound support for its predictive, concurrent, discriminant, convergent, and construct validity (Cutrona et al., 1986; Kahn et al., 2003; Russell, Altmaier, & van Velzen, 1987; Russell & Cutrona,

1991). For the present study, Cronbach's α for the total SPS was 0.88 at T1 and 0.88 at T2.

Retirement adjustment quality. The outcome index for retirement adjustment quality in the present study was psychological wellbeing, which was operationalised at T1 and T2 using the MCS score, a sub-measure of the Medical Outcomes Study SF-12v2. The development, format, factor scores, reliability and validity, as well as norming of the SF-12v2 (Fleishman et al., 2010; Frieling et al., 2013; Ware et al., 2002) have been detailed previously in the *Physical health* sub-section, so the focus of this sub-section will be restricted to the relevant properties of the MCS. The MCS comprises sub-scales pertaining to 'energy and vitality' (1 item), 'social functioning' (1 item), 'role limitations due to emotional problems' (2 items), and 'mental health' (2 items) (Frieling et al., 2013). An example item is as follows: *During the past four weeks, how much of the time have you had any of the following problems with your work or regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?* (1) *Cut down on the amount of time you spent on work or other activities*, (2) *Accomplished less than you would like*, (3) *Didn't do work or other activities as carefully as usual*. All parts of the example item were answered on a 5-point Likert scale: (1) *All of the time,* (2) *Most of the time,* (3) *Some of the time,* (4) *A little of the time,* (5) *None of the time*. Higher scores on the MCS reflect better health status (Ware et al., 2002). The MCS measure has indicated robust reliability across numerous studies, (e.g., $\alpha = 0.82$ (Cheak-Zamora et al., 2009), $\alpha = 0.86$ (Draper et al., 2008), $\alpha = 0.81$ (Lam et al., 2013), $\alpha = 0.82$ (Montazeri et al., 2011)). Reliability analysis indicated the MCS had sufficient internal consistency for its inclusion at T1 ($\alpha = 0.83$) and at T2 ($\alpha = 0.79$) in the present study.

Measurement of Change

Pre- and post-scores with covariate adjustments were used to test the hypotheses relating to change in social resources (i.e., perceived social support) and retirement adjustment quality (i.e., psychological wellbeing) from T1 to T2. These were used in preference to (1) raw change scores or (2) residualised change scores. With respect to the raw change score approach, when measuring change across two time points (e.g., T_a and T_b), raw change scores for a variable are calculated by subtracting a follow-up measurement from

a baseline measurement (e.g., T_b - T_a), with the resulting difference score then regressed on the predictor. While this approach has frequently been proposed as a generally acceptable procedure in the analysis of non-experimental data (Kessler, 1977) often because of its appealing face validity (Griffin, Murray, & Gonzalez, 1999), there exists the widely appreciated problem that change is not generally independent of baseline status (Raykov, 1992). More specifically, this dependence could be a consequence of the presence of a problematic degree of measurement error (Raykov, 1992), or perhaps the existence of different factor structures at T_a and T_b. Further, raw change scores tend to have lower reliability than their component variables (Allison, 1990; Edwards, 2001), are correlated with the measurement error of both their components, and are susceptible to regression toward the mean (i.e., participants with high T_a scores will tend to have lower scores at T_b, and those with low T_a scores will have higher scores at T_b) (Allison, 1990; Kessler, 1977). Thus, simple raw change scores suffer from serious limitations.

An alternative approach to raw change scores is to create residualised change scores which have the advantage of virtually removing the indirect effect of the T_a score by taking the simple difference between the observed T_b score and the predicted T_b score after regressing T_b on the T_a. While it has been asserted that these residualised scores yield superior reliability of estimation to that of simple difference scores (Pendleton, Warren, & Chang, 1979), one disadvantage of partitioning observed T_a scores from observed T_b scores is that it may create interpretative difficulty given the derivation of different score units (Dalecki & Willits, 1991), and, it follows, that inconsistent estimates of relevant correlation coefficients will then threaten subsequent inferential validity (Raykov, 1992). Moreover, the assumption of explanatory variables being known without error is violated, because a potentially fallible 'predictor' (i.e., the T_a response variable) is involved in the construction of a residualised score.

A more favourable strategy for measuring change-from-baseline in the outcome measure is to include the T_a measurement of the outcome variable as a covariate in the regression analysis so as to control for the confounding influence of initial intra-sample differences as well as the T_a measurement's relationship to a study's given predictors (Cochrane Collaboration, 2011; Dalecki & Willits, 1991). Thus, by entering the T_a score into the

predictor equation as a covariate adjustment, the T_b score is not confounded by initial intra-sample differences at T_a, and this form of covariate control offers a reduced bias in the resulting estimate (Cochrane Collaboration, 2011; Dalecki & Willits, 1991). Additionally, given this approach allows for the outcome variable to maintain its original reliability and validity, there is no loss of measurement information as can sometimes occur when using raw change scores (Griffin et al., 1999). The present study used pre- and post-scores with covariate adjustments to measure change in the longitudinal analyses.

Chapter Three: Results

All statistical analysis, except for power analysis, was conducted using *Statistical Package for Social Sciences (SPSS) Version 22* with the incorporation of the *PROCESS Version 2.16* macro (hereafter referred to as 'PROCESS') for mediation, moderation, and conditional level modelling (Hayes, 2012).

Power Analysis

Power analysis was calculated using the statistical power calculation programme, *G*Power Version 3.1* (Faul, Erdfelder, Lang, & Buchner, 2007). To obtain power of 80% with a statistical significance cut-off criterion of $\alpha = 0.05$, a conservative expected effect size of 0.1, and 14 predictors (all independent, mediator, and proposed control variables), a total sample of n = 196 was required. Further, a desirable case-to-independent variable ratio is 20 to 1 (Hair et al., 2010); thus, for the present study, a sample of n = 280 was required to match this ratio. Therefore, the present study's sample size (n = 435) comfortably exceeded the minimum required sample size for sufficient power.

Missing Data and Imputation

Little's missing completely at random (MCAR) test was conducted for the principal variables in this study (i.e., MCS, SPS, Job Satisfaction, and Job Stress), and was non-significant, χ^2 (69) = 73.20, p = 0.34. Thus, it could be inferred that any missing data were MCAR, and devoid of non-random bias with respect to missing data (Tabachnick & Fidell, 2013); however, this inference should be tempered with the following item imputations for Job Satisfaction and Job Stress. Missing data in items from these scales resulted in considerable reduction in n when using listwise deletion in multivariate analyses. To maximise item response for these scales, imputation of their item responses was undertaken. Where participants missed one item on the Job Satisfaction Scale (n=19), missing item scores were replaced by imputing the mean item response values from participants' responses on the remaining three items. Similarly, for the Job Stress Index, where participants missed one item on this scale (n=32), missing item scores were replaced by imputing the mean item response values from participants' responses on the remaining five items.

The extent of missing data for all variables was less than the generally accepted cut-off of 10% (Hair et al., 2010), except for Job Satisfaction (11%) and Job Stress (12.4%). However, as these percentages were only marginally beyond the 10% threshold, this degree of missing data was considered acceptable in a sample of this size. To test whether the extent of missing data impacted the study findings, missing values were estimated for all principal variables using the series mean. This form of imputation is a conservative estimate as the mean is the best estimation of a variable's value, and the mean of a given variable's distribution as a whole does not alter (Tabachnick & Fidell, 2013). Analyses were undertaken using both imputed and unimputed data and no substantive difference in direction or magnitude of findings was evident between the two data sets. To ensure this procedure was not detrimental to subsequent analyses, comparisons of the correlation matrices of the imputed and unimputed variables were undertaken, and were determined to be substantively similar. Therefore, the following reported analyses are those of the imputed data set.

Exploratory Univariate Analyses and Descriptive Statistics

Initial univariate inspection of the data was performed using histograms, box-plots, and unstandardised quantile-quantile plots (QQ plots) for the principal variable distributions at T1 and T2. A mild to moderate degree of negative skewness was evident in all of the variables, except for Total SPS (T2) which had a symmetrical distribution (i.e., the mean was equal to the median). This skewness was acceptable given Central Limit Theorem (CLT) holds that for sample sizes of $n \geq 30$, irrespective of how the sample data are distributed, as sample size increases the sampling distributions of the variables will increasingly approximate the normal distribution (Tabachnick & Fidell, 2013). All variable distributions had slight positive kurtosis. In some cases, positive kurtosis can bias estimations of variance; however, with samples of $n \geq 100$ the detrimental influence of positive kurtosis disappears (Tabachnick & Fidell, 2013). Probable outliers (1.5 x the inter-quartile range) were detected in only two of the variable distributions. Both of these featured in the left tails of the MCS (T1) and Job Satisfaction distributions.

Table 5 provides descriptive statistics for all principal variables at T1 and T2. The left-skew for five of the six distributions is indicated by the median (M) being greater than

the mean ($\bar{y}$), and this is due to the tendency for the mean to be more affected by extreme values than the median. Standard deviations (SD) for both the MCS and Total SPS T1 and T2 scores show similar variability in their baseline and respective follow-up scores. A slight increase in the sample's mean MCS scores can be seen, and, conversely, a slight decrease in the mean Total SPS score occurred. Yet, when comparing the medians for T1 and T2 for both MCS and Total SPS, the difference appears slightly more pronounced. Also, response ranges for the MCS decreased from T1 to T2, and those for the Total SPS increased across time.

Table 5. *Sample Means ($\bar{y}$), Medians (M), Standard Deviations (SD), Standard Errors (SE), and Ranges for Principal Variables at T1 (2006) and T2 (2014).*

Variable	$\bar{y}$	M	SD	SE	Range
MCS Score (T1)	50.72	52.57	9.00	0.43	56.52
MCS Score (T2)	51.21	53.48	9.40	0.45	42.25
Total SPS (T1)	80.71	82.00	9.42	0.45	52.00
Total SPS (T2)	79.19	79.19	9.59	0.45	60.00
Job Satisfaction (T1)	21.90	23.00	3.93	0.19	24.00
Job Stress (T1)	15.72	16.00	3.47	0.17	24.00

Note. Table values rounded to 2dp as per APA 6th edition.

Bivariate Analyses

To explore the linearity of relationships and homoscedasticity in the data, bivariate scatterplots were used. Bivariate scatterplots for MCS (T1) plotted on the y-axis, and Total SPS (T1), Job Satisfaction, and Job Stress plotted on the x-axis revealed no evidence of evidence of non-linearity in these bivariate relationships, nor was there any sub-grouping in the data. Thus, it was appropriate to fit a straight line to these data. MCS (T1) appeared to be weakly to moderately positively associated with Total SPS (T1) and Job Satisfaction, and weakly to moderately negatively associated with Job Stress. However, these plots also revealed some heterogeneity, or 'fanning', of variance in the response of MCS (T1) across each variable. This variance appeared to decrease as x-values increased for both Total SPS (T1) and Job Satisfaction, and increase as Job Stress increased. Heteroscedasticity may result from the non-normal distribution of one of the variables or changes in measurement error at different levels of the independent variable (IV). However, the presence of heterogeneity of variance in ungrouped data is not

necessarily catastrophic for their analysis. The linear relationship is still captured; however, the predictive power of its analysis is more diminished than if homoscedasticity was present (Tabachnick & Fidell, 2013). Further, several unusual cases were evident in these plots (i.e., observations which at first glance showed potential for moderate to high influence given their combinations of high potential leverage with low discrepancy, low potential leverage with high discrepancy, or high potential leverage with high discrepancy). Therefore, these were further investigated in later stages of analysis to diagnose whether or not these cases were influential. Bivariate scatter plots were also used to investigate the associations between Total SPS (T1) on the y-axis and Job Satisfaction, as well as Job Stress. No evidence of non-linearity or sub-grouping was present in either plot. Total SPS (T1) appeared to be moderately positively associated with Job Satisfaction, and moderately negatively associated with Job Stress. Variance in Total SPS (T1) seems fairly constant across both variables. Again, several unusual observations featured in these scatterplots, signalling further investigation as to their nature and potential influence was required.

The bivariate scatterplots used for T2 data showed similar findings to those above. Firstly, MCS (T2) was plotted on the y-axis against Total SPS (T2), Job Satisfaction, and Job Stress on the x-axis. Again, these plots showed no evidence of non-linearity or sub-grouping in these data; therefore, a straight line fit was appropriate. MCS (T2) appeared moderately positively associated with Total SPS (T2) and more weakly with Job Satisfaction, as well as weakly to moderately negatively associated with Job Stress. A similar pattern of heteroscedasticity to that in the T1 plots was observed, with variance appearing to decrease as x-values increased for both Total SPS (T2) and Job Satisfaction, and increase as Job Stress increased. Moreover, some unusual cases were evident, and required further investigation to assess their potential influence. Secondly, bivariate mediator versus predictor plots for Total SPS (T2) on the y-axis and Job Satisfaction and Job Stress were also examined. No evidence of non-linearity or sub-grouping was present in either plot. Total SPS (T2) appeared to be moderately positively associated with Job Satisfaction, and moderately negatively associated with Job Stress. Variance in Total SPS (T2) seems fairly constant across both Job Satisfaction and a small degree of increasing variance was noted as Job Stress increased. Again, several unusual observations featured in these scatterplots, and required further investigation in the later

stages of analysis. Pearson's product-moment correlation coefficients were calculated to determine the strength and direction of these associations, and these are featured in Table 6.

Table 6. *Bivariate Correlation Matrix for Principal Variables at T1 (2006) and T2 (2014).*

	MCS Score (T1)	**Total SPS (T1)**	**MCS Score (T2)**	**Total SPS (T2)**	**Job Satisfaction**	**Job Stress**
MCS Score (T1)	1					
Total SPS (T1)	0.31**	1				
MCS Score (T2)	0.38**	0.32**	1			
Total SPS (T2)	0.22**	0.61**	0.39**	1		
Job Satisfaction (T1)	0.21**	0.21**	0.14**	0.18**	1	
Job Stress (T1)	-0.21**	-0.19**	-0.21**	-0.19**	-0.43**	1

Note. Table values rounded to 2dp as per APA 6th edition. ** Correlations were significant at the $p<0.01$ level.

All correlations between the principal variables for both T1 and T2 were statistically significant at the $\alpha = 0.01$ level. Elaborating on the description from the table, the features of note in the bivariate correlation matrix are the following. The IVs were moderately, negatively associated ($r = -0.43$), indicating the need to statistically control for each in the analysis of the other in subsequent analyses. Both MCS variables were moderately, positively associated ($r = 0.38$), and both Total SPS variables were strongly, positively associated ($r = 0.61$). Thus, these correlations underscored the methodological need to control for the T1 variables in the analysis of their T2 counterparts given their shared variance. Job Satisfaction had weak, positive associations with all mediating variables (MVs) and dependent variables (DVs). Weak, negative associations were found between Job Stress and all MVs and DVs. Finally, MCS (T1) and Total SPS (T1) were moderately and positively associated ($r = 0.31$), and the direction and magnitude of this relationship was similar for the T2 variables ($r = 0.39$). As an initial examination, Table 6 provides no evidence of any multicollinearity among the predictors (i.e., associations of $r \geq 0.70$). Table 7 presents Pearson's product-moment correlations between the independent, mediating, and dependent variables and known socio-demographic and other covariates.

Table 7. *Bivariate Correlations for Principal Variables and Covariates at T1 (2006) and T2 (2014).*

Covariate	MCS Score (T1)	Total SPS (T1)	MCS Score (T2)	Total SPS (T2)	Job Satisfaction	Job Stress
Age	0.12*	-0.13*	-0.07	-0.12*	-0.13**	-0.11*
Economic living standards	0.24**	0.24**	0.28**	0.40**	0.23**	-0.19**
Marital Status	-0.03	-0.17*	-0.13*	-0.23**	0.03	0.01
Ethnicity	-0.07	0.02	-0.05	0.00	0.04	-0.07
Education	0.05	0.13*	0.04	0.17**	0.14**	0.04
Occupation	-0.03	-0.07	-0.08	-0.10	-0.18**	-0.07
Physical health	0.12*	0.14**	0.20**	0.09	-0.05	0.01
Time in retirement	-0.09	0.06	-0.05	0.00	-0.03	0.01
Employment Status	-0.08	0.09	0.00	0.06	0.11*	-0.19**
Gender	-0.09	0.10*	-0.02	0.07	0.01	-0.05

Note. Table values rounded to 2dp as per APA 6th edition. ** Correlations were significant at the $p<0.01$ level. * Correlations were significant at the $p<0.05$ level.

Control variables were selected for inclusion in hypothesised mediation models on the basis of their significant associations with the primary variables of each model (i.e., if they were identified as confounds). If a covariate was significantly correlated with either both an IV and a DV, both an IV and an MV, or both an MV and a DV for a given model, then it was statistically controlled for in that model. A summary of the control variables included for each hypothesised mediation model is featured in Table 8.

Table 8. *Summary of Control Variables Included in Each Hypothesised Mediation Model.*

Hypothesis	Independent (*X*), Mediator (*M*), and Dependent (*Y*) Variables	Control Variables
Hypothesis 1 (Model 1)	*X* = Job Satisfaction *M* = Total SPS (T1) *Y* = MCS (T1)	Age, education, physical health, economic living standards, job stress
Hypothesis 2 (Model 2)	*X* = Job Stress *M* = Total SPS (T1) *Y* = MCS (T1)	Age, physical health, economic living standards, job satisfaction
Hypothesis 3 (Model 3)	*X* = Job Satisfaction *M* = Total SPS (T2) *Y* = MCS (T2)	Age, marital status, education, economic living standards, MCS (T1), Total SPS (T1), job stress
Hypothesis 4 (Model 4)	*X* = Job Stress *M* = Total SPS (T2) *Y* = MCS (T2)	Age, marital status, economic living standards, MCS (T1), Total SPS (T1), job satisfaction

Multivariate Analyses

As PROCESS does not provide a residual analysis function, screening of multivariate data with respect to the assumptions of multiple regression was performed through two-step hierarchical multiple regressions for each hypothesised model. These regressions generated the requisite diagnostic values and residual plots to determine whether the assumptions guiding the subsequent mediation analyses had been met.

Assumptions of multiple regression.

Independence of error terms. The assumption of uncorrelated error terms was assessed using the Durbin-Watson (DW) Test. Unlike the statistical software programme R, SPSS does not offer a significance test of the DW statistic; therefore, determination of error correlation will be guided by the assumption that values of *D* close to 2 suggest independence of error terms (Cohen, Cohen, West, & Aiken, 2003). The DW statistics for each model were as follows; Model 1, $D = 1.932$; Model 2, $D = 1.911$; Model 3, $D = 1.965$, and Model 4, $D = 1.949$. Based on these values, there was no evidence of violation of this assumption.

Linearity and homoscedasticity of error terms. Given the sample size, it was justified to use a multivariate outlier threshold of ± 4 for standardised residual values in standardised predicted value versus standardised residual value plots (Hair et al., 2010). This plot type can be used to simultaneously detect problems with multivariate linearity and homoscedasticity using z-scores for predicted values and errors, and, therefore, determine whether these assumptions have been met (Field, 2013). Plots for all four models exhibited an evenly dispersed, random scatter of points, and, thus, no evidence of non-linearity nor heteroscedasticity. Further, all points for each model fell within the ± 4 z-score limits. Therefore, it was concluded that the assumptions of linearity and homoscedasticity had been met.

Normality of the error term distribution. Using histograms of standardised residuals for each model, the error term distribution of each model was negatively skewed, with residual z-scores for each distribution falling between -4 and 3. However, non-normally distributed errors are more serious when attempting to establish trustworthy

significance tests and confidence intervals in small samples (Cohen et al., 2003). As sample size increases, the importance of this particular assumption decreases (Williams, Grajales, & Kurkiewicz, 2013). Therefore, given the size of the present sample, the slightly left-skewed error term distributions mentioned above were cause for minimal concern, as the sampling distribution of the regression coefficients would approximate the normal distribution according to the CLT.

Multivariate outliers. Standardised residual versus standardised predicted value plots were used for the preliminary screening of multivariate outliers. No multivariate outliers were detected using the ± 4 z-score cut-off criterion, nor by visual inspection of the variates for high discrepancy cases in these residual plots. The second stage of outlier detection involved a case-wise approach. Cut-off scores for Mahalanobis distance (using a conservative criterion of $p = 0.001$ for critical χ^2), Cook's distance, and central leverage statistics were calculated for each model, and dummy variables were created for each statistic (i.e., 0 = not an outlier, 1 = potential outliers). If a case was a potential outlier across all three dummy variables, then the case was determined to be an outlier. For the cross-sectional models two outliers were identified, and these were the same cases in each model. The same two cases were also identified as outliers for the longitudinal models. Thus, the two-step hierarchical regressions were re-run with and without these cases, and this resulted in no appreciable differences in fit for any of the models. Therefore, given the extreme caution associated with decisions to delete outlying observations (Cohen et al., 2003; Tabachnick & Fidell, 2013), and having no reason to believe these cases were not members of the population of interest after inspecting the individual cases, it was decided that the outliers should be included in the following mediation analyses as there were no grounds for their exclusion.

Multicollinearity. Multicollinearity was evaluated using tolerance and variance inflation factor (VIF) diagnostics. VIF values of equal to or greater than 10 indicate multicollinearity issues, and, similarly, tolerance values of less than 0.2 also indicate potential problems (Field, 2013). Using these thresholds, no evidence of artificially inflated variance was found in any of the four models.

Mediation analyses. The mediation analyses for the four hypothesised models used the simple mediation model structure (*Model 4*) provided in PROCESS (Hayes, 2012). Figure 3 depicts a generic path diagram of this mediation model representing the direct effect (c') and the two paths constituting the indirect effect, path (a) and path (b). Historically, this form of mediation analysis was conducted by means of three separate regression analyses (e.g., Baron & Kenny, 1986), where four necessary conditions had to be established in order to confirm the status of a variable as a mediator (Tabachnick & Fidell, 2013). This approach holds that a variable is mediator if (1) there is a significant relationship between the IV and the DV (path c), (2) the IV significantly predicts the proposed mediator (path a), (3) the mediator significantly predicts the DV when controlling for the IV (path b), and (4) the strength of the relationship between the IV and the DV is reduced when the mediator is included in the regression equation (path c'). However, this traditional approach is prone to family-wise error (i.e., the problem of 'inflating α' or increasing the Type 1 error rate) (Tabachnick & Fidell, 2013), and modern perspectives on mediation have questioned the utility of determining the total effect (path c) before proceeding to estimate the direct effect (path c') and the indirect effect (ab) (Field, 2013; Hayes, 2012).

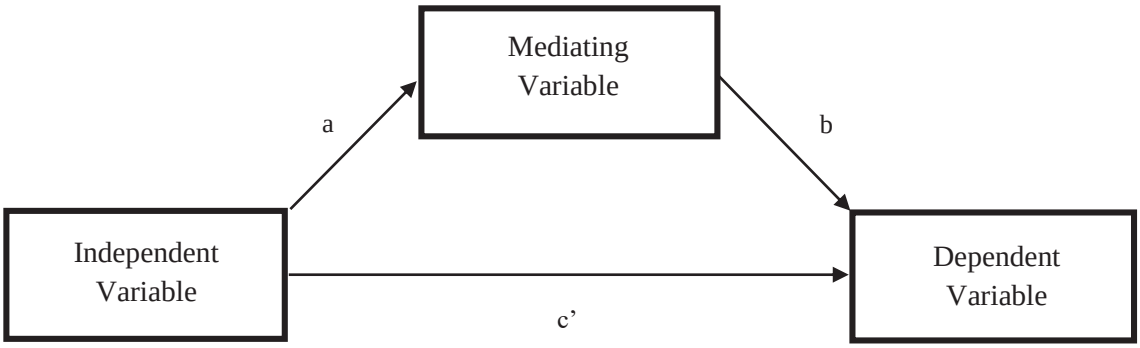

Figure 3. Diagram of mediation model depicting the direct effect path (c') and two paths representing the indirect effect path (a) and (b).

An alternative to the traditional approach to mediation analysis is to estimate the indirect effect and its statistical significance (Field, 2013). The coefficient of the indirect effect is formed by multiplying the regression coefficients of paths (a) and (b) (i.e., ab). One approach to testing the significance of the indirect effect (i.e., determining whether

significant mediation has occurred), is via the Sobel test (Tabachnick & Fidell, 2013). If the Sobel test is significant, then the IV significantly affects the DV via the mediator (Field, 2013). However, the Sobel test has some notable limitations (e.g., the Sobel test falsely presumes normality of the sampling distribution of the indirect effect when it is non-normal), and some authors (e.g., Field, 2013; Hayes, 2012) recommend the more powerful and trustworthy method of constructing confidence intervals using of non-parametric bootstrap methods in preference to testing the significance of the indirect effect with the Sobel test. In estimating the indirect effects of the four hypothesised models, the present investigation adopted the approach of bias-corrected bootstrap confidence intervals using the PROCESS default option of 5,000 bootstrap samples. Before examining the indirect effects in this way, summaries of overall indirect effect model fit and their explained variance will be provided in Table 9 for each of the hypothesised mediation models as measured by the indices of the F-Statistic, the coefficient of determination (R^2), and adjusted R^2 (R^2_{adj}). As PROCESS does not provide R^2_{adj} in outputs of analysis, this measure was calculated by hand using the Wherry's equation (see Equation 1), where n = sample size, and k = number of predictors (Tabachnick & Fidell, 2013).

$$R^2_{adj} = 1 - \left(\frac{(1-R^2)(n-1)}{(n-k-1)}\right) \qquad (1)$$

The reason for including R^2_{adj} in the summaries of model fit is that it provides a more reliable measure of fit than unadjusted R^2, as it accounts for the expected inflation of explained variance as additional variables are added to the model (i.e., a more trustworthy estimate is produced using R^2_{adj} because it accounts for the loss of predictive power when multiple IVs are used in a model) (Tabachnick & Fidell, 2013).

Table 9. *Summaries of Overall Indirect Effect Model Fit and Explained Variance for Cross-sectional and Longitudinal Mediation Models.*

Models	Overall Model Fit	Explained Variance
Cross-sectional Models	***F*-Test**	**R^2 (R^2_{adj})**
Model 1		
Job Satisfaction (n = 435)	$F(7, 427) = 12.50$, $p < 0.001$	0.170 (0.156)
Model 2		
Job Stress (n = 435)	$F(6, 428) = 16.04$, $p < 0.001$	0.184 (0.172)
Longitudinal Models		
Model 3		
Job Satisfaction (n = 430)*	$F(9, 420) = 16.70$, $p < 0.001$	0.264 (0.250)
Model 4		
Job Stress (n = 430)*	$F(8, 421) = 18.59$, $p < 0.001$	0.261 (0.247)

Note. *n = 5 missing resulted from missing data in the T2 Marital Status control variable which could not be imputed. Models include control variables listed in Table 8. Explained variance values were rounded to 3dp to show the source of percentages presented later in the text.

As can be seen in Table 9, the overall fit for each hypothesised mediation model was significant. The overall cross-sectional models explained less variance in their respective outcomes than did the longitudinal models. The following synopsis will use the more accurate R^2_{adj} when reporting the overall predictive accuracy of the mediation models. The overall model for the indirect effect of Job Satisfaction and Total SPS (T1) (model 1) accounted for 15.6% of the variance in MCS (T1). That is, 15.6% of the variation in psychological wellbeing was explained by the indirect effect of job satisfaction via perceived social support at T1. The overall model of the indirect effect of Job Stress and Total SPS (T1) (model 2) accounted for 17.2% of the variance in MCS (T1). In other words, 17.2% of the variation in psychological wellbeing was explained by the indirect effect of job stress via perceived social support at T1. For the third model, the overall model for the indirect effect of Job Satisfaction and Total SPS (T2) explained 25% of the variance in MCS (T2). Thus, a quarter of the variation in post-retirement psychological wellbeing was explained by the indirect effect of job satisfaction via change in perceived social support from T1 to T2. Finally, the overall model for the indirect effect of Job Stress and Total SPS (T2) (model 4) accounted for 24.7% of the variance in MCS (T2). This means almost one quarter of the variation in post-retirement psychological wellbeing was explained by the indirect effect of job stress via change in perceived social support from T1 to T2. The hypothesised indirect effects will now be explored by means of bias-corrected bootstrap confidence intervals with each model depicted by a diagram of the

mediation model, and interpretations of indirect effects will be based on these as per Field (2013).

Hypothesis 1: Perceived social support will mediate the influence of job satisfaction on psychological wellbeing. There was a significant indirect effect of job satisfaction on psychological wellbeing through perceived social support at T1, $ab = 0.07$, BCa CI [0.02, 0.15] (2dp). That is, perceived social support significantly mediated the effect of job satisfaction on psychological wellbeing at T1 as zero was not included in the bias-corrected bootstrap confidence interval. The unstandardised regression coefficient of the indirect effect was positive, showing that increases in job satisfaction predicted associated increases in psychological wellbeing via perceived social support, and vice versa. In fact, it appears complete mediation occurred as the direct effect was not significant at the $\alpha = 0.05$ level; this mediation is illustrated in Figure 4.

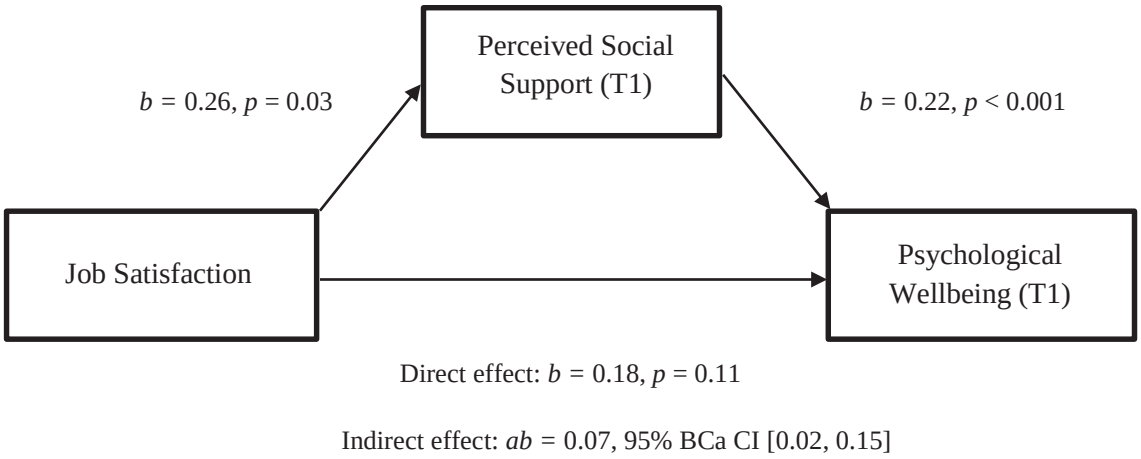

Figure 4. Model of job satisfaction as a predictor of psychological wellbeing mediated by perceived social support at T1.

Hypothesis 2: Perceived social support will mediate the influence of job stress on psychological wellbeing. There was a significant indirect effect of job stress on psychological wellbeing through perceived social support at T1, $ab = -0.07$, BCa CI [-0.15, -0.01] (2dp). Thus, perceived social support significantly mediated the effect of job stress on psychological wellbeing at T1 as zero was not included in the bias-corrected bootstrap confidence interval. The unstandardised regression coefficient of indirect effect

was negative, showing that increases in job stress predicted associated decreases in psychological wellbeing via perceived social support, and vice versa. Figure 5 depicts this mediation.

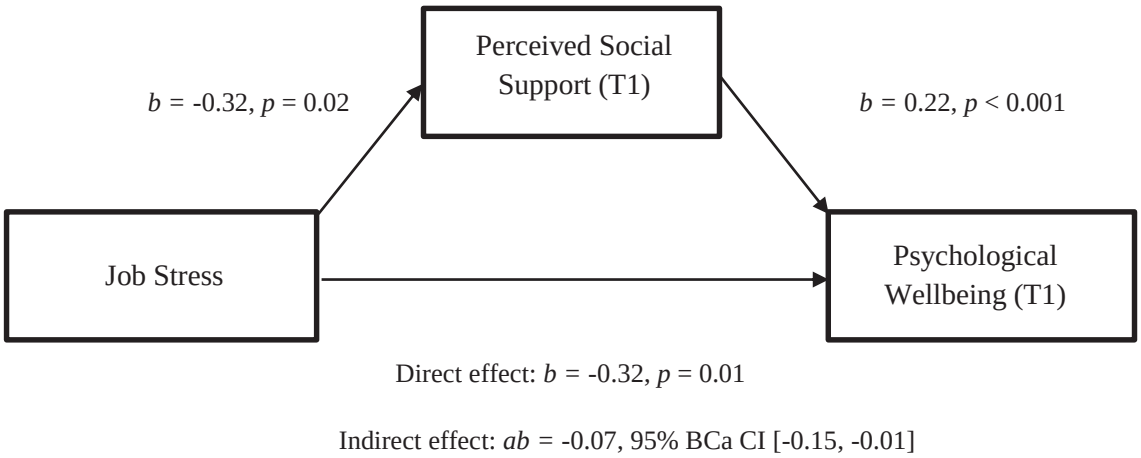

Figure 5. Model of job stress as a predictor of psychological wellbeing mediated by perceived social support at T1.

Hypothesis 3: Change in perceived social support will mediate the influence of job satisfaction on post-retirement psychological wellbeing across the period of 2006 to 2014. This hypothesis was not supported. The indirect effect of job satisfaction on post-retirement psychological wellbeing through change in perceived social support from T1 to T2 was non-significant, *ab* = 0.00, BCa CI [-0.05, 0.06] (2dp). Therefore, change in perceived social support from T1 to T2 did not significantly mediate the effect of job satisfaction on post-retirement psychological wellbeing at T2 as zero was included in the bias-corrected bootstrap confidence interval. When rounded to two decimal places, the unstandardised regression coefficient for the indirect effect was zero, indicating no covariation between job satisfaction and post-retirement psychological wellbeing at T2 via changes in perceived social support from T1 to T2. Figure 6 depicts this mediation.

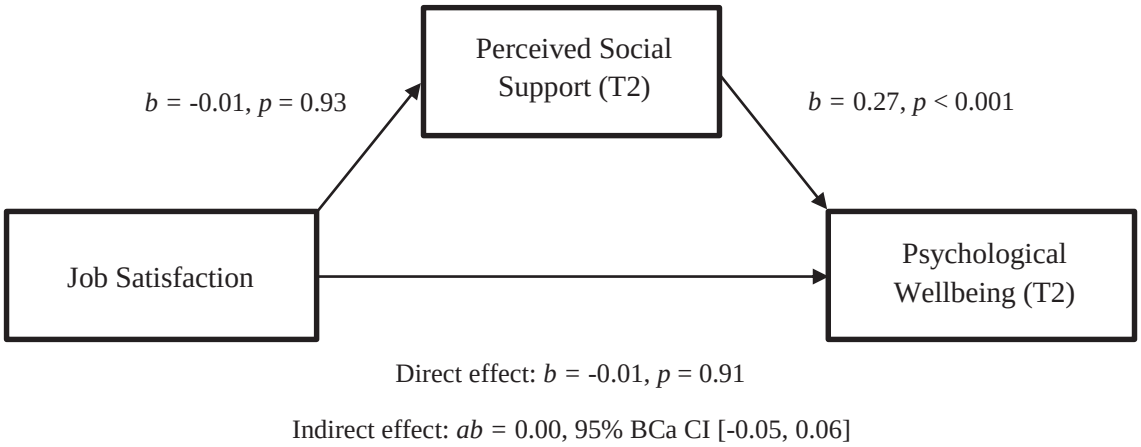

Figure 6. Model of job satisfaction as a predictor of post-retirement psychological wellbeing at T2 mediated by change in perceived social support from T1 to T2.

Hypothesis 4: Change in perceived social support will mediate the influence of job stress on post-retirement psychological wellbeing across the period of 2006 to 2014. This hypothesis was not supported. The indirect effect of job stress on post-retirement psychological wellbeing through change in perceived social support from T1 to T2 was non-significant, *ab* = -0.04, BCa CI [-0.12, 0.02]. Therefore, change in perceived social support from T1 to T2 did not significantly mediate the effect of job stress on post-retirement psychological wellbeing at T2. Figure 6 depicts this mediation. The unstandardised regression coefficient of the indirect effect was negative (as it was at T1), indicating the negative covariation between job stress and post-retirement psychological wellbeing at T2 via changes in perceived social support from T1 to T2; however, to reiterate, this mediation was not significant. Interestingly, this model highlights Hayes' (2012) assertion that inferences regarding the indirect effect should not be premised on the significance of the paths which define it (i.e., paths 'a' and 'b'), but rather on the indirect effect itself (i.e., ab) using a statistical test which assumes the non-normality of the sampling distribution of the indirect effect. It can be seen in Figure 7 that both paths which form the indirect effect were statistically significant; however, the bias-corrected bootstrap confidence interval revealed the non-significance of the indirect effect as zero was included in the interval.

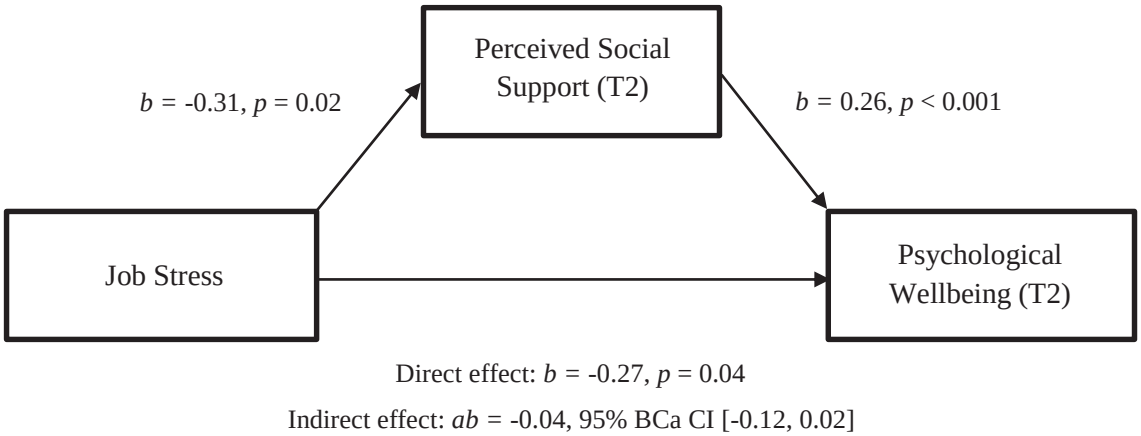

Figure 7. Model of job stress as a predictor of post-retirement psychological wellbeing at T2 mediated by change in perceived social support from T1 to T2.

Thus, two of the four hypotheses were supported. Both cross-sectional hypotheses were supported by significant mediation effects (i.e., perceived social support did mediate the relationships between both job satisfaction and psychological wellbeing, and job stress and psychological wellbeing). However, neither longitudinal hypotheses received such support. At this point, it is convention to report the sizes of these mediation effects. However, given the focus of this thesis was to investigate whether or not mediation would occur in these relationships, effect size calculation is more of a statistical afterthought, yet one which deserves attention.

A variety of approaches to the calculation of effect sizes in mediation analyses exist, and one frequently implemented effect size statistic is kappa-squared (κ^2). According to Preacher and Kelley (2011, p.106), κ^2 can be interpreted as "the proportion of the maximum possible indirect effect that could have occurred, had the constituent effects been as large as the design and data permitted." It is said to be an interpretable, standardised metric, bound between 0 and 1, and is insensitive to sample size (Preacher & Kelley, 2011). Further, it has been suggested that its values can be generally paralleled by those used for R^2 when judging the size of an effect (i.e., 0.01 = small, 0.09 = medium, and 0.25 = large) (Field, 2013). However, while some have recommended its use (e.g., Field, 2013; Preacher & Kelley, 2011), others have cautioned against its use as a trustworthy measure of effect size in mediation models (Wen & Fan, 2015).

The chief criticism of κ^2 is that it lacks the property of 'rank preservation' (i.e., it is possible for κ^2 to decrease in size even when the magnitude of the of the mediation effect it measures actually increases) (Wen & Fan, 2015). Given this absence of monotonicity, Wen and Fan (2015) suggest using the ratio of the indirect effect to the total effect (P_M) (see Equation 2) as an alternative, yet this statistic is unstable for studies with $n \leq 500$ (MacKinnon, Fairchild, & Fritz, 2007) and is, therefore, inappropriate for use in the present investigation. Instead, this study will demonstrate the effect size of the mediation effects using the unstandardised regression coefficient of the indirect effect (i.e., ab), and the 'index of mediation' (see Equation 3, where *s* = standard error of the estimate) which is a completely standardised effect size measure of mediation effects, and useful in the event of future meta-analyses (Field, 2013). Effect sizes for the significant indirect effects for this study and their 95% bias-corrected bootstrap confidence intervals are presented in Table 10.

$$P_M = \frac{ab}{c' + ab} \qquad (2)$$

$$\text{Index of mediation} = \frac{ab}{s_{DV}} \times s_{IV} \qquad (3)$$

Table 10. *Effect Sizes of Significant Indirect Effects with Bias-corrected Bootstrap Confidence Intervals (BCa CI) and Standard Errors (SE).*

	Unstandardised Effect Size (*ab*)	**95% BCa CI (*SE*)**	**Index of Mediation**	**95% BCa CI (*SE*)**
Model 1	0.07	[0.02, 0.15] (0.03)	0.03	[0.01, 0.06] (0.01)
Model 2	-0.07	[-0.15, -0.01] (0.04)	-0.03	[-0.10, -0.00]* (0.01)

Note. All values were rounded to 2dp as per APA 6th edition. *The upper-bound of this interval is actually less than zero, [-0.001], and, so will be reported as significant given zero is not included in the 95% BCa CI.

As shown in Table 10, the unstandardised regression coefficients for the indirect effects in models 1 and 2 are of equivalent magnitude, yet opposite sign, and this pattern holds

for the completely standardised regression coefficients for both models. Fully standardised regression coefficients provide a means of comparing the relative importance of predictors, as they are insensitive to the differences in measures used for predictors, mediators, and response variables (Field, 2013; Preacher & Kelley, 2011). Thus, the index of mediation is more useful for comparisons between models than the raw, unstandardised regression coefficient of the indirect effect. This index represents the impact on the DV for every 1 standard deviation (SD) increase or decrease in the IV via the mediator (Preacher & Kelley, 2011). For model 1, psychological wellbeing increased by 0.03 standardised units for every 1 SD increase in job satisfaction via perceived social support. Conversely, psychological wellbeing decreased by 0.03 standardised units for every 1 SD increase in job stress. To the author's knowledge, at present there is no standard criterion for judging the magnitude of the index of mediation, and, therefore, it is recommended that Cohen's benchmarks ought to be adopted for the purposes of interpretation (Durlak, 2009). Therefore, given a small effect is 0.01 and a medium effect is 0.09 (Field, 2013), the indirect effects of both job satisfaction and job stress on psychological wellbeing via perceived social support at T1 represent relatively small effects.

Chapter Four: Discussion

The central aim of this study was to test the resource-based dynamic model of retirement adjustment with respect to the influence of job-related conditions (i.e., job satisfaction and job stress) on post-retirement psychological wellbeing via change in perceived social support using data from a sub-sample of participants (n = 435) from the 2006 and 2014 data waves of the HWR study (Alpass et al., 2007). The study was conducted in response to the paucity of longitudinal retirement adjustment, particularly with regard to retirees' social resources (Matthews & Fisher, 2013; Shultz & Wang, 2011; van Solinge, 2013). Longitudinal mediation analyses were prefaced with preliminary cross-sectional mediation analyses in order to provide a contextual snapshot of the relationships between the constructs of interest at the cusp of the participants' retirement adjustment process. Cross-sectional hypotheses held that perceived social support would mediate the relationship between job satisfaction and psychological wellbeing, as well as that between job stress and psychological wellbeing. Hypotheses for the longitudinal analyses maintained that change in perceived social support would mediate the influence of job satisfaction on post-retirement psychological wellbeing, as well as the influence of job stress on post-retirement psychological wellbeing. This discussion will sequentially review and interpret the major findings, limitations, and qualifications of the present study, before proceeding to offer recommendations for future research and crystallise the current investigation's contribution to the retirement adjustment literature.

Cross-sectional Findings

Both cross-sectional hypotheses were supported. Firstly, the relationship between job satisfaction and psychological wellbeing appeared to operate via perceived social support (i.e., job satisfaction had a small, positive indirect effect on psychological wellbeing via perceived social support). Similarly, the relationship between job stress and psychological wellbeing functioned through perceived social support (i.e., job stress had a small, negative indirect effect on psychological wellbeing through perceived social support). These findings suggest that participants' perceived social support was pivotal in the relationship between their job-related conditions (i.e., job satisfaction, job stress) and their psychological wellbeing, as both relationships were mediated via this social resource. Further, these indirect effects are consistent with similar cross-sectional mediation analyses involving older adult populations. Specifically, social support and

perceived social support have been shown to mediate relationships involving mental health outcomes (e.g., Azam et al., 2013; Liu, Gou, & Zuo, 2016) and other indices of psychological wellbeing (e.g., Newsom & Schulz, 1996; Park, Roh, & Yeo, 2012). More generally, the cross-sectional findings accord with the wider literature body concerning the importance of social resources in contributing to the optimisation of health-related outcomes in the pursuit of successful ageing (Bowling & Dieppe, 2005; Charles & Carstensen, 2010; Ryff et al., 2006), particularly the positive association of perceived social support with psychological wellbeing in older adults (Berkman et al., 2000; Cornwell & Waite, 2009). Yet, given the cross-sectional nature of these data, a caveat ought to be placed against the previously drawn inferences. Among several limitations of the cross-sectional design pertaining to the present study (to be discussed in greater detail later in this chapter), a primary concern is the potential for reciprocal causal relationships among the principal variables in the cross-sectional analyses (Cohen et al., 2003). In such cases where causal direction cannot be definitively established, it is recommended that analyses be viewed as exploratory, correlational probes (e.g., the strength of association between two given variables is dependent on a third variable) (Wu & Zumbo, 2008). Thus, interpreted in this light, the positive, indirect association between job satisfaction and psychological wellbeing, and the negative, indirect association between job stress and psychological wellbeing, both depended on perceived social support.

Notwithstanding, the cross-sectional, correlational findings of this study are concordant with those found in the broader context of successful ageing research. Social resources have been linked to the attainment of successful ageing outcomes in older adults (Charles & Carstensen, 2010; Sadler & Biggs, 2006), and have been asserted as a central factor of successful ageing (Depp et al., 2010). Perceived social support and psychological wellbeing were positively associated with each other in the present study, and these findings were consistent with previous research concerning the relationship between perceived social support and positive mental health outcomes (Cornwell & Waite, 2009; Berkman et al., 2000). Moreover, these findings accord with the notion that social resources are associated with retirees' increased agency in positively adapting to major changes in later life (McFadden & Basting, 2010; Sadler & Biggs, 2006), such as the retirement transition process (Wang & Shultz, 2009). Similarly, psychological wellbeing

covaried with job-related conditions in the expected directions (i.e., it was positively associated with job satisfaction and negatively correlated with job stress). Situational characteristics proximal to the retirement transition (e.g., pre-retirement job characteristics) are germane to the retirement adjustment process (van Solinge, 2013), and the covariation in the present study's job-related conditions with psychological wellbeing on the cusp of the retirement transition is consistent with previous research highlighting the association of such work-related antecedents' with psychological wellbeing (Wang & Shi, 2014; Wang & Shultz, 2009). While these cross-sectional analyses provide some evidence that the expected relationships between the constructs of interest were supported as the participants approached the retirement transition, the current study centred on the two longitudinal hypotheses which are examined in the next section.

Longitudinal Findings

Neither of the longitudinal hypotheses were supported. Change in perceived social support did not mediate the relationship between job satisfaction and post-retirement psychological wellbeing, nor that of job stress and post-retirement psychological wellbeing. Thus, initially, it appears the longitudinal findings of the present study do not support the resource-based dynamic model's theoretical position that change in retirees' social resources influence their retirement adjustment quality as predicted by meso-level, work-related antecedents to the retirement. These findings are in contrast to similar retirement adjustment research using a resource perspective to investigate the role of social support as a mediator between retirees' resource stocks and their post-retirement psychological wellbeing (Topa et al., 2016). The interpretations of the present study's apparent lack of support for the resource-based dynamic model of retirement adjustment are manifold. Firstly, it is possible that the data actually capture the initial and lattermost stages of the 'maintaining pattern' (i.e., flat line) retirement adjustment trajectory identified by Wang (2007) over an 8-year duration (5 data waves), yet the study's design and statistical strategies were insufficiently sophisticated to confirm or disconfirm the existence of the entire adjustment trajectory. Retirees' average pre- and post-retirement levels of psychological wellbeing were comparable, and this indicated the possible presence of, broadly speaking, a continuous state of psychological wellbeing commensurate with the predictions of continuity theory. In other words, while controlling

for known covariates of the principal variables, the retirees may have experienced no, or minimal, appreciable change in perceived social support and/or psychological wellbeing from T1 to T2. Assuming the retirees' psychological wellbeing was relatively constant across the intervening 8 years from T1 to T2, then the absence of, or negligibly small, differences in psychological wellbeing outcomes across this period could imply retirees may have successfully adapted to the associated life changes of the retirement transition process. However, such an interpretation is, at best, a hopeful supposition.

The interpretative scope of these findings is curtailed by the use of only two assessment waves over the 8-year duration (i.e., potential 'turning points' in retirement adjustment quality or different rates of change concerning resource fluctuation may have been missed between these data waves). This fairly circumscribed interpretation is further compounded by the length of time between these waves (i.e., 8 years), as an inter-assessment phase of this duration may problematically reflect outcomes of established retirement behaviour routines rather than those of the retirement adjustment process (Curl & Townsend, 2014). Having only the minimum number of waves required for measuring change precluded this study from yielding more detailed analyses of retirees' adjustment trajectories.

Another explanation of the longitudinal findings is that the hypothesised indirect effects of job-related conditions on post-retirement psychological wellbeing via change in perceived social support simply do not exist. Cross-sectional mediation analyses can imply a substantial indirect effect exists even when in fact no underlying longitudinal mediational mechanism exists (Maxwell, Cole, & Mitchell, 2011). Thus, despite the associations between job-related conditions, perceived social support, and psychological wellbeing at T1, these findings do not necessarily suggest the existence of longitudinal indirect effects. Further, variables which seem to demonstrate complete mediation can actually represent longitudinal data where there is a strong direct effect yet a complete absence of an indirect effect (Maxwell & Cole, 2007; Maxwell et al., 2011). With these considerations in mind, the results of this study may imply evidence of the non-existence of the indirect effects of job-related conditions (i.e., job satisfaction, job stress) on post-retirement psychological wellbeing via change in perceived social support.

Another possible contributing factor to the evident lack of support for the longitudinal hypotheses concerns the means by which change was measured. The use of change scores, in numerous forms, has been widely criticised (e.g., Allison, 1990; Edwards, 2001; Kessler, 1977; Raykov, 1992). In using simple pre- and post-change scores with baseline covariate adjustment, the present study used a predictor with measurement error which featured in the regression analyses as a mediator variable (i.e., perceived social support at T2 in models 3 and 4). When the assumption that a regressor ought to be known without error is violated, biased slope parameter estimates can result (Raykov, 1992; William et al., 2013), and, consequently, erroneous inferences may be drawn (Williams et al., 2013). Therefore, with respect to the current findings, given a fallible predictor featured as a mediator in the calculation of the indirect effects for both longitudinal models, this may have ultimately led to the underestimation of this effect, and, the subsequent acceptance of both longitudinal null hypotheses. That is, the use of simple pre- and post-change scores may have resulted in a Type 2 error in both longitudinal mediation analyses.

At face value, the findings of the present study do not support the resource-based dynamic model; however, various design and methodological issues place considerable restrictions on the conclusions which can be drawn regarding the theoretical implications for this model. At one level of consideration, the longitudinal associations between job-related conditions, social resources, and post-retirement wellbeing in this study suggest potential for the application of a resource-based dynamic framework to their analysis, and accord with syntheses of the literature recommending their respective status as predictors, resources, and outcomes worthy of investigation (e.g., Barbosa et al., 2016; van Solinge, 2013; Wang et al., 2011; Wang & Shi, 2014). The lack of support for the longitudinal hypotheses may be an artefact of the methodological and statistical approaches adopted for this investigation, and more sophisticated methodological and data analytic strategies will be reviewed and recommended in the ensuing section to address these concerns.

Reflections on the Research Design and Methodological Approach

Major strengths of the current study include its basis in a nationally representative sample of the general New Zealand older adult population at T1, the use of longitudinal data, and its orientation to statistical control. The inaugural 2006 data wave of the HWR study (Alpass et al., 2007) was determined to be nationally representative with respect to age, gender, and ethnicity, and provided an accurate reflection of the population characteristics of New Zealand's general older adult population at that time (Towers, 2007; Towers & Noone, 2007). A further strength of this study was its use of longitudinal data in investigating the role that change in social resources plays in the retirement adjustment process and associated psychological wellbeing outcomes. Numerous researchers (e.g., Matthews & Fisher, 2013; Shultz & Olson, 2013; van Solinge, 2013; Wang et al., 2011; Wang & Shi, 2014) have signalled the need for more longitudinal research in the area of retirement adjustment, an essentially longitudinal process. Further, social resources have seldom been investigated from a resource-based dynamic perspective, and the testing of this aspect of the associated model was warranted (Koopmann & Wang, 2016; Wang et al., 2011). This study aimed to directly address both these research needs by longitudinally investigating the potential influence of change in social resources on the relationship between job-related conditions and retirement adjustment quality. Finally, the conception of theoretically and empirically driven statistical control of known covariates constitutes a mark of methodological rigour in the present study. An array of known socio-demographic and other related covariates was screened for the presence of confounding variables, and variables identified as such were statistically controlled in subsequent analyses. However, as well as its robust qualities, the present investigation was not without its limitations.

Several limitations and qualifications must be placed on the findings of this study at the levels of both design and methodology. The present study measured change in perceived social support and psychological wellbeing over an 8-year period, with the first assessment point at 2006 (T1) and the second at 2014 (T2). Thus, more nuanced fluctuations in social resources and associated psychological wellbeing could not be measured, as requisite data were not available from the intervening data waves for all measures. Additionally, the stationarity assumption (Cohen et al., 2003) was arguably only tenuously met. While follow-up studies may often use too short a time period, in

the case of the present study, the given time period between T1 and T2 may not have been an appropriate temporal estimation for the expected effect to occur. That is, the 8-year inter-assessment interval may have been too long to accurately detect the potential influence change in social resources had on retirement adjustment quality as predicted by job-related conditions. Moreover, as previously alluded to, longitudinal analyses which focus on the early years of retirement, as compared with longer term analyses of post-retirement wellbeing outcomes, may more accurately capture changes in these wellbeing states resulting from retirement adjustment rather than routine behaviour (Curl & Townsend, 2014). Thus, the use of only two data waves to measure change over a duration of 8 years may have contributed to the possibility for Type 2 error regarding both longitudinal hypotheses, as highlighted in the previous section. Yoked with the previously mentioned flaws of change scores, these limitations strongly suggest caution ought to be applied to the findings of this study.

The methodological limitations pertain to measure selection, internal consistency, data imputation methods, lack of statistical control for the voluntariness of participants' retirement transitions, the limitations of cross-sectional mediation analyses, and issues concerning causal inference. Given this study used extant data from the HWR study, the measures used to generate these data were not specifically selected for this investigation. Optimally, multiple measures should be used to capture the variegated aspects of central constructs of interest. Irrespective of how robust its psychometric properties may be, a single measure is an inadequate sample of a construct domain as it measures only a circumscribed approximation of the construct (Kazdin, 1995). By implementing single measures for the IVs, MV, and DV, the present study only minimally sampled the construct domains of job-related conditions, social resources and retirement adjustment quality, and, ideally, multiple measures should have been used to provide greater coverage for each of these construct domains.

A further consideration is that retirement adjustment is frequently inferred indirectly via measures of psychological wellbeing which are considered valid indicators of retirees' adaptation to the retirement transition (van Solinge, 2013). However, although the two are empirically related, using states of psychological wellbeing as proxies of adjustment

difficulties may misrepresent these relations (van Solinge, 2013; van Solinge & Henkens, 2008). For example, it could be possible to practically adjust to the effects of a chronic illness or a substantial financial loss during the retirement transition (i.e., an individual could accept the effects as a matter of unchangeable circumstance and behaviourally adapt), and, yet, still report adverse psychological experiences as a result of such phenomena. Thus, the assumption of low post-retirement wellbeing as an indicator of poor retirement adjustment has its limitations (van Solinge, 2013), and a preferable, more direct approach is to incorporate retirees' self-reported evaluations of their difficulties in adjusting to retirement (e.g., van Solinge & Henkens, 2005) in conjunction with additional indices of retirement adjustment quality such as psychological wellbeing. The HWR study implemented a self-evaluation item specifically measuring retirees' retirement adjustment in the 2013 off-wave; however, this item was not included in the 2014 questionnaire, and, therefore, the current investigation was limited to the use of the SF-12v2 MCS as the sole proxy of retirement adjustment quality.

With respect to properties of the measurement instruments, internal consistency and data imputation deserve mention. The Job Stress Index had a questionable Cronbach's α of 0.63. As well as demonstrating the inter-relatedness of a scale's items, Cronbach's α can be used to estimate the degree of measurement error in a measure (Tavakol & Dennick, 2011). This index of measurement error is calculated by subtracting α^2 from 1. Thus, the adapted Job Stress Index's scores exhibited an error variance (or random error) of 0.6 across the present study's sample (i.e., 60% of Job Stress scores were attributable to measurement error). Therefore, the degree of measurement error in the adapted Job Stress Index markedly limits the strength of inferences which can be drawn based on its use in this study, although, reliability of $\alpha = 0.60$ is arguably acceptable in exploratory research such as the current study (Hair et al., 2010).

Regarding missing data, these were imputed using the series mean. The foremost disadvantage of this approach is that it reduces the variance of variables for which data have been imputed, and, consequently, reduces their correlation with other variables (Tabachnick & Fidell, 2013). The correlation matrices of the unimputed and imputed data were found to be substantively similar, and, therefore, reduction in variance was not

an issue in this study; however, there are more sophisticated imputation techniques available. Another approach to the estimation of missing values is 'hot deck' imputation, where missing data are imputed using a randomly selected similar case (Fisher & Willis, 2013). However, a more sophisticated technique to the two previously mentioned methods involves regression analysis. By taking more robust variables (i.e., those with less missing data than the variable to be imputed) as predictors and regressing the variable to be imputed on these, the resultant regression equation can be used to estimate the missing values (Tabachnick & Fidell, 2013).

A further point of reflection concerns the omission of a potential confound, namely voluntariness of retirement. Unfortunately, the present study could not control for the influence of forced or voluntary retirement, as the voluntariness of participants' retirement was not measured in the HWR study's 2014 questionnaire. A lack of agency over the initial retirement transition (i.e., involuntary retirement) is one of the strongest predictors of retirement adjustment difficulties (van Solinge, 2013). Forced or involuntary retirement is associated with increased retirement adjustment difficulties and negative effects on retirees' health and wellbeing (Hershey & Henkens, 2013; van Solinge, 2013), with retirees who also perceive their retirement transition as forced in nature being more vulnerable to the development of greater adjustment difficulties (van Solinge & Henkens, 2005). Additionally, Dingemans and Henkens (2015) found involuntary retirement was associated with declines in life satisfaction and self-efficacy in later retirement life. Therefore, given the present study could not control for the voluntariness of participants' retirement, the possibility of retirement type (i.e., involuntary or voluntary retirement) functioning as a confound presents an important limitation, because of its probable association with job-related conditions and retirement adjustment quality.

Moving to consider barriers to causal inference, this study entailed several important limitations due to aspects of its design. Despite their pervasive popularity in psychological research over the previous several decades, cross-sectional mediation analyses are associated with a variety of methodological concerns (Maxwell et al., 2011; Preacher, 2015; Shrout, 2011), not least of all the fact that causal processes necessarily

unfold over time (Maxwell & Cole, 2007). Until relatively recently, the practical pitfalls of this approach have not often been articulated; however, an emergent body of literature now urges researchers to explicitly regard the role of temporality in empirical investigations of mediational processes (Maxwell et al., 2011). Relationships implied by the mediation paths are considered causal, and, thus, the IV must temporally precede the MV, and the MV must precede the DV. However, conducting mediational analyses with cross-sectional data implies the expected effects are instantaneous, and, thus, such analyses fail to realistically reflect the hypothesised causal sequence (Maxwell et al., 2011; Selig & Preacher, 2009). Consequently, such cross-sectional models are prone to specification error and biased parameter estimates. Thus, to reiterate the aforementioned position regarding this study's cross-sectional findings, given causal direction cannot be definitively established, these findings ought to be viewed as exploratory, correlational probes. That is, while in some cases it can be reasonable to assume observed relationships in cross-sectional data are representative of temporally ordered effects (Cohen et al., 2003), the cross-sectional findings of this study showed a positive, indirect association between job satisfaction and psychological wellbeing, and a negative, indirect association between job stress and psychological wellbeing, both of which depended on perceived social support.

As a final note on the problems surrounding causal inference, this study was limited by its observational nature. Typically, four levels of design control are implied in mediation analyses; (1) observation; (2) precedence; (3) manipulation, and (4) randomisation (Preacher, 2015; Wu & Zumbo, 2008). Given all four of these criteria were not met, inferences of causality regarding the longitudinal findings should be cautioned against as issues of reciprocal causality or the endogeneity problem cannot be categorically excluded (Cohen et al., 2003; Wang, 2013b). It cannot be discounted that perceived social support and psychological wellbeing influenced each other across time via a reciprocal-causal feedback loop (e.g., change in perceived social support may have effected a change in post-retirement psychological wellbeing, which then led to post-retirement psychological wellbeing effecting a change in perceived social support, or vice versa). Thus, given a plausible case exists for each variable to having an effect on the other, the causal mechanism still remains unclear. The rudimentary framework of the fully sequenced, recursive mediation models used in this study are perhaps too simplistic to

accurately represent the complexity of such relationships. Therefore, more sophisticated estimation techniques are required to capture the complexities of these relationships.

The problem of endogeneity may be present in observational studies where it is reasonable to assume that given predictor and outcome variables have some cause (or causes) in common, and these have not been integrated into the research design (Cohen et al., 2003; Wang, 2013b). In other words, the estimation of the relationship between the predictor variable and the dependent variable will be biased as a result of neglecting to partition out the influence of unmeasured causes (Wang, 2013b). Theoretically established confounds ought to be attended to in the research design to minimise any potential for the problem of endogeneity. In the case of the longitudinal findings, it is possible that the potential associations between change in perceived social support, post-retirement psychological wellbeing, and voluntariness of retirement represent a problem of endogeneity in this study.

Further, it cannot be ruled out that voluntariness of retirement (particularly involuntary retirement) may have causal relations to both social resources and post-retirement psychological wellbeing. For example, having to retire involuntarily may possibly contribute to a concurrent, substantial loss of retirees' social resources in addition to the potential adverse wellbeing outcomes and adjustment difficulties associated with involuntary labour force exits. This reduction in social resources during the initial years of the retirement transition has been illustrated by Damman et al. (2013), where it was found that work-related social resources were the job characteristics most likely to be missed by recent retirees. Further underscoring the import of social resources in this context, retirees who were divorced and without a partner at the time of the study, were most likely to encounter adjustment difficulties after losing their work role (Damman et al., 2013). Adding greater complexity to the relations between involuntary retirement, social resources, and post-retirement life, van Solinge and Henkens (2007) maintain that how the retirement transition is framed via the wider social norms, as well as the social networks of retirees (i.e., familial and collegial relations), in which retirees are embedded influences retirees' subjective experiences of retirement. It has even been said that the experience of involuntary retirement is, to a large extent, socially defined and determined

(van Solinge & Henkens, 2007). Further, Hershey and Henkens (2013) have shown that the adjustment difficulties arising from involuntary retirement frequently involve the loss of a familiar context of social support and retirees' subjective interpretations of the non-normative timing of their retirement transition. Considering these findings, the associations among voluntariness of retirement, social resources, and post-retirement states of wellbeing suggest that the conditions of voluntary or involuntary retirement may represent possible boundary conditions (i.e., potential moderating variables) in the modelling of the retirement adjustment process. In any case, voluntariness of retirement should be considered as a theoretically established confound if it is not to be tested directly in analyses, and, therefore, it ought to be adjusted for accordingly. Of course, as mentioned previously, voluntariness of retirement was not measured in the HWR study's 2014 wave; therefore, the preceding explanation serves only to further illustrate this limitation. The limitations encompassed in this section will now be addressed with recommendations for future research.

Recommendations for Future Research

Limitations will be addressed in order of their presentation in the previous section where necessary, and recommendations for future research will made. To begin with, the present study was limited in its number of data waves, and the duration of its inter-assessment intervals. Future study of the impact of retirees' social resources on their retirement adjustment quality, as predicted by work-related antecedents to retirement, would benefit from the use of multiple data waves in order to increase measurement sensitivity of the retirement adjustment process. For example, Wang's (2007) approach used five data waves at 2-year intervals. Additionally, such an approach aids in more directly addressing the assumption of stationarity as it relates to the retirement adjustment process. Multiple, biennial data waves more precisely sketch the contours of the retirement adjustment process (Curl & Townsend, 2014) as it unfolds from the initial retirement transition and early years of adjustment, to the later years and establishment of more routine retirement life.

Recommendations addressing methodological and measurement level issues involving construct domains, the use of indirect indices of retirement adjustment quality, and data

imputation are as follows. No single measure, however well psychometrically validated, constitutes an adequate sample of a given construct domain, and, therefore, additional measures of a construct should be used to capture its various facets (Kazdin, 1995). In particular, social resources and retirement adjustment quality were each operationalised using only a single measure. Future work in this area using the HWR datasets may be enhanced by measurement of retirees' objective, structural dimensions of their social relations using the Wenger Network Assessment Instrument (Wenger, 1997; Wenger & Burholt, 2003). Similarly, measurement of retirement adjustment quality could be improved with additional measures of post-retirement psychological wellbeing. The inclusion of the Centre for Epidemiological Studies Depression Scale (CES-D) (Irwin, Artin, & Oxman, 1999), which was introduced to the HWR study in 2010, would provide another measure of post-retirement psychological wellbeing, and, therefore, another indirect index of retirement adjustment quality. Regarding more direct evaluations of retirees' adjustment quality, self-reports of subjective retirement adjustment difficulties would be a useful addition to future studies. Implementation of the self-evaluation retirement adjustment item used in the HWR study's 2013 off-wave would be beneficial to the generation of future data waves and analyses. Finally, if they are of a similar nature in future studies, missing data should be treated using the more robust regression imputation technique in preference to using the series mean or hot deck imputation approaches. Of course, it must be acknowledged that the simple mediation analysis framework used in this study was a limiting factor in the number of principal variables used in the models. Thus, more suitable modelling techniques ought to be adopted in further research using a resource-based dynamic perspective.

A variety of more sophisticated statistical strategies are to be recommended to address the major limitations relating to measurement error and the endogeneity problem in the longitudinal analyses of the present study. Measurement error commonly results, not from the modelling of measures' error variance in the analyses, but rather from incorporating imprecisely measured variables within the research design (Wang, 2013b). By using statistical modelling techniques which account for measurement error during analysis, such as structural equation modelling (SEM) (Preacher, 2015; Wang, 2013b), Multi-level SEM (MSEM) (Bauer, Preacher, & Gil, 2006; Preacher, 2015; Raykov & Mels, 2007), or the instrumental-variable technique (e.g., two-stage least squares [2SLS]

regression) (Wang, 2013b), the problem of inadequately measured variables can be more usefully approached. Regarding the endogeneity problem, Wang (2013b) suggests countering the endogeneity problem via 2SLS procedures (e.g., nested data modelling, regression discontinuity models). Moreover, the approaches mentioned here, as well as related classes of longitudinal mediation models, offer more respect for the role of time in mediational processes, and bolster evidence for the causal ordering of variables.

The traditional simple mediation model has been criticised as overly constrained and seldom appropriate by contemporary methodological standards (Preacher, 2015). Advances in statistical methods of measuring longitudinal change have shown such change can be more suitably analysed using latent growth curve modelling (LGM) methods (MacKinnon et al., 2007; Preacher, 2015; Wang & Bodner, 2007; Wang & Hanges, 2011), and LGM can be conceptualised and fitted using SEM frameworks (McArdle, 2009). LGM is particularly apt for the examination of mediation chains over multiple data waves, given its capacity to measure the effect of earlier change on later change (MacKinnon et al., 2007). Thus, the part that change itself plays in mediation can be investigated (Preacher, 2015), and LGM can accommodate individual differences in parameter estimates (Maxwell et al., 2011). Additionally, casual claims can be made more robust by adopting a two-stage LGM approach where early change in a given mediator can be shown to temporally precede change in a target outcome variable (Preacher, 2015). Considering all factors, selection of the most appropriate statistical procedures for longitudinal data analysis should be driven in tandem by the particular theory and the particular research questions of interest, as well as the aim of minimising threats to the establishment causal knowledge (Wang, 2013b; Wang & Hanges, 2011). Thus, future research involving work-related antecedents to retirement, change in social resources, and retirement adjustment quality should premise the selection of data analytic strategies on these considerations.

Another important factor to consider in the longitudinal study of the retirement adjustment process is the role of the moderator. Moderators frequently allow for more precise delineation of the conditions which necessitate a given casual effect (Wang, 2013b), as they offer insight into how casual effects are modified (i.e., they address the

questions of ‘when’, ‘for whom’, or ‘where’ a predictor most strongly or weakly causes an outcome) (Wu & Zumbo, 2008). The omission of moderators can create model specification errors which result in erroneous conclusions about the observed causal relations (Wu & Zumbo, 2008); therefore, it is necessary to investigate the effects of potential moderating variables (Barbosa et al., 2016). In recent times, more attention has been directed to the potential for unobserved heterogeneity of retiree populations, and the possibility of multiple subpopulations (Wang, 2013b). These subpopulations are correlated with differing retirement adjustment processes, and their identification has been made more accessible to investigation with recent methodological advances in latent class procedures (Wang, 2013b). As this heterogeneity cannot be alone sufficiently explained by the decomposition of a sample into its demographic constituents (e.g., Pinquart & Schindler, 2007; Wang, 2007), future research may benefit from the use of latent class procedures with respect to the identification of unobserved moderators associated with the modelling of causal relationships (Wang, 2013b). Therefore, differing retirement adjustment trajectories of retiree population sub-groups may potentially be specified with greater nuance by these means.

Additionally, one final point of note concerning moderators is that studies of the retirement adjustment process have rarely examined theoretically supported moderators of this process aside from gender (Wang & Shultz, 2009). Partnered retirees tend to experience more favourable retirement adjustment than those who are single or widowed (Pinquart & Schindler, 2007), and involuntary retirement (i.e., lack of control over the decision to retire) is associated with negative health and wellbeing outcomes (van Solinge, 2013; van Solinge & Henkens, 2005; 2008). The theoretically founded relations these social and work-related resources have to the retirement adjustment process warrant further investigation; therefore, future research ought to examine the roles of marital status and voluntariness of retirement as potential moderating variables of retirees’ adjustment to retirement.

Contributions of the Present Research and Concluding Remarks

The present study was a secondary analysis conducted on the 2006 and 2014 data waves of the HWR study (Alpass et al., 2007), and was devised to address the current paucity of

research concerning the longitudinal retirement adjustment process and the influence of retirees' social resources on their retirement adjustment quality. As a contextual sketch of the sample at the cusp of the retirement transition, cross-sectional associations from the 2006 wave aligned with previous empirical evidence surrounding the importance of work-related antecedents proximal to the retirement transition and social resources to the pursuit of successful ageing with respect to psychological wellbeing. The central premise of this study was to use the resource-based dynamic model (Wang et al., 2011) to investigate whether change in social resources would influence the longitudinal relationships between job-related conditions and retirement adjustment quality. Change in perceived social support mediated neither the influence of job satisfaction, nor job stress, on post-retirement psychological wellbeing. While the longitudinal mediational hypotheses were not supported, this should not undermine the validity of the resource-based dynamic model of retirement adjustment, as this study's design and methodological approach entailed several limitations. A summary of recommendations to remedy the cardinal limitations is as follows; (1) the use of multiple, biennial data waves; (2) the use of multiple measures of construct domains, as well as direct indices of retirees' adjustment difficulties; (3) the implementation of latent class procedures and structural equation modelling frameworks; (4) the investigation of retirement adjustment trajectories of retiree population sub-groups, and (5) the examination of seldom explored potential moderators of retirees' adjustment to retirement (e.g., voluntariness of retirement, marital status). To conclude, this investigation represents an exploratory effort to engage a synthesis of emergent retirement adjustment research recommendations from a resource-based dynamic perspective, and contributes practical recommendations to further research in this field.

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Appendix

HEALTH WORK AND RETIREMENT

E tū te huru mā, haramai e noho

LONGITUDINAL STUDY

Massey University

Health, Work and Retirement Survey

March 2006

A research collaboration between:

The School of Psychology Massey University

The Health Research Council of New Zealand

The New Zealand Institute for Research on Ageing

The Centre for Maori Health Research and Development School of Maori Studies Te Putahi-a-Toi Massey University

How to complete this survey

Instructions:

- Use a blue/black pen or pencil to complete this survey
- Try to mark your response clearly with a tick
- When asked to write a response, please print clearly.
- If you make a mistake, please put a cross over the incorrect response and place a tick in the box that best reflects your answer

Example:	
At this time do you consider yourself partly retired, completely retired, or not retired at all (Please tick one box)	
Completely retired	☐ 1
Partly retired	☑
Not retired at all	☐ 3
Not applicable (e.g., have not or do not work for pay)	☐ 4

Please read the following carefully:

- All the information you give us is in confidence and will be used only for the purposes of this study.
- There are no right or wrong answers; we want the response that is best for you.
- It is important that you give your own answers to the questions. Please do not discuss your answers with others.
- Do not linger too long over each question; usually your first response is best.
- Completion and return of this survey implies consent to take part in the study

Thank you for taking the time to complete this survey

If you need help to answer any questions please contact us either by toll-free phone or via email at:

Phone: *0800 100 134* ***Email:*** *hwr@massey.ac.nz*

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Health

Firstly, we would like to ask you some questions about your health. This information will help us keep track of how you feel and how well you are able to do your usual activities. For each of the following questions, please tick the box that best describes your answer.

Q 1 **In general, would you say your health is:**
(Please tick one box)

Excellent	☐ 1
Very Good	☐ 2
Good	☐ 3
Fair	☐ 4
Poor	☐ 5

Q 2 **Compared to one year ago, how would you rate your health in general now?**
(Please tick one box)

Much better than one year ago	☐ 1
Somewhat better now than one year ago	☐ 2
About the same as one year ago	☐ 3
Somewhat worse now than one year ago	☐ 4
Much worse now than one year ago	☐ 5

Q 3 **The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?**
(Please tick one box on each line)

	Activities	Yes, limited a lot	Yes, limited a little	Not limited at all
(a)	*Vigorous activities*, such as running, lifting heavy objects, participating in strenuous sports	☐ 1	☐ 2	☐ 3
(b)	*Moderate activities*, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐ 1	☐ 2	☐ 3
(c)	Lifting or carrying groceries	☐ 1	☐ 2	☐ 3
(d)	Climbing *several* flights of stairs	☐ 1	☐ 2	☐ 3
(e)	Climbing *one* flight of stairs	☐ 1	☐ 2	☐ 3
(f)	Bending, kneeling, or stooping	☐ 1	☐ 2	☐ 3
(g)	Walking *more than one* kilometre	☐ 1	☐ 2	☐ 3
(h)	Walking *several blocks*	☐ 1	☐ 2	☐ 3
(i)	Walking *one block*	☐ 1	☐ 2	☐ 3
(j)	Bathing or dressing yourself	☐ 1	☐ 2	☐ 3

Q 4 **During the past 4 weeks, how much of the time have you had any of the following problems with your work OR other regular daily activities as a result of your physical health?**
(Please tick one box on each line)

		All of the time	Most of the time	Some of the time	A little of the time	None of the time
(a)	Cut down on the *amount of time* you spent on work or other activities	1	2	3	4	5
(b)	Accomplished less than you would like	1	2	3	4	5
(c)	Were *limited* in the *kind* of work or other activities	1	2	3	4	5
(d)	Had *difficulty* performing the work or other activities (for example, it took *extra* effort)	1	2	3	4	5

Q 5 **During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?**
(Please tick one box)

Not at all	1
Slightly	2
Moderately	3
Quite a bit	4
Extremely	5

Q 6 **How much bodily pain have you had during the past 4 weeks?**
(Please tick one box)

None	1
Very mild	2
Mild	3
Moderate	4
Severe	5
Very severe	6

Q 7 **During the past 4 weeks, how much of the time have you had any of the following problems with your work OR other regular daily activities as a result of any emotional problems (e.g. feeling depressed or anxious)?**
(Please tick one box on each line)

		All of the time	Most of the time	Some of the time	A little of the time	None of the time
(a)	Cut down on the *amount of time* you spent on work or other activities	1	2	3	4	5
(b)	Accomplished less than you would like	1	2	3	4	5
(c)	Didn't do work or other activities as *carefully* as usual	1	2	3	4	5

Q 8 **During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?**
(Please tick one box)

Not at all	1
Slightly	2
Moderately	3
Quite a bit	4
Extremely	5

Q 9 **During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives etc.)**
(Please tick one box)

All of the time	1
Most of the time	2
Some of the time	3
A little of the time	4
None of the time	5

Q 10 **These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that is closest to the way you have been feeling. How much of the time during the past 4 weeks...**
(Please tick one box on each line)

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
(a)	Did you feel full of life?	1	2	3	4	5	6
(b)	Have you been very nervous?	1	2	3	4	5	6
(c)	Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
(d)	Have you felt calm and peaceful?	1	2	3	4	5	6
(e)	Did you have a lot of energy?	1	2	3	4	5	6
(f)	Have you felt downhearted and blue?	1	2	3	4	5	6
(g)	Did you feel worn out?	1	2	3	4	5	6
(h)	Have you been happy?	1	2	3	4	5	6
(i)	Did you feel tired?	1	2	3	4	5	6

Q 11 **How *TRUE* or *FALSE* is each of the following statements for you?**
(Please tick one box on each line)

		Definitely true	Mostly true	Don't know	Mostly false	Definitely false
(a)	I seem to get sick a little easier than other people	1	2	3	4	5
(b)	I am as healthy as anybody I know	1	2	3	4	5
(c)	I expect my health to get worse	1	2	3	4	5
(d)	My health is excellent	1	2	3	4	5

Q 12 **The following questions focus on health problems you may have. Please tick the box corresponding to the word 'Yes' or 'No' to indicate if a doctor, nurse or other health care worker has told you that you have any of the following health problems.**
(Please do not skip any questions)

		Yes	No
(a)	Skin cancer?	1	2
(b)	Other forms of cancer?	1	2
(c)	Diabetes?	1	2
(d)	Epilepsy?	1	2
(e)	High blood pressure or hypertension?	1	2
(f)	Heart trouble (e.g., angina or myocardial infarction)?	1	2
(g)	Asthma?	1	2
(h)	Other respiratory conditions (e.g., bronchitis)?	1	2
(i)	Stomach ulcer or duodenal ulcer?	1	2
(j)	Chronic liver trouble (e.g., cirrhosis)?	1	2
(k)	Bowel disorders (e.g., colitis or polyps)?	1	2
(l)	Hernia or rupture?	1	2
(m)	Chronic kidney or urinary tract conditions?	1	2
(n)	Chronic skin conditions (e.g., dermatitis or psoriasis)?	1	2
(o)	Arthritis or rheumatism?	1	2
(p)	Hepatitis?	1	2
(q)	Sight impairment (that cannot be corrected by glasses)?	1	2
(r)	Hearing impairment?	1	2
(s)	Stroke?	1	2

The following questions concern your alcohol consumption. For each question, please tick the answer that is correct for you.

Q 13

(a) How often do you have a drink containing alcohol?
(Please tick one box)

Never	☐ 1
Monthly or less	☐ 2
Two to four times a month	☐ 3
Two to three times a week	☐ 4
Four or more times a week	☐ 5

- **If you ticked 'NEVER' to the question above please answer Q 13 (b) below.**
- **All other people please go straight to Q14 below.**

(b) Have you ever drunk alcohol in the past?

Yes	☐ 1
No	☐ 2

(Now, please go straight to Q16 on the next page.)

Q 14 How many drinks containing alcohol do you have on a typical day when drinking?
(Please tick one box)

1 or 2	☐ 1
3 or 4	☐ 2
5 or 6	☐ 3
7 to 9	☐ 4
10 or more	☐ 5

Q 15 How often do you have six or more drinks on one occasion?
(Please tick one box)

Never	☐ 1
Less than monthly	☐ 2
Monthly	☐ 3
Weekly	☐ 4
Daily or almost daily	☐ 5

The following questions concern your use of health services (such as doctors or hospitals). For each question, please tick the answer that is correct for you.

Q 16 **In the last 12 months, have you seen a doctor or been visited by a doctor about your own health? By 'doctor' we mean any GP or family doctor, but not a specialist.**
(Please tick one box)

Yes	☐ 1
No (Tick and go down to **Q 18**)	☐ 2
Don't know (Tick and go down to **Q 18**)	☐ 3

Q 17 **How many times?**
(Please tick one box)

1 time	☐ 1
2 times	☐ 2
3 to 5 times	☐ 3
6 to 11 times	☐ 4
12 times or more	☐ 5
Don't know	☐ 6

Q 18 **In the last 12 months, have you yourself used a service at, or been admitted to, a hospital (either public or private)?**
(Please tick one box)

Yes	☐ 1
No (Tick and go down to **Q 20**)	☐ 2
Don't know (Tick and go down to **Q 20**)	☐ 3

Q 19 **In the last 12 months, how many times were you admitted for one night or longer?**
(Please tick one box)

Never admitted over-night	☐ 1
1-2 times	☐ 2
3-4 times	☐ 3
5 or more times	☐ 4

Q 20 **In the last 12 months, how many times did you go to a hospital *emergency* department as a patient?**
(Please tick one box)

Never	☐ 1
1-2 times	☐ 2
3-4 times	☐ 3
5 or more times	☐ 4

Q 21 **In the last 12 months, have you seen any of the following people for health care or advice for yourself:**
(Tick all that apply)

GP's practice nurse, without also seeing the doctor?	1
district, public health or other nurse?	1
chemist or pharmacist, for health advice or medication only?	1
physiotherapist?	1
dentist or dental nurse?	1
optician or optometrist?	1
chiropractor or osteopath?	1
podiatrist or chiropodist?	1
alternative therapist such as a naturopath, homeopath, iridologist or acupuncturist?	1
psychologist or counsellor?	1
occupational or speech therapist?	1
traditional healer such as tohunga, rongoa Māori specialist or fofo?	1
Māori health worker, Pacific Island health worker?	1
specialist medical practitioner (e.g., neurologist, oncologist)	1

Q 22

(a) Would you currently consider yourself a *regular* smoker?
(Please tick one box)

Yes (Tick and go down to **Q 22 b**)	1
No (Tick and go down to **Q 22 c**)	2

(b) IF YOU CONSIDER YOURSELF A *REGULAR* SMOKER: How many do you think you would smoke on an average day?
(Please tick one box)

1 to 10 a day	1
11 to 20 a day	2
21 to 30 a day	3
31 or more a day	4

(c) IF YOU DO NOT CONSIDER YOURSELF A *REGULAR* SMOKER: Have you, at any stage of your life, ever been a *regular* smoker?
(Please tick one box)

Yes	1
No	2

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Physical activity

The following questions concern the kinds of physical activities that people do as part of their everyday lives. Please answer each question even if you do not consider yourself to be an active person.

Please think about the activities you do at work, as part of your house and garden work, to get from place to place or in your spare time for recreation, exercise or sport.

Q 23 **How many hours EACH DAY do you typically spend sitting down while doing things like visiting friends, driving, eating, reading, watching television or working at a desk or computer?**

(a)	On a usual WEEK day		Hours
(b)	On a usual WEEKEND day		Hours

Q 24 **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?**
(If you **did not** do an activity, please write '0' in the box)

(a)	*Briskly walking* (at a pace where you are breathing harder than normal, but only a little harder; e.g., for recreation or exercise, or to get from place to place)		Hours		Minutes
(b)	*Moderate physical activity* (which makes you breath harder than normal, but only moderately harder; e.g., carrying light loads, gardening, bicycling at a regular pace, recreational swimming)		Hours		Minutes
(c)	*Vigorous physical activity* (that makes you breathe a lot harder than normal or huff and puff; e.g., heavy lifting, fast bicycling, aerobics, running)		Hours		Minutes

Q 25 **Thinking about all your physical activities (brisk walking, moderate or vigorous) on how many of the LAST 7 DAYS were you active?**
('Active' means doing 15 minutes or more of vigorous activity, OR 30 minutes or more of moderate activity or brisk walking).
(Please tick one box)

0	1	2	3	4	5	6	7
0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days

Q 26 **Please indicate which of the following describes your physical activity over the PAST 6 MONTHS.** ('Regular physical activity' means doing 15 minutes or more of vigorous activity, OR 30 minutes or more of moderate activity or brisk walking each day for 5 or more days a week).
(Please tick one box)

I am not regularly physically active and do not intend to be so in the next 6 months	1
I am not regularly physically active but am thinking about starting in the next 6 months	2
I do some physical activity but not enough to be described as *regular* physical activity	3
I am regularly physically active but only began in the last 6 months	4
I am regularly physically active and have been so for longer than 6 months	5

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY
E tū te huru mā, haramai e noho

Support

The following section of the survey focuses on your social networks, your beliefs about yourself and your beliefs about your family.

Q 27 **I contribute my time and/or labour to volunteer activities:**
(Please tick one box)

Very often	1
Often	2
Sometimes	3
Rarely	4
Never	5

Q 28 **How far away, in distance, does your nearest:**
(Please tick one box on each line)

	Same house / within 1 kilometre	1-5 kilometres	6-15 kilometres	16-50 kilometres	50+ kilometres	*Not applicable or none living*
(a) relative live (not including your spouse/child/siblings)?	1	2	3	4	5	9
(b) child live?	1	2	3	4	5	9
(c) brother or sister live?	1	2	3	4	5	9

Q 29 **How often do you speak to or do something with:**
(Please tick one box on each line)

	Daily	2-3 times a week	At least weekly	At least monthly	Less often	Never / I have none
(a) any of your children or other relatives?	1	2	3	4	5	6
(b) any friends in your community/neighbourhood?	1	2	3	4	5	6
(c) any of your neighbours?	1	2	3	4	5	6

Q 30 **Please answer the following questions about your contact with family and friends.**
(Please tick one box on each line)

	Yes	No
(a) Do you feel you have regular contact with your family?	1	2
(b) Do you feel you have regular contact with your friends?	1	2
(c) Do you regularly participate in family (whanau) activities?	1	2
(d) Do you have family or friends over for a meal at least once a month?	1	2

Q 31 **To what extent do you agree that each statement describes your current relationships with other people?**
(Please tick one box on each line)

		Strongly disagree	Disagree	Agree	Strongly agree
(a)	There are people I can depend on to help me if I really need it.	1	2	3	4
(b)	I feel that I do not have close personal relationships with other people.	1	2	3	4
(c)	There is no one I can turn to for guidance in times of stress.	1	2	3	4
(d)	There are people who depend on me for help.	1	2	3	4
(e)	There are people who enjoy the same social activities I do.	1	2	3	4
(f)	Other people do not view me as competent.	1	2	3	4
(g)	I feel personally responsible for the well-being of another person.	1	2	3	4
(h)	I feel part of a group of people who share my attitudes and beliefs.	1	2	3	4
(i)	I do not think other people respect my skills and abilities.	1	2	3	4
(j)	If something went wrong, no one would come to my assistance.	1	2	3	4
(k)	I have close relationships that provide me with a sense of emotional security and well-being.	1	2	3	4
(l)	There is someone I could talk to about important decisions in my life.	1	2	3	4
(m)	I have relationships where my competence and skills are recognized.	1	2	3	4
(n)	There is no one who shares my interests and concerns.	1	2	3	4
(o)	There is no one who really relies on me for their well-being.	1	2	3	4
(p)	There is a trustworthy person I could turn to for advice if I were having problems.	1	2	3	4
(q)	I feel a strong emotional bond with another person.	1	2	3	4
(r)	There is no one I can depend on for aid if I really need it.	1	2	3	4
(s)	There is no one I feel comfortable talking about problems with.	1	2	3	4
(t)	There are people who admire my talents and abilities.	1	2	3	4
(u)	I lack a feeling of intimacy with another person.	1	2	3	4
(v)	There is no one who likes to do the things I do.	1	2	3	4
(w)	There are people I can count on in an emergency.	1	2	3	4
(x)	No one needs me to care for them.	1	2	3	4

Q 32 **Do you regularly provide unpaid care for grandchildren or other people's children?**
(Please tick one box)

Yes, daily	1
Yes, weekly	2
Yes, occasionally	3
No, never	4

Q 33 **Do you regularly provide care or assistance (e.g., personal care, transport) to any of the following people because of their long-term illness, disability or frailty?**
(Please tick one box on each line)

		Yes	No
(a)	Someone who lives with you	1	2
(b)	Someone who lives elsewhere	1	2

- ***If you answered 'Yes' to EITHER (a) and (b) above, go on to Q 34***
- ***If you answered 'No' to BOTH (a) and (b) above, go straight to Q 37 on the next page***

Q 34 **How many people with a long-term illness, disability or frailty do you regularly provide care for?**
(Please tick one box)

One person	1
Two people	2
More than two people	3

Q 35 **How often in total do you provide this care or assistance?**
(Please tick one box)

Everyday	1
Several times a week	2
Once a week	3
Once every few weeks	4
Less often	5

Q 36 **How much time do you usually spend providing such care or assistance on each occasion?**
(Please tick one box)

All day and night	1
All day	2
All night	3
Several hours	4
About an hour	5

Q 37 **Which of the following statements do you agree with the most?**
(Please tick one box)

People can almost always be trusted	1
People can usually be trusted.	2
You usually can't be too careful	3
You almost always can't be too careful.	4
Don't know	5

Q 38 **Some people tell us that they feel lonely or isolated while others say that they don't. In the last 12 months how often have you felt lonely or isolated?**
(Please tick one box)

Always	1
Most of the time	2
Sometimes	3
Rarely	4
Never	5
Don't know	6

Q 39 **Do you attend any of the following:**
(Please tick one box on each line)

		Yes, regularly	Yes, on occasion	No
(a)	religious meetings	1	2	3
(b)	meetings of any community/neighbourhood or social groups, such as clubs, lectures or anything like that	1	2	3

Q 40 **Please answer the following questions about how you contact people**
(Please tick one box on each line)

		Yes	No
(a)	Do you regularly use a telephone to contact family, friends or colleagues?	1	2
(b)	Do you regularly use email to contact family, friends or colleagues?	1	2
(c)	Do you regularly use the internet (i.e., online chat rooms, purchasing goods or services)	1	2

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Work

The following questions are for those currently in paid employment. If you are not currently in paid employment please go straight to the *Retirement* section on page 18.

Q 41

(a) Are you self-employed or employed by another person or company?

Self-employed (tick the box and go to **Q 41 b**) ☐ 1

Employed by another person or company (tick the box and go to **Q 41 c**) ☐ 2

(b) IF YOU ARE SELF-EMPLOYED:
Do you employ any people to work for you? If so, how many?

Yes: (Please indicate below the approximate number of people you employ) ☐ 1

Number of employees: ☐☐☐☐☐

No ☐ 2

(c) IF YOU ARE EMPLOYED BY ANOTHER PERSON OR COMPANY:
Approximately how many people work for your employer?

Number of employees: ☐☐☐☐☐

Q 42 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree 1	Somewhat disagree 2	Moderately disagree 3	Neither agree nor disagree 4	Moderately agree 5	Somewhat agree 6	Strongly agree 7
(a)	I can financially afford to retire now.	☐	☐	☐	☐	☐	☐	☐
(b)	One reason I continue to work is because I cannot afford to retire	☐	☐	☐	☐	☐	☐	☐
(c)	When I imagine what retirement will be like, I feel depressed	☐	☐	☐	☐	☐	☐	☐
(d)	I am tired of work	☐	☐	☐	☐	☐	☐	☐
(e)	If I could get another job different from my current occupation and paying the same amount, I would probably take it	☐	☐	☐	☐	☐	☐	☐
(f)	I definitely want a career for myself in my current occupation	☐	☐	☐	☐	☐	☐	☐
(g)	If I could do it all over again, I would not choose to work in my current occupation	☐	☐	☐	☐	☐	☐	☐
(h)	If I had all the money I needed without working, I would probably still continue to work in my current occupation	☐	☐	☐	☐	☐	☐	☐
(i)	I like this occupation too well to give it up	☐	☐	☐	☐	☐	☐	☐
(j)	This is the ideal occupation for a life's work	☐	☐	☐	☐	☐	☐	☐

Q 42 *(continued)*

		Strongly disagree	Somewhat disagree	Moderately disagree	Neither agree nor disagree	Moderately agree	Somewhat agree	Strongly agree
(k)	I spend a significant amount of personal time reading journals or books related to my occupation	1	2	3	4	5	6	7
(l)	I am disappointed that I ever entered my current occupation	1	2	3	4	5	6	7
(m)	I am satisfied with the success I have achieved in my career	1	2	3	4	5	6	7
(n)	I am satisfied with the progress I have made toward meeting my overall career goals	1	2	3	4	5	6	7
(o)	I am satisfied with the progress I have made toward meeting my goals for income	1	2	3	4	5	6	7
(p)	I am satisfied with the progress I have made toward meeting my goals for advancement	1	2	3	4	5	6	7
(q)	I am satisfied with the progress I have made toward meeting my goals for the development of new skills	1	2	3	4	5	6	7

Q 43 **Please indicate how satisfied or dissatisfied you are with the following aspects of your job. Answer by ticking the box that best reflects how you feel. Tick '*Not applicable*' if an item does not apply to your situation**

(Please tick <u>one</u> box on each line)

		Extremely unsatisfied	Very unsatisfied	Moderately unsatisfied	I'm not sure	Moderately satisfied	Very satisfied	Extremely satisfied	*Not applicable*
(a)	The physical work conditions	1	2	3	4	5	6	7	9
(b)	The freedom to choose your own work method	1	2	3	4	5	6	7	9
(c)	Your fellow workers	1	2	3	4	5	6	7	9
(d)	The recognition you get for good work	1	2	3	4	5	6	7	9
(e)	Your immediate supervisor	1	2	3	4	5	6	7	9
(f)	The amount of responsibility you are given	1	2	3	4	5	6	7	9
(g)	Your rate of pay	1	2	3	4	5	6	7	9
(h)	Your opportunity to use your abilities	1	2	3	4	5	6	7	9
(i)	Industrial relations between the organization and employees	1	2	3	4	5	6	7	9
(j)	Your chance of promotion	1	2	3	4	5	6	7	9
(k)	The way the organization is managed	1	2	3	4	5	6	7	9
(l)	Attention paid to suggestions you make	1	2	3	4	5	6	7	9
(m)	Your hours of work	1	2	3	4	5	6	7	9
(n)	The amount of variety in your job	1	2	3	4	5	6	7	9
(o)	Your job security	1	2	3	4	5	6	7	9

Q 44 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
(a)	The most important things that happen in life involve work	1	2	3	4	5
(b)	Work is something people should get involved in most of the time	1	2	3	4	5
(c)	Work should be only a small part of one's life	1	2	3	4	5
(d)	Work should be considered central to life	1	2	3	4	5
(e)	In my view, an individual's personal life goals should be work-oriented	1	2	3	4	5
(f)	Life is worth living only when people get absorbed in work	1	2	3	4	5

Q 45 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*Not applicable*
(a)	I enjoy my work environment	1	2	3	4	5	9
(b)	If something in my work environment is annoying me then I can get it changed or removed	1	2	3	4	5	9
(c)	My boss is a good boss to work for	1	2	3	4	5	9
(d)	I feel that my boss values my work and the contributions I make	1	2	3	4	5	9
(e)	My boss always listens to my opinion	1	2	3	4	5	9
(f)	My co-workers are good to work with	1	2	3	4	5	9
(g)	If I have a problem my co-workers will help me	1	2	3	4	5	9
(h)	My co-workers always listen to my opinion.	1	2	3	4	5	9
(i)	I am in a position of responsibility for other workers	1	2	3	4	5	9
(j)	I find my job very stressful	1	2	3	4	5	9
(k)	I am responsible for important jobs at work	1	2	3	4	5	9
(l)	I often seem to have a lot of work to do at once	1	2	3	4	5	9
(m)	I work longer hours than most people	1	2	3	4	5	9
(n)	I feel that my job is an important role in my workplace	1	2	3	4	5	9
(o)	I feel that I am not likely to lose my job anytime soon	1	2	3	4	5	9
(p)	I have often had physical symptoms (e.g. headaches, high blood pressure) that were a result of the stress of my job	1	2	3	4	5	9

Q 46 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree	Disagree	Agree	Strongly agree	*Not applicable*
(a)	I have a good relationship with my supervisors	1	2	3	4	9
(b)	I am getting on well with my co-workers	1	2	3	4	9
(c)	There is a pleasant atmosphere at my work place	1	2	3	4	9
(d)	There is good group cohesion at my work place	1	2	3	4	9
(e)	There are often conflicts and arguments at work	1	2	3	4	9

Q 47 **Now we would like to ask some questions about your leisure activities. Please tick the answer that you believe gives an accurate indication of your CURRENT situation.**
(Please tick one box on each line)

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
(a)	When I am not working, my time is filled with non-work interests such as hobbies, clubs and projects	1	2	3	4	5
(b)	When I am not working I like to take it easy	1	2	3	4	5
(c)	When I am not working, I don't know what to do with my time	1	2	3	4	5
(d)	I wish I had more leisure time	1	2	3	4	5
(e)	I look forward to having more leisure time after retirement	1	2	3	4	5
(f)	I feel that work prevents me from having as much leisure time as I would like	1	2	3	4	5
(g)	I enjoy spending time pursuing leisure activities	1	2	3	4	5
(h)	I feel that retirement will allow me to enjoy more leisure activities	1	2	3	4	5

Q 48 **What do you think the chances are that you will be working <u>full-time</u> when you reach:**

		Absolutely no chance	I likely won't	I'm not sure	I likely will	Absolutely certain	*I am this age or older*
(a)	62 years of age?	1	2	3	4	5	9
(b)	65 years of age?	1	2	3	4	5	9

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Retirement

In the following sets of questions we are interested in what people think about retirement (whether they themselves are retired or not).

IMPORTANT NOTE: If you have never been in paid employment, please skip this section and go straight to the *Background Information* section on page 23.

Q 49 **At this time do you consider yourself partly retired, completely retired, or not retired at all?**
(Please tick one box)

- Not retired at all [1]
- Partly retired [2]
- Completely retired [3]

Q 50 **IF YOU ARE *NOT RETIRED* AT ALL: At what age do you think you will retire completely?**

I think I will retire at age: ____

IF YOU ARE *PARTLY/COMPLETELY* RETIRED: In what month and year did you partly/completely retire?

M M Y Y Y Y
Month Year

- ***If you are PARTLY or COMPLETELY RETIRED please go on to Q 51.***
- ***If you are NOT RETIRED AT ALL please go to Q 53 on the next page.***

Q 51 **If you consider yourself partly/completely retired, was your retirement:**
(Please tick one box)

- Forced [1]
- Voluntary [2]

Q 52 **If you consider yourself partly/completely retired, how satisfying did you find your previous work?**
(Please tick one box)

- Extremely unsatisfying [1]
- Unsatisfying [2]
- Somewhat unsatisfying [3]
- Neither satisfying nor unsatisfying [4]
- Somewhat satisfying [5]
- Satisfying [6]
- Extremely satisfying [7]

Q 53 **Do/did you expect your spouse/partner to retire at about the same time as you?**
(Please tick one box)

Yes	1
No	2
Spouse not working	3
Not applicable (no spouse/partner)	4

Q 54 **When you and/or your spouse/partner (if applicable) retire(d), do/did you expect your living standards to:**
(Please tick one box)

Increase a lot	1
Increase somewhat	2
Stay the same	3
Decline somewhat	4
Decline a lot	5

Q 55 **Some people want to stop paid work entirely when they retire, while others would like to continue doing some paid work – what about you?**
(Please tick one box)

Stop paid work entirely	1
Continue some paid work	2
Don't know	3

Q 56 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree	Somewhat disagree	Neither agree nor disgaree	Somewhat agree	Strongly agree
(a)	I feel uncertain about how economic trends will affect my life in retirement	1	2	3	4	5
(b)	I feel secure that the government will financially support me in retirement	1	2	3	4	5
(c)	I feel/felt pressure to retire	1	2	3	4	5
(d)	I worry about the standard of living I will have in retirement	1	2	3	4	5
(e)	I worry about having enough income in retirement	1	2	3	4	5
(f)	I am satisfied with what my family income will be in retirement	1	2	3	4	5
(g)	I am confident that I will easily adjust to retirement	1	2	3	4	5
(h)	I don't think I will have any trouble handling retirement	1	2	3	4	5
(i)	I expect to enjoy retirement	1	2	3	4	5

Q 57 **Please indicate how much you agree or disagree with the following statements. Answer by ticking the box that best reflects how you feel.**
(Please tick one box on each line)

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
(a)	Retirement is a time to rest	1	2	3	4	5
(b)	Retirement is a time to slow down	1	2	3	4	5
(c)	Retirement is a time to relax	1	2	3	4	5
(d)	Retirement is a time to set to work on long-awaited goals	1	2	3	4	5
(e)	Retirement is a welcome beginning of a new stage	1	2	3	4	5
(f)	Retirement is a time to do what I want	1	2	3	4	5
(g)	My life in retirement will be very similar to my life before retirement	1	2	3	4	5
(h)	Retirement isn't a big issue for me	1	2	3	4	5
(i)	I don't think retirement is a major change	1	2	3	4	5
(j)	The only change in retirement is to have more time	1	2	3	4	5
(k)	In retirement, I won't/don't know what to do with my time	1	2	3	4	5
(l)	Nothing will be able to replace work in my life	1	2	3	4	5
(m)	Retirement means making the best of an unwanted situation	1	2	3	4	5
(n)	Retirement is a period of frustration	1	2	3	4	5

Q 58 **Below is a list of reasons why some people retire. Please indicate how important these reasons are, or could be, for you. We would like you to respond even if you are not currently retired.**
(Please tick one box on each line)

		Very important	Moderately important	Somewhat important	Not important at all	*Not applicable*
(a)	Poor health	1	2	3	4	
(b)	The health of other family members	1	2	3	4	9
(c)	Want to do other things	1	2	3	4	
(d)	Don't like the work	1	2	3	4	
(e)	Don't get along with the boss	1	2	3	4	9
(f)	Don't need to work – have enough money	1	2	3	4	
(g)	Can't find any work	1	2	3	4	
(h)	Work was not appreciated	1	2	3	4	
(i)	Husband/wife/partner about to retire	1	2	3	4	9
(j)	Employer policy toward older workers	1	2	3	4	9

Q 59 **Below is a list of things that some people say are *good* about retirement. Please indicate how important you think they are or will be during your retirement. We would like you to respond even if you are not currently retired.**
(Please tick one box on each line)

		Very important	Moderately important	Somewhat important	Not important at all	*Not applicable*
(a)	Being your own boss	1	2	3	4	
(b)	Lack of pressure	1	2	3	4	
(c)	Being able to take it easy	1	2	3	4	
(d)	Having more time with husband/wife/partner	1	2	3	4	9
(e)	Spending more time with grand/children	1	2	3	4	9
(f)	Spending more time on hobbies or sports	1	2	3	4	
(g)	Having more time for volunteer work (church, civic organisation etc)	1	2	3	4	
(h)	Having the chance to travel	1	2	3	4	

Q 60 **Below is a list of things that some people say are *bad* about retirement. Please indicate how bothersome you think they will be during your retirement. We would like you to respond even if you are not currently retired.**
(Please tick one box on each line)

		Bothered a lot	Bothered somewhat	Bothered a little	Not at all bothered	*Not applicable*
(a)	Being bored, having too much time on your hands	1	2	3	4	
(b)	Not doing anything productive or useful	1	2	3	4	
(c)	Missing people you work(ed) with	1	2	3	4	9
(d)	Illness or disability	1	2	3	4	
(e)	Not having enough income to get by	1	2	3	4	
(f)	Inflation and the cost of living	1	2	3	4	

Q 61 **Please answer the following questions whether you are retired or not.**
(Please tick one box on each line)

		A lot	Some	A little	Hardly at all	*Not applicable*
(a)	While still in the paid workforce, how much have/had you thought about retirement?	1	2	3	4	
(b)	While still in the paid workforce, how much have/had you discussed retirement with your spouse/partner?	1	2	3	4	9
(c)	While still in the paid workforce, how much have/had you discussed retirement with your friends or co-workers?	1	2	3	4	

(d) While still in the paid workforce, have/had you attended any meetings on retirement or retirement planning?

Yes	1
No	2

(e) Thinking about your future retirement years compared to your working years, would you say the retirement years will be:

Better	1
About the same	2
Not as good	3

Q 62 Some people feel that in retirement their roles in life might change. For example, some may feel that in retirement their role will be to look out for their grandchildren's welfare, and become a better golfer. What do you think your role in retirement will be?

Please complete the following sentence: "*I feel my main role in retirement will be to…*

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Background Information

Lastly, we would like to ask you for some general background information. Please place a tick next to the answer that you believe gives an accurate indication of your CURRENT situation, or write details in the spaces provided.

Q 63 When were you born?

D	D		M	M	1 9	Y	Y

Day Month Year

Q 64 Are you?
(Please tick one box)

- Male [1]
- Female [2]

Q 65 Which one of these statements is true about your legal marital status?
(If you have been married more than once, answer for your most recent marriage)

- I am legally married [1]
- I am in a civil union/de facto/partnered relationship [2]
- I am permanently separated from my legal husband or wife [3]
- I am divorced or my marriage has been dissolved [4]
- I am a widow or widower [5]
- I have never been legally married [6]

Q 66 Which ethnic group do you belong to?
(Please tick all the boxes that apply to you)

- Pakeha / New Zealander of European descent [1]
- Māori [1]
- Samoan [1]
- Cook Island Māori [1]
- Tongan [1]
- Niuean [1]
- Chinese [1]
- Indian [1]
- Other (such as Dutch, Japanese, Tokelauan). Please state below: [1]

_____

Q 67

(a) Were you born in New Zealand?
(Please tick one box)

- Yes (Tick and go to **Q 68** on the next page) [1]
- No (Tick and go to **Q 67 B** on the next page) [2]

(b) If you were not born in New Zealand please indicate below the approximate date that you came to live permanently in New Zealand:

	M	M		Y	Y	Y	Y
	Month			Year			

Q 68 Excluding yourself, please give the total number of people that live in the same household as you.

Total number of people	

Q 69 How many people, excluding yourself, are dependent on you for their financial support?

Total number of people	

Q 70 Mark as many spaces as you need to show all the people who live in the same household as you.

My legal husband or wife	☐ 1
My partner or de facto, boyfriend or girlfriend	☐ 1
My son(s) and/or daughter(s)	☐ 1
My mother and/or father	☐ 1
My sister(s) and/or brother(s)	☐ 1
My flatmate(s)	☐ 1
Other (Please state: e.g. my grandmother, my mother-in-law, my partner's father, boarder etc). _____	☐ 1
None of the above – I live alone	☐ 1

If you indicated above that you live with some of your children, please indicate below how many children live in the same household as you and their ages:

Number of children	

Ages: | | | | | | | | | | | | |

Q 71 Which of the following best describes the area where you live?

(Please tick one box)

Main Urban Area	⇨	A city with population of 30,000 or more	⇨	☐ 1
Secondary Urban Area	⇨	A town / city with a population of between 10,000 & 29,999	⇨	☐ 2
Minor Urban Area	⇨	A town with a population of between 1,000 & 10,000	⇨	☐ 3
Rural Centre	⇨	A town with a population of between 300 & 1,000	⇨	☐ 4
Rural Area	⇨	Outside a town / city boundaries	⇨	☐ 5

Q 72 **What is your highest secondary school qualification?**
(Please tick one box)

No school qualifications	1
NZ School Certificate in one or more subjects	2
NZ Sixth Form Certificate in one or more subjects	3
NZ Higher School Certificate, or Higher Leaving Certificate	4
NZ University entrance	5
NZ A or B Bursary or University Scholarship	6
Other NZ secondary school qualification (Please print the qualification below): _____	7
Overseas secondary school qualification	8

Q 73 **Apart from secondary school qualifications, do you have other qualifications?**
(Please don't count incomplete qualifications or qualifications that take less than 3 months of full-time study to get).

Yes (Please print your highest qualification below): _____	1
No	2

Q 74 **In the following table:**

- **Please tick in column 1 the situation which best describes your current situation.**
- **Please tick in column 2 the situation which you would prefer to be in.**

(Tick the box in the same row if you are currently in your preferred situation).

Employment Status	① Your *Current* Situation	② Your *Preferred* Situation
Full-time paid employment, including self employment	1	1
Part-time paid work, including self employment	2	2
Retired, no paid work	3	3
Full-time homemaker	4	4
Full-time student	5	5
Unemployed and seeking work	6	6
Not in the workforce – other (please specify below) _____	7	7

Q 75 **Do you regularly perform shift work?**

Yes	1
No	2
Not applicable (not employed)	3

Q 76 **IF IN PAID EMPLOYMENT: What is your occupation in your main job?**
(Try to be as specific as you can. For example: Primary School Teacher, Clothing Machinist, Motel Manager, Word Processor Operator).

_____

How many hours (to the nearest hour) do you usually work each week?

	Hours
In your main job?	
In your other jobs (if applicable)?	

IF PARTLY/COMPLETELY RETIRED: What was your occupation in your main job prior to partial/complete retirement?
(Try to be as specific as you can. For example: Primary School Teacher, Clothing Machinist, Motel Manager, Word Processor Operator).

_____

Q 77 **Is your spouse/partner in paid employment?**
(Please tick one box)

Full-time paid employment, including self employment	1
Part-time paid work, including self employment	2
Retired, no paid work	3
Full-time homemaker	4
Full-time student	5
Unemployed and seeking work	6
Other: (please specify) _____	7
Not applicable (No spouse/partner)	9

Q 78 **Tick as many boxes as you need to show all the ways you received income in the 12 months ending today.**

NOTE: Please DON'T count loans because they are not income.

Wages, salary, commissions, bonuses…etc, paid by my employer	1
Self-employment, or business I own and work in	1
Interest, dividends, rent, other investments	1
Regular payments from ACC or a private work accident insurer	1
New Zealand Superannuation or Veterans Pension	1
Other superannuation, pensions, annuities (other than NZ Superannuation, Veterans Pension or War Pension)	1
Unemployment Benefit	1
Domestic Purposes Benefit	1
Invalids Benefit	1
Student Allowance	1
Other government benefits, income support payments, or war pensions	1
Other sources of income, counting support payments from people who do not live in my household	1
No source of income during that time	1

Q 79 **From all the sources of income you marked in question 78, what would the total income be that you yourself received before tax in the last 12 months?**
(Please specify the approximate dollar amount below.)

(Approximately) **$** $ $ $ $ $ $ $ $

Q 80 **What would be the combined income that *every other member* of your household received in the last 12 months?**
(Please specify the approximate dollar amount below.)

(Approximately) **$** $ $ $ $ $ $ $ $

Q 81

(a) Altogether, how many superannuation schemes (either in New Zealand or offshore) do you belong to?
(Please tick one box)

None	1
1	2
2	3
3 or more	4

(b) Does your spouse/partner belong to a superannuation scheme?
(Please tick one box)

Yes	1
No	2
Not applicable (no spouse/partner)	3

(c) Do you own any of the following? IF YOU WANT TO, please provide the approximate value.
(Please tick one box on each line)

	Yes	No		Value *(In thousands)*
The property where you live?	1	2	$	
A farm or farms?	1	2	$	
A business or businesses?	1	2	$	
A holiday house?	1	2	$	
A rental property or properties?	1	2	$	
Any shares?	1	2	$	
Any managed funds?	1	2	$	
Any banks deposits or savings?	1	2	$	
A motor vehicle or vehicles?	1	2	$	
Other major assets? (Please specify below)	1	2	$	

_____

(d) Do you have any of the following?

	Yes	No
A mortgage or mortgages?	1	2
A loan from a bank, finance company, family member or friend?	1	2

Q 82 **For the following questions, please indicate whether or not you have (or have access to) the item by ticking one of the boxes.**

1. **Tick the first box if you have the item or have access to it**
2. **Tick the second box if you don't have the item because you don't want it**
3. **Tick the third box if you don't have the item because of its cost**
4. **Tick the forth box if you don't have the item because of some other reason.**

		Yes I have it	No because I don't want it	No because of the cost	No for some other reason
(a)	Telephone	1	2	3	4
(b)	Washing machine	1	2	3	4
(c)	Heating available in all main rooms	1	2	3	4
(d)	A good pair of shoes	1	2	3	4
(e)	A best outfit for special occasions	1	2	3	4
(f)	Personal computer	1	2	3	4
(g)	Home contents insurance	1	2	3	4
(h)	Enough room for family to stay the night	1	2	3	4

Q 83 **For the following questions, please indicate whether or not you do the activity by ticking one of the boxes.**

		Yes I do it	No because I don't want to	No because of the cost	No for some other reason
(a)	Give presents to family or friends on birthdays, Christmas or other special occasions.	1	2	3	4
(b)	Visit the hairdresser at least once every three months	1	2	3	4
(c)	Have holidays away from home every year	1	2	3	4
(d)	Have a holiday overseas at least every three years	1	2	3	4
(e)	Have a night out at least once a month	1	2	3	4
(f)	Have family or friends over for a meal at least once a month	1	2	3	4

Q 84 **The following questions are about your material standard of living – the things that money can buy** (this does not include your health or capacity to enjoy life). **Tick the answer that best applies to you.**

(a) Generally, how would you rate your material standard of living?

High	1
Fairly high	2
Medium	3
Fairly low	4
Low	5

(b) Generally, how satisfied are you with your current material standard of living?

Very satisfied	1
Satisfied	2
Neither satisfied nor dissatisfied	3
Dissatisfied	4
Very dissatisfied	5

(c) How well does your total income meet your everyday needs for such things as accommodation, food, clothing and other necessities?

My income is not enough	1
My income is *just* enough	2
My income is enough	3
My income is more than enough	4

Q 85 The following are a list of things some people do to help keep costs down. In the last 12 months, how often have you done any of these things? Tick the box that best applies to you.

		Not at all	A little	A lot
(a)	Gone without fresh fruit and vegetables to keep down costs	1	2	3
(b)	Continued wearing clothing that was worn out because you couldn't afford a replacement	1	2	3
(c)	Put off buying clothes for as long as possible to help keep down costs	1	2	3
(d)	Stayed in bed longer to save on heating costs	1	2	3
(e)	Postponed or put off visits to the doctor to help keep down costs	1	2	3
(f)	NOT picked up a prescription to help keep down costs	1	2	3
(g)	Spent less on hobbies than you would like to keep down costs	1	2	3
(h)	Done without or cut back on trips to the shops or other local places to help keep down costs	1	2	3

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Whakapapa/ Whanaungatanga

In this section we would like to ask you for some general background information about your Māori ancestry.

Q 86 **Do you identify as Māori?**
(Please tick one box)

Yes	1
No	2

Q 87 **How many generations of your Māori ancestry can you name?**
(Please tick one box)

I generation (parents)	1
2 generations (grandparents)	2
3 generations (great-grandparents)	3
More than 3 generations	4

Q 88 **Have you ever been to a marae; and if yes – how often over the past 12 months?**
(Please tick one box)

Not at all	1
Once	2
A few times	3
Several times	4
More than once a month	5

Q 89 **In terms of your involvement with your whanau, would you say that your whanau plays...**
(Please tick one box)

A very large part in your life	1
A large part in your life	2
A small part in your life	3
A very small part in your life	4

Q 90 **Do you have a financial interest in Māori land (i.e. as an owner, part/potential owner or beneficiary)?**
(Please tick one box)

Yes	1
No	2
Not sure/don't know	3

Q 91 **This question considers your contacts with people. In general, would you say that your contacts are with…**
(Please tick one box)

Mainly Māori	1
Some Māori	2
Few Māori	3
No Māori	4

Q 92 **How would you rate your overall ability with Māori language?**
(Please tick one box)

Excellent	1
Very good	2
Good	3
Fair	4
Poor	5
Not applicable	6

Thank you for taking the time to complete this survey

Please turn the page

HEALTH WORK AND RETIREMENT LONGITUDINAL STUDY

E tū te huru mā, haramai e noho

Invitation

This study is being done *by* New Zealanders *for* New Zealanders, to help us understand what factors might help New Zealanders have a better, active, and more fulfilling retirement. To make this study work, we need people like you to help us. We would like to invite you to take part in future research regarding your plans, expectations and behaviour in relation to health, work, and retirement. This would involve completing further surveys in the future. You are under no obligation to take part in future research (it is your choice). If you choose to be contacted in the future please complete your name and contact details below:

Name: _____

Address: _____

_____

_____

_____

Phone: _____

Email: _____

We are also interested in interviewing a small number of people regarding their current work or retirement situation. If you are interested in being interviewed please fill in your details above and tick the box below:

"Yes, I am interested in being interviewed about my work or retirement situation" ☐

(If you tick this box you will receive more information about the interview).

Before you place the completed survey in the addressed, FREEPOST envelope, please:

- Check to see that you have NOT skipped any pages
- Double check to make sure you have entered ALL the information that you intended to.

If you are keen to take part in further research, we would like you to nominate three people whom we can contact in the event that we lose track of you. This is optional (*you do not have to do this*), but it would help us.

Contact Person Number 1

Name:

_____, _____
Surname First Name

Address: Phone:

_____ _____

_____

_____ Email:

_____ _____

Contact Person Number 2

Name:

_____, _____
Surname First Name

Address: Phone:

_____ _____

_____

_____ Email:

_____ _____

Contact Person Number 3

Name:

_____, _____
Surname First Name

Address: Phone:

_____ _____

_____

_____ Email:

_____ _____