Wellbeing in New Zealand: A reliability and validity study of the New Zealand Sovereign Wellbeing Index

Amanda Reid

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Abstract

Background

Measurement tools that evaluate personal, social and occupational life domain wellbeing are increasingly being used to measure how people are feeling and flourishing. The New Zealand Sovereign Wellbeing Index (NZSWI) is a measure specifically developed to evaluate the wellbeing of New Zealanders, and to track how their wellbeing is changing over time. Best practice in psychometric measurement requires sound assessment in order to be useful for those interpreting and utilising the results of wellbeing measures, and the NZSWI's reliability and validity has yet to have been investigated. The aim of this research was to determine the test-retest reliability, internal consistency, and construct validity of the NZSWI.

Methods

The aim of this research was to determine the test-retest reliability, internal consistency, and construct validity of the New Zealand Sovereign Wellbeing Index. Seventy-one adults aged 18 years and over completed a survey battery, including the New Zealand Sovereign Wellbeing Index and additional validated wellbeing measures at two time points, one week apart. Test-retest reliability between the two time points was analysed by calculating an intraclass correlation coefficient. Internal consistency was assessed at time point 1 using a Cronbach's alpha correlation coefficient. Construct validity, both convergent and discriminant, was evaluated against validated psychometric tools using Spearman's rank correlation coefficient.

Results

With regard to test-retest reliability, 78 items (89%) displayed substantial reliability (Cronbach's coefficients between 0.61 and 1). Ten items (11%) had moderate reliability (coefficients between 0.41 and 0.6). For internal consistency, five of the twenty total topic headings (25%) had coefficient alphas above 0.7, eleven (55%) had coefficient alphas between 0.5 and 0.69, two (10%) had alphas between 0.4 and 0.49, and two (10%) had coefficient alphas under 0.25. With regard to convergent validity, all items measured within the 15 topic tables displayed strong validity with Spearman's coefficients above 0.5. For discriminant validity, one topic (11%) returned a small correlation, six topics (67%) returned medium correlations, and two topics (22%) returned strong correlations, therefore demonstrating variable validity in this aspect.

Conclusion

On the whole these results suggest that the New Zealand Sovereign Wellbeing Index is a reliable and valid psychometric measurement tool for assessing wellbeing constructs in a New Zealand adult population.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning

Signed……. Date…….

Name…….

Overview

Since the mid-20th century, economic indicators such as the Gross Domestic Product (GDP) and Gross National Product (GNP) have been utilised as measures of a country's quality of life (Cobb, Goodman, & Wackernagel, 1999). However, Michaelson et al. (2009) argue that population wellbeing cannot be evaluated solely by measuring the value of a nation's production of goods and services, and governments are looking to non-economic indicators of societal progress.

The concept of wellbeing has emerged from an immense body of psychological and social indicator research on the subjects of life satisfaction, strengths, happiness, and quality of life (see the journal Social Indicators Research). Tools measuring wellbeing constructs may be used to explain how individuals flourish within communities, and how they perceive and respond to events and situations in their lives. For many in the developed world, increases in life satisfaction have not been comparable to the increases in income, education levels or health status (Huppert et al., 2009). Many researchers and social commentators have recommended that these objective indicators of national progress be supplemented with subjective indicators evaluating the wellbeing of a nation’s population experience that can be used to inform new policy interventions and to evaluate existing policies.

The first of the six chapters in this thesis is a literature review on relevant subjects, describing wellbeing constructs, measurement tools, and psychometric measurement considerations, including assessing reliability and validity. The second chapter is an introduction to the research proper. The third chapter describes the variables of interest in the research including the New Zealand Sovereign Wellbeing Index and the five measurement tools used in the validity aspects of this study. The chapter also explains the data analysis methodology. The fourth and fifth chapters present results of obtained from the data analysis in the form of papers. The sixth chapter discusses the main findings, acknowledges the limitations and strengths of the research, explains implications that are important to the study, and provides overall concluding remarks.

Chapter 1. Literature Review

This chapter focuses on the relevant literature, theories and practices central to understanding the science of wellbeing. First, the constructs that are widely considered to make up wellbeing are described (1.1), addressing subjective wellbeing (1.1.1), psychological wellbeing (1.1.2), and social wellbeing (1.1.3). The second section (1.2) explores the ways these constructs are measured in the field of psychometric testing (1.2.1), including the methodologies by which psychometric tests are calibrated and found to be reliable (1.2.2) and valid (1.2.3). Methodological issues are also briefly presented. Finally, the rationale for developing national measures of wellbeing is presented (1.3). This section is followed by a brief conclusion (1.4) where this study's contribution to the gap in current literature is explained.

1.1. What is Wellbeing?

Positive psychology was founded as a counter to the disease model of modern psychology (Seligman, 2003), and is a return to one of the original missions of psychology, which is to make people's lives happier and more fulfilling. Seligman and Csikszenmihalyi (2000) stated that "the field of positive psychology at the subjective level is about valued subjective experiences: wellbeing, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present)", and signalled the need for a shift away from the focus on pathology. In a later paper, Seligman (2003) describes the three pillars of positive psychology as the study of positive subjective experiences of the past, present and future, the exploration into individual's positive strengths and virtues, and the analysis of positive communities and the role of socialisation. Knowledge obtained in these fields may be applied to assessment or intervention, as well as furthering understanding of lifespan development.

As Keyes and Lopez (2002) noted, systematically building individual's competency has led to greater strides in the prevention of mental illness and substance abuse, than the disease model's focus on correcting weakness. Keyes and Lopez also discovered that a strengths-based psychological approach acts as a buffer against mental illness.

Wellbeing is a core concept of positive psychology, and is multifaceted and multidimensional. There is a vast body of research on wellbeing constructs, with two

main philosophical viewpoints that underpin their categorisation (Keyes, 2009). The first states wellbeing has a *hedonic* foundation; it is affective, and based on feelings and experiences of pleasure and displeasure. This type of wellbeing is described as subjective or emotional, and research based on this viewpoint concerns itself with an individual's global evaluation of their life satisfaction, and affect balance, which is the balance between positive affect (experiences of pleasure) and negative affect (experiences of displeasure) (Diener, 1984). The second philosophical stance views wellbeing through a *eudaimonic* lens; it is a result of positive functioning. This type of wellbeing is described as psychological, and research based on this perspective addresses an individual's perceptions of the quality of their psychological functioning (Ryff, 1989). To a lesser extent there is also a body of research on social wellbeing, with literature on social wellbeing coming through both philosophical viewpoints, and referring to an individual's quality of social functioning (Biswas-Diener, 2011; Keyes, 1998).

In all three domains of wellbeing (emotional, psychological and social), there are clear defining characteristics. Wellbeing is based on an individual's subjective experience, therefore is it self-evaluated and self-reported, and an integrated judgement needs to be considered (Diener, 2009). There may be a range of time frames considered, from the past 24 hours to a few weeks to an individual's lifetime. Being strengths-based and focusing on constructs such as happiness and flourishing, it includes positive measures (Seligman, 2003).

1.**1.1. Subjective wellbeing.** Subjective wellbeing has variously been described as being made up of the degree of positive feelings experienced, perceptions of one's life and emotional wellbeing (Diener, Suh, Lucas & Smith, 1999; Gurin, Veroof & Feld, 1960), and as consisting of avowed happiness, satisfaction with life, and being concerned with people's affective and cognitive perceptions (Keyes & Magyar-Moe, 2003). Some wellbeing literature uses terms such as subjective wellbeing, emotional wellbeing, happiness and life satisfaction interchangeably.

General consensus, however, defines subjective wellbeing as the combination of affect balance, which is the balance of the positive affect to negative affect, and global evaluations of life satisfaction (Diener, 2000; Bryant & Veroff, 1982; Linley & Joseph, 2004; Lucas, Diener & Suh 1996; Shmotkin 1998). Peterson (2006) suggests that

subjective wellbeing is "relatively high levels of positive affect, relatively low levels of negative affect, and the overall judgement that one's life is a good one" (p. 84). This will be the operational definition used for the purposes of this study as the connection of affect and life satisfaction allows for the meaningful and measurable conceptualisation of subjective wellbeing. In addition, Sheldon and Lyubomirsky (2004) found these three constructs to be highly correlated. The remainder of this section will address how the literature further defines the constructs of affect balance and life satisfaction.

People's perceptions of pleasure and pain are prominent in wellbeing research. Frijda (1999) states that affect is the subjective experience of pleasure or pain, and is a core component of emotions. Diener (1994) considers affective experiences to be important indicators of subjective wellbeing that has influence on life satisfaction as a whole. Barrett and Russell (1999) describe the affective domain as being on a continuum of experience. Positive affect is the experience of aspects such as joy, enthusiasm, contentment, relaxation and excitement, and negative affect is the experience of the absence of these aspects, including the experience of aspects such as hopelessness, nervousness, sadness, lethargy and tension (Barrett & Russell, 1999; Keyes & Magyar-Moe, 2003; Watson & Tellegen, 1985).

There is extensive debate over the structure of positive and negative affect. One perspective is that affect is unidimensional with positive ('pleasant') affect and negative ('unpleasant') affect being highly correlated due to operating at opposite ends of a single continuum (Feldman-Barrett & Russell, 1998; Russell & Carroll, 1999). Another perspective is that positive and negative affect are relatively independent and are weakly negatively correlated with each other, therefore affect balance is bidimensional (Diener et al., 1985; Watson, 2002). Some studies on affect have shown that positive and negative affect have different correlates, and levels of both affective states may be experienced at the same time (Bradburn & Noll, 1969; Feldman-Barrett & Russell, 1998).

Watson et al. (1988) queried these inconsistencies and posited that the scales used to measure affect may also have variability in how they measure underlying factors. In addition, the validity and reliability of scales purporting to measure affect varies widely with some scales demonstrating low Cronbach's coefficient alphas, such as Bradburn's (1969) scales with alphas of 0.52 for negative affect and 0.54 for positive affect. This compares to Watson et al. (1988) Positive and Negative Affect Scales

(PANAS) with coefficient alphas of 0.88 for positive affect and 0.87 for negative affect, and Diener et al's (2010) Scale of Positive and Negative Experience (SPANE) with alphas of 0.87 for positive affect and 0.81 for negative affect.

Andrews and McKennell (1980) described the difference between happiness and life satisfaction as happiness deriving from affective components regarding feelings and emotions, and life satisfaction deriving from cognitive components regarding thoughts, beliefs and evaluations. Keyes and Magyar-Moe (2003) supported this position in temporal terms, with happiness being based on the spontaneous reflection of an individual on the immediate experience of pleasant or unpleasant feelings, and life satisfaction being a longer-term assessment of life by an individual.

Life satisfaction is widely considered to be the cognitive, information-based and evaluative assessment people make when judging how their life measures up to their ideals and expectations (Pavot & Diener, 2008). Bradley and Corwyn (2004) contend that life satisfaction self-reports indicate whether basic needs are being met and the extent to which self-realisation goals are viewed as being achievable, with the perspective that increases in goal attainment are correlated with increases in life satisfaction. Vittersø (2013) argued that both cognitive and emotional processes were involved in the evaluation of life satisfaction with participants typically taking no more than a few seconds to answer survey items such as, "All things considered, how satisfied are you with your life as a whole?" and that people do not have the cognitive capacity to evaluate "all things", and therefore give them proper weight and consideration in this short time frame. Thus, it seems reasonable to assume there must be a degree of automaticity in these responses, and life satisfaction may be influenced by both affective and cognitive components.

Beyond overall judgments, within an individual's life there are a number of important life domains that they give weight to, such as family relationships, intimate relationships, spirituality, employment, and education. Schimmack et al. (2002) identified the relevance of the ascribed importance of a domain and a person's level of satisfaction with that domain as being integral in their evaluation of their overall life satisfaction. While some studies have argued that satisfaction with important life domains should be considered a fourth dimension of subjective wellbeing (e.g. Diener et al., 1999; Diener, 2000), and Schimmack and Oishi (2005) stated that "... domain satisfaction is the most proximal determinant of life satisfaction, and examining the

determinants of domain satisfaction can provide important information about the determinants of life satisfaction" (p. 404), other studies have countered that life satisfaction surveys incorporate important life domain satisfaction and that there is a "bottom-up" direction of causality between life domains and life satisfaction (Brief et al., 1993; Rode & Near, 2005). Studies also show life satisfaction is correlated with better physical and mental health, and character strengths such as hope, love, gratitude, zest and curiosity (Beutell, 2006; Park, Peterson & Seligman, 2004).

Both single item measures, such as the Self Anchoring Striving Scale (Cantril, 1965), and multi-item measures, such as the Satisfaction With Life Scale (Diener, 1984), have been developed in the search to effectively measure the degree of satisfaction people experience in their lives. Single item measures have the advantage of brevity, and have some validity, but usually they have low reliability, while multiple-item scales offer greater validity and reliability, as well as a greater breadth of coverage of aspects of the life satisfaction construct (Keyes & Magyar-Moe, 2003; Lucas, Diener & Larsen, 2003). The internal reliability of the Satisfaction With Life Scale, the mostly widely used research measure, consistently has coefficient alphas exceeding 0.80 (Diener 1993; Diener et al., 1985; Pavot & Diener 1993), while there seems to be limited research on the psychometric properties of the Self-Anchoring Striving Scale.

In conclusion, subjective wellbeing is a psychological construct with two main aspects –affective and emotional wellbeing as measured by positive and negative affect, and evaluative and cognitive wellbeing as measured by global evaluations of life satisfaction. Both aspects may be analysed at different temporal levels, including momentary, intermediate or overall levels, although the cognitive aspect of life satisfaction has been shown to be a more stable construct over longer periods of time (Diener & Pavot, 2009). In a consensus document, more than 50 researchers agreed with Diener et al. (2006) that subjective wellbeing refers to "the various types of evaluations, both positive and negative, that people make of their lives. It includes reflective cognitive evaluations, such as life satisfaction and work satisfaction, interest and engagement, and affective reactions to life events, such as joy and sadness. Thus, subjective wellbeing is an umbrella term for the different valuations people make regarding their lives, the events happening to them, their bodies and minds, and the circumstances in which they live. (pp. 399-400)."

1.1.2. Psychological wellbeing. There has been extensive debate among wellbeing researchers as to whether subjective and psychological wellbeing are alternate views of the same construct or whether they are in fact discrete aspects (Henderson & Knight, 2012). Chen et al. (2013) undertook a study of the relationship between the two aspects and found that although subjective and psychological wellbeing are closely related in terms of the general wellbeing paradigm, they are also separate concepts.

Keyes (2009) suggests there are two underlying philosophical viewpoints on the nature of happiness and wellbeing. The first viewpoint, as detailed in section 1.1.1, is hedonic, that is based on affective components, with research on this viewpoint evaluating subjective wellbeing (Kashdan, Biswas-Diener & King, 2008). The second viewpoint, and the focus of this section, is eudaimonic (Waterman, 2008), where happiness is a causality of positive functioning, with studies from this perspective describing psychological wellbeing (Ryff & Keyes, 1995).

These two philosophical viewpoints have their foundations in Ancient Greece. In the third century BC, a student of Socrates, Aristippus of Cyrene, provided his hedonic manifesto where he stated "that pleasure is the *sole* good, but also that only one's own physical, positive, momentary pleasure is a good, and is so regardless of its cause" (Tatarkiewicz, 1976, p. 317). Likewise in the third century BC, Plato mentored Aristotle of Stagira, but Aristotle's stance was quite different to Aristippus'. Aristotle declared "the function of man is to live a certain kind of life, and this activity implies a rational principle, and the function of a good man is the good and noble performance of these, and if any action is well performed it is performed in accord with the appropriate excellence: if this is the case, then happiness turns out to be an activity of the soul in accordance with virtue" (Aristotle, 1985, 1098a). Thus, for Aristotle eudaimonia was not something to be passively experienced, rather, it must be actively practiced.

The philosophical duality in the nature of wellbeing is the one of the largest debates in positive psychology with wellbeing historically defined less through the lens of eudaimonic and psychological wellbeing, and more through the lens of hedonic and subjective wellbeing. This debate appears to be shifting however, with evidence of an increasing consensus between leading wellbeing researchers about the multifaceted nature of wellbeing (Henderson & Knight, 2012; Linley, 2013). The clearest example of this is from the father of the positive psychology movement, Martin Seligman, who

shifted from defining wellbeing as authentic happiness (subjective wellbeing) in 2002 to outlining the basis of a life well lived as flourishing (psychological wellbeing) in 2011.

Psychological wellbeing has more recent roots in personality, developmental and clinical psychology concepts. Ryff (1989) details it as drawing from self-actualisation theory (Maslow, 1968), optimal functioning models (Rogers, 1961), individuation theory (Jung 1933), models of maturity development (Allport, 1961), and successful resolution of adult developmental stages and tasks (Erikson, 1959; Neugarten, 1973). For the purposes of this study, the definition of psychological wellbeing will be taken from Ryff and Keyes (1995) who in developing the Scales of Psychological Wellbeing outlined a theoretical model with six distinct and interrelated facets of psychological wellbeing. These facets include autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. These six facets are linked to the eudaimonic perspective of optimal psychological functioning (Huta & Ryan, 2010; Ryan & Deci, 2000). In summarising this model, the researchers stated that content must be considered as a facet of wellbeing, with a life well lived having other qualities beside satisfaction and hedonic pleasure. This view is supported by Waterman (2008) who states "experiences of eudaimonia are always accompanied by experiences of hedonia, but…the reverse is not true" (p. 243).

Autonomy is defined by Rogers (1961) as the ability to maintain an internal locus of evaluation and control, and Maslow (1968) further defined it as being able to resist enculturation. Ryff (2013) elaborated on these definitions by including qualities and actions of independence, self-regulation, and self-determination. Self-Determination Theory holds that subjective and psychological wellbeing is dependent on autonomy, and that autonomy is important in multiple levels of operating, including settings, situations, and domains (Ryan & Deci, 2000). Analysis of Gallup polls across countries has shown that autonomy is also associated with subjective wellbeing as one of the strongest predictors of positive affect (Diener et al., 2010).

Jahoda (1958) explained environmental mastery as being an individual's sense of competence in creating and choosing situations, contexts and communities suitable to their own needs and desires. Essentially, this means that people feel they have a sense that they can act as their own advocate. Research has shown environmental mastery, both inside and outside of one's home, is one of the most important aspects of wellbeing in older adults alongside perceived independence, and is related to less experience of

depressive symptoms (Oswald et al., 2007). The same study by Oswald et al. (2007) found that the more positive meaning a person ascribed to their home across multiple aspects (physical, cognitive, emotional), the better their sense of environmental mastery. Windle and Woods (2004) conducted a literature review of the environmental mastery subscale of the Scales of Psychological Wellbeing, and found for older adults in the community environmental mastery was found to be "the key to experiencing life satisfaction in the midst of adversity" (p.595). They also found it contributed to the absence of mood disorders in those suffering from rheumatoid arthritis, and was a predictor of fatigue and stress among those with multiple sclerosis. In parents of children with developmental and cognitive disabilities, and mental health disorders, higher levels of environmental mastery is associated with accommodative coping (Seltzer et al., 2004). The rest of this section will address how the literature further defines the six components of psychological wellbeing.

Personal growth is concerned with the continual and dynamic progression of individual self-realisation, and is the closest in meaning to Aristotle's definition of eudaimonia (Ryff, 2013). All people need experiences of autonomy, competence and relatedness in order to experience personal growth and develop to their full potential; Ryan and Deci (2000) state that these needs evolved because those who sought these experiences and succeeded in obtaining them, acquired selective advantages compared with those who did not. In cultures where life experiences are viewed as opportunities for personal and spiritual growth, individual's perceptions of life conditions can be viewed favourably as compared to other cultures (Flores & Obasi, 2003). For Huta (2013) the pursuit of growth sensitises people to states such as awe, transcendence, and inspiration, elevating them to function at higher levels and push their boundaries.

The interpersonal realm of psychological wellbeing is measured by positive relations with others, as characterised by trusting and satisfying relationships, the ability to feel empathy, and the capacity for intimacy and affection (Ryff, 1989; Ryff & Keyes, 1995; Ryff & Singer, 2000). Ryff and Singer (2000) state that "interpersonal flourishing is a core feature of quality living" (p.30). Studies have shown a causal relationship between positive relations with others, life satisfaction and positive affect; and negative relations with others, depression, and negative affect (Ryff, 1989; Suresh & Sandhu, 2012). Thus, the positive relations with others construct mediates the relationships between subjective and psychological wellbeing. According to Burke et al. (2012) positive relations also mediate the associations between psychological and

social wellbeing, with the experience of positive relations with others being "an *expression* of social skills" (p. 77). Greater loneliness is associated with greater family environment conflict and less positive relations with others. In other words, it appears as though the expression of social skills (i.e., positive relations with others) is more strongly associated with loneliness than are the mechanisms through which people express their social skills (i.e., disclosure skills). The research of Segrin and Flora (2000) found perception of positive relations with others was also indicative of the ability to gather and draw on support networks during times of stress and trauma, and Ness et al. (2014) observed how when individuals with PTSD symptoms experienced positive relationships, this was associated with increased resilience and decreased avoidance coping strategies in tertiary academic settings.

According to Frankl (2011) purpose in life is directly concerned with creating direction in life in the quest to live authentically, and draws heavily on existential perspectives of finding meaning in suffering and effort. In positive psychology, the relationship of purpose in relation to pursuing and attaining goals, and developing personal potential has been extensively studied (Ryff, 1989; Ryff & Keyes, 1995; Ryff & Singer, 2000). Hill and Turiano (2014) cited purpose in life as an indicator of longevity, with the longitudinal Midlife in the United States (MIDUS) cohort revealing correlations between healthy aging and purpose in life. Yager (2014) also found mortality risk attenuated by having a clear and conscious life purpose. The pursuit of purpose in life has also been shown to be associated with the construct of positive relations with others as it is harder to reach one's goals in isolation (Damon, 2003). Hart and Sasso (2011) found research into meaning and purpose had waned since 2007 while studies on resilience, happiness, and flourishing have increased.

Identifying one's true nature and aligning all actions with this true nature is a fundamental purpose of eudaimonia. At the heart of self-acceptance is the ability to accurately perceive and evaluate one's strengths, weaknesses, feelings, motivations, and actions (Waterman, 2008). For Weinstein and Przybylski et al. (2012) self-acceptance is part of the congruence component of autonomy in Self-Determining Theory. The level of support from parents in developing one's autonomy is central to the potential for self-acceptance (Grolnick, 2003). However, a lack of parental support for autonomy can be mediated in later life with support from peers, partners and work colleagues, resulting in increased capacity for self-acceptance (Weinstein et al., 2012).

In summary, psychological wellbeing is generally concerned with euidaimonic qualities of positive human functioning and of "striving toward excellence based on one's unique potential" (Ryff & Singer, 2008, p.14). Ryff, (1989) articulated a concept of psychological wellbeing to assess the goals of reaching human potential and having a meaningful life, encompassing six domains covering a range of beliefs, attitudes, and abilities identified as important to that purpose. Having discussed these six psychological wellbeing constructs, aspects that constitute social wellbeing are now explored.

1.1.3. Social wellbeing. Whereas subjective wellbeing is hedonic and concerned with what happiness is, and psychological wellbeing is eudaimonic and is concerned with meaning in life and flourishing, social wellbeing is concerned with positive functioning in a social sphere. Positive functioning is multidimensional, encompassing the constructs of psychological and social wellbeing (Ryff, 1989; Keyes, 1998). According to Keyes and Magyar-Moe (2003), social wellbeing is largely the public perception of individuals as they engage with structures in their interpersonal realm whilst undertaking social functions and tasks. The importance of interpersonal relationships is even reflected in the constitution of the World Health Organisation (WHO) (1960) where health is defined as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (p.1).

There is a large body of research throughout the social sciences on how fundamental nurturing, affection, intimacy and empathy are to humans not just surviving, but also thriving (Becker, 1992; Bowlby, 1969; Jahoda, 1958; Keyes, 1998; Markus & Kitayama, 1991, 1994; Maslow, 1968). Within positive psychology however, research has been primarily focused on individual strengths and qualities, in comparison with the relationship between people and their communities and cultures. According to Richardson and Guignon (2008), there is a predisposition within positive psychology towards individualism and contextual factors such as culture are often neglected, considered only to the degree to which they are integrated into an individual's self-perception. No person is an island, and isolating people from their environment while subjectively interpreting wellbeing risks ignoring value systems, cultural beliefs, collective norms, and social roles (Becker & Marecek, 2008; Berry, 1997).

Worldview is based upon philosophical assumptions informed by cultural variables such as racial identity, social rules of conduct and values, socioeconomic status, acculturation levels, and relationship to an ancestral community or a supreme being (Myers, 1993: Abramson, 1996). These paradigm differences may act as moderating variables for wellbeing constructs as they affect how an individual is socialised to think, feel, experience and perceive the world around them, therefore affecting how they think, feel, experience and perceive their wellbeing within the world – in cultures where spiritual growth is a factor in determining value of life experiences, this informs an individual's perception of situations and incidents (Keyes, 2003).

In a critical evaluation of the underlying ideology of positive psychology, Christopher and Hickinbottom (2008) contended that positive psychology is primarily concerned with an individualistic approach, where an individual is viewed as a "fixed, essential self that is separate from others and the world it inhabits" (p.566), and this separateness is further emphasised by a false dichotomy of an internal subjective world and external objective world. They further held that a constructivist position, where there is a perpetual back-and-forth between individuals and their environments, would better serve the evolution of a positive psychology towards a more cross-cultural perspective.

Ryff and Singer (2000) state that, "quality ties to others are universally endorsed as central to optimal living" (p.30). In 1998, Keyes defined five elements of social wellbeing that indicated whether, and to what degree, individuals functioned socially. These elements include social integration, social acceptance, social contribution, social coherence, and social actualisation. The remainder of this section will address how the literature further defines these elements.

Social integration is the extent to which people feel a part of a community, have a sense of belonging, and share commonalities (Keyes, 1998). The root of research into social integration has its foundations in the work of David Émile Durkheim, a French social psychologist and sociologist, who stated that:

> a social fact is every way of acting, fixed or not, capable of exercising on the individual an external constraint; or again, every way of acting which is general throughout a given society, while at the same time existing in its own right independent of its individual manifestations.(1895, p.13)

One way Durkheim investigated social integration was through studying social environment causes of suicide. He maintained that suicide was a social fact, and rates of suicide were consistent with the degree to which individuals were integrated with and regulated by the collective consciousness, and when abrupt social change occurs (such as during financial or industrial crises, or during marital breakdowns), society is unable to regulate an individual's needs and desires, so that individual feels dis-integrated and excluded from their community (Durkheim, 1897).

Keyes and Shapiro (2004) defined social acceptance as individual's having positive trusting attitudes towards others, acknowledging and accepting them in spite of complexities, and believing in the inherent goodness of people. Ferris (2010) stated social acceptance enhanced quality of life and emotional wellbeing as participation in group activities enhanced peoples own self-acceptance as they developed their ego, world-view, and purpose in life.

The term social contribution encompasses individual's feelings of being of value to and respected by their community, and feeling as though their contributions to society are valued (Keyes, 1998). Cicognani et al. (2008) identified social contribution and social integration as dimensions of social wellbeing that connect self-evaluations to social contexts, while Ferris (2010) uses the term in relation to mastery, stating that contributing to civic life is an essential part of attaining work-life balance, and necessary to counter society's drive towards individual success and consumerism.

Social coherence refers to how an individual evaluates society, and is defined as the individual's perception of how organised, logical and predictable the social world is (Keyes, 1998; Keyes, 2003). One study found that high levels of mental health were associated with high self-reported social coherence, while another found low levels of social coherence and less positive neighbourhood interactions increased the risk for child maltreatment (Garbarino & Kostelny, 1992; Sugiyama et al., 2008).

The conviction that society has the potential to positively evolve through individuals, groups and institutions, is referred to as social actualisation (Keyes, 1998). As with social coherence, it indicates how an individual assesses their community and society as a whole. A study on the social wellbeing of a cohort of Italian university students found that after the internet had become a fixture in their lives, they felt an enhanced sense of social actualisation and social contribution, with the juxtaposition

that their trust in those outside their social circle decreased (Contarello & Sarrica, 2007).

In conclusion, social wellbeing evaluates the interplay between a person and the world they live in. How individuals function in society has a strong relationship to their own feelings of efficacy in their current circumstances. Social wellbeing studies indicated younger adults report less social integration and social acceptance than older adults, greater levels of social contribution and social coherence, and experience similar social actualisation (Keyes 1998; Keyes & Shapiro 2004). Healy (2005) found strong social support, a sense of trust in others, having a sense of belonging, and frequent socialisation were strong predictors of life satisfaction, and thus subjective wellbeing. Other research findings indicate that increased self-reported levels of subjective and psychological wellbeing are indicators of high levels of social wellbeing (Chen et al., 2013; Keyes, 1998; Lawton 1984; Scheier et al., 2001). Thus the three wellbeing constructs of subjective wellbeing, psychological wellbeing, and social wellbeing are distinct and related.

1.2. Positive psychological testing and assessment

The history of psychological testing and assessment is well chronicled (DuBois, 1970; Shum et al., 2013); Zimbardo (2004) claims the development of "objective, quantifiable means of assessing human talents, abilities, strengths, and weaknesses" (p. 7) is one of psychology's greatest achievements. Positive psychology is concerned with the measurement of strengths rather than weaknesses, aiming to define what wellbeing looks like for individuals within an environment or context, and addressing how to measure intended outcomes (Lopez et al., 2003).

Variables such as autonomy, life satisfaction, and social integration, must be operationalised and precisely stated so as to be accurately measured, communicated and replicated. An operational definition of a wellbeing construct allows for the creation of an explanatory framework of constructs, which if assessed as being reliable and valid, will be labelled as a measurement tool, which may be tested and from which inferences may be made (Coolican, 2014). Studies addressing the general definition and construction of psychological tests were not examined for this literature review, with the exception of exploring the psychometric properties necessary to assess the quality (reliability and validity) of a measurement tool.

1.2.1. Psychological test characteristics in the case of wellbeing measurement. According to Diener (2009), the measurement of wellbeing has three primary characteristics. The first is that it is subjective and based on an individual's perceptions and experiences. The second is that it includes positive measures (such as the wellbeing constructs described in section 1.1). And the third is that it is inclusive of global evaluations. These three aspects of wellbeing measurement will now be expanded upon.

The first characteristic of subjectivity is generally captured through self-reporting. Since Flugel (1925) conducted research using self-recording of emotional events, reactions and moods, self-report questionnaires have been the primary tool of psychology researchers aiming to measure subjective wellbeing constructs. These questionnaires are observational with no manipulation of variables, and coding is used to categorise controlled variables, therefore making the subjective quantifiable (Coolican, 2014). Self-report measures have practical advantages in that they can be administered to many people at the same time and can take less time to complete than an interview (Shum et al., 2013). However, being based on memory and personal judgment, they are also vulnerable to reporting biases including culture, memory, personality and environment (Hervás & Vázquez, 2013).

Lucas et al. (2003) agreed with the potential unreliability of self-reporting where participants may be unable or unwilling to answer accurately due to external influences or biases, but suggest that self-report measures are the most efficient and easiest way of assessing psychological wellbeing constructs, as scales may have flexibility in specifying timeframes, or using a variety of assessment methods. They concluded that non self-report methods, such as informant reports rating an individual's frequency or intensity of emotions should be used as a supplement where possible. Known-informant reports, such as from family and friends, have been shown to have moderate correlations with an alpha of 0.5 between positive emotion self-reports and known-informant reports (Diener et al., 1995; Lucas et al., 1996). The expert-rater approach has been used extensively in observing relationship interactions but there is limited research on utilising the expert-rater method with wellbeing measurement (Gottman, 1993; Gottman & Krokoff, 1989).

The second characteristic of wellbeing measurement is the inclusion of positive measures. According to Lucas et al. (2003), "any reasonably diverse collection of

positive emotion adjectives will capture the positive emotion dimension with a fair amount of reliability and validity" (p.193), although in the same text they also stated that:

> emotions are complex phenomena with a broad array of components that range from purely subjective feelings to action tendencies …. (they) may only be modestly related and by measuring only one or two of these components, [and] researchers may miss part of the picture (pp. 201-2).

According to Snyder et al. (2003), accurate yet flexible labelling is fundamental in the measurement of wellbeing constructs and personal characteristics. They argue that labelling communicates a shared meaning and assumptions about shared meanings can cause complications in wellbeing discourses, as labelling merely serves to differentiate the labelled from the non-labelled. Measuring therefore only categorises the extent to which an individual identifies with a wellbeing construct or personal characteristic at any given time.

The inclusion of global evaluations is the third characteristic of wellbeing measurement. Wellbeing research relies on global evaluations, which Seligman and Csikszentmihalyi (2000) considered flawed but credible and consistent. Several other studies suggest global evaluations such as "on the whole, I am satisfied with myself", should be differentiated from evaluations about specific characteristics or abilities, and are explicit measures requiring a conscious self-judgements (Greenwald & Banaji, 1995; Suls & Krizan, 2005).

Aside from the unique character of wellbeing research, traditional quantitative and qualitative methodologies are utilised. In positive psychology research, two types of questionnaires are commonly utilised when evaluating operationalised constructs with direct self-report measures. One type is the single item scale, characterised by one question on one particular aspect of an individual's life. Diener (1994) found that single item measures had the advantage of brevity and generally displayed aspects of validity, but usually also had low reliability. Contrasting this, McDowell (2010) found evidence of moderate test-retest reliability and validity of single item scales. Sandvik et al. (1993) found that Fordyce's Global Scale, and Andrews and Withey's "Delighted-Terrible" Scale, both single-item measures, were correlated at 0.62.

However, as there are many components to wellbeing, the more common type of questionnaire is the multi-item scale, which either aims to cover a wider variety of

wellbeing constructs (i.e., WHO-5 Wellbeing Index) or to cover one wellbeing construct in more depth (i.e., five-item Satisfaction with Life Scale). The WHO-5 Wellbeing Index is used for assessing subjective and psychological wellbeing over a two week period, measuring respondent's positive mood, quality of life, vitality, and general interest; and there is a large body of research supporting reliability and validity of this Index (Bech, 2004; Bech et al., 2003; De Wit et al., 2007; Heun et al., 2001; McDowell, 2010). The Satisfaction With Life Scale, further detailed in sections 1.1.1 and 3.3.4 of this thesis, has demonstrated considerable reliability and validity in the measurement of life satisfaction since its establishment in 1984 (Pavot & Diener, 2008). Diener (1994) reasoned that greater breadth of coverage could be found in multi-item scales, as many aspects of a construct or many related constructs could be explored. As a result, they found strong reliability in scales as short as four or five items such as the Satisfaction With Life Scale (see section 3.3.4).

1.2.2. Evaluating reliability. Reliability is the degree to which a measure is consistent within itself, and will demonstrate stability with the same people on different occasions (temporal stability) (Shum et al., 2013). Internal consistency is the measure of internal reliability, and high internal consistency implies that respondents answer related items within a scale comparably. Test-retest reliability is the measure of external reliability, and evaluates the stability of a scale over time. If a tool is reliable, similar results will be returned from a cohort tested at different times.

1.2.2.1 Test-retest reliability. While wellbeing researchers may have some interest in the fluctuations of momentary emotions, they are generally concerned with those influences which impact wellbeing over time. In order to effectively demonstrate that an aspect such as life satisfaction has some stability over time that transcends emotional fluctuations, researchers have undertaken test-retest reliability on a number of measurement scales, such as the Satisfaction with Life Index and Pemberton Happiness Index, in order to ascertain temporal stability (Diener et al., 1985; Hervás & Vázquez, 2013). In general, wellbeing measures appear to demonstrate stability over time. Coefficient alphas of 0.75 to 0.8 are indicative of high external reliability (Pallant, 2013).

A range of temporal stability coefficients with higher test-retest correlations over shorter intervals were reported in many studies (Diener et al., 2010; Lyubomirsky & Lepper, 1999; Revicki, Leidy, & Howland, 1996). This is appropriate as change in life

domains occurs over greater time periods and retest correlations should reflect true changes in wellbeing and life circumstances (Diener, Inglehart, & Tay, 2012). A study on the Depression Anxiety Stress Scales indicated the presence of emotional syndromes often thought to be influenced by short-term factors such as depression, anxiety and stress, do not influence temporal stability over time (Crawford & Henry, 2003). Diener et al. (2012) reported the wording of wellbeing measures influenced stability coefficients with phrases like “these days” resulting in lower temporal stability as respondents are drawn to reflect upon more immediate circumstances which may not be relevant at each time point measured.

Diener et al (2012) also found higher test-retest correlations in multi-item scales than single-item measures, concluding that more items allow respondents to reflect on wellbeing in more life domains. The same study indicated lower test-retest reliabilities for the Satisfaction with Life Scale were linked to the occurrence of significant changes in circumstances in important life domains and the subjective experience of those changes.

1.2.2.2 Internal consistency. The most commonly used statistic to measure internal consistency of psychometric scales is a Cronbach's alpha coefficient, with a values range from 0 to 1 (Pallant, 2013). High Cronbach's alpha coefficient values of around 0.75 to 1 are seen as a sign of high convergence among wellbeing items even when worded differently and therefore, possessive of adequate reliability (Anastasi & Urbina, 1997). Internal consistency in positive psychometric measures has been erratic with some scales having little supportive reliability data and low alpha coefficient values in the .40’s (Bradburn, 1969; Hedges, Jandorf, & Stone, 1985). More recent multi-item scales demonstrate reliability coefficient values in the .80 and .90 ranges (Crawford & Henry, 2003; Diener et al., 2010; Hervás & Vázquez, 2013). Some of the measurement tools contain sub-scales and while they display internal consistency as a whole, the sub-scales did not always have high alpha coefficient values by themselves (Gaston & Vogl, 2005). For example, the Revised UCLA Loneliness Scale had a coefficient alpha value of .91, while a three-item subscale had a coefficient alpha value of .72. This alpha value was interpreted as being adequate for a sub-scale measuring a single factor (Hughes et al., 2004).

Internal consistency reliabilities do not always appear to be influenced by time instructions, with high alpha coefficient values reported regardless of the period of time

covered by the scale, as in the case of the Positive Affect and Negative Affect Scale, where in a reliability study respondents were asked to rate how they felt right now, today, during the past few days, during the past week, during the past year, and in general (Watson, Clark, & Tellegen, 1988). Some measurement scales, such as the Satisfaction with Life Scale and the Subjective Happiness Scale, have had multiple studies performed on them and were able to demonstrate consistent and stable alpha coefficient values across ages, cultures and languages (Diener et al., 2012; Lyubomirsky & Lepper, 1999; Pavot & Diener, 2008).

Kline (2013) argues that if internal consistency is not high, the tool must be measuring more than one variable. At the same time, a tool with very high internal consistency may be an extremely narrow measure. However, general agreement and common sense contends that internal consistency should be high for the tool to be applicable.

1.2.3. Evaluating validity. Validity is the extent to which a tool measures what it is purported to measure (Nunnally, 1967). As with reliability, a measure can demonstrate both external and internal validity. External validity is the generalisability of the research findings of a tool, and internal validity is the confidence a researcher has in those findings. Internal validity can be measured through assessing face, criterion-related, content, and construct validity. For the purposes of this review, the focus is on construct validity.

Construct validity assesses the degree to which the operationalisation of a measure can be generalised to constructs that are broader or more theoretical, the trajectory of any correlations including the influence of any constructs to explain the correlations, and the extent to which further correlations may be predictable (cause and effect) (Shum et al., 2013). In other words, "…the degree to which a test measures what it claims, or purports, to be measuring…" (Brown, 1996, p. 231). With regard to constructs, there is sometimes a lack of agreement on what a construct is, what its relevance is to a body of research, and how to measure it. The two types of construct validity explored in this literature review are convergent and discriminant validity. Convergent validity is the degree by which there is correspondence or convergence between two similar constructs, while discriminant validity is the degree by which there is a low level of correlation between two dissimilar constructs (Kline, 2005). Validity

was explored in every study included in this literature review, and was for some studies, the main focus.

The standard method of demonstrating construct validity for well-being measures is to concurrently administer other validated measurement scales and evaluate the correlations between the validated measure and the new measure. Hervás and Vázquez (2013) explored the construct validity of the Pemberton Happiness Index across various domains of wellbeing: hedonic, eudaimonic, social, personal, remembered and experienced, while Diener et al (2012) evaluated only one element of these domains, life satisfaction. Self-esteem and self-efficacy were psychological constructs used as convergent validity controls in the Strengths Use and Strengths Knowledge study, which showed that these were significant in predicting subjective wellbeing (Govindji & Linley, 2007). The Pemberton Happiness Index study added questions on perceived health and sleep quality as proxies for wellbeing as additional validation measures (Hervás & Vázquez, 2013).

Both convergent and discriminant validity were evaluated by the authors of the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). Samples were drawn from university students in two countries as well as retirees. Happiness was convergently correlated with self-esteem, optimism, positive emotionality, extraversion and dysphoria. Discriminant validity was measured against unrelated constructs of academic success and stressful life events. Loneliness was only weakly associated with motivation, energy and enjoyment, demonstrating discriminant validity in the three item loneliness scale. In contrast, convergent validity with depressive symptoms was displayed (Hughes et al., 2004).

The Positive Affect and Negative Affect Scales showed strong convergent validity and low discriminant coefficients with several commonly used measures of related constructs including depression, anxiety, lack of pleasurable experiences and psychological distress (Watson et al., 1988). The General Well-Being Index demonstrated construct validity with the Montgomery-Asberg Depression Rating Scale with significant correlations on three samples (Gaston & Vogl, 2005) These samples were all drawn from a clinically depressed population, and a subsequent study to establish normative data was conducted using the Depression Anxiety Stress Scale to assess convergent validity with the sample drawn from a non-clinical population. The

later study indicated concurrent validity between the measurement scales and reported high correlations (Gaston & Vogl, 2005).

Several studies evaluated validity in multiple languages and countries. Hervás and Vázquez (2013) indicated that cultural issues in experiencing wellbeing had an impact on construct validation of wellbeing scales. One theory is that importance of particular life domains, and therefore life satisfaction with those domains, is influenced by cultural beliefs and values (Diener et al., 2012). The Scale of Positive and Negative Experience (SPANE) addressed the potential difference in cultural values by including the words "positive" and "negative" as a way of allowing respondents to reply based on their own perceptions without needing to use words that may be considered more valuable or less desirable (Diener et al., 2010). However, this study on the SPANE was only validated with student samples, and a broader cultural respondent base would be needed to confirm this validation. In studies, such as the Pemberton Happiness Index, where a scale was being created rather than evaluated, those items with the highest mean correlation with pre-validated scales were selected for inclusion in the final scale based on their convergent validity (Hervás & Vázquez, 2013).

In summary, best practice for psychometric tools is to conduct a validity study with a broad cohort of subjects using previously validated tools measuring the same or opposite constructs in order to demonstrate convergent or discriminant validity. In this way, researchers can be certain that a tool measures the construct they are aiming to measure, and the tool may be used to inform decision making processes, whether in a clinical, social, organisational or policy setting.

1.2.4. Methodological issues with measuring wellbeing in populations. Many studies have been conducted in various countries in order to better understand the nature of wellbeing and create measurement tools that reflect the wellbeing status of groups of people. The resulting findings have been varied, predominantly due to methodological issues with research design, representative samples, and measurement tools. These issues are discussed below.

Wellbeing scales and indices have generally been employed in cross sectional studies. Most had at least two time-points for test-retest reliability. The range for subsequent time point was usually between one week and two months, however as an anomaly, the Depression Anxiety and Stress Scale study had a second time point eight

years after the first (Lovibond, 1998). Some scales, such as the Flourishing Scale and the Scale of Positive and Negative Affect, with one month or less between time points have unproven temporal stability over longer time spans (Diener et al., 2010).

Many studies were validated using only small samples of university students with very little age or cultural diversity (Diener et al., 2010; Gaston & Vogl, 2005; Govindji & Linley, 2007; Lovibond, 1998; Watson et al., 1988). In a review of positive psychology literature, Donaldson et al. (2015) found that 39% of studies used university student samples, 35% used adult samples (frequently with an occupational focus), 16% used child or adolescent samples, and 10% of studies did not specify their sample. There was a gender bias in several studies with up to twice as many female respondents than male (Diener et al., 2010; Gaston & Vogl, 2005; Lovibond, 1998; Lyubomirsky & Lepper, 1999). In one study females scored higher than males in wellbeing (Gaston & Vogl, 2005). Two studies had a demonstrable intention to create normative representative data, recruiting large numbers of participants with a diverse age range in several countries, and translated the measurement tools into multiple languages (Hervás & Vázquez, 2013; Pavot & Diener, 2008).

The scales and indices reviewed were all self-report questionnaires using Likert scales (Diener et al., 2010; Gaston & Vogl, 2005; Govindji & Linley, 2007; Lovibond, 1998; Pavot & Diener, 2008). One study reverse scored some questions (Govindji & Linley, 2007). Two studies used multiple versions to control for order effects (Govindji & Linley, 2007; Henry & Crawford, 2005). Studies were conducted both online (Hervás & Vázquez, 2013), and were paper-based (Henry & Crawford, 2005; Watson et al., 1988).

There was limited addressing of the impact of cultural bias in interpreting and responding to measures on reliability and validity in the studies reviewed. In order to assess whether there is conceptual equivalence of a questionnaire or tool, it is important to also evaluate whether a construct is defined in a similar manner across cultures or whether the construct is specific to particular cultures (Flores & Obasi, 2003). In addition, response bias across cultural groups is likely to reflect varying cultural and social norms regarding individual and emotional expression, which affects scaling. For example, individuals from cultures where collectivism and group conformity is valued are more likely to respond in the mid-range of a Likert scale on questions drawing

attention to individual behaviours such as indicating life is going well when in fact it is not (Sue, 1999).

Threats to validity can include inadequate variable definition, selection bias, cognitive bias of respondents resulting in evaluation apprehension, and mono-method bias. Validity may be questioned where procedures or instrumentation are not standardised, or from order effects (Cooke & Campbell, 1979).

1.3. National measures of wellbeing

Most of the studies included in this review thus far have focused on measurement tools intended to be of general use across countries, languages and cultures. So what then is the rationale for developing a national measure of wellbeing? Motivators for assessing the wellbeing of a population include gathering meaningful data to inform governmental policy decisions, and increasing understanding of the national and cultural models of wellbeing in order to provide a complementary alternative indicator to Gross Domestic Product (GDP) of national progress. In addition, repeated administration of a national survey tool allows for an assessment of both the current wellbeing of a population as well as a yardstick by which to measure whether it is rising or falling, and in which areas (Eckersley, 2000).

Evaluating the relationships between wellbeing indicators, income and health, in a New Zealand context can provide valuable information for policy makers. Oswald (1997) stated that the dramatic post-war increases in income have not been matched by similar increases in happiness. In a review on global subjective wellbeing patterns, Diener (2000) queried whether the evaluative standard for living standards, driven by a nation's capacity for meeting economic desires, rises with income levels. As people adapt to any improvement in conditions, such as a pay-rise, they return to a subjective wellbeing set-point. He surmised that focusing on improving economic growth would not increase a population's overall wellbeing, but focusing on policies that considered wellbeing variables as social outcomes, such as improving working conditions or increasing community relationships, are more likely to produce corresponding increases in wellbeing. Cummins et al. (2003) explain why economic indicators, such as the GDP, make for a poor assessment of a population's quality of life; GDP was never intended to measure wellbeing but is simply an account of financial exchanges which make no distinction "between transactions that add to wellbeing and those that diminish it" (Redefining Progress, 1995); there is no consideration for distribution of income and

therefore for the impact of poverty on sectors of society, and there is no consideration for moral factors and values important to a population. However, the New Zealand Treasury (2012) has developed a living standards framework which includes financial, physical, natural, social, and human elements; and suggests measuring these standards using subjective wellbeing measures as a cross-check. The measure the NZ Treasury uses is the Ministry of Social Development's wellbeing evaluation component of the Social Report (Ministry of Social Development, 2010).

The relationship between health and wellbeing is much clearer with health status reported as a driver of life satisfaction and happiness. In a review of the literature to date, Diener et al. (1999) found subjective evaluations of a person's physical and mental health were more important to their overall wellbeing than objective measures. In particular, perception of mental health status was associated with reported life satisfaction. Cummins et al. (2003) reported an association between reduced overall (physical and mental) health status and lower levels of life satisfaction in the elderly, particularly males. A UN commissioned literature review on subjective wellbeing found a long-lasting negative impact of adverse physical health changes with those who have experienced a tragic accident or illness reporting lower levels of subjective wellbeing (Conceição & Bandura, 2008). They also found evidence that people do not demonstrate resilience or adaptation to physical health changes, with those who report feeling less healthy in comparison with others in their age group, also reporting less happiness.

Policy decisions informed by a deeper understanding of the impact of improved societal wellbeing require an increased focus on policies driven by identified community needs and outcomes. Diener and Seligman (2004) give the example of policy imperatives directing more comprehensive treatment to those with mental disorder diagnoses as well as improved assistance for their caregivers as policy outcomes emerging from non-economic indicators, as prolonged periods of mental distress ("negative states") have a tendency to result in detrimental societal outcomes. In 2006, Diener reaffirmed the need for wellbeing research driven policies, stating "Measures of subjective well-being can be useful in assessing the need for certain policies and in measuring the outcomes of policy interventions" (p. 397).

Research supports an imperative for national indices of wellbeing to support more holistic drivers of societal progress and the policies and interventions that are

needed to improve population wellbeing. Professor Lord Richard Layard stated "if policy-makers are to make well-being a central objective they have to have ways of measuring it…guidance on this is crucial" (Michaelson et al., 2009, p.1). Examples of national accounts of wellbeing providing descriptive and policy-relevant data include the European Social Survey, which surveys 25 European Countries (ESS, 2001), and the Australian Unity Wellbeing Index (Cummins et al., 2003). There is no current national account of wellbeing for New Zealand although Statistics New Zealand has included a single-item wellbeing question on life satisfaction in the New Zealand Social Survey since 2010 (Statistics New Zealand, 2015).

1.4. Conclusion

This chapter considered the literature on wellbeing constructs, psychometric measurement, and national measures of wellbeing. The three branches of wellbeing philosophy – subjective, psychological, and social – were discussed, including the history and development of each branch. There is a growing body of research evaluating the relationship between all three branches, acknowledging that the sum of parts is greater when assessing overall wellbeing.

Aspects of psychometric measurement were reviewed, and the importance of assessing whether a tool measures what it purports to measure and can return the same results consistently over time was addressed. Methodological issues that may arise with such tools were also considered. Finally the rationale for developing a national index of wellbeing was outlined. There is a lack of studies administered in a New Zealand context that are focused on wellbeing within relevant cultural and political frameworks, and informed by an understanding of local factors.

Chapter 2. Introduction

This research evaluated aspects of the reliability and validity of the New Zealand Sovereign Wellbeing Index, an online questionnaire developed to monitor the psychological wellbeing and physical health indicators of adult New Zealanders. This section presents a brief overview of the aims and background of the thesis.

2.1. Aims of and background to the thesis

Many countries around the world are developing their own wellbeing questions, scales or indices as a way of measuring the personal and social wellbeing of their citizens (Diener, 2006; Michaelson et al., 2009). In addition, as part of the *Better Life Initiative*, the OECD has developed a comprehensive set of guidelines intended to provide a level of standardisation to measuring subjective wellbeing (OECD, 2013). The New Zealand Sovereign Wellbeing Index, developed by The Human Potential Centre at Auckland University of Technology (AUT) in partnership with Sovereign Insurance, is one such tool that is designed to measure and evaluate the wellbeing of New Zealanders (Jarden et al., 2013). The New Zealand Sovereign Wellbeing Index evaluates how New Zealanders are flourishing in personal and social life domains over time (Jarden et al., 2013). Many of the wellbeing questions in the New Zealand Sovereign Wellbeing Index were drawn from previously validated scales in other countries, including from Round 6 of the European Social Survey (ESS) Personal and Social Wellbeing module (European Social Survey, 2012), the Flourishing Scales (Diener et al., 2010), and the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). However, the mix of these scales along with additional questions has not been validated or tested for reliability, and it is critical that the NZSWI demonstrates validity and reliability in order for the results to be interpreted confidently.

Evaluating the test-retest reliability of the New Zealand Sovereign Wellbeing Index will measure the extent to which the Index is stable and repeatable, returning similar results at different points in time a week apart with the same participants and phenomena. Assessing internal consistency implies that there is a level of item homogeneity; that is, there is a degree of consistency between participant responses to items within the Index measuring the same construct. Examining convergent and discriminant validity will allow researchers to be confident that each item within the measure is evaluating the same construct, and that the Index is an effective

psychometric tool for evaluating the underlying constructs it is purporting to measure (Crocker & Algina, 1986).

This study has two overarching research questions:

1. What are the test-retest reliability and internal consistency of the New Zealand Sovereign Wellbeing Index? And;

2. What are the convergent and discriminant validity of the New Zealand Sovereign Wellbeing Index when measured against validated subjective wellbeing measurement tools?

While there have been large scale studies in New Zealand evaluating wellbeing from a health or social science paradigm (e.g. The NZ General Social Survey), or within particular demographics (e.g. The Youth 2000 National Youth Health and Wellbeing Survey series), there are no validated instruments that currently address the frequency or intensity of wellbeing experiences of New Zealand adults in various life situations, across the demographic spectrum, or over time. This study contributes to the gap in current literature by evaluating the validity and reliability of the New Zealand Sovereign Wellbeing Index; a wellbeing-focused psychometric index developed for the New Zealand population.

Chapter 3. Method

3.1. Participants

There were two phases in the participant recruitment process. The initial and original recruitment phase consisted of five thousand postcards (Appendix 1, p.97) with a website address for study registration being delivered through a letterbox drop to targeted households in Auckland through the marketing company Reachmedia. Recruitment was an opt-in process whereby respondents registered directly on the study website contact form, and this was advertised on the postcard. Using household income and ethnicity demographic profiling, Reachmedia targeted areas that have the highest percentage of income and ethnicity variables in order to ensure diversity (Appendix 2, p.99).

The letterbox drop occurred over the weekend of 15-16 March 2014. The end date for study registration was 30 March 2014. As at 1 April 2014, only five participants had registered for the study with a further two participants registering after this date, indicating the initial original recruitment method was unsuccessful - less than 1% of those who received a mail drop registered on the website.

A secondary phase of participant recruitment was planned whereby the researcher and supervisors recruited participants through snowballing personal and professional networks by sending out an email (Appendix 3, p.100). A personal note was added to emails sent to potential participants to ensure the emails were not considered spam. Emails were sent between 4 and 7 April 2014 and the end date for study registration was revised to 27 April 2014. The seven original registrants were advised of the new dates. This method provided sufficient participants (N = 94) to proceed with the study.

3.2. Procedures

This study contributes to a wider body of research on the nature of wellbeing in the New Zealand adult population specifically in respect to developing a national account of wellbeing, the New Zealand Sovereign Wellbeing Index (see 3.3.1). Best practice in evaluation of the efficacy of such a tool is to carry out a reliability and validity study with a sample population over at least two time points alongside validated tools measuring the same constructs. In this instance, the sample population was adult

New Zealanders 18 years and older, over two time points with a one week interval using the New Zealand Sovereign Wellbeing Index and several validated measures as detailed in section 3.3.

The original intention of the study was to include method effect (e.g. online vs. pen and paper) as an additional reliability measure of the New Zealand Sovereign Wellbeing Index. The effect of administering the scales utilising different methods of delivery such as online, face-to-face or by pen and paper was not investigated in any depth in the indices and scales studied; this is a weakness of this developing literature. The various studies were conducted online, by written paper-based questionnaire, or by interview, and therefore the existence of biases related to different methods of delivery cannot be ruled out. In the present study, it was intended that two cohorts of adults (internet respondents and pen and paper respondents) of 100 minimum and 200 maximum per cohort would be included. Respondents were to be randomised using alternate allocation into online or paper-based study participation conditions after they registered on a registration website (as detailed below). However, despite widespread advertisement, there were not enough registrations for two cohorts to be included in the study, thus the investigation of the method effect was abandoned and only the online administration was tested.

Participants were directed to a web address, www.wellbeingstudy.co.nz, dedicated to study registration (see 3.1.1 for participant recruitment). The website was hosted by Weebly.com. Participants either input the study web address manually into their web browser, as in the case of the postcard they received in the mail, or clicked on the link in the email they received. Participants were directed to the website where they were able to view the text from the information sheet (Appendix 4, p.101) and consent form (Appendix 5, p.105). The information sheet and consent form were also available for download in order for the participants to seek independent advice or to take time to consider the information. If they wished to participate, they were able to revisit the website and complete the online consent form. Participants typed their name and contact details (email and postal addresses) into the online consent form and clicked the box indicating their consent to participate. Informed consent was deemed to have been given once they read the study information and clicked on the button labelled “I consent and agree to participate in this study”. Ethics approval was granted by Auckland University of Technology Ethics Committee on 6 March 2014 (AUTEC Reference

number 14/08), and the approval was stated on the website and in the downloadable information sheet and consent form.

Regarding informed consent, the online information page contained all information required for participants to make an informed decision regarding their participation and written consent was obtained. Participants were fully informed of the nature of the research and given opportunities to withdraw from the study at any time. On the matter of confidentiality, information from participants, including raw data, will be kept confidential and stored at the Human Potential Centre at AUT University for a minimum of 1 year and a maximum of 10 years. Data folders will be stored under a password protected folder. Only Drs Aaron Jarden and Scott Duncan will have access to this information. Concerning risk minimisation, there was no deceit, anticipated harm or coercion in this research. Participants were informed of the nature of the questions. If participants felt uncomfortable answering some of the questions, they were advised in the study information that they were not required to answer any questions that they did not feel comfortable answering and there was an option "Prefer not to answer" for every question. This was different from the main NZSWI survey where this option was not provided. The details for Lifeline were included in the study information should participants have felt any negative feelings about their emotional state while participating in the study. Participants could also contact the study administrator with any concerns.

The New Zealand Sovereign Wellbeing Index was completed at both time points as the first scale administered in the battery, with two additional wellbeing measures administered at time point (T1), and three additional wellbeing measures administered at time point (T2). The five additional wellbeing measures were spread over the two time points in order to more evenly spread the time commitment required by participants. Study questionnaires were hosted by the online survey software QuestionPro (QuestionPro, 2015).

On 2 May 2014, participants were sent an email (Appendix 6, p.106) with a weblink to the first time point (T1) questionnaire, asking them to complete it between 5 and 11 May 2014 (Appendix 7, p.107). All participants received a reminder email regarding completion of the questionnaire on 8 May 2014 (Appendix 8, p. 118). On 9 May 2014, participants were sent an email (Appendix 9, p.119) with a weblink to the second time point (T2) questionnaire (Appendix 10, p.120), asking them to complete it

between 12 and 18 May 2014, seven days after they completed T1. All participants received a reminder email regarding completion of the questionnaire on 15 May 2014 (Appendix 11, p.132).

3.3. Psychometric Measurement Tools

In order to evaluate the reliability and validity of the New Zealand Sovereign Wellbeing Index as a psychometric measurement scale assessing the wellbeing of adult New Zealanders, all participants were asked to complete a set of questionnaires at T1 and T2. The New Zealand Sovereign Wellbeing Index is a 134-item structured questionnaire, with 87 items on wellbeing variables, 31 items on socio-demographic variables, and 16 items on health and lifestyle variables (Jarden et al., 2013). Wellbeing questions in the New Zealand Sovereign Wellbeing Index have been drawn from validated psychometric scales measuring components of wellbeing as well as an original life domains scale created for the purpose of the study. These already established scales include Round 6 of the European Personal and Social Wellbeing module of the European Social Survey (European Social Survey, 2012), the Flourishing Scale (Diener et al., 2010), the Center for Epidemiologic Studies Depression Scale Revised (Van Dam & Earleywine, 2011), and the Strengths Use and Current Knowledge Scale (Govindji & Linley, 2007).

As this is a reliability and validity study, correlations between wellbeing variables, socio-demographic variables and health variables will not be measured although some demographic variables were included in the questionnaires. The additional instruments selected to evaluate the construct validity of the New Zealand Sovereign Wellbeing Index were chosen by the supervisory team of Dr Aaron Jarden and Dr Scott Duncan. To measure the convergent and discriminant validity of the New Zealand Sovereign Wellbeing Index, the Pemberton Happiness Index (Hervás & Vázquez, 2013), and the seven item depression subscale from the 21 item short-form Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995) were administered at time point 1, and the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), Scale of Positive and Negative Experience (Diener, Wirtz et al., 2010), and additional questions from the Strengths Use and Current Knowledge Scale (Govindji & Linley 2007) were administered at time point 2. The scales used are described below.

3.3.1. The New Zealand Sovereign Wellbeing Index. In 2011-12, the Human Potential Centre (HPC) at Auckland University of Technology (AUT) undertook to develop an overall index of the health and wellbeing of New Zealanders. Sponsored by Sovereign Insurance, the project team aimed to develop a tool that would provide accurate and timely data on the occurrence of wellbeing components in particular demographic and geographic sectors, model changes in the wellbeing of individuals and the general population over a period of time, and compare wellbeing data to data generated by indices in other comparable countries (Human Potential Centre, 2012; Jarden et al., 2013). Sovereign Insurance was a third party that had no input into or influence over the study design or administration.

The resulting New Zealand Sovereign Wellbeing Index is a survey developed by the project team at HPC, and is in the data collection phase of an observational longitudinal study over four years where baseline (T1) was conducted in 2012, Year 2 (T2) was conducted in 2014, and Year 4 (T3) will be conducted in 2016 (Human Potential Centre, 2012). Data collection is being managed by TNS, an international market research company, with participant recruitment occurring via SmileCity, an online rewards programme which has one of the largest commercial databases in New Zealand (Jarden et al., 2013). A total of 38,439 adults over 18 years received the email invitation to participate, and 9,962 (26%) people completed the T1 survey (Human Potential Centre, 2012). This sample was stratified to be similar to the demographic variables of the 2006 New Zealand Census, which indicates good generalisability to the New Zealand population (Jarden et al., 2013).

The variables of interest being measured in the New Zealand Sovereign Wellbeing Index include wellbeing variables (emotional wellbeing, life satisfaction, vitality, resilience and self-esteem, positive functioning, supportive relationships, and flourishing), health and lifestyle variables (health status, weight, physical activity, food and nutrition, energy levels, cigarette and alcohol consumption), and socio-demographic variables (age, gender, ethnicity, household makeup, employment and household income) (Human Potential Centre, 2012). The diversity of variables allows for thorough analysis of predictors, moderators and determinants of New Zealanders' wellbeing, and initial analysis from T1 is already yielding rich results indicating who in New Zealand is flourishing, what health and social factors are associated with wellbeing, and how New Zealanders wellbeing compares with European countries using similar measures (Human Potential Centre, 2013; Jarden et al., 2013).

3.3.2. The Pemberton Happiness Index. The Pemberton Happiness Index (PHI) is a relatively new measure for evaluating remembered and experienced wellbeing in various life domains, including hedonic, eudaimonic, social and general wellbeing, as well as positive and negative affect (Hervás & Vázquez, 2013). Hervás and Vázquez (2013) tested the measure over nine countries in seven languages, presenting evidence of a high degree of reliability and validity.

The Pemberton Happiness Index is a 21 item scale with two sections (see Appendix 7, T1 survey, items C1-C21, p.116). The first section has 11 items evaluating remembered wellbeing using an 11-point Likert scale, where 0 is "totally disagree" and 10 is "totally agree. The second section has 10 items evaluating experienced wellbeing by using yes/no questions to potential positive and negative experiences from the previous day.

The PHI Project website gives clear guidelines in calculating and interpreting PHI scores (Hervás & Vázquez, 2013). To calculate the total score, each of the two sections must be totalled separately. There is a negative item in the first section and the score from this must be reversed (i.e. subtracted from the highest Likert point of 10 to sum to the others scores). The total for the second section must be calculated before the total of the whole can be arrived at, and this is considered item 12 for these purposes. Calculation for the second section is done by adding one point for each "yes" in positive experiences and each "no" in negative experiences. The lowest possible score for the second section is zero, and the highest possible score is 10. The score from each of the items is then added together and divided by 12 to get a total score out of 10, with two decimal places. The PHI Project website (Hervás & Vázquez, 2013), indicates a score of 0 to 3.70 infers a very low happiness level, 3.71 to 5.90 a low happiness level, 5.91 to 7.90 a medium happiness level, 7.91 to 9.20 a high happiness level, and 9.20 to 10, a very high happiness level. Differentiated scores may be obtained for each of the sections in order to evaluate remembered and experienced wellbeing separately.

The alpha reliability test for internal consistency for the Pemberton Happiness Index at T1 had an acceptable alpha level of 0.74. Items from this scale were used to validate life satisfaction, competence, engagement, vitality, life meaning, relationships, resilience and self-esteem, and positive and negative affect items of the New Zealand Sovereign Wellbeing Index with higher alpha values indicating a higher degree of convergent validity between the items.

3.3.3. The Depression Anxiety Stress Scales. The Depression Anxiety Stress Scales (DASS) is a 42-item questionnaire containing a set of three self-report measures, assessing the negative emotional states of depression, anxiety and stress (Lovibond & Lovibond, 1995). Each of the three measures has 14 items focusing on the three emotional states with further subscales of 2-5 items. The Depression scale includes items on pessimism, lack of interest, satisfaction and hope, dysphoria, and inertia. The Anxiety scale includes items on situational anxiety, autonomic arousal, and effect of anxiety on skeletal muscles. The Stress scale includes items on irritability, agitation, reactivity, and impatience. There is also the DASS21, which is a shorter form 21-item questionnaire.

The seven-item Depression sub-scale from the DASS21 has been validated for individual sub-scale use (Henry & Crawford, 2005) (see Appendix 7, T1 survey, items D1-D7, p.117). The depression sub-scale evaluates how often and/or how greatly a respondent experienced depressive symptoms over the previous week using a four-point Likert scale, where 0 is "did not apply to me at all" and 3 is "applied to me very much, or most of the time". The lowest possible score is zero, indicating normal severity of depression symptoms, and the highest possible score is 21, indicating extreme severity of depression symptoms (Lovibond & Lovibond, 1995).

The alpha reliability test for internal consistency for the DASS21 Depression sub-scale at T1 had a high alpha level of 0.87. This sub-scale was used to validate items on negative affect and vitality, with higher alpha values indicating a higher degree of convergent validity between the items. This sub-scale was also used to validate items on positive affect and flourishing, with lower alpha values indicating a higher degree of discriminant validity between the items.

3.3.4. The Satisfaction with Life Scale. The Satisfaction with Life Scale was designed to measure global evaluations of general life satisfaction and appreciation (Diener et al., 1985) (see Appendix 10, T2 survey, items C1-C5, p.129). The Satisfaction with Life Scale is a five-item questionnaire with a seven-point Likert scale, where 1 is "strongly disagree" and 7 is "strongly agree". Responses for each item are aggregated to produce an overall score with a higher score indicating higher general life satisfaction; the lowest possible score is five and the highest possible score is 35. The Satisfaction with Life Scale has been validated in several countries over many studies with satisfactory psychometric properties including sound test-retest reliability (alpha of 0.82), and high internal consistency (Diener, 1994; Diener et al., 2012).

The alpha reliability test for internal consistency for the Satisfaction with Life Scale at T2 had an alpha level of 0.89 indicating a high degree of internal consistency. Items from this scale were used to further validate life satisfaction items with higher values indicating a higher degree of convergent validity between the items.

3.3.5. The Scale of Positive and Negative Experience. The Scale of Positive and Negative Experience (SPANE) is a subjective wellbeing tool developed to measure positive and negative affect, and affect balance (Diener et al., 2010) (see Appendix 10, T2 survey, items D1-D12, p.130). The SPANE is a 12 item Likert scale with six items assessing positive experiences and six items assessing negative experiences over the previous four weeks, including three general and three specific items per sub-scale. Diener et al. (2010) reported that the SPANE had acceptable levels of reliability and convergent validity with other measures of happiness, wellbeing, life satisfaction including a correlation of feelings alpha score of 0.76 with Positive and Negative Affect Scales (Watson, Clark, & Tellegen, 1988) and a convergent validity alpha of 0.61 with LOT-R assessing optimism (Scheier, Carver, & Bridges, 1994).

The two sub-scales are scored separately but in both cases 1 is "very rarely or never" and 5 is "very often or always". The sum of the negative affect, SPANE-N, is subtracted from the sum of the positive affect, SPANE-P, in order to obtain a combined score, SPANE-B. The score for SPANE-P may range from six, the lowest positive affect score, to 30, the highest positive affect score. The score for SPANE-N may range from six, the lowest negative affect score, to 30, the highest negative affect score. SPANE-B scores may range from -24, the score for the lowest possible affect balance, to 24, the highest possible affect balance, indicating a respondent who reports rarely or

never experiencing negative feelings, and very often or always experiencing positive feelings (Diener et al., 2010).

The alpha reliability tests for internal consistency for the SPANE at T2 had alpha levels of 0.89 for SPANE-P, and 0.87 for SPANE-N, indicating a high degree of internal consistency for both sub-scales. SPANE was used to validate positive and negative affect of the New Zealand Sovereign Wellbeing Index. Both positive and negative experience items will be validated and higher validation values indicate convergent validity between the items.

3.3.6. The Strengths Use and Current Knowledge Scale. The Strengths Use and Current Knowledge Scale evaluates how much people are aware of their personal strengths and utilise them in a variety of settings (Govindji & Linley, 2007) (see Appendix 10, T2 survey, items E1-E6, p.131). The Strengths Use Scale is a subscale of the Strengths Use and Current Knowledge Scale. The Strengths Use Scale is a 10-item seven-point Likert scale, where 1 is "strongly disagree" and 7 is "strongly agree". A subset of the scale consisting of five items was selected by Dr Aaron Jarden for use in this study with a temporal question on amount of strengths use added. There is minimal information on the scoring or validity of the Strengths Use and Current Knowledge Scale beyond the paper by Govindji and Linley (2007). In that paper, the authors wrote that the measure was internally consistent and displayed meaningful correlations. Furthermore, they suggest that the measure would benefit from additional research on its validity.

The alpha reliability test for internal consistency for the Strengths Use and Current Knowledge Scale at T2 had an alpha level of 0.834 indicating a high degree of internal consistency. The alpha dropped slightly to 0.78 when the temporal question was added in to the analysis. Two items from the related Strengths Use and Current Knowledge Scale are contained within the New Zealand Sovereign Wellbeing Index and the administration of additional items from the Strengths Use and Current Knowledge Scale will be used to validate these items within the Index, with higher values indicating convergent validity between the items.

3.4. Analysis

Statistical analysis was conducted using SPSS Version 22 (IBM, 2013). Factor analysis is being undertaken as part of Dr Aaron Jarden's body of work, and will not

form part of the analysis in this study. Table 1 (p.46) outlines the common statistical analysis methods for psychometric measurement tools. Guidelines for reliability (3.4.1) and validity (3.4.2) will now be outlined.

Table 1: Common statistical analysis methods for psychometric measurement tools

Property	**Statistic**	**Guidelines to Interpretation**
Test-retest reliability	Intraclass Correlation Coefficient (ICC)	< .0.2 = poor agreement 0.21-0.4 = fair agreement 0.41-0.6 = moderate agreement 0.61-0.8 = substantial agreement 0.81-1 = almost perfect agreement (Landis & Koch, 1977)
Internal consistency	Cronbachs Alpha (α)	< .70 = inadequate > .70 = good > .80 = excellent (Hicks, 1999)
Validity	Spearman's Rank-Correlation Coefficient (*rs*)	.10 = small .30 = medium .50 = large (Hicks, 1999)

3.4.1. Reliability analysis. One objective of this study is to assess the test-retest reliability and internal consistency of the New Zealand Sovereign Wellbeing Index. Evaluating test-retest reliability and internal consistency are two traditional forms of measuring reliability. Test-retest reliability was evaluated using intraclass correlation coefficients. Internal consistency for the New Zealand Sovereign Wellbeing Index at T1 was calculated using Cronbach's alpha coefficient. Internal consistency was determined by obtaining a Cronbach's alpha coefficient above 0.7 (Pallant, 2013).

3.4.2. Validity analysis. The second objective of the study is to evaluate the convergent and discriminant validity of the New Zealand Sovereign Wellbeing Index against already validated wellbeing measurements (as detailed in 3.3.3). Convergent and discriminant validity of the New Zealand Sovereign Wellbeing Index with the 1) Pemberton Happiness Index, 2) seven-item depression sub-scale from the 21-item short-form Depression Anxiety Stress Scales, 3) Satisfaction with Life Scale, 4) Scale of Positive and Negative Experience, and the 5) Strengths Use and Current Knowledge Scale, was assessed using Spearman's correlation coefficients. Validity was ascertained according to Cohen's (1988) theories on effect size, with a correlation coefficient of 0.5 or larger representing a strong correlation.

Chapter 4. Paper One – Reliability of the New Zealand Sovereign Wellbeing Index[1]

Abstract

Background: Measurement tools evaluating wellbeing in personal, social and occupational life domains are increasingly being used to measure how people are flourishing in ways aside from their contribution to their nation's financial productivity. The New Zealand Sovereign Wellbeing Index is one such tool specifically developed to evaluate the wellbeing of New Zealanders, and to track how their wellbeing is changing. The purpose of this study is to assess the test-retest reliability and internal consistency of the New Zealand Sovereign Wellbeing Index.

Methods: The New Zealand Sovereign Wellbeing Index was administered to a non-clinical sample (*N*=94) of New Zealand adults aged 18 years and over at two time points one week apart using an online survey. Email addresses were used as unique identifiers to permit matching of test-retest surveys. Eighty-eight survey items covered the importance of, time use in, and satisfaction with various life domains (e.g. family, work, education, leisure time), the Flourishing Scale, the CES-D Scale, the Strengths Use and Current Knowledge Scale, and items from the European Social Survey. These items were evaluated for test-retest reliability using intraclass correlation coefficients (ICC) with a 95% confidence interval (CI). The survey items were categorised into eighteen wellbeing construct topics to evaluate internal consistency. The Flourishing Scale and the CES-D Scale were also assessed for internal consistency with this cohort. Internal consistency for the New Zealand Sovereign Wellbeing Index at time point one (T1) was calculated using a Cronbach's alpha coefficient. Internal consistency was determined by obtaining a coefficient above 0.7 (Pallant, 2013).

Results: With regard to test-retest reliability, 78 items (89%) displayed almost perfect or substantial agreement (ICC=0.61-1). Nine items (10%) had moderate agreement (ICC=0.41-0.6), and one item (1%) had fair agreement (ICC=0.21-0.4). For internal consistency, five of the twenty total topic headings (25%) had coefficient alphas above 0.7 demonstrating good internal consistency with one of those results

[1] Papers One and Two will be submitted to a journal for publication. Consequently, there is some repetition in Chapters Four and Five.

demonstrating excellent consistency ($\alpha = 0.85$). Eleven topics (55%) had coefficient alphas between 0.5 and 0.69, two (10%) had alphas between 0.4 and 0.49, and two (10%) had coefficient alphas under 0.25.

Conclusions. The reliability results indicate that on the whole the NZSWI is a reliable instrument with high test-retest intraclass coefficient alphas across the majority of its items, and moderate internal consistency Cronbach alphas for the majority of wellbeing construct topic headings.

4.1. Background

Many countries around the world are developing their own wellbeing questions, scales or indices as a way of measuring the personal and social wellbeing of their citizens (Diener, 2006; Michaelson et al., 2009). The New Zealand Sovereign Wellbeing Index (NZSWI), developed by The Human Potential Centre at Auckland University of Technology (AUT) in partnership with Sovereign Insurance, is one such tool that is designed to measure and evaluate the wellbeing of New Zealanders (Jarden et al., 2013). The New Zealand Sovereign Wellbeing Index evaluates how New Zealanders are flourishing in personal and social life domains over time (Jarden et al., 2013). Many of the wellbeing questions in the New Zealand Sovereign Wellbeing Index were drawn from previously validated scales in other countries, including Round 6 of the European Social Survey (ESS) Personal and Social Wellbeing module (European Social Survey, 2012) and the Flourishing Scales (Diener et al., 2010). However, the mix of these scales along with additional questions has not been validated, and it is critical that the NZSWI demonstrates validity and reliability in order for the results to be interpreted confidently.

Evaluating the test-retest reliability and internal consistency of the New Zealand Sovereign Wellbeing Index will measure the extent to which the NZSWI is stable and repeatable, and the degree of consistency between participant responses to items within the Index measuring the same construct.

4.2. Methods

4.2.1. Participants. The target population for this study was adults aged 18 years and older. The New Zealand Sovereign Wellbeing Index has not been designed for those under the age of 18 years and validation for this age group did not form part of the study design. The only exclusion criterion was a lack of internet access.

This study consisted of 94 participants; seven recruited via the original (largely unsuccessful) recruitment method of a letterbox drop in Auckland, and 87 through the subsequent snowballing email recruitment involving the researcher and supervisors recruiting participants through personal and professional networks by sending out an email advertisement. Fifty-seven participants initiated the online survey at Time point 1 (T1); four of these participants did not complete the T1 survey. Sixty-four participants initiated the online survey at Time point 2 (T2); two of these participants did not complete the T2 survey. There were 71 individual participants in total (77 % response rate) with 49 (52%) completing both T1 and T2 surveys.

4.2.2. Survey items. The survey used in this study was a portion of the New Zealand Sovereign Wellbeing Index (NZSWI) survey. The variables of interest measured by the NZSWI included wellbeing variables (emotional wellbeing, life satisfaction, vitality, resilience and self-esteem, positive functioning, supportive relationships, and flourishing), health and lifestyle variables (health status, weight, physical activity, food and nutrition, energy levels, cigarette and alcohol consumption), and socio-demographic variables (age, gender, ethnicity, household makeup, employment, and household income) (Human Potential Centre, 2012). The diversity of variables allows for thorough analysis of predictors, moderators and determinants of New Zealanders' wellbeing, and initial analysis from T1 is already yielding rich results indicating who in New Zealand is flourishing, what health and social factors are associated with wellbeing, and how New Zealanders' wellbeing compares with European countries using similar measures (Human Potential Centre, 2013). For the purposes of this study, only the wellbeing variable items were used.

4.2.3. Data collection procedures. The information sheet and consent form were available to view on the study registration website, and were also available for download in order for the participants to seek independent advice or to take time to consider the information. Participants typed their name and contact details (email and postal addresses) into the online consent form and clicked the box indicating their consent to participate. Informed consent was deemed to have been given once they read the study information and clicked on the button "I consent and agree to participate in this study". Participation in the survey was voluntary and the survey responses, as well as the unique personal identifiers (email addresses), could only be accessed by the researcher. Participants were informed that their survey answers would be read by the researcher. Ethics approval was granted by the Auckland University of Technology Ethics Committee on 6 March 2014 (AUTEC Reference number 14/08), and the approval was stated on the website and in the downloadable information sheet and consent form.

The survey was administered at two time points, one week apart. The New Zealand Sovereign Wellbeing Index was completed at both time points as the first scale administered in the battery, with two additional wellbeing measures administered at time point (T1) (the Pemberton Happiness Index, and the Depression Anxiety and Stress Scale), and three additional wellbeing measures administered at time point (T2) (the Satisfaction With Life Scale, the Scale of Positive and Negative Effect, and the Strengths Use and Current Knowledge Scale). Study questionnaires were hosted by the online survey software QuestionPro.

On 2 May 2014, participants were sent an email with a weblink to the first time point (T1) questionnaire, asking them to complete T1 between 5 and 11 May 2014. On 9 May 2014, participants were sent an email with a weblink to the second time point (T2) questionnaire, asking them to complete T2 between 12 and 18 May 2014, seven days after they completed T1. Respondents were asked to use the same email address to log-in to the survey to permit matching the test and the retest questionnaires.

4.2.4. Data analyses. All data from test and retest studies were imported from QuestionPro directly into the Statistical Package for the Social Sciences, version 22.0 (SPSS, Inc., Chicago, USA) for analysis. The test-retest reliability of all items on the questionnaire was estimated using Intraclass Correlation Coefficients (ICC), as defined by Nichols (1998), using a two-way random model with measures of absolute agreement and a 95% confidence interval (CI). The classification used to interpret the results according to the strength of test-retest agreement for ICC was as classified by Landis and Koch (1977). Their classification defines almost perfect agreement as 0.81-1, substantial agreement as 0.61-0.8, moderate agreement as 0.41-0.6, fair agreement as 0.21-0.4, and poor agreement as below 0.2. Internal consistency for the NZSWI at T1 was determined by a Cronbach's alpha coefficient using 0.7 as the criterion (Pallant, 2013). Hicks (1999) alpha classification is in agreement with Pallant, defining inadequate consistency as 0-0.69, good consistency as 0.70-0.79, and excellent consistency as 0.80-1.

4.3. Results

4.3.1. Study participants. This study consisted of 94 participants, all New Zealand adults; seven recruited via the letterbox drop in Auckland and 87 through the subsequent email recruitment. Fifty-seven participants initiated the online survey at time point (T1); four of these participants did not complete the T1 survey. Sixty-four participants initiated the online survey at time point (T2); two of these participants did not complete the T2 survey. Therefore there were 71 individual participants in total (a 77 % response rate) with 49 (52%) completing both T1 and T2 surveys.

Each participant was asked to provide demographic information, consisting of gender, date of birth, ethnic group, marital status, where in New Zealand they usually lived, highest academic qualification, current employment status, and general health status. The demographics include all participants that completed questionnaire sets at T1 and/or T2. The demographic information of participants is contained in Table 2 (p.53).

Table 2: Demographic Information

Demographic Variable		**All Participants**	
N		71	
		No.	**%**
Gender	Female	47	71.2
	Male	19	28.8
Age	18 – 24 years	7	14.29
	25 – 34 years	9	18.37
	35 – 44 years	10	20.41
	45 – 54 years	9	18.37
	55 – 64 years	6	12.24
	65 + years	8	16.33
	Average	45.05 years (*SD* = 16.78)	
	Range	19-75 years	
Ethnic group	NZ European / Pakeha	50	70.4
	NZ Maori	5	7.0
	Fijian	1	1.4
	Chinese	1	1.4
	Indian	4	5.6
	British / European	9	12.7
	Australian	1	1.4
	Other	4	5.6
Marital status	Single, never married	15	22.7
	Married or living with partner	49	74.2
	Separated or divorced	2	3.0
Living	Northland	1	1.5
	Auckland	39	59.1
	Waikato	5	7.0
	Hawkes Bay	1	1.5
	Wellington	13	19.7
	Tasman	2	3.0
	Canterbury	5	7.6
Education	Finished primary school	1	1.5
	Finished secondary school	1	1.5
	UE/Bursary/Scholarship	4	6.1
	Apprenticeship/Trade/Diploma	5	7.6
	Bachelor degree or higher	15	22.7
	Postgraduate diploma/degree or higher	40	60.6
Employment	Working in paid employment	9	13.8
	Not in paid work, looking for job	31	47.7
	In education, or on holiday	3	4.6
	Permanently sick or disabled	7	10.8
	Retired	1	1.5
	Housework, caring for children or others	7	10.8
	Prefer not to answer	7	10.8
Health	Very good	22	41.5
	Good	25	47.2
	Fair	4	7.5
	Bad	2	3.8

4.3.2. Test-retest reliability. The test-retest interval was two weeks. The values of ICC for all respondents were stratified by construct. The ICC values are shown in Table 3 (p.55), Table 4 (p.56) and Table 5 (p.57).

4.3.2.1 Domains. The items classified under the construct "Domains" in Table 3 (p.55) cover eleven domains and include items on the importance in life of, satisfaction with, and time the respondent would like to spend on, that domain. The reliability of the 33 items assessing "Domains" ranged from moderate agreement (ICC = 0.53) to almost perfect agreement (ICC = 0.95). The item measuring "satisfaction with leisure time" returned the lowest reliability (ICC = 0.53), and was statistically significant. The item measuring "satisfaction with religion" also returned moderate agreement (ICC = 0.60) and statistical significance ($p < .01$, two tailed). The item measuring "importance in life of community involvement" returned the highest reliability (ICC = 0.95).

4.3.2.2 The Flourishing Scale, the Center for Epidemiologic Studies - Depression Scale, and the Strengths Use and Current Knowledge Scale. The items in Table 4 (p.56) are from the Flourishing Scale, the Center for Epidemiologic Studies Depression Scale (CES-D), and the Strengths Use and Current Knowledge Scale. The reliability of the 22 items assessing these pre-designed and externally validated scales ranged from fair agreement (ICC = 0.33) to almost perfect agreement (ICC = 0.88). The item measuring "try to use my strengths" from the Strengths Use and Current Knowledge Scale returned the lowest reliability (ICC = 0.33). The item measuring "I am optimistic about my future" returned the highest reliability (ICC = 0.88).

4.3.2.3 The European Social Survey. The items in Table 5 (p.57) were derived from Round 6 of the European Social Survey and include items on subjective, psychological and social wellbeing. The reliability of the 25 items assessing these wellbeing constructs range from moderate agreement (ICC = 0.52) to almost perfect agreement (ICC = 0.92). The item measuring "sense accomplishment from what I do" returned the lowest reliability (ICC = 0.52). The item measuring "subjective general health" returned the highest reliability (ICC = 0.92).

Table 3: Test-retest reliability: Domains

	Intraclass Correlation Coefficients	***95% Confidence Interval***		***F-Test***
	Average Measure	***Lower Bound***	***Upper Bound***	***Sig***
Domain – importance in life				
Intimate relationships	0.67	0.42	0.81	0.000
Family	0.78	0.61	0.88	0.000
Friends	0.78	0.60	0.88	0.000
Leisure time	0.85	0.73	0.92	0.000
Time on your own	0.82	0.67	0.90	0.000
Politics	0.93	0.88	0.96	0.000
Work	0.88	0.78	0.93	0.000
Education	0.83	0.70	0.91	0.000
Religion	0.94	0.89	0.97	0.000
Spirituality	0.89	0.81	0.94	0.000
Community Involvement	0.95	0.91	0.97	0.000
Domain – satisfaction with				
Intimate relationships	0.87	0.77	0.93	0.000
Family	0.75	0.56	0.86	0.000
Friends	0.76	0.57	0.86	0.000
Leisure time	0.53	0.17	0.73	0.005*
Time on your own	0.76	0.51	0.85	0.000
Politics	0.88	0.79	0.93	0.000
Work	0.92	0.86	0.96	0.000
Education	0.77	0.59	0.87	0.000
Religion	0.60	0.30	0.77	0.001*
Spirituality	0.89	0.81	0.94	0.000
Community Involvement	0.65	0.38	0.80	0.000
Domain – time would like to spend				
Intimate relationships	0.80	0.65	0.89	0.000
Family	0.76	0.57	0.86	0.000
Friends	0.71	0.49	0.84	0.000
Leisure time	0.70	0.46	0.83	0.000
Time on your own	0.72	0.52	0.85	0.000
Politics	0.94	0.89	0.97	0.000
Work	0.80	0.65	0.89	0.000
Education	0.80	0.64	0.89	0.000
Religion	0.68	0.43	0.82	0.000
Spirituality	0.72	0.50	0.84	0.000
Community involvement	0.74	0.55	0.85	0.000

** Statistically significant at the 0.01 level*

Table 4: Test-retest reliability: Flourishing Scale, Center for Epidemiologic Studies - Depression Scale, and Strengths Use and Current Knowledge Scale

	Intraclass Correlation Coefficients	**95% Confidence Interval**		**F-Test**
	Average Measure	**Lower Bound**	**Upper Bound**	**Sig**
Flourishing Scale				
I lead a purposeful and meaningful life	0.81	0.66	0.89	0.000
My social relationships are supportive and rewarding	0.68	0.44	0.82	0.000
I am engaged and interested in my daily activities	0.80	0.65	0.89	0.000
I actively contribute to the happiness and wellbeing of others	0.55	0.19	0.75	0.004*
I am competent and capable in the activities that are important to me	0.60	0.30	0.78	0.001*
I am a good person and live a good life	0.59	0.26	0.77	0.002*
I am optimistic about my future	0.88	0.77	0.94	0.000
People respect me	0.75	0.56	0.86	0.000
Total	0.86	0.74	0.92	0.000
CES-D scale				
Felt depressed, How often past week	0.86	0.75	0.92	0.000
Felt everything did was effort, How often past week	0.62	0.32	0.79	0.001*
Sleep restless, How often past week	0.84	0.71	0.91	0.000
Were happy, How often past week	0.76	0.57	0.86	0.000
Felt lonely, How often past week	0.67	0.43	0.82	0.000
Enjoyed life, How often past week	0.79	0.63	0.88	0.000
Felt sad, How often past week	0.77	0.59	0.87	0.000
Could not get going, How often past week	0.79	0.63	0.88	0.000
Had a lot of energy, How often past week	0.77	0.60	0.87	0.000
Felt anxious, How often past week	0.81	0.66	0.89	0.000
Felt calm and peaceful, How often past week	0.72	0.50	0.84	0.000
Total	0.80	0.65	0.89	0.000
Strengths Use and Current Knowledge Scale				
Satisfied with way I use time	0.83	0.70	0.91	0.000
Try to use my strengths	0.33	-0.21	0.63	0.090
I know my strengths well	0.59	0.27	0.77	0.001*

** Statistically significant at the 0.01 level*

Table 5: Test-retest reliability: European Social Survey items

	Intraclass Correlation Coefficients	95% Confidence Interval		F-Test
	Average Measure	Lower Bound	Upper Bound	Sig
How satisfied are you with your life as a whole nowadays	0.87	0.77	0.93	0.000
How happy you are	0.81	0.67	0.89	0.000
I'm always optimistic about my future	0.84	0.71	0.91	0.000
In general feel very positive about myself	0.89	0.81	0.94	0.000
At times feel as if I am a failure	0.83	0.70	0.90	0.000
Free to decide how to life my life	0.83	0.69	0.90	0.000
Little chance to show how capable I am	0.78	0.61	0.88	0.000
Sense accomplishment from what I do	0.52	0.16	0.73	0.006*
When things go wrong it takes a long time to get back to normal	0.79	0.63	0.88	0.000
Learn new things in your life, extent	0.79	0.63	0.88	0.000
Feel people in local area help one another, extent	0.74	0.54	0.85	0.000
Feel people treat you with respect, extent	0.77	0.60	0.87	0.000
Feel what I do in life is valuable and worthwhile	0.60	0.28	0.77	0.001*
Hard to be hopeful about the future of the world	0.85	0.74	0.92	0.000
Lots of things I feel I am good at	0.56	0.21	0.75	0.003*
For most people in New Zealand life is getting worse	0.65	0.38	0.80	0.000
Feel close to people in my local area	0.77	0.59	0.87	0.000
Make time to do things you want to do, extent	0.62	0.32	0.79	0.001*
Feel appreciated by people close to	0.89	0.80	0.94	0.000
Deal with important problems	0.83	0.70	0.91	0.000
Interested in what you are doing	0.76	0.57	0.86	0.000
Absorbed in what you are doing	0.91	0.84	0.95	0.000
Enthusiastic about what you are doing	0.84	0.72	0.91	0.000
Take notice and appreciate surroundings, how often	0.91	0.84	0.95	0.000
Have a sense of direction in life, what extent	0.87	0.77	0.93	0.000
Receive help and support from people you are close to, what extent	0.76	0.58	0.87	0.000
Provide help and support from people you are close to, what extent	0.70	0.46	0.83	0.000
Place on society ladder	0.75	0.56	0.86	0.000
Meet socially with friends, relatives, or colleagues, how often	0.87	0.77	0.93	0.000
How many people whom discuss intimate and personal matters	0.91	0.84	0.95	0.000
Involved in work for voluntary or charitable organisations, 12 months	0.92	0.84	0.96	0.000
Most people can be trusted or you can't be too careful	0.88	0.79	0.93	0.000
Subjective general health	0.92	0.86	0.96	0.000

** Statistically significant at the 0.01 level*

4.3.3. Internal consistency. The items in the NZSWI were grouped by the research team into topic headings prior to this study being initiated. The allocated topic groupings used to assess internal consistency are shown in Table 6 (p.58), Table 7 (p.59), Table 8 (p.59), and Table 9 (p.60). The full list of items found under each topic heading is in Appendix 12 (p.133).

4.3.3.1 Domains. The items classified under the construct "Domains" in Table 6 (p.58) cover three topics and include "importance of", "satisfaction with", and "time would like to spend on" with respect to that domain. Internal consistency alpha coefficients were modest to good, including 0.50 (Time), 0.64 (Importance), and 0.78 (Satisfaction).

Table 6: Internal Consistency - Domains

	Cronbach's Alpha (95% CI)
Domains / Importance	0.64 (0.48, 0.77)
Domains / Satisfaction	0.78 (0.68, 0.86)
Domains / Time	0.50 (0.28, 0.68)

4.3.3.2 Emotional wellbeing, positive functioning, and resilience and self-esteem. The eight topics in Table 7 (p.59) cover the constructs of absence of negative feelings, positive feelings, competence and achievement, engagement, meaning and purpose, optimism, resilience, and self-esteem. Internal consistency alpha coefficients were modest to good, ranging from 0.50 (Resilience), to 0.85 (Engagement).

4.3.3.3 Relationships, society and social progress, time use and strengths, trust and belonging, and vitality. The seven topics in Table 8 (p.59) cover the constructs of relationships, society and social progress, strengths, time use, belonging, trust, and vitality. Internal consistency alpha coefficients were low to modest, ranging from 0.18 (Time Use), to 0.65 (Strengths).

Table 7: Internal Consistency - emotional wellbeing, positive functioning, and resilience and self-esteem

	Cronbach's Alpha (95% CI)
Emotional wellbeing / Absence of negative feelings	0.80 (0.68, 0.88)
Emotional wellbeing / Positive feelings	0.76 (0.64, 0.85)
Positive functioning / Competence and achievement	0.53 (0.26, 0.71)
Positive functioning / Engagement	0.85 (0.77, 0.90)
Positive functioning / Meaning and purpose	0.72 (0.55, 0.83)
Resilience and self-esteem / Optimism	0.66 (0.42, 0.81)
Resilience and self-esteem / Resilience	0.50 (0.13, 0.71)
Resilience and self-esteem / Self -esteem	0.60 (0.37, 0.76)

Table 8: Internal Consistency - relationships, society and social progress, time use and strengths, trust and belonging, and vitality

	Cronbach's Alpha (95% CI)
Relationships	0.56 (0.36, 0.72)
Society and social progress	0.46 (0.13, 0.67)
Time use and strengths / Strengths	0.65 (0.39, 0.80)
Time use and strengths / Time use	0.18 (-0.42, 0.53)
Trust and belonging / Belonging	0.57 (0.33, 0.74)
Trust and belonging / Trust	0.23 (-0.34, 0.55)
Vitality	0.62 (0.41, 0.77)

4.3.3.4 The Flourishing Scale, and the Center for Epidemiologic Studies - Depression Scale. The two topics in Table 9 (p.60) cover the Flourishing Scale, and Center for Epidemiologic Studies - Depression scale. Internal consistency alpha coefficients were modest, including 0.58 for CES-D and 0.70 for the Flourishing Scale.

Table 9: Internal Consistency - Flourishing Scale, and Center for Epidemiologic Studies - Depression Scale

	Cronbach's Alpha (95% CI)
Flourishing Scale	0.70 (0.56, 0.80)
CES-D	0.58 (0.38, 0.73)

4.4. Discussion

4.4.1. Test-retest reliability. Overall, the test-retest reliability results for the New Zealand Sovereign Wellbeing Index returned moderate to almost perfect agreement across the majority of the items. The exception is an item from the Strengths Use Scale relating to strengths use ("try to use my strengths"). Eighty-eight items were evaluated in this study and the ICC classification of agreement according to Landis and Koch (1977) was used. Accordingly, 36 items (41%) showed almost perfect agreement, 42 items (48%) displayed substantial agreement, 9 items (10%) indicated moderate agreement, and 1 item (1%) returned fair agreement. The ICC of the New Zealand Sovereign Wellbeing Index items ranged from 0.33 to 0.95, with the lowest value for the item "try to use my strengths", and the highest value being the item regarding "importance of community involvement".

Items measuring "importance in life of domain" returned reliability results indicating substantial to almost perfect agreement, indicating that these items are reliable and stable measures across time. Items measuring "satisfaction with domain" returned a wider range of results from moderate to almost perfect agreement. The items with moderate agreement include satisfaction with leisure time, satisfaction with community involvement, and satisfaction with religion, implying that these items are more subject to temporal changes. Previous research has indicated that satisfaction with leisure time is affected by factors such as internal barriers including optimism/pessimism, personal interest and capacity, and external barriers including

socioeconomic determinants and time availability (Francken & Raaji, 1981). In addition, there is an association between leisure and community involvement, with satisfaction with leisure being a predictor of satisfaction with community involvement (Allen & Beattie, 1984). Items measuring the "time individuals would like to spend on domain" also returned moderate to almost perfect agreement reliability results, although the results for these items were at the higher end of the moderate range compared to the "satisfaction with domains" moderate agreement items. The items with moderate agreement include the amount of time an individual would like to spend on leisure time, and time they would like to spend on religion. These results support the moderate results from "satisfaction with domains", indicating there is a possible relationship between the amount of time an individual would like to spend on the leisure and religious domains and their level of satisfaction in leisure and religious domains, and that these items may have lower temporal stability. However, with the small sample size of this study, it is difficult to draw more definitive conclusions about the lower reliability scores.

The test-retest reliability of items from the Flourishing Scale returned varying results, from moderate to almost perfect agreement. Three of the four moderate agreement items also returned statistically significant F-test results ($p < .01$, two tailed), including "I actively contribute to the happiness and wellbeing of others", "I am a good person and live a good life", and "I am competent and capable in the activities that are important to me". The overall result from the Flourishing Scale was 0.86, categorised as almost perfect agreement, which indicates high test-retest reliability of the scale despite the individual scale item results. This is a higher temporal stability result than the psychometric statistics reported in the development of the Flourishing Scale, 0.71 (Diener et al., 2010). Thus, the result shows there are some changes in some items over a one week period, but flourishing as an overall construct is relatively stable.

The majority of items in the CES-D returned substantial to almost perfect agreement indicating high levels of temporal stability. The exception was one item with moderate agreement, which asked about how often during the past week the individual felt everything they did was an effort (ICC = 0.62), although this item has a statistically significant F-test result ($p < .01$, two tailed). The result indicates that this item in isolation may have less temporal stability over a one week period. However, as with the Flourishing Scale, the overall test-retest reliability coefficient for the CES-D is 0.8, indicating substantial agreement and high reliability. These results support previous

test-retest reliability results for the full 20 item CES-D and the 10 item CES-D-10, which have returned poor to excellent temporal stability results for individual items, and excellent results for the overall scales (Eng & Chan, 2013).

The three items from the Strengths Use and Current Knowledge Scale were widely variable with results from fair to almost perfect agreement. The item measuring "try to use my strengths" from the Strengths Use sub-scale returned the lowest reliability at 0.33 (CI = -0.21, 0.63), although it was statistically significant. This result indicates this item within the NZSWI either has fairly low temporal stability over time (the past week as asked in this study) or it is measuring a larger than average shift of response. A second item from the Strengths Use sub-scale, "I know my strengths well", had moderate ICC agreement results, indicating this item may also have less temporal stability over time. The development literature on the Strengths Use and Current Knowledge Scale did not appear to evaluate temporal stability (Govindji & Linley, 2007). However, a later study by Wood et al. (2011) returned a high result for the entire 14-item Strengths Use sub-scale over three time points across six months (ICC = 0.85) indicating high temporal stability for the Strengths Use sub-scale as a whole. The "try to use my strengths" item returned an ICC result of 0.84 in the same study indicating there is another factor present in the lack of temporal stability, perhaps order effect. In the original scale, this item follows "I always play to my strengths", but in the NZSWI this item follows "Overall, I am satisfied with the way I use my time". Altering the preceding question may be introducing a confounding variable that impacts the temporal stability of the item. In addition, the NZSWI uses only 10 of the 14 items from the Strengths Use sub-scale.

The test-retest reliability of items derived from the Personal and Social Wellbeing module of Round 6 of the European Social Survey (ESS6) indicating that these items had moderate to almost perfect agreement, therefore good to excellent temporal stability. The majority of items returned ICC results over 0.7, with a few exceptions. The item measuring "sense accomplishment from what I do" returned the lowest reliability (ICC = 0.52), and was statistically significant at the 0.01 level ($p < .01$, two tailed). The items measuring "there are lots of things I feel I am good at" (ICC = 0.56), "I feel what I do in life is valuable and worthwhile" (ICC = 0.60), and "the extent to which I make time to do things I want to do" (ICC = 0.62), were also statistically significant at the 0.01 level ($p < .01$, two tailed). The report for ESS6 is not available at the time of writing to compare reliability data with.

This current research is the first study evaluating temporal stability of the New Zealand Sovereign Wellbeing Index, and as the main NZSWI survey has already been implemented, there is limited scope for introducing changes that would hinder the detection of temporal trends. Another limitation is that the sample size is small (N = 74) with limited demographic and geographic diversity in respondents.

4.4.2. Internal consistency. Twenty topics were evaluated in this study and the Cronbach's alpha coefficient classification according to Hicks (1999) was used. Accordingly, 15 (75%) of the topics had coefficient alphas under 0.70 demonstrating inadequate consistency, four topic headings (20%) demonstrated good internal consistency, and one (5%) topic heading demonstrated excellent internal consistency. Overall, the coefficient alpha values of the NZSWI ranged from 0.18 to 0.85, with the lowest α for the topic "Time use and strengths / Time use", and the highest α for the topic "Positive functioning / Engagement". With such a large percentage of the topic tables returning alpha coefficients indicating inadequate internal consistency, it is possible that the topic headings selected by the NZSWI developers (based on face validity) are not adequately capturing the underlying concepts being measured by the items within those topics. Low correlations may indicate that some of the items do not fit comfortably under the topic headings.

The three topics related to domains – importance of, satisfaction with, and time I would like to spend on – had variable internal consistency results. Importance and time returned low correlations, with only satisfaction returning a coefficient alpha above 0.7. The two emotional wellbeing topics, absence of negative feelings, and positive feelings, both returned good Cronbach's alphas above 0.75, indicating these topics demonstrate internal consistency. The positive functioning topics of competence and achievement, engagement, and meaning and purpose returned variable alpha results. Competence and achievement had an inadequate alpha coefficient of 0.53, while engagement had an excellent alpha of 0.85, and meaning and purpose had an adequate result at 0.72. The relationships topic had seven items exploring social connections and it is possible that there could have been sub-topics within those items to explain the inadequate alpha result of 0.56. Society and social progress also had an inadequate alpha of 0.46. When looking at the items, they measure diverse aspects of social wellbeing such as social coherence ("for most people in New Zealand life is getting worse"), social actualisation ("hard to be hopeful about the future of the world"), and social contribution ("place on society ladder"), and this topic may not have effectively captured this diversity. The

time use and strength topics both returned inadequate reliability results with the time use alpha being 0.18 (CI = -0.42, 0.53). This is an exceptionally low result and indicates the items are not measuring the same construct. The trust and belonging topics were also low in reliability, with trust having a low alpha of 0.23 (CI = -0.34, 0.55). As with time use, this indicates that the two items in the topic are measuring different underlying constructs. Lastly, the vitality topic returned a coefficient alpha of 0.62, which indicates inadequate agreement; however it is just under Hicks' (1999) internal consistency guideline for adequacy. As a comparison, internal consistency measures for the five scales in the validity study all returned coefficient alphas over 0.7, with most returning over 0.83.

4.5. Conclusion

This study represents the first reliability study on the wellbeing items of the New Zealand Sovereign Wellbeing Index (NZSWI) in a New Zealand population with adults over 18 years of age. The overall findings of this study suggest the majority of items in the NZSWI have satisfactory test-retest reliability for this population sample. Seventy six items (86%) displayed substantial reliability, and 12 items (14%) had moderate reliability. The findings for internal consistency are less satisfactory with 15 topic headings (75%) returning coefficient alphas under 0.7. However, there is a possibility that the topic tables selected by the NZSWI developers are not adequately reflecting the underlying constructs of the items grouped under those topics. Further investigation into the underlying constructs being measured should be considered.

Chapter 5. Paper Two – Validity of the New Zealand Sovereign Wellbeing Index[2]

Abstract

Background: Wellbeing measurement tools evaluating wellbeing in personal, social and occupational life domains are increasingly being used to measure how people are flourishing in ways aside from their contribution to their nation's financial productivity. The New Zealand Sovereign Wellbeing Index is one such measure specifically developed to evaluate the wellbeing of New Zealanders, and to track how their wellbeing is changing. The purpose of this study is to assess the construct validity of the New Zealand Sovereign Wellbeing Index.

Methods: The New Zealand Sovereign Wellbeing Index was administered to a non-clinical sample (*N*=94) of New Zealand adults aged 18 years and over at two time points one week apart using an online survey. Email addresses were used as unique identifiers to permit matching of test-retest surveys. Eighty-eight survey items covered the importance of, time use in, and satisfaction with, various life domains (e.g. family, work, education, and leisure time), the Flourishing Scale, the CES-D Scale, the Strengths Use and Current Knowledge Scale, and items from the European Social Survey. To measure the construct validity of the New Zealand Sovereign Wellbeing Index, the Pemberton Happiness Index, the seven item depression subscale from the 21 item short-form Depression Anxiety Stress Scales, the Satisfaction with Life Scale, Scale of Positive and Negative Experience, and additional questions from the Strengths Use and Strengths Knowledge Scale were also administered. The NZSWI items were evaluated for convergent and discriminant validity using a Spearman's rank-correlation coefficient (*rs*) with a 95% confidence interval (CI).

Results: With regard to convergent validity, all items measured within the 15 topic tables displayed strong validity with Spearman's coefficients above 0.5. For discriminant validity, there were 9 topic tables with variable validity results. One topic

[2] Papers One and Two will be submitted to a journal for publication. Consequently, there is some repetition in Chapters Four and Five.

(11%) returned a small correlation, six topics (67%) returned medium correlations, and two topics (22%) returned strong correlations.

Conclusions. The overall findings of this study suggest the New Zealand Sovereign Wellbeing Index (NZSWI) has high convergent and moderate discriminant validity, suggesting that the NZSWI is a valid instrument.

5.1. Background

Many countries around the world are developing their own wellbeing questions, scales or indices as a way of measuring the personal and social wellbeing of their citizens (Diener, 2006; Michaelson et al., 2009). The New Zealand Sovereign Wellbeing Index, developed by The Human Potential Centre at Auckland University of Technology (AUT) in partnership with Sovereign Insurance, is one such tool that is designed to measure and evaluate the wellbeing of New Zealanders (Jarden et al., 2013). The New Zealand Sovereign Wellbeing Index evaluates how New Zealanders are flourishing in personal and social life domains over time (Jarden et al., 2013). Many of the wellbeing questions in the New Zealand Sovereign Wellbeing Index were drawn from previously validated scales in other countries, including Round 6 of the European Social Survey (ESS) Personal and Social Wellbeing module (European Social Survey, 2012), and the Flourishing Scales (Diener et al., 2010). However, the mix of these scales along with additional questions has not been validated, and it is critical that the NZSWI demonstrates validity and reliability in order for the results to be interpreted confidently.

Evaluating the validity of the NZSWI allows researchers to be confident that each item within the measure is evaluating the same construct, and that the NZSWI is an effective psychometric tool for evaluating the underlying constructs it is purporting to measure. This paper focuses on assessing the construct validity of the New Zealand Sovereign Wellbeing Index.

5.2. Methods

5.2.1. Participants. The target population for this study was adults aged 18 years and older. The New Zealand Sovereign Wellbeing Index has not been designed for those under the age of 18 years and validation for this age group did not form part of the study design. The only exclusion criterion was a lack of internet access.

This study consisted of 94 participants; seven recruited via the original (largely unsuccessful) recruitment method of a letterbox drop in Auckland, and 87 through the subsequent snowballing email recruitment involving the researcher and supervisors recruiting participants through personal and professional networks by sending out an email advertisement. Fifty-seven participants initiated the online survey at time point 1 (T1); four of these participants did not complete the T1 survey. Sixty-four participants initiated the online survey at time point 2 (T2); two of these participants did not complete the T2 survey. There were 71 individual participants in total (77 % response rate) with 49 (52%) completing both T1 and T2 surveys. Ethics approval was granted by Auckland University of Technology Ethics Committee on 6 March 2014 (AUTEC Reference number 14/08), and the approval was stated on the website and in the downloadable information sheet and consent form.

5.2.2. Survey items. The survey used in this study was a portion of the New Zealand Sovereign Wellbeing Index (NZSWI) survey. The variables of interest measured by the NZSWI included wellbeing variables (emotional wellbeing, life satisfaction, vitality, resilience and self-esteem, positive functioning, supportive relationships, and flourishing), health and lifestyle variables (health status, weight, physical activity, food and nutrition, energy levels, cigarette and alcohol consumption), and socio-demographic variables (age, gender, ethnicity, household makeup, employment, and household income) (Human Potential Centre, 2012). The diversity of variables allows for thorough analysis of predictors, moderators and determinants of New Zealanders wellbeing, and initial analysis from T1 is already yielding rich results indicating who in New Zealand is flourishing, what health and social factors are associated with wellbeing, and how New Zealanders' wellbeing compares with European countries using similar measures (Human Potential Centre, 2013). For the purposes of this study, only the wellbeing variable items were used.

To measure the construct validity of the New Zealand Sovereign Wellbeing Index, the Pemberton Happiness Index (Hervás and Vázquez 2013), the seven item depression subscale from the 21 item short-form Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995), the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), Scale of Positive and Negative Experience (Diener et al., 2010), and additional questions from the Strengths Use and Strengths Knowledge Scale (Govindji & Linley 2007) were also administered.

5.2.2.1 The Pemberton Happiness Index. The Pemberton Happiness Index (PHI) is a 21-item scale evaluating remembered and experienced wellbeing in various life domains, including hedonic, eudaimonic, social and general wellbeing, as well as positive and negative affect (Hervás & Vázquez, 2013). Hervás and Vázquez (2013) tested the measure over nine countries in seven languages, presenting evidence of a high degree of reliability and validity. The alpha reliability test for internal consistency for the Pemberton Happiness Index at T1 had an acceptable alpha level of 0.74. Items from this scale were used to validate life satisfaction, competence, engagement, vitality, life meaning, relationships, resilience and self-esteem, and positive and negative affect items of the New Zealand Sovereign Wellbeing Index.

5.2.2.2 The Depression Anxiety Stress Scales. The Depression Anxiety Stress Scales (DASS) is a 42-item questionnaire containing a set of three self-report measures, assessing the negative emotional states of depression, anxiety and stress (Lovibond & Lovibond, 1995). There is also a shorter form 21-item questionnaire, the DASS21. The seven-item Depression sub-scale from the DASS21 has been validated for individual sub-scale use (Henry & Crawford, 2005). The alpha reliability test for internal consistency for the DASS21 Depression sub-scale at T1 had a high alpha level of 0.87. This sub-scale was used to validate items on negative affect and vitality, with higher alpha values indicating a higher degree of convergent validity between the items. The sub-scale will also be used to validate items on positive affect and flourishing, with lower alpha values indicating a higher degree of discriminant validity between the items.

5.2.2.3 The Satisfaction with Life Scale. The Satisfaction with Life Scale (SWLS) is a five-item questionnaire designed to measure global evaluations of general life satisfaction and appreciation (Diener et al., 1985). The Satisfaction with Life Scale has been validated in several countries over many studies with satisfactory psychometric properties including sound test-retest reliability (alpha of 0.82), and high internal consistency (Diener, 1994; Diener et al., 2012). The alpha reliability test for internal consistency for the Satisfaction with Life Scale at T2 had an alpha level of 0.89 indicating a high degree of internal consistency. Items from this scale were used to further validate life satisfaction items with higher values indicating a higher degree of convergent validity between the items.

5.2.2.4 The Scale of Positive and Negative Experience. The Scale of Positive and Negative Experience (SPANE) is a subjective wellbeing tool developed to measure positive and negative affect, and affect balance (Diener et al., 2010). The SPANE is a 12-item Likert scale with six items assessing positive experiences and six items assessing negative experiences over the previous four weeks, including three general and three specific items per sub-scale. Diener et al. (2010) reported that the SPANE had acceptable levels of reliability and convergent validity with other measures of happiness, wellbeing, and life satisfaction including a correlation of feelings alpha score of 0.76 with Positive and Negative Affect Scales (Watson, Clark, & Tellegen, 1988), and a convergent validity alpha of 0.61 with LOT-R assessing optimism (Scheier et al., 1994). The alpha reliability tests for internal consistency for the SPANE at T2 had alpha levels of 0.89 for SPANE-P, and 0.87 for SPANE-N, indicating a high degree of internal consistency for both sub-scales. SPANE was used to validate positive and negative affect in the New Zealand Sovereign Wellbeing Index. Both positive and negative experience items will be validated and higher validation values will indicate convergent validity between the items.

5.2.2.5 The Strengths Use and Current Knowledge Scale. The Strengths Use and Current Knowledge Scale is a 10-item scale evaluating how much people are aware of their personal strengths and utilise them in a variety of settings (Govindji & Linley, 2007). A subset of the scale consisting of five items was selected by Dr Aaron Jarden for use in this study with a temporal question on the amount of strengths use added. There is minimal information on the scoring or validity of the Strengths Use and Current Knowledge Scale beyond the paper by Govindji and Linley (2007). In that paper, the authors wrote that the measure was internally consistent and displayed meaningful correlations. Furthermore, they suggest that the measure would benefit from additional research on its validity. The alpha reliability test for internal consistency for the Strengths Use and Current Knowledge Scale at T2 had an alpha level of 0.83 indicating a high degree of internal consistency. Two items from the related Strengths Knowledge Scale are contained within the New Zealand Sovereign Wellbeing Index, and the additional administration of the Strengths Use and Current Knowledge Scale will be used to validate these items within the NZSWI, with higher values indicating convergent validity between the items.

5.2.3. Data collection procedure. The information sheet and consent form were available to view on the study registration website, and were also available for download in order for the participants to seek independent advice, or to take time to consider the information. Participants typed their name and contact details (email and postal addresses) into the online consent form and clicked the box indicating their consent to participate. Informed consent was deemed to have been given once they read the study information and click on the button "I consent and agree to participate in this study". Participation in the survey was voluntary and the survey responses, as well as the unique personal identifier (email address) could only be accessed by the researcher. Participants were informed that their survey answers would be read by the researcher. Ethics approval was granted by the Auckland University of Technology Ethics Committee on 6 March 2014 (AUTEC Reference number 14/08), and the approval was stated on the website and in the downloadable information sheet and consent form.

The survey was administered at two time points, one week apart. The New Zealand Sovereign Wellbeing Index was completed at both time points as the first scale administered in the battery, with two additional wellbeing measures administered at T1 (the Pemberton Happiness Index, and the Depression Anxiety and Stress Scale), and three additional wellbeing measures administered at T2 (the Satisfaction With Life Scale, the Scale of Positive and Negative Effect, and the Strengths Use and Current Knowledge Scale). Study questionnaires were hosted by the online survey software QuestionPro.

On 2 May 2014, participants were sent an email with a weblink to the first time point (T1) questionnaire, asking them to complete T1 between 5 and 11 May 2014. On 9 May 2014, participants were sent an email with a weblink to the second time point (T2) questionnaire, asking them to complete T2 between 12 and 18 May 2014, seven days after they completed T1. Respondents were asked to use the same email address to log-in to the survey to permit matching the test and the retest questionnaires.

5.2.4. Data analyses. All data from test and retest studies were imported from QuestionPro directly into the Statistical Package for the Social Sciences, version 22.0 (SPSS, Inc., Chicago, USA) for analysis. The items in the New Zealand Sovereign Wellbeing Index were grouped by the research team into topic headings prior to this research. Items from the validation scales used in this study were grouped into the same topic headings and evaluated for convergent and discriminant validity. The convergent and discriminant validity of the NZSWI was assessed using Spearman's rank correlation coefficients. The classification used to interpret the results according to the strength of correlation was as defined by Hicks (1999). This classification defines small correlation as under 0.10, medium correlation as 0.11-0.49, and large as 0.50-1.

5.3. Results

5.3.1. Study participants. This study consisted of 94 participants; seven recruited via the letterbox drop in Auckland and 87 through the subsequent email recruitment. Fifty-seven participants initiated the online survey at T1; four of these participants did not complete the T1 survey. Sixty-four participants initiated the online survey at T2; two of these participants did not complete the T2 survey. Therefore there were 71 individual participants in total (77 % response rate) with 49 (52%) completing both T1 and T2 surveys.

Each participant was asked to provide demographic information, consisting of gender, date of birth, ethnic group, marital status, where in New Zealand they usually lived, highest academic qualification, current employment status, and general health status. The demographics include all participants that completed questionnaire sets at T1 and/or T2. The demographic information of participants is contained in Table 10 (p.73).

Table 10: Demographic Information

Demographic Variable		***All Participants***	
N		71	
		No.	**%**
Gender	Female	47	71.2
	Male	19	28.8
Age	18 – 24 years	7	14.29
	25 – 34 years	9	18.37
	35 – 44 years	10	20.41
	45 – 54 years	9	18.37
	55 – 64 years	6	12.24
	65 + years	8	16.33
	Average	45.05 years (*SD* = 16.78)	
	Range	19-75 years	
Ethnic group	NZ European / Pakeha	50	70.4
	NZ Maori	5	7.0
	Fijian	1	1.4
	Chinese	1	1.4
	Indian	4	5.6
	British / European	9	12.7
	Australian	1	1.4
	Other	4	5.6
Marital status	Single, never married	15	22.7
	Married or living with partner	49	74.2
	Separated or divorced	2	3.0
Living	Northland	1	1.5
	Auckland	39	59.1
	Waikato	5	7.0
	Hawkes Bay	1	1.5
	Wellington	13	19.7
	Tasman	2	3.0
	Canterbury	5	7.6
Education	Finished primary school	1	1.5
	Finished secondary school	1	1.5
	UE/Bursary/Scholarship	4	6.1
	Apprenticeship/Trade/Diploma	5	7.6
	Bachelor degree or higher	15	22.7
	Postgraduate diploma/degree or higher	40	60.6
Employment	Working in paid employment	9	13.8
	Not in paid work, looking for job	31	47.7
	In education, or on holiday	3	4.6
	Permanently sick or disabled	7	10.8
	Retired	1	1.5
	Housework, caring for children or others	7	10.8
	Prefer not to answer	7	10.8
Health	Very good	22	41.5
	Good	25	47.2
	Fair	4	7.5
	Bad	2	3.8

5.3.2. Convergent validity. The New Zealand Sovereign Wellbeing Index showed a consistent pattern of convergent validity with the validation scales used in this study. The full list of items under each topic heading is displayed in Appendix 13 (p.137). The allocated topic groupings for convergent validity are presented in Table 11 (p.74) and Table 12 (p.74). Topics within these tables include emotional wellbeing, life satisfaction, positive functioning, relationships, resilience and self-esteem, time use and strengths, and vitality. Spearman's correlation coefficient alphas ranged from 0.51 to 0.95, which, according to Hicks (1999), indicates a large correlation between the items within the topic headings and therefore a high degree of convergent validity. The topic with the lowest alpha was time use (r = 0.51), which compared the two time use items in the NZSWI ("make time to do things you want to do" and "satisfied with way I use time") with an item from the Strengths Use and Current Knowledge Scale ("percentage of time using strengths"). The topic with the highest alpha was resilience (r = 0.95), which compared an item from the NZSWI ("how difficult or easy to deal with important problems that come up in your life") with an item from the Pemberton Happiness Index ("I feel I am able to solve the majority of my daily problems").

Table 11: Convergent validity - emotional wellbeing, life satisfaction, and positive functioning

	Cronbach's Alpha (95% CI)	**Magnitude of Correlation**
Emotional wellbeing / PHI - Absence of negative feelings	0.64 (0.47, 0.77)	Large
Emotional wellbeing / DASS - Absence of negative feelings	0.88 (0.82, 0.92)	Large
Emotional wellbeing / SPANE - Absence of negative feelings	0.89 (0.84, 0.93)	Large
Emotional wellbeing / PHI - Positive feelings	0.76 (0.65, 0.85)	Large
Emotional wellbeing / SPANE - Positive feelings	0.91 (0.87, 0.94)	Large
Life Satisfaction - SWLS	0.61 (0.43, 0.74)	Large
Life Satisfaction - PHI	0.78 (0.65, 0.87)	Large
Positive functioning / Competence and achievement	0.67 (0.47, 0.80)	Large
Positive functioning / Engagement	0.79 (0.69, 0.90)	Large
Positive functioning / Meaning and purpose	0.84 (0.76, 0.90)	Large

Table 12: Convergent validity - relationships, resilience and self-esteem, time use and strengths, and vitality

	Cronbach's Alpha (95% CI)	**Magnitude of Correlation**
Relationships	0.64 (0.48, 0.77)	Large
Resilience and self-esteem / Resilience	0.95 (0.92, 0.97)	Large
Resilience and self-esteem / Self-esteem	0.69 (0.51, 0.81)	Large
Time use and strengths / Strengths	0.84 (0.77, 0.89)	Large
Time use and strengths / Time use	0.51 (0.25, 0.69)	Large
Vitality	0.74 (0.60, 0.84)	Large

5.3.3. Discriminant validity. The results for discriminant validity were more variable than the convergent validity results, with small, medium and large coefficient alphas across the topics therefore correlations exist between items that appear to measure different constructs. The full list of discriminant validity items under each topic heading is displayed in Appendix 14 (p.140), with the topic results presented in Table 13 (p.75). Topics within these tables include emotional wellbeing, positive functioning, resilience and self-esteem, and trust and belonging. Spearman's correlation coefficient alphas ranged from 0.57 to 0.06. The topic with the highest alpha, thus the lowest discriminant validity, was resilience (r = 0.57), which compared an item from the NZSWI ("when things go wrong it takes a long time to get back to normal" – reverse coded) with an item from the Pemberton Happiness Index ("I feel I am able to solve the majority of my daily problems"). The topic with the lowest alpha and the highest discriminant validity, was absence of negative feelings (r = 0.06), which compared three items from the NZSWI (how often in the past week an individual felt depressed, felt sad, or felt anxious) with two items from the Pemberton Happiness Index ("I enjoy a lot of little things every day" and "I did something I really enjoy doing").

Table 13: Discriminant validity - emotional wellbeing, positive functioning, resilience and self-esteem, and trust and belonging

	Cronbach's Alpha (95% CI)	**Magnitude of Correlation**
Emotional wellbeing / PHI - Absence of negative feelings	0.06 (-0.42, 0.41)	Small
Emotional wellbeing / SPANE - Absence of negative feelings	0.39 (0.14, 0.60)	Medium
Emotional wellbeing / PHI - Positive feelings	0.43 (0.16, 0.64)	Medium
Emotional wellbeing / DASS - Positive feelings	0.24 (-0.12, 0.52)	Medium
Emotional wellbeing / SPANE - Positive feelings	0.25 (-0.06, 0.50)	Medium
Positive functioning / Competence and achievement	0.21 (-0.37, 0.55)	Medium
Resilience and self-esteem / Resilience	0.57 (0.26, 0.75)	Large
Resilience and self-esteem / Self-esteem	0.56 (0.24, 0.75)	Large
Trust and belonging / Belonging	0.36 (-0.11, 0.63)	Medium

5.4. Discussion

5.4.1. Convergent validity. Overall, the results for the New Zealand Sovereign Wellbeing Index indicated high levels of convergent validity between items in the NZSWI and items in the validity measures. All convergent validity coefficients were above 0.5, and all five additional wellbeing tools were used for evaluating the convergent validity of the NZSWI.

The emotional wellbeing topics, absence of negative feelings and positive feelings, had convergent validity coefficients between 0.64 and 0.91. Validity measures used include the Pemberton Happiness Index (PHI), Scale of Positive and Negative Effect (SPANE), and Depression Anxiety and Stress Scale (DASS). SPANE and NZSWI had the highest coefficients for both absence of negative feelings (r = 0.89) and positive feelings (r = 0.91), indicating the relevant items in these two measures are highly likely to be measuring the same underlying constructs. These are higher coefficients than the SPANE achieved in its own reliability and validity study where items assessing positive feelings in both the SPANE and the Satisfaction With Life Scale (SWLS) and Cantril's Ladder had alphas of 0.58 and 0.62 respectively (Diener et al., 2009). The PHI alphas were also quite high for absence of negative feelings (r =

0.64) and positive feelings (r = 0.76). This compares favourably with PHI convergent validity coefficients of 0.66 for the SWLS in the USA (Hervás & Vázquez, 2013). The DASS was only used to assess construct validity for absence of negative feelings with a high coefficient of 0.88, which compares favourably with the high correlation between DASS and Beck Anxiety Inventory (BAI) (Crawford & Henry, 2003).

The convergent validity of the NZSWI's life satisfaction items were assessed against the SWLS and PHI. Surprisingly, there was a higher correlation between the NZSWI and PHI life satisfaction items (r = 0.78) than with the SWLS (r = 0.61). The SWLS was also used to assess the validity of PHI life satisfaction items (including "I am very satisfied with my life") resulting in a correlation coefficient of 0.69 (Hervás & Vázquez, 2013).

Positive functioning topics included competence and achievement, engagement, and meaning and purpose. Items within these topics were evaluated against four PHI items on positive functioning. The NZSWI was highly correlated with these items with alphas of 0.67 (CI = 0.47, 0.80) for competence and achievement, 0.79 (CI = 0.69, 0.90) for engagement, and 0.84 (CI = 0.76, 0.90) for meaning and purpose. Hervás and Vázquez (2013) reported convergent validity alphas of 0.5 and 0.6 on two of these items with Ryff's Scales of Psychological Well-being (SPWB); therefore, these results indicate a high degree of convergent validity between NZSWI positive functioning items and PHI eudaimonic wellbeing items.

The convergent validity between the PHI relatedness item ("I feel very connected to the people around me") and the seven NZSWI items was also high (r = 0.64). This is considerably higher than when the PHI was validated against the SPWB positive relationship item (r = 0.48) (Hervás & Vázquez, 2013). The highest convergent validity coefficient (r = 0.95) was found in the resilience topic which looked at the convergence between one NZSWI item (how difficult or easy it is to deal with important problems that come up in your life) and one PHI item ("I feel I am able to solve the majority of my daily problems"). Again, the result compares well with the SPWB and PHI result of 0.57 for competence/environmental control. The self-esteem topic had a coefficient of 0.69 between the PHI and NZSWI, as matched against the PHI and SPWB coefficient of 0.41 for items on autonomy (Hervás & Vázquez, 2013).

Strengths and time use were evaluated against the Strengths Use and Current Knowledge Scale (SUCK). Two NZSWI items on strengths were validated against five SUCK items with a resulting coefficient of 0.84. Two NZSWI items on time use were validated against one SUCK item with the lowest alpha of 0.51, which still indicates satisfactory convergent validity. SUCK has returned inter-correlations between 0.45 and 0.63 when compared to other measurement tools (Govindji & Linley, 2007).

The final topic of vitality was between three NZSWI items and one DASS item. The convergent validity coefficient for this topic was 0.74, a similar outcome to the coefficient alpha of 0.74 between the Beck Depression Inventory and DASS depression subscale (Crawford & Henry, 2003).

5.4.2. Discriminant validity. For the majority of topics, the NZSWI displayed low to moderate discriminant validity coefficients, with two topics returning high correlation coefficients demonstrating weak discriminant validity in those topics. The Pemberton Happiness Index (PHI), Scale of Positive and Negative Effect (SPANE), and Depression Anxiety Stress Scale (DASS) were used to evaluate the discriminant validity of the NZSWI. To date, few of the measures used within the NZSWI as validity measures have well documented discriminant validity, so there is very little comparative data. Neither the PHI or SPANE evaluated discriminant validity in their reliability and validity studies, however Cameron and Henry (2003) reported that the discriminant validity of the DASS was not as impressive as its convergent validity results, and this result was in line with discriminant validity studies of other self-report measures. The authors stated that the evidence for the discriminant validity of the DASS was that the within-construct correlations were considerably higher than the between-construct correlations.

The emotional wellbeing topics, absence of negative feelings and positive feelings, had discriminant validity coefficients ranging between 0.06 and 0.43. Validity measures used included the PHI, SPANE, and DASS. For absence of negative feelings, the coefficients were 0.06 with PHI and 0.39 with SPANE respectively. The NZSWI items were derived from the Center for Epidemiological Studies Depression Scale (CES-D), while the PHI and SPANE items were measuring positive affect. In respect of positive feelings, the coefficients were 0.25 with SPANE, 0.24 with DASS, and 0.43 with PHI. Again, the NZSWI items were derived from the CES-D, with PHI and SPANE items measuring negative affect and DASS measuring depressive symptoms.

The remainder of the topics evaluated for discriminant validity of the NZSWI were measured against PHI items, including competence and achievement (r = 0.21), and belonging (r = 0.36).

Resilience and self-esteem items displayed weak discriminant validity with alphas of 0.57 (CI = 0.26, 0.75) and 0.56 (CI = 0.24, 0.75) respectively. The discriminant coefficient for self-esteem in particular was not much lower than the convergent coefficient of 0.69 (CI = 0.51, 0.81). One possibility for the weak discriminant validity is that the PHI item used ("I think that I can be myself on the important things") was not measuring a divergent enough construct to display discriminant validity with the NZSWI item ("At times feel as if I am a failure"), which was reverse coded. The PHI item was defined in the construction and validation study for this measure as measuring the psychological wellbeing construct of autonomy (Hervás & Vázquez, 2013). Previous research has indicated a close association between autonomy and self-esteem (Marmot, 2003; Sennett, 2003). Thus, the items were unlikely to return low discriminant validity values. With respect to the resilience topic, the NZSWI item "when things go wrong it takes a long time to get back to normal" was also reverse coded against a PHI item "I feel I am able to solve the majority of my daily problems", which according to Hervás and Vázquez (2013) measures perceived control. Tung et al. (2014) state that perceived control is a stable personality trait that contributes to a resilient personality. As with the self-esteem item, it was clear that comparing the items was unlikely to result in a low discriminant validity coefficient as these concepts are too related. Diener et al. (2012) suggest that "… discriminant validity in practice means that a measure correlates with other measures of the same concept at high levels and with measures of other concepts at lower levels than this". The NZSWI discriminant validity results reflect this proposition.

5.5. Conclusion

This study represents the first validity study on the wellbeing items in the New Zealand Sovereign Wellbeing Index (NZSWI) in a New Zealand population sample with adults over 18 years of age. The overall findings of the study suggest that the majority of items in the NZSWI have high convergent validity, although the findings for discriminant validity were, at first glance, less satisfactory. However, further investigation into the constructs being measured within the topics showed clear relationships between the topics thus higher discriminant validity coefficients. A

limitation is that the sample size is small (N = 74) with limited demographic and geographic diversity in respondents.

Chapter 6. Discussion

This thesis has reviewed literature concerning the various wellbeing constructs and their measurement, including how reliability and validity is evaluated, as well as addressing the rationale for accounts of national wellbeing. The aim of this research was to assess the reliability and validity of the New Zealand Sovereign Wellbeing Index (NZSWI), a wellbeing measurement tool developed to assess and track the wellbeing and health of the New Zealand adult population. In general, the results support the reliability and validity of the NZSWI, and indicate that it returns consistent results over time, and that on the whole it measures what it is purporting to measure. The findings will be discussed in 6.1. In light of these findings, it is critical that the strengths and limitations of the study are also addressed. Sample size will be discussed in 6.2.1, sample bias in 6.2.2, and measurement issues in 6.2.3. Lastly, conclusions will be drawn and detailed in 6.3.

6.1. Findings

This study addressed the research questions of whether the New Zealand Sovereign Wellbeing Index (NZSWI) is a reliable and valid psychometric measure of wellbeing. In respect of temporal stability, the overall findings of the study suggest satisfactory test-retest reliability for the majority of wellbeing items in the NZSWI with moderate to almost perfect agreement with interclass correlation coefficients (ICC) ranging from 0.33 to 0.95 and the vast majority being over 0.61. Of the 88 wellbeing items evaluated, 36 items (41%) showed almost perfect agreement, 42 items (48%) displayed substantial agreement, 9 items (10%) indicated moderate agreement, and 1 item (1%) returned fair agreement. No items displayed poor agreement. Thus, the NZSWI demonstrated consistent results in the majority of wellbeing constructs over time. These findings are comparable with test-retest reliability studies of other psychometric measures with ICC results of 0.7 or more (Diener et al., 2010; Eng & Chan, 2013).

For internal consistency, the findings were less conclusive as to the internal reliability of the NZSWI with coefficient alpha values ranging from 0.18 to 0.85. The items in the NZSWI were grouped by the primary NZSWI research team into topic headings based on face validity prior to this study being initiated. Twenty topic items were evaluated and 15 (75%) of the topics had coefficient alphas under 0.70

demonstrating inadequate consistency, four topic headings (20%) demonstrated good internal consistency, and one (5%) topic heading demonstrated excellent internal consistency. Given the large percentage of topic tables returning alpha coefficients under 0.70 indicating inadequate internal consistency according to Hicks (1999), there is a strong possibility that the topic headings that were selected by the research team are not reflecting the underlying constructs, and thus caution is needed regarding those particular topics. Low correlations may indicate that some of the items do not fit comfortably under the topic headings. Further investigation into the underlying constructs being measured should be considered.

The results for construct validity were favourable on the whole. There were high levels of convergent validity between items in the NZSWI and items in the validity measures with all convergent validity coefficients were above 0.5 indicating large correlations between items. The results compare favourably with previous validity studies of measurement tools such as the Depression Anxiety Stress Scale, the Scale of Positive and Negative Affect, and the Pemberton Happiness Index (Crawford & Henry, 2003; Diener et al., 2009; Hervás & Vázquez, 2013). For discriminant validity, the NZSWI displayed low to moderate coefficient for the majority of the nine topics measured, with the exception of two topics returning high correlation coefficients, which according to Hicks (1999) demonstrates weak discriminant validity. However, further exploration of the constructs within the topics revealed associations that would result in higher discriminant validity coefficients. In addition, very few of the measures evaluated in the course of this research have well documented discriminant validity to utilise as a comparison but the discriminant validity study of the Depression Anxiety Stress Scale revealed the discriminant validity results of the DASS were less satisfactory than the convergent validity results (Cameron & Henry, 2003).

6.2. Limitations

6.2.1. Sample size. There were 94 participants in the research over both time points, with 71 individual participants in total (77 % response rate) and 49 participants (52%) completing both surveys. The low number of participants may call into question whether the cohort was representative of the target population and therefore whether the results are generalisable. A review of online survey response rates estimated an average response rate of 33%, and in that light, the response rate of 77% was higher than average (Nulty, 2008). Thus, the rate of dropouts in this study is not considered to be

high and a sufficient proportion of the participants were retained throughout the course of the study. There was no analysis of demographic differences between those who completed both time points and those who completed only one of the time points. The argument for a larger cohort is that the larger the sample size, the less sampling bias will occur, and larger sample sizes increase statistical power (Shum et al., 2013). With a larger sample size, the more likely a statistical effect will be detected. A larger sample size of two hundred participants as originally intended would not only have been able to detect method effect differences (between online and pen and paper survey administration), but would have given more credence to the claim that the sample population accurately represented the wider population of adult New Zealanders.

6.2.2. Sample bias. The data in this study was generated from the responses of email contacts of the study supervisors and researcher. Samples should be representative of the population in which results are intended to be generalised. The nature of the sample population brings with it range restriction. In this study, there was an over-representation of women, New Zealand Europeans, and participants with a post-graduate education, and an under-representation of men, Pacific Islanders, Asians and Maori, and participants with trade qualifications. There is a possibility of bias in that attributes such as gender, ethnicity, and educational status may be more homogenous, thus offering a more limited range of responses (Sackett et al., 2002). There is also a possibility that what people perceive as important in their lives over time may not be that variable. In any case, being a reliability and validity study, this research assessed consistency in answers rather than what the content of those answers described. In addition, the common sampling bias of university students was avoided in this instance - around 75% of US and UK psychological research is conducted on students (Valentine, 1992).

6.2.3. Measurement issues. As is typical in positive psychology studies, all research variables were self-report measures. Participants were assured of anonymity aside from the unique identifier their email addresses provided that was used only to match data from the two time points; however, self-report measures have intrinsic limitations such as social desirability bias (Presser & Stinson, 1998). Though the subjectivity of responses opens these measures to criticism, tools such as these demonstrate consistently high correlations with similar measures as described in the validity section of this study (Chapter 5). This study incorporated best practice for measurement and validation, using various tools measuring a variety of wellbeing

constructs, such as life satisfaction, positive and negative affect, psychological functioning, and social wellbeing, to capture a diversity of wellbeing experiences. An advantage of the New Zealand Sovereign Wellbeing Index was that some of the subscales, such as the Flourishing Scale and the Center for Epidemiological Studies Depression Scale, have been already validated, and included and cited in wellbeing literature.

6.3. Conclusion

This study represents the first evaluation of the test-retest reliability, internal consistency, and construct validity of the New Zealand Sovereign Wellbeing Index, a psychometric tool measuring wellbeing and health in a New Zealand adult population. The results of this research suggest that most items within the NZSWI have satisfactory test-retest reliability and construct validity. Internal consistency results were less satisfactory, however this could be a reflection of inadequate topic headings selected by the research team (based on face validity) rather than a reflection of the adequacy of the tool itself or of the scales within it (e.g. Flourishing Scale, CES-D).

Despite the limitations around sample size and potential bias, this research has provided valuable information on the reliability and validity of the NZSWI. Further internal consistency studies with different topic headings more in line with current wellbeing construct research (as detailed in literature review section 1.1) may be advisable. In addition, a study with a larger and more diverse sample population would increase the statistical power of the results.

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Appendix 1

Front of postcard

"Overall, how satisfied are you with life as a whole these days?"

HUMAN POTENTIAL CENTRE
AN AUT UNIVERSITY RESEARCH CENTRE

SOVEREIGN

Back of postcard

AUT UNIVERSITY

The Sovereign Wellbeing Index www.mywellbeing.co.nz is the first comprehensive survey for New Zealand measuring the wellbeing and quality of life of New Zealanders. We are conducting further research on this survey, and your household is one of 5,000 in Auckland that has been randomly chosen to participate.

You may be eligible to participate if you:

- Are over 18 years old, and
- Have internet access.

This is an opportunity to have your wellbeing compared to the rest of New Zealand.

To register your interest in this research,
visit www.wellbeingstudy.co.nz

Appendix 2

Reachmedia Demographic Targeting

Stats for targeted plan on
High Medium and Low income for European, Maori/Pacific and Asian

reachmedia
REACH OUT INTELLIGENTLY

Row Labels	Sum of Urban_Excl
Urban	**5096**
DANNEMORA	**1429**
DANNEMORA	1429
EAST COAST BAYS NORTH	**90**
SHERWOOD	90
EAST COAST BAYS SOUTH	**162**
CAMPBELLS BAY	162
EAST TAMAKI	**731**
EAST TAMAKI	231
OTARA	500
GREY LYNN	**1442**
GREY LYNN	1042
PONSONBY	400
HILLSBOROUGH	**330**
BLOCKHOUSE BAY	330
OREWA RED BEACH	**92**
OREWA	92
OTAHUHU	**349**
OTAHUHU	349
PAKURANGA	**258**
PAKURANGA HEIGHTS	258
REMUERA	**213**
REMUERA	213
Grand Total	**5096**

Appendix 3

Second phase recruitment email

Hello

The New Zealand Sovereign Wellbeing Index (www.mywellbeing.co.nz) is the first comprehensive survey for New Zealand measuring the wellbeing and quality of life of New Zealanders. We are conducting further research on this survey, and would like to invite you to participate. The aim of the research is to evaluate and measure the personal and social wellbeing of New Zealanders and perceptions of their own quality of life, as well as assess the quality of this measurement. This information will be used to evaluate the reliability and validity of the New Zealand Sovereign Wellbeing Index.

You may be eligible to participate if you:

- Are over 18 years old, and

- Have internet access.

This is an opportunity to have your wellbeing compared to the rest of New Zealand. For further information and to register your interest in this research, visit www.wellbeingstudy.co.nz.

From the team at AUT – Dr Scott Duncan, Dr Aaron Jarden and Amanda Reid

Appendix 4

Information sheet

Participant Information Sheet

Date Information Sheet Produced:

9 April 2014

Project Title

Subjective wellbeing in New Zealand: A reliability and validity study of the New Zealand Sovereign Wellbeing Index

An Invitation

We would like to invite you to participate in a national wellbeing study. I am conducting this research as part of the requirements for a Masters of Philosophy thesis. My name is Amanda Reid, and my supervisors are Drs. Scott Duncan and Aaron Jarden. The aim of the research is to evaluate the reliability and validity of the New Zealand Sovereign Wellbeing Index, and national survey of health and wellbeing. You have been invited to participate in the study. **Your participation in this study is voluntary and you may withdraw at any stage prior to completing the survey.** Please read through the information below carefully before consenting to partake in the research. The New Zealand Sovereign Wellbeing Index is funded by Sovereign, New Zealand's largest life insurer.

What is the purpose of this research?

The aim of the research is to evaluate and measure the personal and social wellbeing of New Zealanders and perceptions of their own quality of life, as well as assess the quality of this measurement. This information will be used to evaluate the reliability and validity of the New Zealand Sovereign Wellbeing Index. We will also be using and comparing the data gathered in this study to determine the feasibility of using online and paper based surveys for future research. The results from this research will be published in my Masters of Philosophy thesis and may also be published in academic journals, presented at conferences, and through the media. However, individuals will not be identified in any report or publication.

How was I identified and why am I being invited to participate in this research?

Your email address has been selected from the address book or contacts list of the researcher or project supervisors. This study is open to adults aged 18 years and over who have access to the internet. More than one adult in your household may be eligible to participate.

What will happen in this research?

You will be asked to complete two surveys, either online or by pen and paper one week apart, that will contain questions on various aspects of wellbeing. This will take about 20 minutes each time. There will also be some demographic questions for statistical purposes. These questions will enable us to better understand what helps bring out the best in New Zealanders lives and how a constantly changing society can adjust to keep striving towards the goal of wellbeing for everyone.

What are the discomforts and risks?

We do not anticipate that you will experience any discomforts or risks as a result of participating in this survey. In our experience it is unlikely; however the psychometric questions included in this survey may prompt some individuals to be concerned about their wellbeing or aspects of their wellbeing.

How will these discomforts and risks be alleviated?

You will not need to answer any questions in the survey that you would prefer not to answer or feel uncomfortable answering. You are also free to withdraw from the study at any stage without being disadvantaged in any way. If you are concerned about your wellbeing we encourage you to use the support offered by Lifeline (0800 543 354, www.lifeline.org.nz).

What are the benefits?

To thank you for your time and participation in the study we will send you the study results. Your participation in the research will be support the requirements of my Masters of Philosophy thesis and will provide us with valuable information which will potentially benefit all New Zealanders. The New Zealand Sovereign Wellbeing Index will be able to show:

- The people and places in New Zealand who are getting the most out of life

- Insight into the components that build New Zealanders wellbeing.

- Who in New Zealand is best prepared to deal with the highs and lows (e.g., economic catastrophe, environmental catastrophe).

- Insights into what can change at both an individual and societal level to make New Zealand a better place to live.

Such information can help areas such as business, education, parenting, and government make decisions about our future with wellbeing (rather than wealth) in mind. If you would like further information and research updates please visit www.mywellbeing.co.nz.

How will my privacy be protected?

For the reliability of the New Zealand Sovereign Wellbeing Index to be evaluated, the questionnaires require a unique personal identifier in order to match the two completed surveys. Your email address will be used as this identifier. Your email address will not be stored with the dataset after the final data collection period has been completed, and no names, contact details or any other identifiable information will be stored. The data provided for this research may be shared with other researchers for research purposes, e.g. comparisons in future studies. This means that your data may be kept in a databank indefinitely. However, there will be no personal identifiers included in any of the datasets. All data will be stored and shared using codes only.

What are the costs of participating in this research?

There will be no financial costs to you as a participant. However, it will take approximately 20 minutes of your time to complete the survey during each of the two data collection rounds one week apart.

What opportunity do I have to consider this invitation?

You have until 27 April 2014 to consider this invitation. You will be asked to complete the first time point questionnaire between the 5 and 11 May 2014 and to complete the second time point questionnaire between 12 and 18 May, 7 days after you have completed the first questionnaire. All surveys will need to be completed within the timeframe given.

How do I agree to participate in this research?

If you wish to complete the survey please read and agree to the consent points on the study registration page and indicate this by ticking the box - "I have read the above and agree to participate in this study".

Will I receive feedback on the results of this research?

The study registration website will include a page for the results of the research. You will be emailed when the summary of research findings has been uploaded to the website.

Regular updates on the main findings of the study can be found at www.mywellbeing.co.nz. The website also contains information on study and wellbeing which may be of interest to you.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Scott Duncan, scott.duncan@aut.ac.nz, (09) 921 7678.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, ethics@aut.ac.nz , (09) 921 9999 ext 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:

Amanda Reid
Human Potential Centre
AUT University
Private Bag 92006
Auckland, 1142
Email: jvv9007@aut.ac.nz

Project Supervisor Contact Details:

Dr Scott Duncan
Human Potential Centre
AUT University
Private Bag 92006
Auckland, 1142
Phone: (09) 921 7678
Email: scott.duncan@aut.ac.nz

This research is funded by Sovereign.

Approved by the Auckland University of Technology Ethics Committee on 6 March 2014, AUTEC Reference number 14/08.

Appendix 5

Consent form

Project title: ***Subjective wellbeing in New Zealand: A reliability and validity study of the New Zealand Sovereign Wellbeing Index***

Project Supervisor: ***Dr Scott Duncan***

Researcher: ***Amanda Reid***

- I have read and understood the information provided about this research project in the Information Sheet dated 9 April 2014.
- I have had the opportunity to contact the researchers to discuss the study and ask them any questions I have about it, and I am satisfied with the answers I have been given.
- I have had the opportunity to use whānau support or a friend to help me ask questions and understand the study.
- I understand that my participation in this study is confidential and nothing that could identify me will be used in anything written or spoken about this study.
- I have had time to consider whether to give consent to take part in this study.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant information including survey questionnaires, or parts thereof, will be destroyed.
- I agree to take part in this research.
- I am over 18 years of age.

Consent to participate I have read and understood the above information and agree to participate in this study.	Yes

Participant's name:

.....……
……

Participant's Contact Details (email address):

……..

Date:

Approved by the Auckland University of Technology Ethics Committee on 6 March 2014 AUTEC Reference number 14/8.

Note: The Participant should retain a copy of this form.

Appendix 6

Time point 1 email with survey link

Dear…

Thank you for registering for the New Zealand Sovereign Wellbeing Index Reliability and Validity Study. You have been selected to complete the study online. This email contains instructions on how to access the survey.

Below is a hyperlink to Time point 1.

…….

Please complete the Time point 1 study on any day of the week between 5 and 11 May 2014. During that week you will receive an email with a hyperlink to Time point 2. Please complete the Time point 2 study on the same day of the following week, between 12 and 18 May 2014. For example, if you complete Time point 1 on Wednesday 7 May, you will complete Time point 2 on Wednesday 14 May. For the reliability of the New Zealand Sovereign Wellbeing Index to be evaluated, the surveys require a unique personal identifier in order to match the two completed surveys. Your email address will be used as this identifier. It is very important that you use the same email address that you registered with, and that you use this email for both of the surveys – that way we can link your data between the two time points. Each survey will take approximately 20 minutes to complete.

Depending upon your e-mail provider and your personal e-mail settings, some e-mails may be diverted directly into your Junk Mail folder. To avoid this, please add my email address to your safe list or address book. If the link in your email invitation does not work, the link in the survey may be broken into two or more lines, or it may not be completely underlined or active. Please select the entire link in order to access the survey or copy and paste the link into your browser.

Information about the study can be found on the registration website, www.wellbeingstudy.co.nz.

Thank you for your time and participation.

Regards

Amanda Reid

Appendix 7

Time point 1 survey

Section A: Wellbeing

Answer the statements telling us how strongly you agree or disagree or where you place yourself on the scales provided. Please select one response only for each statement. You do not need to answer a statement if you do not wish to do so.

A1 All things considered, how satisfied are you with your life as a whole nowadays?

Extremely Dissatisfied										Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10

A2 Taking all things together, how happy would you say you are?

Extremely unhappy										Extremely happy
0	1	2	3	4	5	6	7	8	9	10

A3 – A10 Below are eight statements with which you may agree or disagree.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I lead a purposeful and meaningful life	1	2	3	4	5	6	7
My social relationships are supportive and	1	2	3	4	5	6	7
I am engaged and interested in my daily activities	1	2	3	4	5	6	7
I actively contribute to the happiness and wellbeing of	1	2	3	4	5	6	7
I am competent and capable in the activities that are important	1	2	3	4	5	6	7
I am a good person and lead a good life	1	2	3	4	5	6	7

I am optimistic about my future	1	2	3	4	5	6	7
People respect me	1	2	3	4	5	6	7

A11 – A21 How IMPORTANT is each of these aspects in your life?

	Extremely unimportant										Extremely important
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10
Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A22 – A32 How SATISFIED are you with each of these aspects in your life?

	Very dissatisfied										Very satisfied
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10

Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A33 – A43 Compared with now, how much TIME WOULD YOU LIKE to spend on each these aspects?

Where 0 is a lot less time, 5 is about the same amount of time, and 10 is a lot more time.

	A lot less time										A lot more
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10
Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A44 – A46 Please indicate how much you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I'm always optimistic about my future	1	2	3	4	5
In general I feel very positive about myself	1	2	3	4	5
At times I feel as if I am a failure	1	2	3	4	5

A47 – A57 Please indicate, how much of the time during the past week...

	None or almost none of the time	Some of the time	Most of the time	All or almost all of the time
...you felt depressed?	1	2	3	4
...you felt that everything you did was an effort?	1	2	3	4
...your sleep was restless?	1	2	3	4
...you were happy?	1	2	3	4
...you felt lonely?	1	2	3	4
…you enjoyed life?	1	2	3	4
...you felt sad?	1	2	3	4
...you could not get going?	1	2	3	4
...you had a lot of energy?	1	2	3	4
...you felt anxious?	1	2	3	4
...you felt calm and peaceful?	1	2	3	4

A58 –A61 Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel I am free to decide for myself how to live my life	1	2	3	4	5
In my daily life I get very little chance to show how capable I am	1	2	3	4	5
Most days I feel a sense of accomplishment from what I do	1	2	3	4	5
When things go wrong in my life, it generally takes me a long time to get back to normal	1	2	3	4	5

A62 – A64 To what extent do...

	Not at all						A great deal
...you learn new things in your life?	0	1	2	3	4	5	6
...you feel that people in your local area help one another?	0	1	2	3	4	5	6
...you feel that people treat you with respect?	0	1	2	3	4	5	6

A65 – A69 To what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither agree nor	Agree	Strongly agree
I generally feel that what I do in my life is valuable and worthwhile	1	2	3	4	5
The way things are now, I find it hard to be hopeful about the future	1	2	3	4	5
There are lots of things I feel I am good at	1	2	3	4	5
For most people in New Zealand life is getting worse rather than better	1	2	3	4	5
I feel close to the people in my local area	1	2	3	4	5

A70 - A71 To what extent do...

	Not at all										Completely
...you make time to do the things you really want to do?	0	1	2	3	4	5	6	7	8	9	10
...you feel appreciated by the people you are close to?	0	1	2	3	4	5	6	7	8	9	10

A72 How difficult or easy do you find it to deal with important problems that come up in your life?

Extremely difficult										Extremely easy
0	1	2	3	4	5	6	7	8	9	10

A73 – A75 How much of the time would you generally say you are...

	None of the time										All of the
...interested in what you are doing?	0	1	2	3	4	5	6	7	8	9	10
...absorbed in what you are doing?	0	1	2	3	4	5	6	7	8	9	10
...enthusiastic about what you are	0	1	2	3	4	5	6	7	8	9	10

A76 On a typical day, how often do you take notice of and appreciate your surroundings?

Never										Always
0	1	2	3	4	5	6	7	8	9	10

A77 To what extent do you feel that you have a sense of direction in your life?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10

A78 – A79 To what extent do...

	Not at all						Completely
...you receive help and support from people you are close to when you need it?	0	1	2	3	4	5	6
...you provide help and support to people you are close to when they need it?	0	1	2	3	4	5	6

A80 There are people who tend to be towards the top of our society and people who tend to be towards the bottom. Where would you place yourself on this scale nowadays?

Bottom of society										Top of society
0	1	2	3	4	5	6	7	8	9	10

A81 How often do you meet socially with friends, relatives, or work colleagues?

1. Never
2. Less than once a month
3. Once a month
4. Several times a month
5. Once a week
6. Several times a week
7. Every day

A82 How many people are there with whom you can discuss intimate and personal matters?

1. None
2. 1
3. 2
4. 3
5. 4-6
6. 7-9
7. 10 or more

A83 In the past 12 months, how often did you get involved in work for voluntary or charitable organisations?

1. At least once a week
2. At least once a month
3. At least once every three months
4. At least once every six months
5. Less often
6. Never

A84 – A86 Please indicate how much you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Overall, I am satisfied with the way I use my time	1	2	3	4	5
I always try to use my strengths	1	2	3	4	5
I know my strengths well	1	2	3	4	5

A87 Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?

You can't be too careful										Most people can be trusted
0	1	2	3	4	5	6	7	8	9	10

Section B: Socio-Demographics

Now some questions about yourself so we can compare your responses with the rest of the participants.

B1 What is your gender?

1. Male
2. Female

B2 What is your date of birth?

_____ / ____ / _____
Month / Day / Year

B3 Which ethnic group(s) do you identify with?

New Zealand
European /
Pakeha New
Zealand
Maori
Samoan
Cook Island Maori Tongan
Niuean
Other Pacific Chinese Korean Indian
Other Asian (e.g.,
Filipino, Japanese)
British / European
Australian
South African
Other (please specify) _____

B4 Are you currently...

1. Single and never married
2. Married or living with a partner
3. Permanently separated or divorced
4. Widowed

B5 Where in New Zealand do you usually live?

1. Northland
2. Auckland
3. Waikato
4. Bay of Plenty
5. Gisborne
6. Hawkes Bay
7. Taranaki
8. Manawatu - Whanganui
9. Wellington
10. Tasman
11. Marlborough
12. West Coast
13. Canterbury
14. Otago
15. Southland

B6 What is your highest academic qualification?

1. Finished primary school
2. Finished secondary school
3. University Entrance / Bursary / Scholarship (or equivalent)
4. Apprenticeship, diploma, trade certificate
5. Bachelor degree or higher
6. Postgraduate diploma / degree or higher

B7 What best describes your current employment situation?

1. Working in paid employment - or away temporarily
2. Not in paid work and looking for a job
3. In education - or on holiday Permanently sick or disabled
4. Retired
5. Doing housework, looking after children or other persons
6. Other (specify)

B8 How is your health in general?

1. Very good
2. Good
3. Fair
4. Bad
5. Very bad

Section C: Pemberton Happiness Index

C1 - C11 Using the following scale from 0 to 10, with 0 being total disagreement and 10 being total agreement, please rate the extent to which you agree with the following statements.

Totally disagree										Totally agree
0	1	2	3	4	5	6	7	8	9	10

PLEASE READ EACH STATEMENT CAREFULLY (*Select a response for each one)*

1.	I am very satisfied with my life	0	1	2	3	4	5	6	7	8	9	10
2.	I have the energy to accomplish my daily tasks	0	1	2	3	4	5	6	7	8	9	10
3.	I think my life is useful and worthwhile	0	1	2	3	4	5	6	7	8	9	10
4.	I am satisfied with myself	0	1	2	3	4	5	6	7	8	9	10
5.	My life is full of learning experiences and challenges that make me grow	0	1	2	3	4	5	6	7	8	9	10
6.	I feel very connected to the people around me	0	1	2	3	4	5	6	7	8	9	10
7.	I feel I am able to solve the majority of my daily problems	0	1	2	3	4	5	6	7	8	9	10
8.	I think that I can be myself on the important things	0	1	2	3	4	5	6	7	8	9	10
9.	I enjoy a lot of little things every day	0	1	2	3	4	5	6	7	8	9	10
10.	I have a lot of bad moments in my daily life	0	1	2	3	4	5	6	7	8	9	10
11.	I think that I live in a society that lets me fully realize my potential	0	1	2	3	4	5	6	7	8	9	10

C12 – C21 Please mark now which of the following things happened to you YESTERDAY:

Something I did made me proud	YES ☐	NO ☐
At times, I felt overwhelmed	YES ☐	NO ☐
I did something fun with someone	YES ☐	NO ☐
I was bored for a lot of the time	YES ☐	NO ☐
I did something I really enjoy doing	YES ☐	NO ☐
I was worried about personal matters	YES ☐	NO ☐
I learned something interesting	YES ☐	NO ☐
Things happened that made me really angry	YES ☐	NO ☐
I gave myself a treat	YES ☐	NO ☐
I felt disrespected by someone	YES ☐	NO ☐

Section D: DASS

D1 – D7 Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I couldn't seem to experience any positive feeling at all	0	1	2	3
2	I found it difficult to work up the initiative to do things	0	1	2	3
3	I felt that I had nothing to look forward to	0	1	2	3
4	I felt down-hearted and blue	0	1	2	3
5	I was unable to become enthusiastic about anything	0	1	2	3
6	I felt I wasn't worth much as a person	0	1	2	3
7	I felt that life was meaningless	0	1	2	3

Appendix 8

Reminder email on 8 May to non-completers of T1

Dear…

This is a friendly reminder regarding your participation in the New Zealand Sovereign Wellbeing Index reliability and validity study. Time point 1 is due to be completed by 11.59pm 11 May 2014. The survey link is….. A link to Time point 2 will be sent Friday 9 May.

Thank you for your time and participation.

Regards

Amanda Reid

Appendix 9

Time point 2 email with survey link

Dear…

Below is a hyperlink to Time point 2.

…….

Please complete Time point 2 between 12 and 18 May 2014 on the same day of the week as you completed Time point 1. For example, if you completed Time point 1 on Wednesday 7 May, please complete Time point 2 on Wednesday 14 May. For the reliability of the New Zealand Sovereign Wellbeing Index to be evaluated, the surveys require a unique personal identifier in order to match the two completed surveys. Your email address will be used as this identifier. It is very important that you use the same email address that you registered with, and that you use this email for both of the surveys. Each survey will take approximately 20 minutes to complete.

Depending upon your e-mail provider and your personal e-mail settings, some e-mails may be diverted directly into your Junk Mail folder. To avoid this, please add my email address to your safe list or address book. If the link in your email invitation does not work, the link in the survey may be broken into two or more lines, or it may not be completely underlined or active. Please select the entire link in order to access the survey or copy and paste the link into your browser.

Information about the study can be found on the registration website, www.wellbeingstudy.co.nz.

Thank you for your time and participation.

Regards

Amanda Reid

Appendix 10

Time point 2 survey

Section A: Wellbeing

Answer the statements telling us how strongly you agree or disagree or where you place yourself on the scales provided. Please select one response only for each statement. You do not need to answer a statement if you do not wish to do so.

A1 All things considered, how satisfied are you with your life as a whole nowadays?

Extremely Dissatisfied										Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10

A2 Taking all things together, how happy would you say you are?

Extremely unhappy										Extremely happy
0	1	2	3	4	5	6	7	8	9	10

A3 – A10 Below are eight statements with which you may agree or disagree.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
I lead a purposeful and meaningful life	1	2	3	4	5	6	7
My social relationships are supportive and	1	2	3	4	5	6	7
I am engaged and interested in my daily activities	1	2	3	4	5	6	7
I actively contribute to the happiness and wellbeing of	1	2	3	4	5	6	7
I am competent and capable in the activities that are important	1	2	3	4	5	6	7
I am a good person and lead a good life	1	2	3	4	5	6	7
I am optimistic about my future	1	2	3	4	5	6	7
People respect me	1	2	3	4	5	6	7

A11 – A21 How IMPORTANT is each of these aspects in your life?

	Extremely unimportant										Extremely important
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10
Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A22 – A32 How SATISFIED are you with each of these aspects in your life?

	Very dissatisfied										Very satisfied
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10
Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A33 – A43 Compared with now, how much TIME WOULD YOU LIKE to spend on each these aspects?

Where 0 is a lot less time, 5 is about the same amount of time, and 10 is a lot more time.

	A lot less time										A lot more
Intimate relationships	0	1	2	3	4	5	6	7	8	9	10
Family	0	1	2	3	4	5	6	7	8	9	10
Friends	0	1	2	3	4	5	6	7	8	9	10
Leisure time	0	1	2	3	4	5	6	7	8	9	10
Time on your own	0	1	2	3	4	5	6	7	8	9	10
Politics	0	1	2	3	4	5	6	7	8	9	10
Work	0	1	2	3	4	5	6	7	8	9	10
Education	0	1	2	3	4	5	6	7	8	9	10
Religion	0	1	2	3	4	5	6	7	8	9	10
Spirituality	0	1	2	3	4	5	6	7	8	9	10
Community involvement	0	1	2	3	4	5	6	7	8	9	10

A44 – A46 Please indicate how much you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I'm always optimistic about my future	1	2	3	4	5
In general I feel very positive about myself	1	2	3	4	5
At times I feel as if I am a failure	1	2	3	4	5

A47 – A57 Please indicate, how much of the time during the past week...

	None or almost none of the time	Some of the time	Most of the time	All or almost all of the time
...you felt depressed?	1	2	3	4
...you felt that everything you did was an effort?	1	2	3	4
...your sleep was restless?	1	2	3	4
...you were happy?	1	2	3	4
...you felt lonely?	1	2	3	4
…you enjoyed life?	1	2	3	4
...you felt sad?	1	2	3	4
...you could not get going?	1	2	3	4
...you had a lot of energy?	1	2	3	4
...you felt anxious?	1	2	3	4
...you felt calm and peaceful?	1	2	3	4

A58 –A61 Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel I am free to decide for myself how to live my life	1	2	3	4	5
In my daily life I get very little chance to show how capable I am	1	2	3	4	5
Most days I feel a sense of accomplishment from what I do	1	2	3	4	5
When things go wrong in my life, it generally takes me a long time to get back to normal	1	2	3	4	5

A62 – A64 To what extent do...

	Not at all						A great deal
...you learn new things in your life?	0	1	2	3	4	5	6
...you feel that people in your local area help one another?	0	1	2	3	4	5	6
...you feel that people treat you with respect?	0	1	2	3	4	5	6

A65 – A69 To what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither agree nor	Agree	Strongly agree
I generally feel that what I do in my life is valuable and worthwhile	1	2	3	4	5
The way things are now, I find it hard to be hopeful about the future	1	2	3	4	5
There are lots of things I feel I am good at	1	2	3	4	5
For most people in New Zealand life is getting worse rather than better	1	2	3	4	5
I feel close to the people in my local area	1	2	3	4	5

A70 - A71 To what extent do...

	Not at all										Completely
...you make time to do the things you really want to do?	0	1	2	3	4	5	6	7	8	9	10
...you feel appreciated by the people you are close to?	0	1	2	3	4	5	6	7	8	9	10

A72 How difficult or easy do you find it to deal with important problems that come up in your life?

Extremely difficult										Extremely easy
0	1	2	3	4	5	6	7	8	9	10

A73 – A75 How much of the time would you generally say you are...

	None of the time										All of the
...interested in what you are doing?	0	1	2	3	4	5	6	7	8	9	10
...absorbed in what you are doing?	0	1	2	3	4	5	6	7	8	9	10
...enthusiastic about what you are	0	1	2	3	4	5	6	7	8	9	10

A76 On a typical day, how often do you take notice of and appreciate your surroundings?

Never										Always
0	1	2	3	4	5	6	7	8	9	10

A77 To what extent do you feel that you have a sense of direction in your life?

Not at all										Completely
0	1	2	3	4	5	6	7	8	9	10

A78 – A79 To what extent do...

	Not at all						Completely
...you receive help and support from people you are close to when you need it?	0	1	2	3	4	5	6
...you provide help and support to people you are close to when they need it?	0	1	2	3	4	5	6

A80 There are people who tend to be towards the top of our society and people who tend to be towards the bottom. Where would you place yourself on this scale nowadays?

Bottom of society										Top of society
0	1	2	3	4	5	6	7	8	9	10

A81 How often do you meet socially with friends, relatives, or work colleagues?

8. Never
9. Less than once a month
10. Once a month
11. Several times a month
12. Once a week
13. Several times a week
14. Every day

A82 How many people are there with whom you can discuss intimate and personal matters?

5. None
6. 1
7. 2
8. 3
5. 4-6
6. 7-9
7. 10 or more

A83 In the past 12 months, how often did you get involved in work for voluntary or charitable organisations?

7. At least once a week
8. At least once a month
9. At least once every three months
10. At least once every six months
11. Less often
12. Never

A84 – A86 Please indicate how much you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Overall, I am satisfied with the way I use my time	1	2	3	4	5
I always try to use my strengths	1	2	3	4	5
I know my strengths well	1	2	3	4	5

A87 Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?

You can't be too careful										Most people can be trusted
0	1	2	3	4	5	6	7	8	9	10

Section B: Socio-Demographics

Now some questions about yourself so we can compare your responses with the rest of the participants.

B1 What is your gender?

3. Male
4. Female

B2 What is your date of birth?

_____ / ____ / _____
Month / Day / Year

B3 Which ethnic group(s) do you identify with?

New Zealand
European /
Pakeha New
Zealand
Maori
Samoan
Cook Island Maori Tongan
Niuean
Other Pacific Chinese Korean Indian
Other Asian (e.g.,
Filipino, Japanese)
British / European
Australian
South African
Other (please specify) _____

B4 Are you currently...

5. Single and never married
6. Married or living with a partner
7. Permanently separated or divorced
8. Widowed

B5 Where in New Zealand do you usually live?

16. Northland
17. Auckland
18. Waikato
19. Bay of Plenty
20. Gisborne
21. Hawkes Bay
22. Taranaki
23. Manawatu - Whanganui
24. Wellington
25. Tasman
26. Marlborough
27. West Coast
28. Canterbury
29. Otago
30. Southland

B6 What is your highest academic qualification?

7. Finished primary school
8. Finished secondary school
9. University Entrance / Bursary / Scholarship (or equivalent)
10. Apprenticeship, diploma, trade certificate
11. Bachelor degree or higher
12. Postgraduate diploma / degree or higher

B7 What best describes your current employment situation?

3. Working in paid employment - or away temporarily
4. Not in paid work and looking for a job
3. In education - or on holiday Permanently sick or disabled
7. Retired
8. Doing housework, looking after children or other persons
9. Other (specify)

B8 How is your health in general?

6. Very good
7. Good
8. Fair
9. Bad
10. Very bad

Section C: Satisfaction With Life Scale

C1 – C5 Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ In most ways my life is close to my ideal.

____ The conditions of my life are excellent.

____ I am satisfied with my life.

____ So far I have gotten the important things I want in life.

____ If I could live my life over, I would change almost nothing.

_____ **TOTAL**

Section D: Scale of Positive and Negative Experience

D1 – D12 Please think about what you have been doing and experiencing during the past four weeks. Then report how much you experienced each of the following feelings, using the scale below. For each item, select a number from 1 to 5, and indicate that number on your response sheet.

1 = Very Rarely or Never

2 = Rarely

3 = Sometimes

4 = Often

5 = Very Often or Always

Positive	_____
Negative	_____
Good	_____
Bad	_____
Pleasant	_____
Unpleasant	_____
Happy	_____
Sad	_____
Afraid	_____
Joyful	_____
Angry	_____
Contented	_____

Section E: Strengths Use Scale

E1 – E5 The following questions ask you about your strengths, that is, the things that you are able to do well or do best.

1 = Strongly disagree

2 = Disagree

3 = Slightly disagree

4 = Neither agree nor disagree

5 = Slightly agree

6 = Agree

7 = Strongly agree

1. I always try to use my strengths. _____

2. I achieve what I want by using my strengths. _____

3. Using my strengths comes naturally to me. _____

4. I find it easy to use my strengths in the things I do. _____

5. I am able to use my strengths in lots of different ways. _____

Circle how much of your time do you spend using your strengths?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Appendix 11

Reminder email on 15 May to non-completers of T2

Dear…

This is a friendly reminder regarding your participation in the New Zealand Sovereign Wellbeing Index reliability and validity study. Time point 2 is due to be completed by 11.59pm 18 May 2014. The survey link is…..

Thank you for your time and participation.

Regards

Amanda Reid

Appendix 12

Internal Consistency Items

Domains / Importance
Intimate relationships, Important in life
Family, Important in life
Friends, Important in life
Leisure time, Important in life
Time on your own, Important in life
Politics, Important in life
Work, Important in life
Education, Important in life
Religion, Important in life
Spirituality, Important in life
Community Involvement, Important in life

Domains / Satisfaction
Intimate relationships, Satisfied with
Family, Satisified with
Friends, Satisified with
Leisure time, Satisified with
Time on your own, Satisified with
Politics, Satisified with
Work, Satisified with
Education, Satisified with
Religion, Satisified with
Spirituality, Satisified with
Community Involvement, Satisified with

Domains / Time
Intimate relationships, Time would like to spend
Family, Time would like to spend
Friends, Time would like to spend
Leisure time, Time would like to spend
Time on your own, Time would like to spend
Politics, Time would like to spend
Work, Time would like to spend
Education, Time would like to spend
Religion, Time would like to spend
Spirituality, Time would like to spend
Community involvement, Time would like to spend

Emotional wellbeing / Absence of negative feelings
Felt depressed, How often past week
Felt sad, How often past week
Felt anxious, How often past week

Emotional wellbeing / Positive feelings
How happy you are
Were happy, How often past week
Enjoyed life, How often past week
Felt calm and peaceful, How often past week

Positive functioning / Competence and achievement
I am competent and capable in the activities that are important to me
Little chance to show how capable I am (item reverse coded)
Sense accomplishment from what I do

Positive functioning / Engagement
I am engaged and interested in my daily activities
Learn new things in your life, extent
Interested in what you are doing
Absorbed in what you are doing
Enthusiastic about what you are doing
Take notice and appreciate surroundings, how often

Positive functioning / Meaning and purpose
I lead a purposeful and meaningful life
Feel what I do in life is valuable and worthwhile
Have a sense of direction in life, what extent

Resilience and self-esteem / Optimism
I am optimistic about my future
I'm always optimistic about my future

Resilience and self-esteem / Resilience
When things go wrong it takes a long time to get back to normal (Item reversed coded)
How difficult or easy to deal with important problems that come up in your life

Resilience and self-esteem / Self-esteem
Lots of things I feel I am good at
In general feel very positive about myself
At times feel as if I am a failure (Item reverse coded)

Relationships
My social relationships are supportive and rewarding
I actively contribute to the happiness and wellbeing of others
Feel appreciated by people close to
Receive help and support from people you are close to, what extent
Provide help and support from people you are close to, what extent
Meet socially with friends, relatives, or colleagues, how often
How many people whom discuss intimate and personal matters
Society and social progress
For most people in New Zealand life is getting worse
Hard to be hopeful about the future of the world
Place on society ladder (Item reverse coded)

Time use and strengths / Strengths
Try to use my strengths
I know my strengths well

Time use and strengths / Time use
Make time to do things you want to do, extent
Satisfied with way I use time

Trust and belonging / Belonging
People respect me
Feel people treat you with respect, extent
Feel close to people in my local area

Trust and belonging / Trust
Feel people in local area help one another, extent
Most people can be trusted or you can't be too careful
Vitality
Felt everything did as effort, How often past week
Sleep restless, How often past week
Could not get going, How often past week

Flourishing Scale
I lead a purposeful and meaningful life
My social relationships are supportive and rewarding
I am engaged and interested in my daily activities
I actively contribute to the happiness and wellbeing of others
I am competent and capable in the activities that are important to me
I am a good person and live a good life
I am optimistic about my future
People respect me

CES-D (8-item)

Felt depressed, How often past week
Felt everything did as effort, How often past week
Sleep restless, How often past week
Were happy, How often past week
Felt lonely, How often past week
Enjoyed life, How often past week
Felt sad, How often past week
Could not get going, How often past week

Appendix 13

Convergent Validity Items

Key
NZSWI – New Zealand Sovereign Wellbeing Index
PHI – Pemberton Happiness Index
DASS – Depression Anxiety Stress Scale
SPANE – Scale of Positive and Negative Experience
SWLS – Satisfaction with Life Scale
SUCK – Strengths Use and Current Knowledge Scale

Emotional wellbeing / Absence of negative feelings	
Felt depressed, How often past week	NZSWI
Felt sad, How often past week	NZSWI
Felt anxious, How often past week	NZSWI
Things happened that made me really angry	PHI
I have a lot of bad moments in my daily life	PHI
I was worried about personal matters	PHI
I felt down-hearted and blue	DASS
I couldn't seem to experience any positive feeling at all	DASS
Negative	SPANE
Bad	SPANE
Unpleasant	SPANE
Sad	SPANE
Afraid	SPANE
Angry	SPANE

Emotional wellbeing / Positive feelings	
How happy you are	NZSWI
Were happy, How often past week	NZSWI
Enjoyed life, How often past week	NZSWI
Felt calm and peaceful, How often past week	NZSWI
I enjoy a lot of little things every day	PHI
I did something I really enjoy doing	PHI
Positive	SPANE
Good	SPANE
Pleasant	SPANE
Happy	SPANE
Joyful	SPANE
Contented	SPANE

Life Satisfaction

How satisfied are you with your life as a whole nowadays	NZSWI
I am very satisfied with my life	PHI
I am satisfied with myself	PHI
In most ways my life is close to my ideal.	SWLS
The conditions of my life are excellent.	SWLS
I am satisfied with my life.	SWLS
So far I have gotten the important things I want in life.	SWLS
If I could live my life over, I would change almost nothing.	SWLS

Positive functioning / Competence and achievement

I am competent and capable in the activities that are important to me	NZSWI
Sense accomplishment from what I do	NZSWI
My life is full of learning experiences and challenges that make me grow	PHI

Positive functioning / Engagement

I am engaged and interested in my daily activities	NZSWI
Learn new things in your life, extent	NZSWI
Interested in what you are doing	NZSWI
Absorbed in what you are doing	NZSWI
Enthusiastic about what you are doing	NZSWI
Take notice and appreciate surroundings, how often	NZSWI
I did something fun with someone	PHI
I learned something interesting	PHI

Positive functioning / Meaning and purpose

I lead a purposeful and meaningful life	NZSWI
Feel what I do in life is valuable and worthwhile	NZSWI
Have a sense of direction in life, what extent	NZSWI
I think my life is useful and worthwhile	PHI

Relationships

My social relationships are supportive and rewarding	NZSWI
I actively contribute to the happiness and wellbeing of others	NZSWI
Feel appreciated by people close to	NZSWI
Receive help and support from people you are close to, what extent	NZSWI
Provide help and support from people you are close to, what extent	NZSWI
Meet socially with friends, relatives, or colleagues, how often	NZSWI
How many people whom discuss intimate and personal matters	NZSWI
I feel very connected to the people around me	PHI

Resilience and self-esteem / Resilience	
How difficult or easy to deal with important problems that come up in your life	NZSWI
I feel I am able to solve the majority of my daily problems	PHI
Resilience and self esteem / Self esteem	
Lots of things I feel I am good at	NZSWI
In general feel very positive about myself	NZSWI
I think that I can be myself on the important things	PHI
Time use and strengths / Strengths	
Try to use my strengths	NZSWI
I know my strengths well	NZSWI
I always try to use my strengths.	SUCK
I achieve what I want by using my strengths.	SUCK
Using my strengths comes naturally to me.	SUCK
I find it easy to use my strengths in the things I do.	SUCK
I am able to use my strengths in lots of different ways.	SUCK
Time use and strengths / Time use	
Make time to do things you want to do, extent	NZSWI
Satisfied with way I use time	NZSWI
Percentage of time using strengths	SUCK
Vitality	
Felt everything did as effort, How often past week	NZSWI
Sleep restless, How often past week	NZSWI
Could not get going, How often past week	NZSWI
I found it difficult to work up the initiative to do things	DASS

Appendix 14

Discriminant Validity Items

Key
NZSWI – New Zealand Sovereign Wellbeing Index
PHI – Pemberton Happiness Index
DASS – Depression Anxiety Stress Scale
SPANE – Scale of Positive and Negative Experience
SWLS – Satisfaction with Life Scale
SUCK – Strengths Use and Current Knowledge Scale

Emotional wellbeing / Absence of negative feelings	
Felt depressed, How often past week	NZSWI
Felt sad, How often past week	NZSWI
Felt anxious, How often past week	NZSWI
I enjoy a lot of little things every day	PHI
I did something I really enjoy doing	PHI
Positive	SPANE
Good	SPANE
Pleasant	SPANE
Happy	SPANE
Joyful	SPANE
Contented	SPANE

Emotional wellbeing / Positive feelings	
How happy you are	NZSWI
Were happy, How often past week	NZSWI
Enjoyed life, How often past week	NZSWI
Felt calm and peaceful, How often past week	NZSWI
Things happened that made me really angry	PHI
I have a lot of bad moments in my daily life	PHI
I was worried about personal matters	PHI
I felt down-hearted and blue	DASS
I couldn't seem to experience any positive feeling at all	DASS
Negative	SPANE
Bad	SPANE
Unpleasant	SPANE
Sad	SPANE
Afraid	SPANE
Angry	SPANE

Positive functioning / Competence and achievement		
Little chance to show how capable I am	NZSWI	(Item reverse coded)
My life is full of learning experiences and challenges that make me grow	PHI	
Resilience and self esteem / Resilience		
When things go wrong it takes a long time to get back to normal	NZSWI	(Item reverse coded)
I feel I am able to solve the majority of my daily problems	PHI	
Resilience and self esteem / Self esteem		
At times feel as if I am a failure	NZSWI	(Item reverse coded)
I think that I can be myself on the important things	PHI	
Trust and belonging / Belonging		
Feel people treat you with respect, extent	NZSWI	
I felt disrespected by someone	PHI	