THE RELATIONSHIP BETWEEN
MĀORI CULTURAL IDENTITY
AND HEALTH

by

Brendan Stewart Stevenson
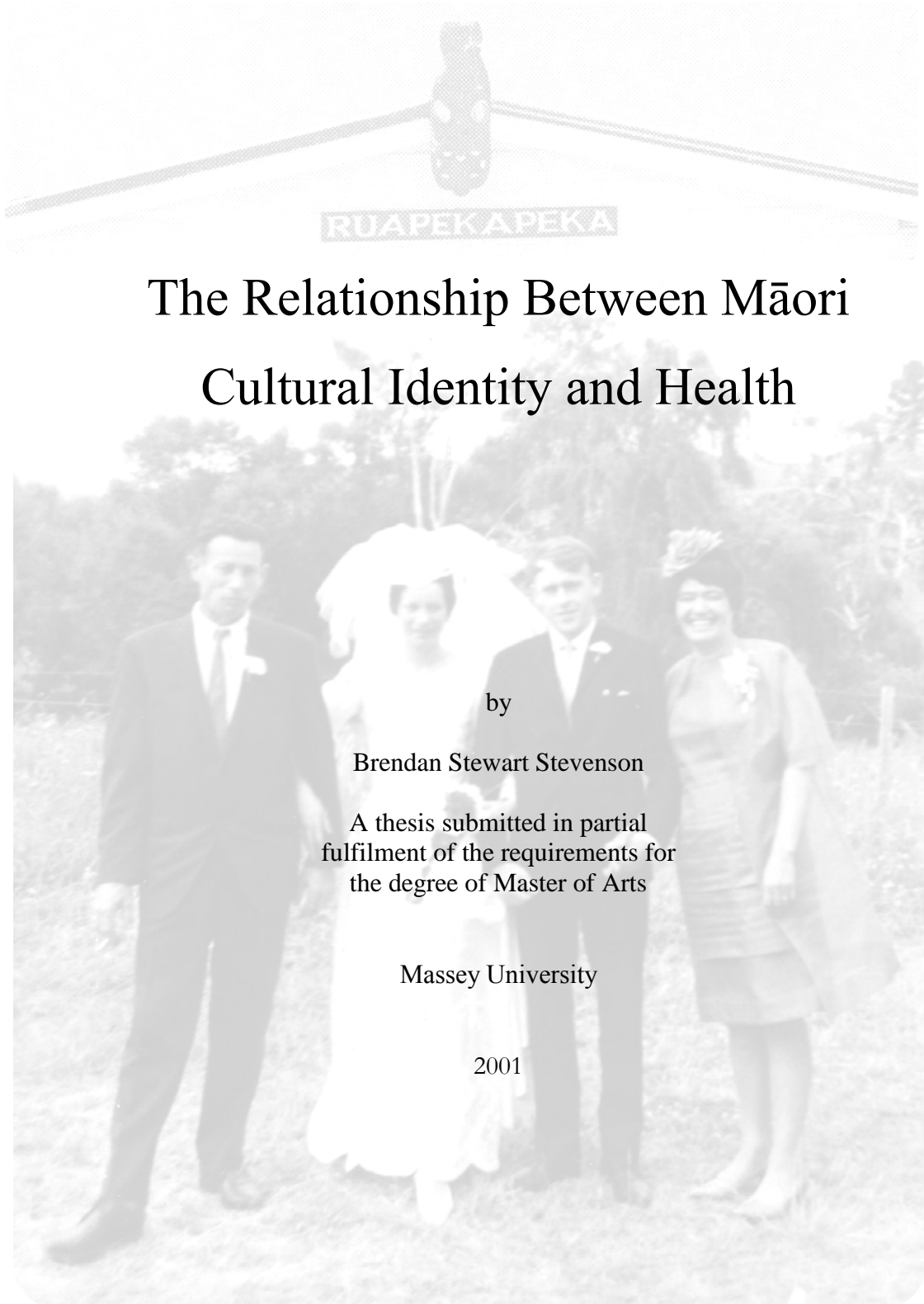
A thesis submitted in partial
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Master of Arts

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Supervisor: Doctor Fiona Alpass

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ABSTRACT

While the differences in health between cultures co-existing in the same country have been well researched, there has been insufficient attention paid to the definition of culture used in these studies. Typically the ethnicity of an individual has been determined along biological lines or by the country of origin. However, the culture with which an individual identifies may not be so clear: an individual may identify with a number of cultures, from the social group with whom they socialise, to the religion they follow. Measuring the degree to which an individual identifies with a particular culture (their cultural identity), would allow an assessment of how membership in that culture influences health outcomes. The present study investigated the relationship between the cultural identity (CI) of Māori and their health. The main hypothesis was that a higher CI would be positively correlated with better health. The relationships between demographic factors (e.g. age, gender, & socio-economic status (SES)), CI, and a number of health indicators (self rated health, smoking behaviour, alcohol consumption, & exercise/sporting behaviours) were also examined. The sample used in the present study (767 adult Māori) was a subset of the data collected the Te Hoe Nuku

Roa Māori profiles project. The development of a CI measure incorporated seven cultural indicators: Whakapapa (ancestry), Marae Participation, Whanaū associations (extended family), Whenua Tipu (ancestral land), contact with Māori people, Use of te Reo (Māori language), and kai (food preferences).

A series of hierarchical linear regressions found that CI was not directly related to health indicators in the present study. There were weak interactions between CI, age, and smoking behaviour; CI, home ownership, and involvement in sport; and age, Crowding and involvement in sport. Additional findings were that more Sporting Involvement/exercise was moderately correlated with improved health, and there was a weak relationship between CI and SES. It was speculated that the lack of significant findings may be due to a difference in the quality of participants' CI: The CI measure did not distinguish between those who learn their culture and those who live their culture (each group tending to be in differing social and economic positions). Recommendations from the study were: Further validation of the CI measure, and assessment of the distribution of CI over urban/rural areas, SES and age; additional research into the relationship between young Māori smokers and their CI; assessing how the level of Sporting Involvement varies across the social and economic realities of Māori; and the development of appropriate measures utilising the whanaū/household as the unit of analysis.

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Kia ora

Introduction

Ko Ngāpuhi te Iwi
Ko Ngati hau te Hapū
Ko Ruawahine te Awa
Ko Ruapekapeka te Maunga
Ko Ngā Ruawahine te Whare Tupuna
Ko Akerama te Marae
Ngā Tupuna
    Daniel Kiriwai Poutu
    Te Roma Kake
Koro
    Douglas Hildreth
Kuia
    Isabel Tahurikino Hildreth
Papa
    Stewart Robert Stevenson
Whaia
    Geneva Tui Hildreth

Ko Brendan Stewart Stevenson tāku ingoa

MACBETH:
Canst thou not minister to a mind diseas'd,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?
DOCTOR:
Therein the patient
Must minister to himself.
               MACBETH   Act 5, scene 3, 40-47

Chapter 1

Overview

When an individual's health is examined, and the factors that influence health isolated, first among them is the physical - diet, exercise, medical care, and socio-economic status. With such effects on our health readily observable, and quantifiable, it can be forgiven that other intangible factors related to health have been studied in less detail. These intangible factors are primarily social in nature, and arise from the nature of our interactions with other people and our environment (for example, Angel and Angel (1995) included cultural norms, beliefs and values in their definition of health).

While it would be impractical to assess an individual's entire personal history in order to determine how that individual will react to particular physical and social stressors, it is possible to assess the broader social context in which the individual is embedded. This broader social context structures the world of the individual, and determines how that person makes sense of their interactions with the world. A person's culture attributes meaning to life: Providing social roles for its members, determining "how they show feelings, express emotions and distress, and experience conflict in behaviour, thought or action" (Baxter, 1998, p.65). Culture in this sense, is the shared resource of language, action (body language and all physical activities), ethics, and history.

The relationship between culture and health, is becoming well established (refer MacLachlan, 1997; Johnson et al., 1995; LaVeist, 1992; Wessels 1999; Angel & Angel, 1995; Waitzkin & Magna 1997; Myers, Kakawa-Singer, Kumanyika, Lex, & Markides, 1995; Dyck, 1994; Bond, 1991; Kauffman & Joseph-Fox, 1996; Johnson et al., 1995), and

involves the actions of many interacting social, personal, and environmental factors. The contribution of any particular factor is difficult to assess and is complicated by interactions with many other factors. Despite these difficulties, several aspects of culture have demonstrated a relationship with aspects of health, particularly social relationships and health behaviours. Summaries of the link between social relationships and health (House, Landis, & Umberson, 1997; and Taylor & Seeman, 1999) have found empirical evidence of a beneficial relationship between social support (the assistance of others), psychological well-being, and physical indicators of health (e.g. mortality rates). Health behaviours on the other hand, can be divided into health risk behaviours and health-enhancing behaviours. There is clear evidence that these behaviours vary across cultures (Myers, Kakawa-Singer, Kumanyika, Les, & Markides, 1995) and that health risk behaviours contribute to the health differences that often exist between cultures (Bagley, Angel, Dilworth-Anderson, Liu, & Schinke, 1995).

In studying the relationship culture has with health, it is important to note that within a country's boundaries there often exists more than one culture, one of which is typically defined as the dominant culture (for example English culture in England is regarded as the dominant culture, despite the large number of cultures that also inhabit England). The differences in health between these cultural groupings are often a source of social and political debate, greatly influencing the nature of society and government policy.

Given such variability in cultures with any given country's boundaries, identifying an individual as belonging to any particular culture is fraught with difficulties. Which culture a person identifies with is the first measure of cultural identity (CI), but does a person just belong within the one cultural grouping? Or is it possible for an individual to show characteristics belonging to other cultures (for example, an Englishman living in New Zealand who identifies as a Rastafarian). Mathews (2000) proposes that people choose identities from the 'cultural supermarket' at a conscious level, while their upbringing within a particular cultural context shapes their behaviour at a more fundamental (unconscious) level.

Since an individual may identify with a number of cultures, it becomes necessary to measure the degree to which an individual identifies with any one culture or demonstrates characteristics unique to that culture. Isolating such unique characteristics as language or spiritual beliefs, and measuring the extent to which the individual displays, or has knowledge of these characteristics, has been used to measure CI in the past (e.g. Thomas, 1988; Durie, 1993).

The current study investigates the health and cultural identity of 767 adult Māori in Aotearoa (New Zealand). Māori were the people inhabiting the land before European settlement, and are one of a number of cultures in Aotearoa (in 1996, Māori made up 15% of the population in Aotearoa; Statistics New Zealand, 1996a). To allow for meaningful interpretations of the data to be made, it must be noted that Māori are one of two major cultures in Aotearoa (Thomas, 1986), with the English-based Pākehā culture (originally meaning European, now often used to define non-Māori[1]) being the other. To put the relationship of Māori and Pākehā into perspective, following the arrival of Europeans in Aotearoa in the early 1800's, the Māori population dropped from around 175,000 to 42,650 individuals by 1886 (Durie, 1997). This coincided with the active repression of Māori language, culture (Durie, 1994), and the illegal acquisition of large areas of Māori land (O'Malley, 1997). While no such legalised repression of Māori exists today, the effects of such oppression do not disappear so swiftly. In what seems to be a typical post-colonial situation (Schech & Haggis, 2000), there are pronounced health differences between these cultural groups. The health differences between Māori and Pākehā reflect negatively on Māori, and in some cases are quite pronounced. For example, Māori males born between 1995 and 1997 are expected to live 67.2 years, while equivalent non-Māori males will live

75.3 years (Figure 1). Māori smoking rates (Table 1) are twice that of the rest of the population (e.g. in 1997, 50.9% of Māori smoke, compared with 24.1% of non-Māori), reflecting a lung cancer death rate over 4 times that of the general population (Table 2).

**Māori and non-Māori life expectancy at birth,
1995-1997**

Data source: Statistics New Zealand, unpublished tables,1999.
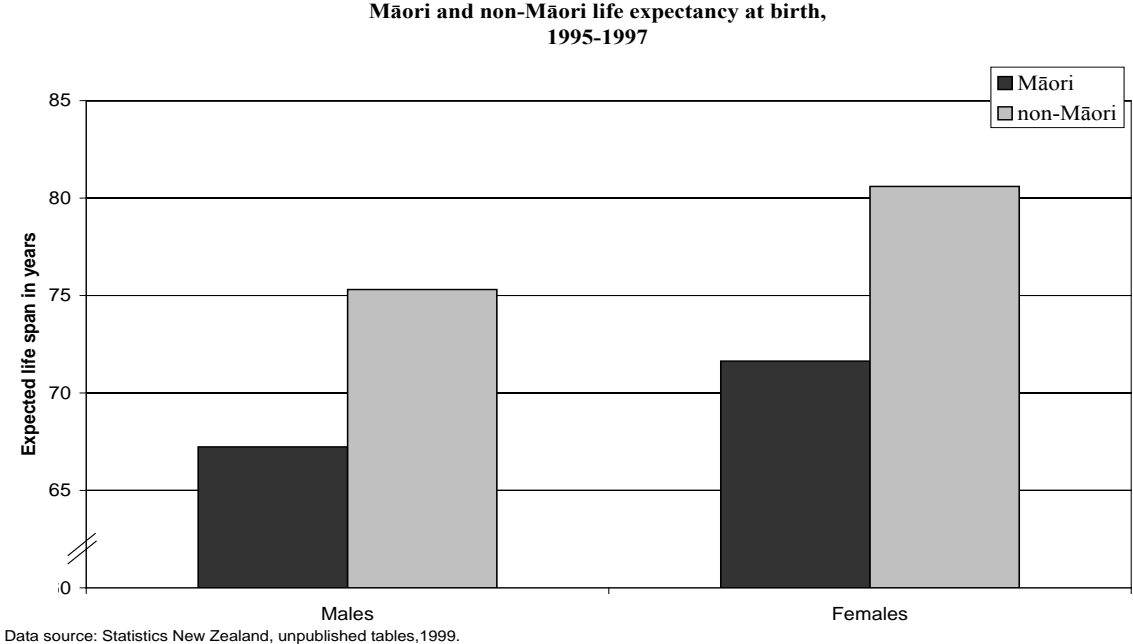
Figure 1. Graph showing differences in life expectancy between Māori and non-Māori, and males and females.

Table 1. Table showing smoking rates for Māori and non-Māori aged over 15 years (adapted from Ministry of Health, 2000).

	Māori (%)	Non-Māori (%)
1997	50.9	24.1
1998	49.0	23.2
1999	49.8	22.1

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[1] In splitting the people inhabiting Aotearoa into these two groups, no disrespect is meant to the other cultures also present in Aotearoa who are subsumed under the Pākehā grouping.

Table 2. Table showing age-standardised (Segi's population) lung cancer death rates per 100,000 population for Māori and non-Māori (adapted from New Zealand health information service, 1999, and Statistics New Zealand, 1998a).

	Māori (%)	Non-Māori (%)
1996	99.1	23.5
1997	101.1	23.5

The research data to be used already exists in the form of Te Hoe Nuku Roa, a longitudinal study with a baseline survey of 1574 individuals, covering 655 Māori households (Te Hoe Nuku Roa, 1999). The set of questionnaires used captured important cultural, social, and economic information of relevance to Māori. To date there have been two 'slices' of the sample taken, and some preliminary analysis done. Of interest to the current study, was a finding that those with a secure CI (who identify strongly as Māori) tended to have a sound health profile, when compared with those who have a 'weaker' Māori identity (Te Hoe Nuku Roa, 1996). The analysis in this case was a comparison of percentages between the four categories, representing levels of Māori identity and a measure of their health. Given the complexity of the proposed relationships between cultural identity and health indicator variables (see page 49 for the proposed model), a secondary analysis of the Hoe Nuku Roa data will be undertaken in the present study utilising multivariate analysis in order to clarify the relationship between CI and health. In addition, the role of particular demographic factors (e.g. age, SES) on the relationship between CI and health will also be studied.

Chapter One Summary

This chapter has given a brief summary of the nature of the current research within the broader context. The following chapter (chapter 2) provides a review of the relevant literature, and will summarise important research models and findings, as well as defining

concepts underlying the current study. Chapter 3 will outline the theoretical framework

guiding the analysis. The framework is based on the work summarised in the literature

review, and on methods currently being utilised to analyse the existing data set. Chapter 4

describes the methods employed to collect the data and the measures used in the study.

Chapter 5 summarises the results of the analyses, the methods used to ensure statistical

reliability, and the measures used in the analyses. Chapter 6 summarises the findings of the

analyses, discusses possible interpretations of the findings, and proposes directions for further

research.

Chapter 2

Literature Review

Chapter 2 will review the research conducted in the areas of health and culture. A number of perspectives will be taken in the definition of crucial concepts, such as mainstream 'western' medicine, and other 'holistic' views of health. Such holistic views of health will include two Māori models of health, Whare Tapa Whā (Durie, 1994), and Te Wheke (Pere, 1984). The many ways of defining culture will then be summarised, and a broad definition given. Finally, the connection between health and culture will be discussed, and models making explicit the relationship presented.

Health

"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

World Health Organisation (2000)

A more succinct definition of health was proposed by Findley (1992), where good health was "the ability to function" (p. 3); these definitions are far broader than the more common-sense definition of health as 'the absence of illness' (a rare situation). The ability of the individual to function effectively includes those who are classically defined as less than healthy (such as those with physical or mental handicaps). From this perspective health is relative, and the emphasis is on changes to individual health.

Helman (1994) described the many ways of defining health, from the broad statement of the World Health Organisation (see above), to the environmentally and spiritually inclusive views of many non-western nations (generally associated with non-industrialised countries), to the views of many Western communities (Western views are often splintered into physical, psychological, and behavioural aspects of health).

The other side to these anthropological assessments of health is the perspective of the individual. This functional view of health may be based on economic expectations (i.e. the need to keep working), or the interpretation (learnt from, and with the aid of others) of various subjective experiences, such as unpleasant physical symptoms or changes to the five major senses (Helman, 1994).

One perspective of health that is common to many westernised countries is the medical model of health, where health is viewed more as an absence of illness. This is often described in the literature as the mainstream or western view of health. The model reduces illness to signs (what the clinician observes, e.g. raised temperature), symptoms (what the patient complains of, e.g. headache), diagnosis (what the illness is, e.g. bronchitis), aetiology (causation profile, e.g. severe asthma, associated with excess mucous production, inflammation and scarring of the lung), and prognosis (expected future course of the illness). Within such a model, disease occurrence can "be seen largely as the result of discrete phenomena" (Brandt, 1997, p.57), where illness is the result of an event (e.g. accident) or an external agent (e.g. infection) which can be isolated and quantified. This medical perspective may be better described as scientific rationality (Helman, 1994). The emphasis is on objective, numerical measurement, physiochemical data, and mind-body dualism. The approach views 'disease' as an entity, with the emphasis placed on the individual, ignoring the wider context of family or community. This model was developed from a rationalist view of disease, with roots in Greek philosophy and the philosopher Hippocrates, and was popularised when the European renaissance rediscovered this "ancient Greek medical

knowledge" (Conrad & Schneider, 1997, p. 163). Such a 'scientific rationalism' of the causes of disease, led in turn, to rational treatments. Unfortunately, these syllogisms were often flawed, and reflected the beliefs of a few recognised intellectuals. For example, the Hippocratic physician attributed disease to the imbalance of four humors in the body - blood, yellow bile, black bile, and phlegm (Lloyd, 1983). Treatment involved an attempt to balance the humors, initially through control of diet, exercise, and sleep. If this 'let nature take its course' approach failed, then progressively more aggressive treatments were employed, from drugs (e.g. Hellebore was used to induce vomiting and diarrhoea - removing the excess humor), to venesection (blood-letting), and cauterisation (which would consume the excess humor). All of these treatments were of course reasonable and logical when viewed from within a renaissance medical model. While the current medical model has changed since then, its progress has been largely due to incremental advances in knowledge about biology, particularly the development of germ theory in the late nineteenth century (Brandt, 1997), all the while maintaining a rational, reductionist view of health.

Sitting firmly within the rational, reductionist paradigm and related to the World Health Organisation definition of health, is the idea that perceived quality of life captures "current personal status with respect to a wide range of perceptions of health, function, and mood state" (Shepard, 1997, p.311). Kaplan (1985) was quoted by Shepard as suggesting that quality of life be measured using a weighted combination of perceived symptoms (from a list of 35 symptom complexes) and functional concerns (ratings of mobility, physical activity and social activity). Other methods range from generic questionnaires (often insensitive due to the large number of domains being sampled), to disease or function specific instruments (sampling a specific domain, such as arthritis or mood states).

Shepard (1997) summarised the domains influencing quality of life as:

1. Physical well-being (e.g. dyspnea, fatigue, level of energy, pain, symptom perception, appetite, and sleep patterns).

2. Psychological well-being (e.g. self-concept, self-esteem, mood, and affect).

3. Perceived levels of physical function.

4. Social function.

5. Cognitive function (to limited extent).

In order to measure any aspect of health, an operational definition of that aspect must be generated (a listing of the symptoms for example), which in turn implies a conceptual framework. This framework is created within particular conceptual categories that precede and guide the observation, making "symptoms (complaints) and signs (observable indications) of disease" (Kleinman, 1995, p. 73), interpretations of the observed states. Kleinman also pointed out the emphasis of medicine on measurement and the consequent need for reliable and valid measures. While measurements made within the medical paradigm are generally reliable (a cough and runny nose will almost always be associated with a cold), the validity of an observation may be an issue (particularly when there are cross-cultural assessments of health being made). Kleinman used chronic fatigue syndrome (CFS) as an example, where a grieving middle-class North American widower, and a poor mother with six malnourished children in Brazil, all display the symptoms of CFS. While those within the medical community will make the same diagnosis reliably, the interpretation of the symptoms is only valid within the medical paradigm. The interpretation of CFS may not be valid within the world of the burdened mother in Brazil – the explanation of her symptoms lies in her experiences, and not in the label of CFS.

Despite these criticisms of the medical model, it remains the most powerful and coherent model with which to understand health.

Other Models of Health

A summary of the many other models of health is ambitious to say the least. While it is possible for a summary of the western or medical model to be made (due to the vast amount of literature available on the matter), to discuss the common elements and structures of other health models, presupposes accurate information on these models and an understanding of the culture in which the model is embedded. This is often done by comparing relevant aspects of other models of health to the western medical model. Although as Nichter (1994, p.xii) noted, the western medical model should not be the standard by which all other medicines are judged, particularly as "scientific reasoning is motivated and as much a product of culture and practical reason as are traditional systems of ethnomedicine" (Nichter, p.xii). Given such difficulties in summarising other models of health, it is still possible to provide an example of two Māori models of health, given that the author of this work is Māori.

Māori Models of Health

In common with the many indigenous models of medicine around the world, Māori view health holistically, the body, mind and spirit bound together. Additionally, Māori include whānau (extended family), and the land in the individual's sense of health.

Māori exist within a multi-cultural society, with competing worldviews and models of health jostling for position in the beliefs of any one person. This is illustrated most clearly by a paper examining the cross-cultural validity of a measure of physical and mental health (the SF-36) in Aotearoa (Scott, Sarfati, Tobias, & Haslett, 1999). This paper found that while it was valid to assume a differentiation of health determinants into physical and mental components for New Zealand Europeans and young Māori, results for older Māori (65 years and older) showed significantly less differentiation between the physical and mental health scales. The authors suggested that this may be a result of younger Māori becoming more urbanised, with a consequent weakening of Iwi (tribal) ties and a loss of te Reo (the Māori

language), while older Māori still retained much of Māori tradition and language (Durie et al., 1996). These findings support the Māori concept of health where the body, mind, and spirit are bound together; those with a stronger Māori identity displayed health characteristics more in keeping with this holistic view of health

Whare Tapa Whā (Durie, 1994)

Literally, meaning a four sided house, this model constructs health as having four dimensions: taha wairua (spiritual health), taha hinengaro (thoughts and feelings), taha tinana (physical health), and taha whānau (the health of family). Within such a model, health is viewed as an interaction between these four aspects, with taha wairua pivotal to all other aspects of health – "without a spiritual awareness and a mauri (spirit or vitality, sometimes called the life-force) an individual cannot be healthy and is more prone to illness or misfortune" (Durie, p. 71). Wairua extends beyond belief in a religion; it embraces the land, and the sea, in a sense, Māori belong to the land. Thus, access to traditional lands is fundamental to Māori health and well-being.

Taha hinengaro refers to the mental health of the individual, which to Māori is a holistic concept, affect as essential as cognition, within an environment laden with meaning. "Whenua, for example, can mean both placenta and the land" (Durie, p. 72), while the smallest gesture (tears or the tilt of a head) at the appropriate moment renders words unnecessary or inappropriate.

The physical health of the individual is described by the concept of taha tinana, which, though following closely the western concept of physical health, differs in its polarisation of health into particular activities (such as sleeping and eating), and parts of the body. This separation is performed by the concepts of tapu and noa, where tapu is similar to sacredness, but is far broader and subtler (the head is considered tapu, as are toileting activities, and a tapu may be placed on a particular resource to protect it – a rahui). Noa, in contrast, is more

about common use, "food, for example, is a leveller which removes any vestige of sacredness or distance (as between people)" (Durie, pp. 72-73).

Taha whānau describes the importance of family (in an extended sense, where a single common ancestor is sufficient to establish a whānau link, and so be family) and its centrality to the life of an individual, and the support that it provides. To Māori, the western insistence on independence and self-actualisation (e.g. Maslow's Need-Hierarchy theory, 1970) reflects a defensive attitude or immaturity on the part of the individual. Taha whānau then, emphasises the interdependence of individual and family, in all aspects of life (from job choice to marriage).

Te Wheke (Pere, 1984)

Te wheke (the octopus) has features in common with Durie's 'Whare Tapa Whā', but focuses on whānau and the many influences upon the health of the family. The body of Te Wheke represents the family unit, with the eight tentacles symbolising differing aspects of health (wairuatanga, taha tinana, hinengaro, whanaungatanga, mana ake, mauri, hā a Koro mā a Kui mā, whatumanawa, and waiora), the suckers on each tentacle represent the complexity of each health aspect, and the intertwining of the tentacles represents the interaction and interdependence of the eight health dimensions. The eyes (the mirrors of the soul) reflect the influence of the eight dimensions on the family unit, here called waiora, or total well-being. Similar to whare tapa whā, wairuatanga represents the spirituality of Māori (taha wairua), and taha tinana physical health in the model. Also of great importance to Māori is the life force (mauri) that is within all people and in all things, and importantly, in language.

Mana ake embraces the uniqueness of the individual and family, while whanaungatanga resembles taha whānau, emphasising knowledge of tupuna (ancestry) and kinship. Hā a Koro mā a Kui mā is the 'breath of life' that has come from our ancestors, acknowledging the role our heritage has played in our development.

The importance of emotional development is shown by the inclusion of Whatumanawa, and regards the expression of all emotion as natural and healthy. Hinengaro, like whare tapa whā, describes the importance of learning, and the full use of all the senses. As in Durie's model, cognition is described as being intuitive and holistic.

Summary of Māori models of health

In common with many other peoples around the world, the Māori model of health emphasises a sense of connection with the environment (as with the Aboriginal people of Australia for whom "the land was a living resource from which people drew sustenance – both physical and spiritual" Bell, 1982, p.48), of spirituality, and links to family and to history. While it may be said that such a model of health is alternative (and so non-Western), spirituality is as present in as many Western minds as non-Western. For instance, Catholicism invokes the assistance of spirits and angels to heal those afflicted with disease, whereas in Pentecostalism sickness and suffering are synonymous with sin and the invitation of Satan into their lives (Nichter, 1994, p.233-234). Furthermore, a sense of family and history is present in all people; to what degree such an awareness of family and history affects the health of the individual, will vary as widely as there are people living.

Health Determinants

While it is possible to describe health using a holistic view of health as presented above (pages 12 to 15), to talk about the relative influences of any of these factors requires the reductionist approach of the western model.

The National Health Committee (1998) summarised the determinants of health as being: income, employment, education, housing, culture and ethnicity, population-based services and facilities, and social cohesion. Of these, income, employment, education and housing operate at the individual level and are often used as indicators of Socioeconomic Status.

Social cohesion describes the degree of connectedness or social isolation of the individual. Examples of population-based services and facilities are water, sewerage reticulation, transport systems, recreational facilities, and environmental oversight. Culture and ethnicity were viewed in the National Health Committee report as being strongly associated with Socioeconomic Status, and were acknowledged as influencing health outcomes.

In common with other models of health, Māori view physical and mental health, as well as social factors (for example the health of whanaū), as being essential determinants of health. However, for Māori, spiritual beliefs are also fundamental to health. The concepts of Taha Wairua (Te Whare Tapa Whā) and Wairuatanga (Te Wheke) reflect the importance of the spiritual realm to Māori. The Whakapapa (geneology) of Māori connect them to ngā Atua (the gods), and the seed of life within all Maori that originates from this "supreme supernatural influence" (Henare, 1988, p. 16). This aspect of health does not fit well with the western deterministic models of health. Measuring Taha Wairua is problematic – there is no scale with which to measure Māori spirituality, nor could such a measure be easily isolated. However, the strength of the individuals CI will reflect the strength of their Taha Wairua. A person strong in their sense of identity will have a strong sense of their spiritual identity – their Taha Wairua.

For the present study, an outline of the determinants of health will be based on Shepard's (1997) summary of the domains influencing health, and will include several other relevant factors that impact on health. 'Physical well-being' and 'perceived levels of physical function' were collapsed into a single 'physical health' category:

1. Physical health

2. Psychological well-being (e.g. self-concept, self-esteem, mood, and affect).

3. Social function.

Other factors which may be incorporated into the above summary of health influences, but which deserve to be treated separately due to their significant contribution to health, are health behaviours, education, employment status, income, and housing. Of these factors, education, income, employment status, and housing status are indicators of Socioeconomic Status (SES) (Davis, Howden-Chapman & McLeod, 1997). Crampton, Salmond, and Sutton (1997) found that a higher level of deprivation (as measured by such things as income, education, and house ownership) was correlated with higher mortality rates, increased hospital discharge ratios, and increased registration for lung cancer. Winkleby, Cubbin, Ahn, and Kraemer (1999), in research on cardiovascular disease (CVD) risk factors, showed that these factors are not distributed evenly along SES groupings. They found that those in lower SES groups were more at risk of CVD, and that this had been an increasing trend as "societies dynamically create and shape these patterns of inequality" (p. 206). These factors have been included in the determinants of health below as below.

4. Health Behaviours

5. Education

6. Employment Status

7. Income

8. Housing

All of these factors have a direct effect on health, in addition to complex inter-relationships between these factors. While culture may not have such a direct impact on health, it is certainly related to most, if not all of these factors. As is discussed in more detail later (page 40), an individual's lifestyle choices (particularly health risk and health enhancing behaviours) are influenced by their culture, which in turn has a marked impact on physical health (Johnson et al., 1995; Whitely & Winett, 2000). Education, employment status, income, and housing, as measures of SES, are linked to health differences between rich and

poor. For many multicultural societies, particular cultures are over represented within lower

SES groups. For example, Māori earn $12/hr average compared to $13.57/hr for Pākehā, and

12% of Māori received the unemployment benefit in contrast to 3% of Pākehā (Statistics New

Zealand, 1999). While in 1997 22.4 % of Māori school leavers entered formal tertiary

education compared to 45.1% of Pākehā (Ministry of Education, 1999), and in 1996 50.4% of

Māori aged 15 or older owned a home (with or without a mortgage) compared to 72.1% of

Pākehā (Statistics New Zealand, 1998b). The next section briefly discusses the role of these

health determinants and their relationship to cultural factors.

Physical health

Physical health could be viewed as ranging along a continuum from optimal health to

clinical illness. A major influence on physical health is physical activity, where there is

general agreement that physical activity has a beneficial effect on health at all ages. This

effect may also arise from the social aspects of the exercise program, independently of any

physiological gains (Shepard, 1997).

A major influence on overall health are the many physical ailments and injuries that

affect us over the course of our lives, from a mild cold to AIDs, from a twisted ankle to a

major spinal injury. To bring such a broad range of influences into perspective, Findley's

(1992) definition of good health as "the ability to function" (p. 3) where health is considered

relative, changing over their lifespan.

Age has a considerable impact on physical function (possibly the greatest single

influence). With increasing age, loss of strength and cardiorespiratory function begin to

impact on the individual's ability to perform daily living tasks. Shepard (1997) stated that

due to the automated world in which we live (requiring lower levels of strength and fitness),

the age at which performing these tasks becomes an issue is for those in middle-old and older

age groups, or where chronic disease has accelerated the effects of aging. Other factors that

may influence physical function are accidents or impairments that can temporarily or permanently affect the individual (e.g. a sprained ankle or loss of a limb respectively). Where physical function is affected, the degree of disability can be assessed by the individual's ability to perform basic activities of daily living (Shepard). These range from fundamental activities such as eating, dressing, bathing, and independent movement to activities that impact more on quality of life such as housekeeping, shopping, and transportation. Such disability may also affect the individual's ability to work, travel, or participate in religious or social activities (such as sport). There are also economic costs to disability, for the individual (from a loss of income, changes in the home environment, and the need to meet health care costs), and for the community who must care for those disabled by injury and his or her dependents (Royal Commission on Social Policy, 1988, p.571).

The World Health Organisation (1999), defined health along three dimensions: Body functions (physiological or psychological) and structure (anatomic parts of the body); Activities (the integrated use of body functions in life tasks); and Participation. Impairment involves "an anomaly, defect, loss or other significant deviation in body structure" (p. 16); such an impairment of structure will lead to impairment in the function of the affected structure (e.g. the loss of an eye will mean an impairment in vision). The impact of impairment in body function will affect those activities the individual performs in the normal course of living (rather than those activities the individual is capable of). Participation includes the relationship of the individual's health with the environment within which the individual lives. Given a particular individual's level of impairment, the environment will have an important effect on their level of participation. Barriers to participation (e.g. inaccessible buildings, prejudice) or ineffective facilitation (e.g. unavailable assistive devices) will reduce individual participation. The importance of many of these factors can vary between cultures; for example, Levin, Chatters, and Taylor (1995) found that the religious involvement of African Americans was related to greater life satisfaction. An

inability to participate in religious activities may impact indirectly on their health. Scheer (1994) emphasises how cultures vary in their integration of disabled individuals; "the marginal status of people with disabilities is a variable cultural pattern, not a natural occurrence present in all societies" (p. 249). This is illustrated by a description of how between 2% and 10% of the Cuna Indian population (from the San Blas Islands of Panama) had inherited a dominant gene for albinism. Those men who were affected simply became night fishermen (a traditional role in the islands), and albinism simply a characteristic of the individual.

Psychological well-being

Assessing mental health is problematic – there is a tendency to define people as either mentally healthy or mentally ill. Additionally, while there is a continuum of mental illness to be measured, those who are mentally healthy require no further quantification. This is reflected in the measurement of mental health or psychological well-being, which has tended to be for clinical assessment (Shepard, 1997). Such measurements are often not appropriate for use on 'normal' populations (the instruments are more sensitive to the extremes of the particular domain).

Again, the mainstream methods of defining mental health and mental illness are based on the medical model, where a mental illness is considered a disease, with a cause (aetiology), a prognosis (probable course of illness), and a diagnosis (which is used to name the illness, distinguishing that illness from any other). Such a method runs the risk of inappropriately categorising an individual displaying the symptoms of a particular illness, where the culture within which the individual is displaying the behaviour does not view such categories as valid. In addition, the illness may have a different social role within a particular culture than that assumed in the medical model (Helman, 1994). For example, Matsumoto (2000) describes a woman in a group of people talking loudly to no one, often using unintelligible

sounds and words. The woman explains her behaviour as the result of being possessed by the spirit of an animal and was talking to a man who had recently died. The Yoruba (in Africa) and some Eskimo tribes in Alaska are examples of cultures that consider such behaviour more normal.

Psychological well-being can also be thought of in terms of such concepts as self-esteem, depression, and locus of control (Shepard, 1997), which have been shown to be related to culture (e.g. Crocker, Luhtanen, Blaine, & Broadnax, 1994). Crocker, Luhtanen, Blaine, and Broadnax in summarising the findings on self-esteem (also called self-worth or self-respect) reported that positive self-esteem is a significant predictor of better satisfaction with life, and that those with higher self-esteem are also at a lower risk of depression and hopelessness. Additionally, Crocker et al. state that measures of collective self-esteem (judgements of feelings about the ethnic group they belong to, such as "I feel good about the race I belong to") may be used to predict psychological well-being over and above that predicted by personal self-esteem. Crocker et al. add a caveat, and warn that the racial grouping the individual is identifying with at the time may not be clear.

In a study of Mexican Americans, Black, Markides, and Miller (1998) found that depression may be viewed as a biopsychosocial phenomenon, and that the stresses related to immigration and acculturation into the American culture (as well as a lack of Health Insurance) will interact with such cultural factors as language, and fatalism in increasing the risk of depressive symptoms. Black, Markides, and Miller also found cultural differences in health locus of control; where a lower level of locus of control (defined as how much control the respondent believed they had over health, which is also an indicator of fatalism) was correlated with higher incidences of depressive symptoms for U.S. born and older immigrant women. In general, people with an internal locus of control are believed to be more likely to seek health information, and take more "preventative steps to maintain their health, such as giving up smoking, starting an exercise program, or getting regular medical checkups"

(Weitan, 1992, p.450), than those with an external locus of control. Matsumoto, in reviewing the cultural differences in locus of control, stated that Americans demonstrated a more internal locus of control than any other culture measured. However, differences in locus of control across gender and social status were far larger than those between countries, and the differences in locus of control were far larger within cultures than between cultures.

In an article reviewing the impact of individual psychosocial resources and the SES-health relationship, Taylor and Seeman (1999) identified four psychosocial resources that moderate the effects of stress and ill health: a sense of personal control, optimism, social support, and ways of coping. Personal control (also called personal mastery, "reflects individuals' beliefs regarding the extent to which they are able to control or influence their outcomes", p. 211) was positively correlated to health, although the effect at low SES groupings was markedly stronger than at higher SES groupings. Similar findings by Weitan (1992) showed that a lower locus of control was correlated with a greater incidence of depressive symptoms, and that there were cultural differences in locus of control. Optimism (put simply) is the belief that "good things, rather than bad things, will happen" (p.212). Taylor and Seeman found that pessimism (assessed using negatively worded items) was significantly related to SES, while optimism was unrelated to SES. Other studies have linked pessimistic explanatory styles with health (e.g. Peterson, C., Seligman, M. E., & Vaillant, G. E., 1988), as well as optimism. That psychosocial resources vary between cultures has been shown by researchers such as MacLachlan (1997) and Weitan (1992). The degree of acculturation of an individual will reflect to what degree the individual possesses those psychosocial resources common to that culture.

Of the work that has been done on these psychosocial resources, one study by MacLachlan (1997) found that while psychosocial stresses do have an impact on both mental and physical health, these psychosocial stresses could vary considerably across cultures. This variance in stressors is a result of the differing ways in which individuals make sense of the

world - in how meaning is attached to their life experiences. In an example by Wessells (1999), an Angolan boy, whose parents who were killed by a landmine, and who fled the village before burying them, may exhibit symptoms consistent with post-traumatic-stress-disorder (PTSD).

> "The larger problem, however, might be the boy's belief that he is haunted by the unavenged spirits of his parents, who cannot make transition to the ancestor's realm unless the rituals have been conducted. The boy's stress is less a matter of what had happened than of the cultural constructed meanings he assigned to his experiences" (p. 272).

Social Function

One social aspect of health that has been intensively studied in the literature is the beneficial effect of social relationships on health. House, Landis, and Umberson (1997) summarised a number of studies examining the link between mortality and social relationships. They found that the relationship between social integration and mortality was strongly negatively correlated and for those men in rural populations, the relationship had a "non-linear, or threshold, form" (p. 86). Results from studies in Tecumseh (US), Evans County (US), and eastern Finland, indicated that mortality is highest amongst the most socially isolated, with a large drop from low to moderate levels of social integration (age adjusted mortality rate of 0.3 dropping to around 0.13 in Tecumseh), while the difference in mortality rates between moderate and high levels of social integration is small (age adjusted mortality rate of 0.13 dropping to around 0.1 in Tecumseh).

As House, Landis, and Umberson (1997) stated, the relationship between social relationships and health has "a predictive, arguably causal, association" (p. 90) independent of biological, health, and personality variables. House, Landis, and Umberson (1997) found that on average:

- Being married is more beneficial to health for men than for women

- Being widowed is more detrimental to health for men than for women

- Women benefit more from same-sex relationships with friends and family

- Men benefit more from cross-gender social relationships

Problems found in measuring these relationships were that measures of social relationships or integration have less variance in rural populations and an assumption was made that men have the same quality of relationships as women.

A related concept to social relationships is social support (the assistance of others), which may be further divided into emotional and instrumental support. Emotional support is generally not tangible, for example, promoting a sense of self-worth or just 'talking about' a problem. Instrumental support is more tangible and involves support with activities (e.g. child care, cleaning, or housing). There are three common measures of social support: network measures, self-report of social support available, and satisfaction with the support available. The literature has shown (as reviewed by Taylor & Seeman, 1999) that social support is positively correlated with SES (although the actual variation is small), and that this relationship holds for both emotional and instrumental support. Health outcomes related to social support, are strongest between social support and psychological well-being (e.g. depression), while smaller effects have been noted linking lower levels of coronary atherosclerosis and "better survival post-myocardial infarction, and post-stroke" (p.215) with higher levels of social support. Amongst children, lower levels of emotional support have been linked to depression and suicidal ideation, while children with little family support are at increased risk of childhood illness and later substance abuse.

Additional support for the relationship between social relationships and health has come from experimental/animal research. House, Landis, and Umberson (1997) summarised a number of studies, concluding that the presence of familiar others, reduces "anxiety and physiological arousal (specifically secretion of free fatty acids) in humans in potentially

stressful laboratory situations" (pp. 87-88). Additionally, the presence of, or a sense of connection with another organism (supporting the link between social relationships and health) will positively affect health via motivational, emotional, or neuroendocrinal pathways independently of other cognitive and behavioural coping mechanisms.

That cultures differ in the quality and quantity of their social relationships is perhaps obvious, nevertheless attempts have been made to assess how cultures differ. The most well known of these attempts to differentiate between cultures is the distinction between individualism and collectivism: An individual within a collectivist culture makes little distinction between personal and group goals, is often born into extended families or clans, and their role and identity provided for them by the group. Conversely, an individual within an individualistic culture tends to define their role and identity in society through individual achievement, cares only for himself/herself or immediate family, and is emotionally independent of organisations and institutions (Franzoi, 1996).

Sue (2000) noted that as minority groups (often coming from collectivist oriented cultures) are acculturated into the U.S. (perhaps the archetypal individualistic society), the resulting changes in diet, lifestyle, and social networks were correlated with negative health outcomes. While Penn et al. (2000) in summarising findings from a number of studies, found that after controlling for disability, older ethnic groups received more support (informal care) than older White persons did, and that this support had a beneficial effect on health status. In addition, Ulbrich and Bradsher (1993) (as quoted by Penn et al., 2000), found that support from friends and relatives moderated the effects of stress associated with caring for African American elders (more so than their White counterparts). Also noted by Penn et al., was that social support networks (particularly from extended family) are integral to Latino health, where family are more likely to become involved in problem-solving behaviour, sometimes to the point that by the time treatment is sought, the disease is too far advanced and recovery from the illness has been compromised.

Health Behaviours

A useful distinction to make when discussing health behaviours is between health-enhancing behaviours, and risk behaviours. Examples of health-enhancing behaviours are exercise and a sensible diet, whereas risk behaviours would include smoking, alcohol consumption, drug use, and poor diet. Pertinent to the current study is strong evidence that cultural differences in risk taking behaviours will lead to differences in health profiles across cultures (Myers, Kakawa-Singer, Kumanyika, Lex, & Markides, 1995; Dyck, 1994). For example, in the United States, six causes of death are responsible for 80% of annual excess deaths in the black population, and smoking and alcohol abuse are risk factors for five out of six causes of death (Johnson et al., 1995). Moreover, Bagley, Angel, Dilworth-Anderson, Liu, and Schinke (1995) note that among Native Americans, nutrition contributed to as much as 4 of the 10 leading causes of death, these being heart disease, cancer, cirrhosis, and diabetes. In addition, 15-24 year old Native Americans have three times the frequency of death likely from unintentional injury than all other ethnic-racial groups (in the US). While in 1997, in Aotearoa, Māori had a suicide rate of 17.5 (per hundred thousand) compared to 13.1 for Pākehā (for 25-44 year olds the difference was much greater – 33.9 and 20.1 respectively; New Zealand Health Information Service, 2001).

Of particular interest to the current study, was a summary by Bagley, Angel, Dilworth-Anderson, Liu, and Schinke (1995) of certain protective or health-enhancing behaviours that are often lost in the process of acculturation. This was most clearly shown in research involving Mexican Americans, where increased incidence of lung cancer, smoking, and alcohol use was associated with increasing assimilation into mainstream American culture (p. 637). Moreover, Penn, Kar, Kramer, Skinner, and Zambrana (1995) note that with non-American Indian interests interfering "with the maintenance of indigenous community lifestyles" (p.643), the American Indian economic base was degraded, forcing migration into

urban areas to work. This forced acculturation, led to the adoption of risk behaviours (e.g. smoking and alcohol consumption), and a consequent decline in health status.

In Aotearoa, Māori smoking rates are twice that of the rest of the population (e.g. in 1997, 50.9% of Māori smoked, compared with 24.1% of non-Māori; Ministry of Health, 2000), reflecting a lung cancer death rate over 4 times that of the general population (Statistics New Zealand, 1998a).

Health enhancing behaviours such as exercise or sports on the other hand have been linked to positive health outcomes, particularly with the prevalence of obesity and a general lack of fitness in most developed countries (Whiteley & Winett, 2000). In America, the prevalence of obesity has increased dramatically, with 24.4% of adults overweight in the period 1976 to 1988, increasing to 33.4% for the period 1988 to 1991. Of even greater concern was a finding that 48.7% of African American females are overweight compared to 30.9% of African American males (Whiteley & Winett). In a study by Blair et al. (1996), it was found that even a moderate level of fitness "was protective against cardiovascular disease and all cause mortality" (pp. 347-349).

Of concern in Aotearoa, was a finding that almost a quarter of Māori were considered sedentary compared to less than a fifth of non-Māori (Hillary commission for sport, fitness and leisure, 1998). It is likely that this discrepancy goes some towards explaining such health differences as the fact that in 1996, 263 Māori per 100,000 died from coronary heart disease (CHD), compared to 98 non-Māori per 100,000 (New Zealand Health Information Service, 1999)

Education

An individual's education level is correlated with a number of SES indicators such as income and occupational status. In summarising the literature on the link between education and health, Ross and Wu (1996) stated that those who are well educated tended to have better

health than those who are less well educated, and suggested that the direction of the effect is of SES (measured as education or income) affecting health. Of particular interest in Ross and Wu's study, was the finding that declines in perceived health and physical functioning with age were smaller among well-educated participants than among poorly educated participants after controlling for marital status, race (white/non-white), gender, and income. Ross and Wu believe that while there may be a cohort effect, this effect is one of improving education with successive cohorts (education has been improving over the years), and in controlling for education; any cohort effects were also controlled for.

The disadvantages conferred by educational underachievement are cumulative. For example, tertiary institutions require a minimum qualification for entry, and a failure by the education system at earlier stages in a child's development will deny them access to higher education later in life. This puts them at a disadvantage in the job market, keeping them within disadvantaged sectors of society. An example of such a negative achievement loop is that of Māori in Aotearoa, where Māori students have often been disadvantaged within the education system. For example, the gap in education between Māori and Pākehā is such that for every 100 Māori who leave school without 6th form certificate or better, only 67 leave with these qualifications. This must be compared to 255 Pākehā who do gain 6th form certificate or better for every 100 Pākehā who leave school without these qualifications (Ministry of Education, 1999). This pattern of educational under-achievement is believed to lead to (among other things) reduced employment opportunities and a worsening SES profile (New Zealand Council for Educational Research, 1988).

Employment Status

There is a significant relationship between the many measures of health (Self Rated Health (SRH), symptoms, physical impairments, death rates, disease and hospitalisation rates) and employment (Ross & Mirowsky, 1995). Additionally, this relationship remains

strong after gender, age, education, marriage and race have been controlled for. The relationship holds for both males and females, with housewives reporting worse health than employed females, and unemployed women reporting the worst health (Ross & Mirowsky).

Ross and Mirowsky summarised the two models linking health to employment. The social causation hypothesis states that employment improves health (through such direct effects as better health care and positive social roles), while the selection hypothesis states that healthy people get (and retain) more jobs. Ross and Mirowsky tested the two hypotheses using a variety of statistical methods (including multiple and logistic regression) while controlling for education, ethnicity (White/non-White), age, marital status, income and economic hardship. The study supported the social causation hypothesis, although there were suggestions that causation and selection were mutually reinforcing and not easily separated. An important finding was that employment has a beneficial effect on health irrespective of gender. Additionally, Ross and Wu (1996) found that the health advantages associated with high income became greater with age, meaning a greater health disparity between high and low-income earners over time.

Examining job loss more closely, there have been two stresses commonly associated with job loss; financial strain (which often predicts symptoms of psychological distress among the unemployed, Turner, 1995), and a loss of self-concept and self-worth, where job loss means the individual goes from having a socially approved role to one having far less social approval. Turner found that the individual experience of unemployment resulted from the interaction of education and the local rate of unemployment. Unemployed and less educated respondents, when unemployment rates are high, will tend to remain jobless for longer, and will not have the financial reserves to cope with such a long period of unemployment. This leads in turn to a worse health profile being presented (self-rated health), psychological distress, and physical functioning) for this group, than better-educated individuals in the same situation.

Not only can a distinction between the health of employed and the unemployed be made, but the nature of an individual's job will also affect their health. For example, in the U.S., Anderson, Bastida, Kramer, Williams, and Wong (1995) stated that migrant and seasonal workers (of whom the majority are Hispanic) are at a higher risk of exposure to toxic pesticides. Additionally, the fact that they (Hispanics) have paid employment makes it difficult for this group to access health care, yet they do not have sufficient income to afford Health Insurance. In 1990, Hispanics comprised 9% of the population and over 20% of the uninsured population in the USA.

In Aotearoa, a report by Te Puni Kōkiri (2000) found that Māori who were employed full or part time reported better health status than Māori who were unemployed or not in the labour force. Such findings are of particular concern in Aotearoa - in 1999 12% of Māori received the unemployment benefit in contrast to 3% of Pākehā (Statistics New Zealand, 1999) and in 1996, 47.5% of Māori of working age were employed compared to 63.2% of Pākehā (Statistics New Zealand).

Income

Saunders (1997) quoted a number of studies (e.g. McIsaac & Wilkinson, 1993) as reporting a statistically significant correlation between income and mortality measures. Most recent literature take the relationship between health and income as a given (greater income allowing access to better health care, housing, diet, etc), however there is a trend towards examining the relationship between health and income inequalities (at the community, county, or country level). The literature indicates that there is a small relationship between income inequality and health at both the individual and household levels. Meaning, with the gap between the richest and poorest increasing, health differences remain after partialing out other demographic factors (although the standard of living is also increasing for the poor their health is not improving as fast as the rich; Robert & House, 2000). Even though the causal

mechanisms are unclear, there are suggestions that this relationship is a statistical artefact resulting from the disproportionate effect of income changes at the individual level, as the health of the poor is affected more by changes to income than that of the rich (Robert & House). Other mechanisms have been proposed (Wilkinson, 1996; Lynch & Kaplan. 1997, as quoted by Robert & House, 2000; Kawachi & Kennedy, 1997) which revolve around human and social capital hypotheses (for example, investment in education, health services, and housing). Where the funding of public education and health services change little (keeping pace with inflation), while private health and education services keep pace with the latest advances in technology and practice due to the increasing affluence of its users.

That there exist cultural differences in income distribution is further supported by the statistics for Māori. The income discrepancy is such that 25% of Māori over 15 years old live in households earning less than $400 per week compared to 15% of Pākehā[2] (Statistics New Zealand, 1999), and 12% of Māori live in households earning more than $1270 per week compared to 24% of Pākehā. Furthermore, research by Davis, Howden-Chapman, and McLeod (1997) found that Māori earn less than Pākehā after controlling for education, age, and occupation.

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[2] Income data has been equivalised based on household size and type using the Luxembourg Income Study (LIS) 0.5 scale.

Housing

The most obvious influence housing has on health is the provision of shelter, fresh water, and sanitation. In conditions of overcrowding, these basic needs can be compromised. For example, 25% of the population in large cities (>5 million people) in developing countries have no safe water, 40% have no sanitation, and children raised under these conditions have 40 times the mortality rate of other children (Acheson, 1990).

Ineichen (1993) stated that an index of increasing affluence is the decreasing size of households (Ineichen questions whether this may also indicate an increasing inability to live together). Conversely, high-density housing (and the consequent overcrowding of households) is correlated with lower SES. Evans, Palsane, Lepore and Martin (1989) found that a higher residential density was correlated with more psychological distress and less social support. This relationship was proposed to occur through a process of social withdrawal, and the consequent weakening of social bonds. This relationship is supported by other studies that found that crowding in US high-rise apartment buildings (Baum & Valins, 1977; Baum & Valins, 1979; McCarthy & Saegert, 1979; as quoted by Evans, Palsane, Lepore and Martin, 1989) was correlated with greater interpersonal distance from strangers (as well as less eye contact and less initiation of conversation). While lower class homes in India (Nagar, 1985; Jain, 1987; as quoted by Evans, Palsane, Lepore and Martin, 1989) were associated with a less socially supportive atmosphere and more social withdrawal between family members (Evans, Palsane, Lepore & Martin, 1989).

Housing tenure (renting or owning) has also been used as a measure of wealth in order to assess SES in a study by Lewis et al. (1998). This measure has proven more robust than income as a measure of SES as home ownership is less likely to be influenced by such things as inflation or government policy.

Waldegrave and Coventry (1987) state that there is a relationship between poor housing and ill health, and that overcrowding especially, contributes to increases in mortality, airborne

infections, neurotic stress, and depression. They also comment on the relationship between poor housing and poverty – people do not usually choose to be homeless or in inadequate housing (poverty is also a significant indicator of poor health). In Aotearoa, 64.1% of those renting from Housing New Zealand were living in poverty, compared to 3.8% of those who owned a house without a mortgage (Waldegrave, Stephens, & Frater, 1995). As poverty is linked to worsening health statistics, the housing statistics for Māori are of concern (in 1996, 72.1% of Pākehā owned their own home (with or without a mortgage) compared to 50.4% of Māori, Statistics New Zealand, 1998b).

Health Determinants Summary

While there are an impossible number of influences on the health of an individual (how can any model account for being struck by lightning), it is still possible to determine broader categories. Physical influences range from the choices the individual makes in living (e.g. smoking, diet), to the environment in which they live (especially housing). Social influences are difficult to disentangle from psychological effects; individual responses to the social and physical environment are as much a function of upbringing (i.e. culture and history) as they are to personality (e.g. locus of control and self-esteem). Furthermore, how wealth is distributed within society also influences health - determining individual SES can be used to predict that person's health. Additionally, within society many ethnic groups can co-exist, and as has been found in previous research, there are significant differences in wealth and health between these ethnic groups.

Māori are an example of an ethnic group that has been consistently portrayed as a disadvantaged group. In 1992/93, 39.3% of Māori lived in poverty compared to 14.2% of Pākehā (Waldegrave, Stephens, & Frater, 1995). Māori are over represented in all of the low-SES indicators - Māori earn less, are more likely to be unemployed, are less well educated, and are less likely to own their own home (Statistic New Zealand, 1998b; Statistics New

Zealand, 1999; Ministry of Education, 1999). While in 1997, the death rate of Māori from lung cancer was 4.3 times that of Pākehā, from coronary heart disease 2.6 times, and from pneumonia and influenza 2.1 times that of Pākehā (New Zealand Health Information Service, 1999).

From such statistics, it appears that just being Māori means you will be more likely to suffer from these health inequities (being Māori was assessed in these cases by simple self-identification). Although, as was noted by Matsumoto (2000), there are more differences within an ethnic group then there are between ethnic groups. To examine why the health of Māori differs so dramatically from that of Pākehā requires a degree of subtly greater than a simple ethnic-identification question. Such a question requires knowledge of the history of society and how the relationship between Māori and Pākehā has developed over the years, and it requires knowledge of just how Māori and Pākehā differ. To define the two cultural groups more concisely necessitates a definition of culture, and the concept of cultural identity.

Culture

Culture is more than the food you eat and the songs you sing; it is more than appreciating art and reading the great novels; and it is more than having a family beyond your parents. A person's culture attributes meaning to life, it provides social roles for its members, "and how they show feelings, express emotions and distress, and experience conflict in behaviour, thought or action" (Baxter, 1998, p. 65). Culture is made of people and in turn makes people, it is an epiphenomenon generated from the language, behaviour, and beliefs of those who share in that culture.

Matsumoto (2000) believes culture is as much an individual construction as it is "a global, social construct" (p.28). Variation within culture can be observed among people in how they display the behaviours, beliefs, and values that (by consensus) make up their culture. The degree to which an individual displays those shared values and behaviours, reflects the degree to which that culture is within the person. If these values and behaviours are not within that person, the person does not share in that culture. This emphasis on individual differences within culture can be differentiated from personality, by emphasising that cultural traits are shared and vary within a culture, while personality traits are shared and vary between people. Another distinction made by Matsumoto is that culture is stable over generations (where behaviours and values are passed onto successive generations), whilst personality traits last an individuals lifetime only.

There are several common heuristics used to fit people into cultural categories, the three most common are; race, ethnicity, and nationality. When defining culture along racial lines, people are grouped into categories based on some physical characteristic such as skin or hair colour. What is closer to reality though, is that there is more within-group variation than there is between-group variation (Zuckerman, 1990, as quoted by Matsumoto, 2000), i.e. people differ more between individuals than between racial groups. As Matsumoto goes on to say, race should be treated more as a social construction than a biological reality - it is culture that gives race meaning, not vice-versa.

Ethnicity is an imprecise method of grouping people; people may be placed into ethnic groups based on characteristics such as common nationality, geographic origin, culture (a circular definition), or language. Ethnic identity is often used in the discipline of psychology when examining differences between ethnic groups, although as Matsumoto explains, knowing a person's ethnicity does little to explain the psychological outcomes being studied.

Nationality is rather simpler to define, but can be just as misleading (when used to categorise people); it is simply a persons country of origin. In this way, a person could be

called an American, or a Kiwi (New Zealander), and it is common to talk of such concepts as American or Kiwi culture. Again, fitting an individual into such a broad category (while still comprehendible) loses all sense of individual difference, and possibly gives entirely the wrong impression about that individual. For example, in Aotearoa there are many cultures intermingled throughout the country - Māori, European, Asian, and Tangata Pasifika (Pacific Island) to name a few. To say a person is a New Zealander provides no more information than that a New Zealander is from New Zealand, and nothing about how a New Zealander looks, speaks, thinks, or acts.

A less ambiguous and probably more accurate way of classifying people based on 'culture' is to look at cultural identity – to what extent a person identifies with their culture.

Cultural Identity

Culture, in a sense, is defined from 'outside'; as though it is possible to isolate a group of people from the rest of the world, based on an arbitrary set of parameters such as geographic location. Such an approach brings issues of ethnocentrism (an interpretation based on culturally specific values and beliefs), objectivity versus subjectivity, and constructionism (where the researcher is as much a part of the research as the people being studied, each affecting the other) to the definition of culture. Matthews (2000) speaks of the globalisation of culture, of the cultural supermarket, where on a conscious level, people can choose an identity. One may choose to be Buddhist or a Christian, or select from a range of political ideologies, or listen to a particular style of music. While these choices are influenced by our environment (e.g. peers, family, or job) and our personal history, it reflects the fuzzy boundaries that shape a person's identity, and the difficulty in defining a person's cultural identity (CI). Despite such ambiguities in the definition of CI, there are cultural 'threads', or elements common to a culture, that are specific to that culture, and are present (to some extent) in every person raised within that culture. Mathews called this the taken-for-granted

level of shaping, where our language and the social practices surrounding us (reflecting essential elements of culture), condition our comprehension of self and the world. This level occurs primarily below that of consciousness, and is largely unobtainable for analysis; as Mathews puts it, "because we think in language, we can't easily comprehend how that language shapes our thinking" (p. 12). A second level proposed by Mathews (between the taken-for-granted level and the conscious choices made in the cultural supermarket), is the "it can't be helped" level, and is characterised by social and institutional expectations such as gender roles and taxation. The individual may be aware of these pressures, but accepts them, rarely transgressing them (risking social censure or punishment). The shallowest level is one of conscious choice, where one chooses ideas and beliefs (rather than be born into them), while these decisions are not entirely free of external influences; they are a selection of one option from many. As Mathews puts it, "what you do without thinking, what you do because you have to, and what you do because you choose to" (pp. 15-16).

Placing CI within the context of society it is possible to show that identity exists within a complex relationship with others, history, and the world (see Figure 2). Hall (1997) argues that culture is "about shared meanings" (p. 1), where language represents our concepts, ideas and feelings to others.
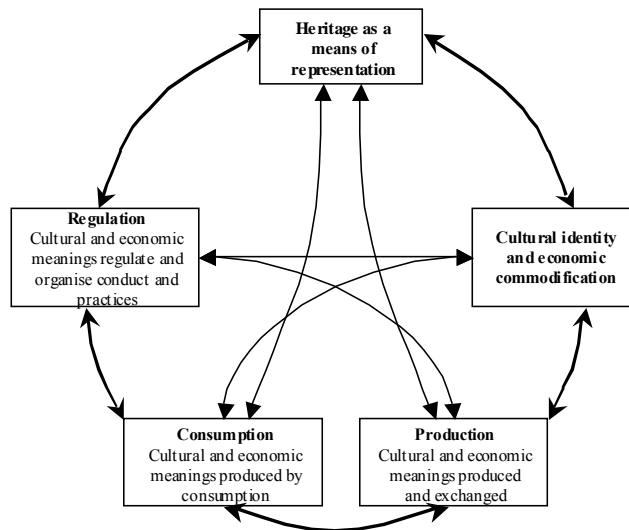
Figure 2. A circuit of heritage and culture.

Source: Adapted from Graham, Ashworth, and Tunbridge (2000, p.3)

In every personal interaction, meaning is produced and consumed, and not only at the level of the individual, but meaning is produced and consumed between cultures and mass media (e.g. television). Such a model places the individual in the midst of shifting cultural boundaries, where their identity cannot be so easily defined purely in terms of their culture, as their culture is as fluid as those individuals comprising it.

Measuring Cultural Identity

As mentioned previously, culture can be defined as race, ethnicity, or culture. Using these groupings as the measure of an individual's CI may be accurate in some cases (for example, the author may call himself Māori), but this measure conveys very little information (the author may also call himself a New Zealander). Matsumoto (2000) summarised attempts by other researchers to measure aspects of culture (e.g. Hofstede, 1984; Hall, 1966; Triandis, 1995; as cited by Matsumoto, 2000) in the following ways: Individualism/collectivism (IC), which assesses the value culture places on the needs of the individual versus that of the

group; power distance (PD), the difference between an individual and a more powerful other; status differentiation (SD), how culture maintains status differences between members; uncertainty avoidance (UA), how a culture develops "institutions and rituals to deal with uncertainty and ambiguity" (p. 41); masculinity (MA), how gender roles are engendered; tightness, the degree of internal homogeneity; and contextualisation, where behaviours are defined according to how specific they are to the situation, where high context behaviours are highly specific, and low context behaviours less specific.

Unfortunately, these measures are designed to measure differences between cultures, rather than the extent to which an individual identifies with a particular culture. Additionally, these measures assume a level of universality, that each measure is present in some measurable form across all cultures. What is also needed when measuring CI, is a way to differentiate the culture under consideration from the many rival cultures that influence the individual, a measure unique to the culture of interest. A formal definition of a person's ethnicity or race was attempted by the New Zealand government (Department of Statistics, 1994), in an attempt to differentiate Māori from the other cultures present in Aotearoa. Māori were defined as those who had at least one Māori ancestor, or chose to identify as Māori. While this approach does allow some differentiation of Māori from Pākehā, there is little subtlety to the method, as the measure does not capture degree of identification. An example of a basis for measurement that does capture more variance in CI is language. The degree of fluency may indicate how and to what degree the values and beliefs of that culture are influencing an individual. This measure would be most valid where the people speaking that language are smaller in number, and the language reflects participation in that culture. English for example, would not be a good case, as the diverse number of people speaking English would preclude any useful differentiation between cultures. Māori language on the other hand, is not spoken by any other group of people in the world, and so is ideal as a measure of Māori cultural identity. Kāretu (1993) quoted the late Sir Apirana Ngata as

saying "'Ki te kore koe e mōhio ki te kōrero Māori ehara koe i te Māori' (if you do not speak Māori you are not Māori)" (p. 223). Other measures may be religious or spiritual beliefs, or observances of unique behaviours and traditions (e.g. an Irish wake or a Jewish bar mitzvah). Such an approach would initially involve a qualitative or anthropological approach to identify such unique cultural traits, culminating in a statistical analysis of the measures (to assess validity) and the construction of appropriate scales. Examples of such culturally specific measures are a Māori knowledge test (Thomas, 1986), which took the form of a 40-item questionnaire on the meanings of everyday Māori words and a questionnaire developed by Durie (1993) measuring aspects of language, knowledge, and involvement with a number of Māori institutions (e.g. Marae).

The current study used measures of Whakapapa (ancestry), Marae Participation (ancestral home), Whanau associations (extended family), Whenua Tipu (ancestral land), contact with Māori people, Use of te Reo (Māori language), and kai (food preferences) to assess levels of acculturation. Details of the CI measure used in the current study are discussed on page 58.

Culture and Health: The Link

The link between culture and health is not a direct one, while it is possible to say that as we get older our health declines, we cannot say (for example) that as we become more acculturated our health improves. To do so, would be like saying 'Bob' is healthy because he is American, whilst 'Mary' is unhealthy because she is Canadian. Nevertheless, relationships between culture and health have been found, in how we experience illness, in how we behave, and in the society we create. Unravelling such complex relationships in order to determine how culture affects health is difficult. As Kaplan (1999) states, the problems in estimating the "independent effects of single variables" upon health do not capture the

"dynamic, multilevel phenomena with feedback between levels" (p. 117) that characterises

the social environment and its relationship with health. Kaplan also notes that many studies

"privilege causal factors that are more proximate to the disease outcome" (p.117), such as

age, rather than considering the role of the many other (more distant) factors that also operate

on health. Fitting culture into a diagrammatic representation of the individual, and our social

and physical environment (Figure 3), we can model the influence of both distant and

proximate factors - these being culture, social and economic policies, institutions,

neighbourhoods and communities, social relationships, and individual risk factors, on the

health of the individual through their life.
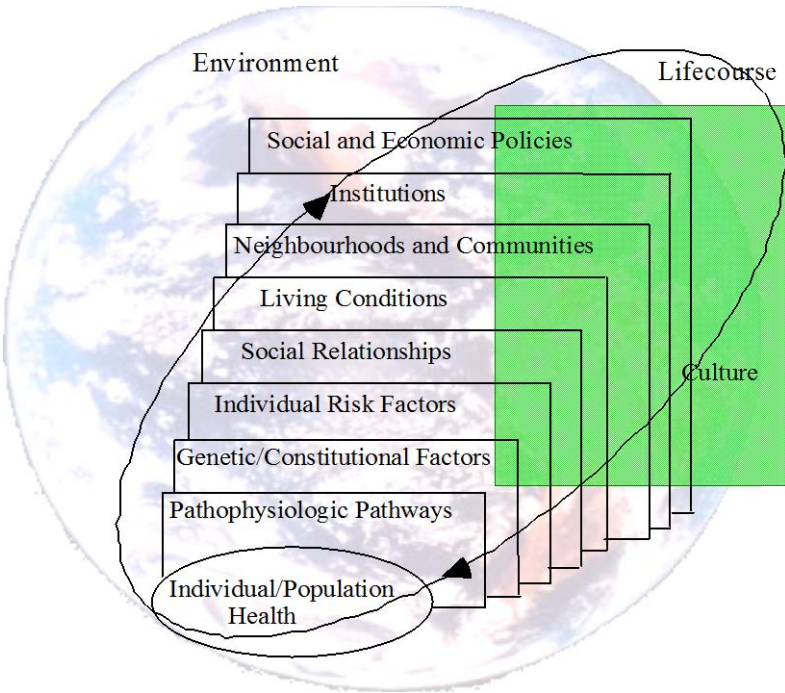
Figure 3. The relationship of the individual to culture, the environment and to those factors determining the individuals health through their life.

Source: Adapted from Kaplan (p. 117, 1999).

Despite the problems in isolating the effect of culture on health, there have been a number of agreed upon and in most cases, empirically supported findings in such fields as psychology, psychiatry, and anthropology. Broadly speaking, these findings can be grouped as cognitive, behavioural, physiological, and systemic (although there is considerable overlap). Cognitive factors describe the way in which culture impacts "on mental and physical health through language and the health-related cognitive categories or schemata that cultures provide their members for talking about and experiencing illness" (Angel & Thoits, 1987, as cited in Angel & Angel, 1995, p.54). Waitzkin and Magna (1997) reported evidence of the influence of culture on how physical symptoms were experienced and presented. They proposed that this was in the way culture "patterns" personal and social narratives of traumatic events, and the accompanying somatic symptoms. As noted previously, cultural differences have also been found in health locus of control, where a lower level of locus of control (defined as how much control the respondent believed they had over health) was correlated with higher incidences of depressive symptoms for U.S. born and older immigrant women (Black, Markides, & Miller, 1998). Sue (2000) suggests that as an individual becomes acculturated (i.e. as the individual accepts a new cultures beliefs and values), the resulting "changes in diets, lifestyle, and deterioration of traditional social networks" have been associated with poorer health outcomes (p. 93).

Behavioural factors include health-risk and health-enhancing behaviours that are common to a culture. That cultural differences in health behaviours affect health has been supported by a number of studies (Myers, Kakawa-Singer, Kumanyika, Lex, & Markides, 1995; Dyck, 1994). As noted earlier, examples of risk behaviours such as smoking and alcohol abuse have been found to be significant mortality risk factors for African Americans (Johnson et al., 1995), and nutritional factors were implicated in at least 4 out of 10 of the leading causes of death among Native Americans (Bagley, Angel, Dilworth-Anderson, Liu, and Schinke, 1995). That cultural differences are at least partially responsible, were

supported by findings that certain protective or health-enhancing behaviours are often lost in the process of acculturation. This was most clearly shown in research on Mexican Americans, where increased incidence of lung cancer, smoking, and alcohol use was associated with increasing assimilation into mainstream American culture (p. 637). Furthermore, Penn, Kar, Kramer, Skinner, and Zambrana (1995) note that with non-American Indian interests interfering "with the maintenance of indigenous community lifestyles" (p.643); the American Indian economic base was degraded, forcing migration into urban areas to work. This forced acculturation, led to the adoption of risk behaviours (e.g. smoking and alcohol consumption), and a consequent decline in health status. A similar pattern was exhibited in Aotearoa with the arrival of Europeans, where Māori moved from their traditional homes (which had organised features such as sanitation, clean water, and drainage systems), into the lowlands (where housing was damp, overcrowded, and the environment was often polluted). This, along with the adoption of a European diet (such as potatoes and bread), less consumption of traditional foodstuffs (such as fern roots, Kūmara, fish, birds, and berries), and the adoption of health risk behaviours such as smoking, and drinking (of alcohol), led to a dramatic decline in the health of Māori (Durie, 1994). Conversely, health enhancing behaviours such as exercise or sports have been linked to positive health outcomes (Blair et al., 1996; Whiteley & Winett, 2000).

Physiological factors cover those physiological reactions common to many aversive social situations. For example, Sue (2000) stated that psychological and physiological reactions to racism can contribute to hypertension, and that discriminated African Americans who challenged the situation, had a systolic blood pressure 7mmHg lower than those who did not (Krieger & Sidney, 1996, as cited by Sue). Related to these findings, were those by McNeilly et al. (1997), who found evidence that African Americans who felt sad, helpless, and powerless when confronted with racist situations, displayed abnormally elevated blood pressure (as cited by Kelty, Hoffman III, Ory, & Harden, 2000, P. 149). There is also

evidence that other emotional-cognitive reactions are correlated with negative health outcomes. Pope and Smith (1991) found that "greater levels of hostility and cynicism have been correlated with increased level of cortisol secretion, which, in turn, can suppress the immune system" (p. 150). Helman (1994) quoted two studies by Marmot et al. (1975) and Marmot and Syme (1976) that compared samples of Japanese men living in Japan, Hawaii, and California. Increasing distance from their traditional culture was related to a higher incidence of coronary heart disease (CHD). As Helman states, "the degree of their adherence to traditional Japanese culture and world-view was correlated with their incidence of CHD" (p.321). The findings suggest that environmental influences are having an impact beyond those of nature.

Systemic factors loosely cover the social and institutional forces affecting all individuals present in society. These forces determine the distribution of wealth, the nature of the health care system, and (to a lesser extent) the degree of inequality in SES groupings (i.e. between rich and poor). As Sue (2000) contended, many cultural groups are over represented in the low SES segments of the population, displaying worse health characteristics (having poorer quality housing, health care, and lower income) than groups with a higher SES profile. One of the most significant influences on how health care, housing, and income are distributed is government policy (e.g. economic, and social policies). An example of how varied government policy can be was demonstrated by Shirley (1991), who discussed the economic development paths taken by industrialised nations in response to the global economic crisis of the 1970s. One path was characterised by "economic sovereignty, a secure domestic market and an institutional commitment to full employment" (p. 2). The second path was based on a restrictive monetary policy, a dismantling of social services (where the state was regarded as the last resort), tax reductions, privatisation, and deregulation. Simply put, the second path led to rampant unemployment, economic deprivation, and second-rate social services (Taylor, 1990 as cited by Shirley), while those following the first path maintained unemployment rates

at 0-4 per cent of the labour force. After summarising over two thousand articles on the personal and social costs of unemployment, Shirley found a significant relationship between unemployment and social problems such as ill health, premature death, suicide, marital breakdown, child abuse, racial conflict, violence and crime.

In Aotearoa, Pākehā involvement with Māori has resulted in the weakening of traditional Māori lifestyles, and a consequent shift of many Māori away from their traditional homes (Māori perspective advisory committee, 1986; Barcham, 1986; O'Malley, 1997). Such a change in Māori lifestyle meant many Māori were moving into industrialised society (typically concentrating in the cities), resulting in a dependence on western economic forces (in 1999, 12% of Māori of working age received the unemployment benefit compared to 3% of Pākehā; Statistics New Zealand, 1999). This is not to say that Māori would have remained an agrarian society had Pākehā not colonised Aotearoa, just that the shift in lifestyles was abrupt and was not initiated by Māori.

Chapter Two Summary

The World Health Organisation (2000) definition of health is that "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". While this states what health is, what determines health? Reducing health to some of the more important determinants produced eight factors: Physical health (e.g. age, physical activity levels), psychological well-being (e.g. stress, depression), social function (especially social support and social integration), health behaviours (smoking, alcohol consumption, diet, and involvement in sport or exercise were highlighted), education, employment status, income, and housing.

When making the link between culture and health, these eight factors were further summarised into cognitive, behavioural, physiological, and systemic domains. The cognitive domain envelops how individuals interpret their physical experiences (such as physical

illness symptoms), which is largely patterned by the culture(s) within which they exist. Also included in the cognitive domain are the psychological well-being and social function factors. Behavioural factors are more overt and are characterised by health-risk (e.g. smoking) and health-enhancing behaviours (e.g. exercise). Physiological factors may be better defined as physiological reactions to external stimuli; examples of such reactions are abnormally elevated blood pressure levels in response to racist situations (McNeilly et al., 1997, as cited by Kelty, Hoffman III, Ory, & Harden, 2000, P. 149). Systemic factors are those social and institutional forces that determine the distribution of wealth and social services (such as health care and welfare agencies). Government policy is the most important of these factors, particularly economic and social policies. Measures of these systemic factors in the present study are the SES indicators: education, employment, income, and housing.

An overriding theme throughout the literature surveyed has been the differences in health that exist between cultures that live or co-exist in the same country. There has already been a great deal of research into the health differences between co-existing cultures (particularly that between mainstream cultures and minority groups), and almost as many theories posited to explain these differences. That cultures differ in their interpretation of the world (Angel & Angel, 1995), in the quality and quantity of social relationships (e.g. Individualism/Collectivism), and in specific health behaviours (Myers, Kakawa-Singer, Kumanyika, Lex, & Markides, 1995; Dyck, 1994) have been proposed as reasons for these health differences. Additionally, historical power imbalances have also been suggested as creating and consequently preserving these health differences. For example, institutionalised racism or apartheid, dispossession of a culture's physical resources by another (Māori Perspective Advisory Committee, 1986; Barcham, 1986; O'Malley, 1997), class systems (Silver, 1996), and the active repression of cultural beliefs and language (Durie, 1994).

While it is clear from the literature that there are differences in health between cultures, there is still more difference in health between people. Moreover, as Mathews (2000) suggested, there are problems in actually labelling an individual as simply belonging to one culture. Often, an individual will belong to several cultures (for example, a young, white, male, Rastafarian member-of-parliament, living in Aotearoa, who was born in England), making it impossible to clearly place an individual into one cultural category for the purpose of inter-cultural comparisons.

A solution to this problem of cultural categorisation is to measure aspects of an individual's Cultural Identity (CI) by determining factors unique to the culture under consideration and assessing to what degree an individual displays these characteristics. This measure of the degree of acculturation of the individual allows greater subtlety in assessing how health factors interact with culture.

A review of the relevant literature has shown that there is a complex relationship between culture (meaning a group of people defined by nationality, ethnicity or language) and health. Defining CI more precisely as the degree to which an individual identifies with a particular culture, will allow an assessment of how culture influences health outcomes that may differ between co-existing cultures. Furthermore, how health-related schema and behaviours, characteristic of that culture, are associated with health status can also be assessed.

Theoretical Framework

In the present study, the measures of CI and health will be taken directly from the Hoe Nuku Roa study. Demographic factors (for example, housing, education, and income) that may confound the relationship between CI and health will be included in any analysis and controlled for. While the Hoe Nuku Roa framework allows such analysis to be performed with relative simplicity, interpretation of the results will still require familiarity with previous theorising on CI and health, and knowledge of the social realities that Māori exist within.

The hypothesised relationships to be investigated are described below in Figure 4. It is hypothesised that the many demographic factors measured (age, gender, Health Insurance, education, Job Status, income, housing status, Mobility, Crowding, Sporting Involvement, and exercise), will be correlated with both CI and the health indicators (self-rated-health, alcohol consumption, smoking behaviour, Sporting Involvement, and exercise). Additionally, CI is expected to modify the relationship between demographics and health. The precise nature of these relationships is described in detail in the hypothesis section.
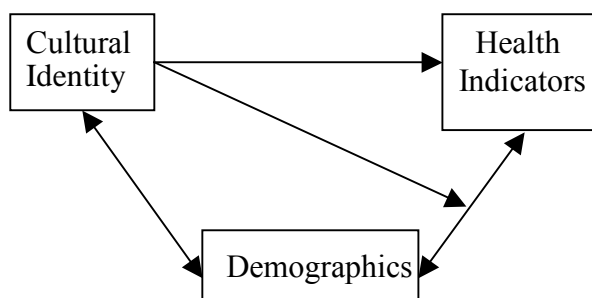
Figure 4. Flow chart detailing proposed relationship between Cultural Identity, Health Indicators, and Demographics

In the current study, the combined score from seven cultural indicators was used to assess the degree to which a participant identified with Māori culture. Cultural identity influences how individuals' present illness should it strike them (Waitzkin & Magna, 1997), and what health behaviours are displayed between differing levels of acculturation (Myers, Kakawa-Singer, Kumanyika, Lex, & Markides, 1995; Dyck, 1994; Bagley, Angel, Dilworth-Anderson, Liu, & Schinke, 1995; Penn, Kar, Kramer, Skinner, & Zambrana, 1995; Whiteley & Winett, 2000; Blair et al., 1996).

The cultural indicators Marae Participation, Whanaū associations (extended family), and contact with Māori people, are measures of the social aspects of CI. As House, Landis, and Umberson (1997) found, higher levels of social integration, social support (Taylor & Seeman, 1999), and better quality social relationships were correlated with better health indicators.

Ineichen (1993) found a relationship between SES, the size of the household (crowding) and health. Such that more household crowding was correlated with worsening health indicators. However, the health of Māori is bound with the strength of their relationships to their whanaū (Durie, 1994). Given the communal atmosphere of the Marae (ancestral home) and the openness of the Māori home to whanaū, the findings of Ineichen seem in conflict with the Māori concept of togetherness; that whanaū is always welcome to stay - nau mai,

haere mai. Given this disparity between previous research findings and the beliefs of Māori, the relationship between Crowding and CI on health will be investigated.

Related to the idea that crowding in the Māori context may have beneficial effects on health, is the concept of whāngai, where grandparents may adopt grandchildren, or nieces and nephews adopted by aunties and uncles. This means that houses occupied by older participants get larger (perhaps after decreasing with middle age and children leaving home), with a consequent improvement in certain health indicators (particularly SRH), as their relationship with their whanaū is strengthened. Since whanaū are so crucial to Māori identity, it is also believed that those older participants with a higher CI will be cared for within the whanaū rather than placed into an elder care institution. It is believed that those in such a situation (with whanaū) will show improved health indicators than older participants with a lower CI.

Also reflecting the nature of whanaū relationships is income. While a clear relationship between higher income and better health or SES, has been found for Māori, more income may mean more is given to whanaū. A higher income is conceivably an opportunity to accept more whanaū into the household, and the real increase in income negligible. For a given occupation then, disposable income may not be comparable between Māori and Pākehā (Taiapa, 1994).

Following the colonisation and subsequent industrialisation of Aotearoa (as with many countries around the world), Māori were forced to move away from their tūrangawaewae or ancestral home (Māori perspective advisory committee, 1986; Barcham, 1986). Such a move not only took Māori away from their culture (taking on aspects of the colonisers culture), but also made them dependent on the new capitalistic system. Given such a relationship and the poorer health indicators associated with lower income and unemployment (Penn, Kar, Kramer, Skinner, & Zambrana, 1995; Helman, 1994; Shirley, 1991) it is speculated that a positive CI (i.e. returning to traditional values) will 'soften' the impact of these SES

indicators on the health indicators. These relationships would be reflected in interactions between CI, occupational status, income, and Mobility (how often participants changed address), and the health indicators.

Also examined in the present study are the relationships between the demographic factors and health. In particular it is believed that:

Increasing age impacts negatively on health (particularly physical health – Shepard, 1997); employment and a higher income are correlated with better health indicators (Shirley, 1991; Ross & Mirowsky, 1995; Saunders, 1997; Robert & House, 2000); better education is correlated with better health (Ross & Wu, 1996); while an over-crowded household is correlated with worsening health indicators (Ineichen, 1993; Evans, Palsane, Lepore, & Martin, 1989). At a slightly broader level, lower SES (as measured by education, Job Status or income) is also correlated with worse health indicators (Taylor & Seeman, 1999).

Finally, to assess how particular age related events such as retirement may moderate the relationships between employment, housing and health, interactions between Age and Housing Status, Age and Job Status, and the health indicators were included.

Hypotheses and Research Aims

Research Aim One

To investigate how demographic factors are related to Cultural Identity. In particular, it is hypothesised that **a higher level of Crowding will be positively correlated with a higher CI** (Hypothesis One).

Research Aim Two

To investigate how Cultural Identity is related to health. In particular, it is hypothesised that **a higher CI is positively correlated with improved health indicators** (Hypothesis Two).

2.1 A higher CI will be positively correlated with a higher SRH

2.2 A higher CI will be negatively correlated with smoking

2.3 A higher CI will be positively correlated with a higher level of Sporting Involvement

2.4 A higher CI will be positively correlated with a higher level of Exercise

2.5 A higher CI will be positively correlated with lower alcohol consumption

Research Aim Three

To investigate how demographic factors are related to health status.

In particular it is hypothesised that:

3.1 Increasing age will be negatively correlated with improved health indicators

3.2 Better Education will be positively correlated with improved health indicators

3.3 Employment will be positively correlated with improved health indicators

3.4 Higher income will be positively correlated with improved health indicators

3.5 Improved Housing Status (as represented by home ownership) will be positively correlated with improved health indicators

3.6 Crowding will be negatively correlated with worsening health indicators

3.7 More Sporting Involvement will be positively correlated with improved health indicators

3.8 Greater levels of Exercise will be positively correlated with improved health indicators.

Research Aim Four

To investigate the interactions between particular demographic factors, CI, and the health

indicators. In particular, to investigate (sub-aims):

4.1 How CI moderates the relationship between age and the health indicators

4.2 How CI moderates the relationship between Job Status and the health indicators

4.3 How CI moderates the relationship between income and the health indicators

4.4 How CI moderates the relationship between Housing Status and the health indicators

4.5 How CI moderates the relationship between Crowding and the health indicators

4.6 How age moderates the relationship between Housing Status and health indicators

4.7 How age moderates the relationship between Job Status and health indicators

4.8 How age moderates the relationship between Crowding and health indicators

Method

Design

The research methodology for Te Hoe Nuku Roa (THNR) is based upon a relational framework comprising four interacting axes – paihere tangāta (human relationships), te ao Māori (Māori cultural identity), ngā āhuatangā noho-a-tangāta (socio-economic circumstances), ngā whakanekeneketangā (change over time). Indicators (ngā waitohu) of levels of choice, access, participation, satisfaction, information, and knowledge and aspirations formed the basis of the questions used to describe these axes. From this framework, a comprehensive questionnaire covering a broad range of cultural, social, and economic indicators relevant to Māori well-being and advancement was developed (the questionnaire is included in Appendix F).

The data for the current study was gathered using a sampling method developed for THNR in conjunction with Statistics New Zealand. Whaihua Tatau (Fitzgerald, Durie, Black, Durie, Christensen, & Taiapa, 1996) is a random stratified sampling method that was developed with five characteristics: Māori representivity, a Māori household focus, regional selectivity, stratified sampling, and representivity weightings.

Sample

Six hundred and fifty-five Māori households (1574 individuals) in the Manawatu-Whanganui, Gisborne, Wellington, and Auckland regional council areas were sampled. The sample from each region was selected using a differential sampling approach based on

information from past census, Household Labour Force Surveys (HLFS), and Household Economic Surveys (HES) conducted by Statistics New Zealand. Based on stratifications within each region (strata are geographically related areas with similar attributes), and in relation to Māori population density, PSUs (Primary Sampling Units consist of 18,800 geographically defined areas which make up the country) were chosen to be surveyed. An enumeration phase involving a door-to-door survey within each PSU was undertaken to establish which households were eligible for inclusion in the study (i.e. which household were Māori). For consistency, each PSU was surveyed three times or until each dwelling had been contacted and an interview time arranged. Repeat surveys were conducted at different times of the day and on different days of the week to increase the likelihood of contacting households. Eligible households were then selected at random to achieve predetermined totals (allowing for non-participation and no-contact) in line with the population stratum proportions (Te Hoe Nuku Roa, 1999).

While weightings were generated to ensure the sample represented Māori accurately, an epidemiological study of health status across Māori, and the influence of CI upon health is not considered within the present study's scope. Consequently, these weightings were not used in any analyses.

Although the entire sample consisted of 1574 individuals, only a subset of this data was used: children (younger than 15 years old) and those who did not identify as Māori were excluded from the analyses.

Measures

Age

The age of the respondent was calculated by subtracting the respondents date-of-birth from the date the questionnaire was completed, yielding a continuous measure.

Gender

The gender of the participant was scored as 1 = Male, and 2 = Female.

Health Insurance

The question "Do you have health/sickness insurance? (e.g. Sourthern Cross,

Medicare)" was scored as 1 = Yes and 2 = No.

Education

An education scale was formed by combining the responses to two questions (Table 3):

one of which assessed the highest secondary qualification gained, while the second assessed

the highest post-secondary school education provider.

Table 3. Table showing how Education scale was created.

Education scale	Qualification
0	None/ Access
1	NZ School Cert/ Other
2	6th Form Cert/UE/ Polytechnic/Marae Based
3	Bursary/Scholarship/ Wananga Based
4	University/Teaching Qualification

Job Status

The questionnaire asked whether the participant had "a paid job, or a business or farm in

which you worked for pay, profit or income?" This created a dichotomous measure, scored

as 1 = Yes (in paid work) and 2 = No (not in paid work).

Housing Status

An equivalent measure (housing tenure) was used by Lewis et al. (1998) as a measure of

SES. Housing tenure (renting or owning their home) has been used as a measure of wealth

(variously defined as income or standard-of-living), which has proven to be more stable than

income as a measure of SES (income distribution is influenced by such things as inflation and

government policy). Accordingly, Housing Status was treated as an ordinal measure, where

renting/boarding/no-payment was considered an indicator of a lower SES than participants

owning their home (with a mortgage). Those who had owned their home without a mortgage

were deemed to be in a better financial state (wealthier) than the other two categories (Table

4).

Table 4. Table showing how the housing status measure was created.

Housing Status	Response
0	You are paying board
0	You are paying rent/lease
0	You are not paying any form of board, rent or mortgage
1	You are paying a mortgage to buy a house
2	You own a house without a loan or mortgage

Mobility

Kearns, Smith, and Abbott (1991) found that a measure of housing stress is mobility –

the number of times the household has changed address. Furthermore, Waldegrave and

Coventry (1987) stated that for homeless families, changing address continually placed

additional stress on the families involved. This measure was created by asking how many

times the participant had changed address in the last 3 years.

Crowding

Crowding has been consistently correlated with a number of health issues (Evans,

Palsane, Lepore, & Martin, 1989) such as psychological distress and greater social support.

Asking how many people lived in the household assessed this.

Sporting Involvement

Amalgamating the responses to three questions created the Sporting Involvement

measure: involvement in an individual sport, involvement in a team sport, and personal

involvement in sport. Table 5 summarises the scoring for the Sporting Involvement measure.

Table 5. Table showing how sporting indicator questions were combined to form Sporting Involvement Variable.

	Not at all	*Only once a month*	*A few times a month*	*Once a week*	*A few times a week*	*Everyday*
Actively involved in an individual sport	0	1	2	3	4	5
Actively involved in a team sport	0	1	2	3	4	5

	No involvement	Social only	Competitive only		Both social & competitive	
Personal involvement in sport	0	1	1		2	
Sporting Involvement	The score from each of the above questions were added together to form a scale from 0 to 12					

Exercise

Exercise was assessed by asking how often the participant had exercised in the past month on the following scale: 1 = Not at all, 2 = Only once a month, 3 = A few times a month, 4 = Once a week, 5 = A few times a week, and 6 = Everyday.

The Exercise measure is distinguished from Sporting Involvement by the nature of the physical activity being engaged in. Sport is social and organised in nature, whereas exercise is often solitary and unstructured (a simple walk in the evenings can be called exercise).

Cultural Identity

Baxter (1998) believed "culture is characterised by notions of collective knowledge, attitudes, values and ways of thinking and acting" (p. 64). Given that one's CI can be drawn from a broad range of experiences, to define an individual's CI in terms of ethnicity, would be too limiting.

An approach used by Te Hoe Nuku Roa research team (1996) was to define CI in terms of responses to the Hoe Nuku Roa questionnaire, giving measures of self identification, whakapapa (ancestry), marae participation, whanau associations (extended family), whenua tipu (ancestral land), contacts with Māori people, and Māori language. These characteristics were considered particularly important to Māori CI. From these seven indicators, four CI profiles were constructed; "secure identity", "positive identity", "notional identity", and "compromised identity".

The current study formed continuous measures of cultural identity by combining relevant questions from the questionnaire into seven sub-scales (Appendix B); Whakapapa (ancestry), Marae Participation, Whanau associations (extended family), Whenua Tipu (ancestral land), contact with Māori people, Use of te Reo (Māori language), and kai (food preferences). These seven cultural indicators were then summed to form a continuous measure of cultural identity (CI). An example of such an approach was one used by Ownbey and Horridge (1998) who applied the Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA) Scale to assess acculturation levels in an Asian-American sample. The study found six interpretable factors from the scale: reading/writing/cultural preference (language, music, and movie preference); generational identity (self ethnic, paternal, and maternal identities); food preference; affinity for ethnic identity and pride (pride in cultural group, participation in Asian traditions); ethnic interaction; and Asian contact. The first factor (reading/writing/cultural preference) related favourably to the current studies Use of te Reo sub-scale, while generational identity has much in common with Whakapapa. Food preference shares some similarities with Kai, whilst Whanau associations and Contact with Māori are very similar to Ethnic Interaction. Whenua Tipu assesses the individual's connection with the land and observances of certain traditions (Māori burial practices), which shares similar concepts to the SL-ASIA factor affinity for ethnic identity and pride. Marae participation is rather unique, in that the individual has a sense of belonging to their Marae.

A greater participation with their Marae indicates a greater sense of belonging to that Marae - a greater sense of being Māori.

Validity

When there are large correlations between variables (especially complex interactions of the 3rd order and higher), combining these variables into a single predictor is a valid method of coping with problems of collinearity (Pedhazur, 1997, p.318). Due to the highly correlated nature of the cultural indicators (Table 6), and the theoretical assumption that they sample the same construct, namely cultural identity, the combining of the cultural indicator variables into a single predictor seems valid in this case. Accordingly, only the Cultural Identity variable was used in regression analyses.

Table 6. Pearson Correlations between CI and the seven cultural indicators.

	CI	Whakapapa	Whenua Tipu	Marae Links	Maori Contact	Whanau Associations	Kai
Whakapapa	.621**						
Whenua Tipu	.523**	.201**					
Marae Links	.690**	.287**	.362**				
Maori Contact	.206**	-.046	-.005	.013			
Whanau Associations	.660**	.287**	.194**	.408**	-.019		
Kai	.493**	.199**	.124**	.279**	.004	.290**	
Use of te Reo	.633**	.380**	.177**	.313**	-.057	.272**	.217**

**p<.01

A method of assessing the validity of the continuous CI measure is by comparing the continuous measure with the ordinal measure generated by the Te Hoe Nuku Roa (THNR) research team. The THNR ordinal measure was formed by placing participants into four categories according to their responses (Appendix C). The first category (compromised identity) consisted of those who responded "no" to the question "Do you identify as Māori?",

yet demonstrated some degree of acculturation. This category was not included in the analysis, as the research question revolved around the degree to which respondents identified as Māori. Saying you are not Māori, while displaying Māori cultural characteristics was considered problematic, and worthy of a separate investigation. The next three categories may also be defined as ordinal, as they covered a range from notional identity (weakest) through to secure identity (Strongest). Examining Table 7, it appears that while there is considerable overlap between the categories, there is sufficient distance between positive identity and secure identity (over one SD) to warrant the use of the continuous measure in discriminating between these categories.

Table 7. Table showing N, means, SD, range, and F statistic for CI across the THNR categories.

Continuous CI

Identity	N	mean	SD	Range
Notional	13	15.85	4.18	9 – 23
Positive	458	16.84	3.95	8 – 28
Secure	305	22.31	3.31	14 – 30
F	203.73***			

***p<.001

Analysing how the participants have been distributed across the three THNR categories, the extreme loading of the positive and secure identities (458 and 305 participants respectively) when compared to only 13 participants in the notional category, suggests a lack of discrimination by the THNR measure. It is suggested that the continuous CI measure does a better job in discriminating between high and low levels of CI, as well as demonstrating a more normal distribution (Figure 5). Accordingly, the continuous CI measure will be used in the analyses.
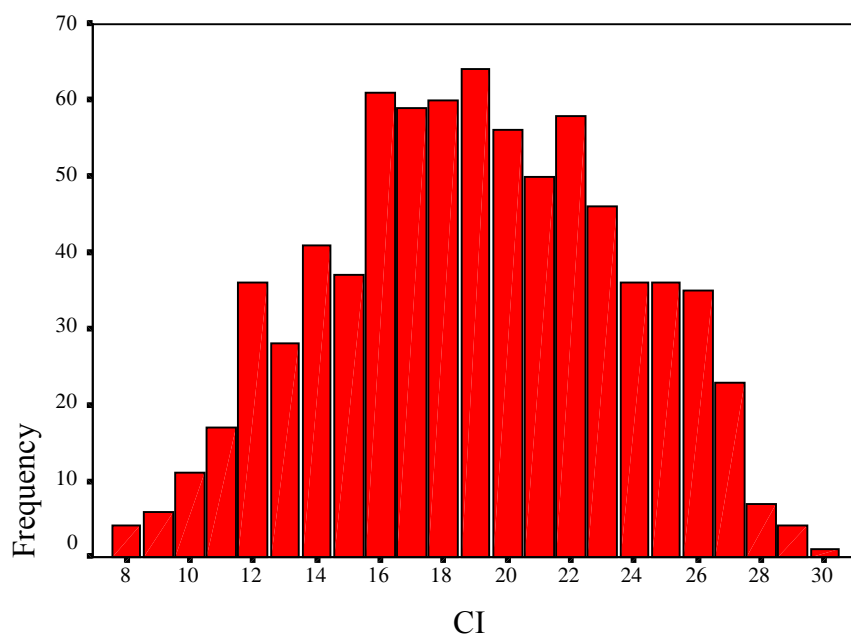
Figure 5. Graph showing frequency distribution of CI measure.

Health

Health was assessed using the results from six questions and the Sporting Involvement measure. The six questions were:

1. Self Rated Health - SRH (Q34). "How would you rate your present state of health?": 1 = Excellent, 2 = very good, 3 = good, 4 = fair, 5= poor.

2. Drink alcohol/month (Q44). "How often did you drink alcohol in the past month?": 1 = Not at all, 2 = only once a month, 3 = a few times a month, 4 = once a week, 5 = a few times a week, 6 = everyday.

3. Exercise (Q45). "How often did you exercise or participate in a fitness program in the past month?": 1 = Not at all, 2 = only once a month, 3 = a few times a month, 4 = once a week, 5 = a few times a week, 6 = everyday.

4. Do you smoke (Q46). "Do you smoke cigarettes regularly (that is, one or more per day)?": 1 = Yes, 2 = No.

5. Number smoke/day (Q46). "If yes how many have you smoked in the past 2 days?".

6. Sporting Involvement. The Sporting Involvement measure was summarised earlier (Page 58) and consisted of a scale ranging from 0 (low) to 12 (high).

One measure of health consisted of the response to the self-rating of their present state of health. The use of the scale in this way is supported by Idler and Benyamini (1997), who reviewed a large number of studies on health self-ratings, finding that such self-ratings provide a measure of global health status (from the respondents perspective) and which closely matched the reality of their health status. Ross and Wu (1996) stated that "self-reported health indicates general well-being, not merely the absence of disability or illness" (p.117). The form of the question asked in the majority of these studies closely matched the one used by Te Hoe Nuku Roa, the most common being "Would you say your health in general is: Excellent, Very Good, Good, Fair, Poor" (p. 23-24).

Correlations between the measures are summarised in Table 8 and Table 9. All the correlations were significant with the exception of the correlations between Drink Alcohol/Month and SRH, and Drink Alcohol/Month and both smoking measures. As would be expected, there were moderate correlations between Exercise and Sporting Involvement (r = .419, p<.001). The other correlations showed only weak relationships.

Table 8. Pearson correlations between health indicators.

	N	1	2	3	4
1 Self Rated Health	776				
2 Drink Alcohol/month	772	.049			
3 Number smoke/day	776	-.132***	.044		
4 Exercise	766	.254***	.129***	-.152***	
5 Sporting Involvement	772	.258***	.217***	-.093**	.419***

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

Table 9. t-test statistics, means and standard deviations for continuous health indicators across Do You Smoke.

		Yes (N=391)		No (N=380)	
	t	M	SD	M	SD
Self Rated Health	-5.08***	3.39	1.04	3.77	1.02
Drink Alcohol/month	1.6	2.63	1.38	2.48	1.32
Exercise	-4.69***	2.77	1.84	3.4	1.86
Sporting Involvement	-3.1**	1.33	1.03	1.57	1.06

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

Ethical Concerns

All participants in the survey completed consent forms that assured the participants of confidentiality, gave details of the purpose of the study, the information to be collected, and the use to which it would be put. Prior to commencement, the study was approved by Massey University Human Ethics Committee.

As this secondary analysis was conducted as part of the Te Hoe Nuku Roa study (subject to Te Hoe Nuku Roa guidelines), it was not necessary to gain independent ethics approval.

Results

Data screening

Before conducting analyses, the data was screened firstly for accuracy of data entry and missing values, and secondly that the assumptions necessary for multivariate analysis were met by the variable distributions. Furthermore, the analysis was restricted to those who answered "yes" to the question "Do you identify as Māori?"

The health indicators Amount of Alcohol/month (Drink Alcohol/Month), Used to Smoke/day and Number Smoke/Day were both positively skewed. Taking the square of Number Smoke/Day improved skewness markedly. Of the demographic data, Age, Education, Housing Status, Income, Job Status, Mobility, Crowding, and Sporting Involvement were positively skewed, while Gender was negatively skewed (reflecting more females than males in the sample). Square root transformations of Housing Status and Crowding also improved skewness noticeably (see Appendix A).

Checks for multivariate outliers revealed seven cases that met the use of $p<.001$ criterion for Mahalanobis distances. These cases were deleted, and the remainder retained for analysis (N=776).

Variable Recoding

Before any analyses were carried out, several categorical and ordinal variables were recoded as follows (further detail is provided in Appendix B):

Self rated health (SRH) was inverted to aid interpretation, meaning a higher score related to better health.

Region was also broken down into four dichotomous variables, corresponding to the sampling areas of Auckland, Gisborne, Manawatū/Whanganui, and Wellington.

Where appropriate, missing values were replaced by means, while this does reduce the variance of the measure, the distribution is left unchanged. This effectively reduces the size of the correlation the measure has with other variables (Tabachnick & Fidell, 1989).

Sample Description

A summary of the demographic data used in the analysis is presented in Table 10 through to Table 13, while

Table 14 and Table 15 summarise the health indicator variables. The number of valid observations varies for each variable, as the data gathered by the questionnaire was prone to missing values. Of the 958 adults surveyed, 776 valid cases remain after including only those who identified as Maori and cases with all necessary variables intact (as it was not possible to substitute the means of missing cases for categorical variables). The number of cases also dropped further depending on which variables (number smoke/day had only 378 valid cases) were included in the analysis.

In the sample, females were over represented (66.9%), when compared to census findings (Statistics New Zealand, 1996a; Statistics New Zealand, 1997) where Māori females make up 51% of the Māori population in the North Island. This may be due to survey difficulties in getting Māori males within the household being surveyed, to participate in the survey (Eljon Fitzgerald; Personal communication, January, 2001). Ages for the sample (15 to 81 years, mean = 34.4, SD = 12.3) are similar to 1996 census figures, although the sample clusters around the mean slightly more. Over forty one percent (41.1%) of the sample had no school qualifications, down from 47.1% for the general Māori population. This contrasted with 3.4% of the sample having a university qualification or teaching degree. The sample also showed large differences in Job Status between the genders, with 67.3% of Māori males

working compared to 50.3% of Māori females (census figures showed a smaller difference, 61.5% and 47.0% respectively). Looking at total income, 54.2% (the census figure was 35.9%) of Māori earned $15,000 or less, while only 2.5% earned $50,000 or more.

Table 10. Summary of gender, age and comparable census figures.

	Number of Respondents	Percentage of Respondents	1996 Census Results (Maori)
		Sample %	Comparable %
Gender			(North Island)
Male	257	33.1	49
Female	519	66.9	51
Total	**776**	**100**	**100**
Age (Years)			
<15	70	9.1	
15-19	110	14.2	15.8
20-24	113	14.6	14.5
25-29	140	18.1	13.2
30-34	109	14.1	12.8
35-39	90	11.6	11.1
40-44	46	6.0	8.6
45-49	35	4.5	6.8
50-54	23	3.0	4.9
55-59	21	2.7	4.2
60-64	16	2.1	3.1
Total	**773**	**100**	**100**

Over half of the sample (62.1%), were boarding or renting, 24.1% owned their own house, but were still paying off a mortgage, while 13.7% were freehold. The frequency with which the respondents changed their address over the last 3 years had over half the sample (52.3%) staying at the same address over the time-period, 14.1% moved once, 11.9% moved twice, with only 2.7% shifting more than 6 times. Assessing how many lived in the house, revealed figures similar to those found by the 1996 census, 2.0% lived by themselves, 29.6% lived with one or two others, dropping to 10.8% having eight or more people living in the same house. The regional distribution of the respondents was similar to the census figures for Auckland and Wellington, with Gisborne being slightly over-represented (13.8% compared to 8.2% in the census).

Table 11. Summary of Education, Job Status, income and comparable census fugures.

	Number of Respondents	Percentage of Respondents	1996 Census Results (Maori)
		Sample %	Comparable %
Educational Qualification			
No school qualification	319	41.1	47.1
School certificate or correspondence	129	16.6	NA
UE, polytechnic, or Marae based training	267	34.4	NA
Bursary, scholarship, or tribal wānanga	35	4.5	NA
University or teaching qualification	26	3.4	NA
Total	**776**	**100**	
Job Status			
Male			
Paid job, business, or own a farm	173	67.3	61.5
Not working	84	32.7	38.5
Female			
Paid job, business, or own a farm	261	50.3	47.0
Not working	258	49.7	53.0
Total	**776**		
Annual Income			
$0 - $2,500	49	9.2	NA
$2,501 - $5,000	22	4.1	NA
$5,001 - $7,500	55	10.3	NA
$7,501 - $10,000 ($0 - $10,000)[3]	83	15.6 (39.2)	NA (23.2)
$10,001 - $15,000	80	15.0	12.7
$15,001 - $20,000	59	11.1	12.9
$20,001 - $25,000	51	9.6	13.7
$25,001 - $30,000	57	10.7	13.6
$30,001 - $40,000	44	8.3	13.5
$40,001 - $50,000	20	3.8	5.6
$50,001 - $70,000	9	1.7	3.0
$70,001 - $100,000	2	0.4	0.9
>$100,000	2	0.4	0.8
Total	**533**	**100**	**100**

[3] Census figures included only the $0 to $10,000 category. Figures in brackets are the comparable figures for Te Hoe Nuku Roa and Census in the $0 to $10,000 category.

Table 12. Summary of Housing Status, Mobility, Crowding and comparable Census figures.

	Number of Respondents	Percentage of Respondents	1996 Census Results
		Sample %	Comparable %
Housing Status			
Boarding/Renting	435	62.1	47.6
Mortgage	169	24.1	39.3
Freehold	96	13.7	13.1
Total	**700**	**99.9**	**100**
Times in last 3 years have moved (Mobility)			
0	370	52.3	NA
1	100	14.1	NA
2	84	11.9	NA
3	63	8.9	NA
4	33	4.7	NA
5	27	3.8	NA
6	16	2.3	NA
7	2	0.3	NA
8	1	0.1	NA
9	5	0.7	NA
10	5	0.7	NA
>10	1	0.1	NA
Total	**707**	**99.9**	
How many live in the household (Crowding)			
1	13	2.0	3.7
2	85	13.1	13.9
3	107	16.5	18.6
4	155	24.0	22.9
5	99	15.3	17.9
6	93	14.4	11.1
7	23	3.6	5.8
8 (8+)[4]	50	7.7 (10.8)	(6.3)
9	12	1.9	NA
10	8	1.2	NA
11	1	0.2	NA
13	1	0.2	NA
Total	**647**	**100.1**	

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[4] In the Census, households with more than 8 people resident were included in the 8+ category. Figures in brackets allow Census figures to be compared to Te Hoe Nuku Roa figures.

Table 13. Summary of Exercise, Identify as Maori, region and comparable Census fiigures.

	Number of Respondents	Percentage of Respondents	1996 Census Results
		Sample %	Comparable %
Improve Health through exercise in past month			
Not at all	288	37.6	NA
Only once a month	49	6.4	NA
A few times a month	87	11.4	NA
Once a week	75	9.8	NA
A few times a week	193	25.2	NA
Everyday	74	9.7	NA
Total	**766**	**100.1**	
Identify Māori			
Yes	903	94.5	NA
No	53	0.5	NA
Total	**956**	**100**	
Region			
Auckland	369	47.6	53.7
Gisborne	107	13.8	8.2
Manawatū/Whanganui	150	19.3	17.0
Wellington	150	19.3	21.1
Total	**776**	**100**	

Self rated health was mildly negatively skewed, with respondents tending to rate their health positively (21.8% described their health as excellent, while 3.5% described their health as poor). Alcohol consumption in the past month ranged from 30.3% of respondents drinking nothing, to 11.7% of respondents drinking a few times a week, while only five people (0.6%) in the sample drank everyday. Smoking history was broken down by gender in Table 16, showing 52.0% of female respondents (47.4% of female respondents in the census) smoked, compared to 40.0% of male respondents (39.7% of male respondents in the census). Over forty percent (42.7%) of respondents smoked between 0 and 5 cigarettes/day, while 13.9% smoked between 16 and 20 cigarettes/day. The remainder of the distribution showed somewhat smaller percentages, with the cluster at 16 to 20 cigarettes/day possibly reflecting a

common response of "about a packet a day". A large proportion of the sample (37.6%) stated

that they did not attempt to improve their health through exercise, with 25.2% exercising a

few times a week, and 9.7% exercising everyday. Sporting Involvement showed a positively

skewed distribution, with the majority having little involvement in sport (55.9% of the

participants scored between 0 and 2 on a scale with a maximum of 12).

Table 14. Summary of Self Rated Health, How often did you drink alcohol in the past month, Do you smoke cigarettes and have you ever smoked cigarettes.

	Number of Respondents	Percentage of Respondents
		Sample %
Self Rated Health		
Poor	27	3.5
Fair	86	11.1
Good	245	31.6
Very good	249	32.1
Excellent	169	21.8
Total	**776**	**100.1**
How often did you drink alcohol in the past month		
Not at all	234	30.3
Only once a month	151	19.6
A few times a month	215	27.9
Once a week	77	10.0
A few times a week	90	11.7
Everyday	5	0.6
Total	**772**	**100.1**
Do you smoke cigarettes		
Yes	391	50.7
No	380	49.3
Total	**771**	**100**
Have you ever smoked cigarettes		
Yes	198	46.8
No	225	53.2
Total	**423**	**100**

Table 15. Summary of how many do you smoke/day, How many did you used to smoke/day, and Sporting Involvement.

	Number of Respondents	Percentage of Respondents
		Sample %
How many do you smoke/day		
0-5	242	42.7
6-10	41	7.2
11-15	36	6.3
16-20	79	13.9
21-25	25	4.4
26-30	38	6.7
31-35	5	0.9
36-40	60	10.6
41+	41	7.2
Total	**567**	**99.9**
How many did you used to smoke/day		
0-5	19	18.1
6-10	28	26.7
11-15	14	13.3
16-20	20	19.0
21-25	10	9.5
26-30	10	9.5
31-35	1	1.0
36-40	3	2.9
41+	0	0
Total	**105**	**100**
Sporting Involvement		
0 (Low)	172	22.2
1	151	19.5
2	110	14.2
3	38	4.9
4	53	6.8
5	63	8.1
6	61	7.9
7	26	3.4
8	36	4.6
9	20	2.6
10	38	4.9
11	6	.8
12 (High)	2	.3
Total	**776**	**100**

Table 16. Summary of smoking history and comparable census figures for Māori by gender.

	Percentage of Sample	1996 Census Results (%)
Smoking History		
Male		
Currently smoking	40.0	39.7
Used to smoke	24.6	17.6
Never smoked	35.5	42.6
Female		
Currently smoking	52.0	47.4
Used to smoke	24.2	17.6
Never smoked	23.8	35.0

Analyses

The statistical package, SPSS for windows (SPSS Inc, 1999), was used to examine the data and the relationships between the variables in line with the research aims and hypotheses outlined on page 51. Firstly, simple correlations between the variables were calculated, and t-tests and Chi-Square were conducted to examine the relationships between the demographic, sport, and cultural identity variables to five of the health indicator variables (SRH, alcohol consumption, do you smoke, number smoke/day, and Exercise). Finally, a series of hierarchical linear regressions were performed, examining the relationships of demographic, sport, and cultural identity variables to the five health indicator variables. The aims and hypotheses presented on page 51 were then examined in light of the analysis findings.

Bivariate Analyses

Simple correlations between the DVs and the continuous variables (using Pearson correlations) are provided in Table 17. Additionally, Table 18, Table 19, and Table 20 summarise the results of the t-tests examining the relationships of the categorical IVs (Gender, Health Insurance, and Job Status) to the continuous variable CI, and the continuous

DVs. Chi-square tests (Table 22) were undertaken on Gender, Health Insurance, and Job Status, comparing them to Do You Smoke. A description of the findings are presented below

Cultural Identity

Cultural Identity was significantly correlated to Age ($r = .209$, $p<.01$), Health Insurance ($t = 2.18$, $p<.05$), and Income ($r = .098$, $p<.01$). There were also significant correlations with Alcohol Consumption ($r = -.109$, $p<.01$) and Number Smoke/Day ($r = .118$, $p<.01$). Cultural Identity showed no relationship to Gender or Job Status.

These relationships show that older participants, those with Health Insurance, and those with a higher income have a higher CI score. Additionally, a higher CI was related to lower alcohol consumption and a higher current smoking rate.

Self Rated Health

Self Rated Health was significant across Age ($r = -.157$, $p<.01$), Education ($r = .105$, $p<.01$), Housing Status ($r = .075$, $p<.05$), Crowding ($r = .089$, $p<.05$), and Sporting Involvement ($r = .268$, $p<.01$). This indicates that those who are better educated, own their own home, have more people living with them, and those with a high involvement in sport, rate their health as better. The negative correlation with Age indicates that older respondents rate their health as worse.

Self Rated Health also showed significant differences across Health Insurance ($t = 2.25$, $p<.05$), and Job Status ($t = 3.73$, $p<.001$). Examining the means showed that participants with Health Insurance rated their health as better than those who did not have Health Insurance, while those who were currently employed also rated their health better than those who did not have a job.

Alcohol Consumption

Alcohol consumption was significantly correlated with Age (r = -.252, p<.01), Housing Status (r = -.122, p<.01), Mobility (r = -.082, p<.05), Sporting Involvement (r = .210, p<.01), and CI (r = -.109, p<.01).

Describing these correlations in more detail, older participants drank less often, owning your own home was correlated with lower alcohol consumption, those who changed their address less often drank less, while those who were more involved in sport drank more frequently. A higher CI was also related to a lower alcohol consumption.

Alcohol also showed significant differences across Gender (t = 4.35, p<.001) and Job Status (t = 3.71, p<.001). Examining the means showed that males drank more frequently than females, and those who were working also drank alcohol more often.

Exercise

Exercise demonstrated correlations with Age (r = -.144, p<.01), Education (r = .150, p<.01), Sporting Involvement (r = .422, p<.01), Alcohol Consumption (r = .129, p<.01), and Number Smoke/Day (r = -.171, p<.01). These correlations indicate that older respondents exercised less often, those with a better education exercised more frequently, and those who exercised were more likely to be involved in sport, drink more, and smoke less.

Exercise also showed significant differences across Gender (t = 2.25, p<.05) and Job Status (t = 3.41, p<.001). The means between these groups indicated that Males exercised more often than Females, while those who were working also exercised more often than those who did not have a job.

Sporting Involvement

Sporting Involvement showed significant correlations with Age (r = -.273, p<.01), Education (r = .168, p<.01), Income (r = .084, p<.05), and Crowding (r = .085, p<.05). There were also correlations with SRH (r = .268, p<.01), Drink Alcohol/Month (r = .210, p<.01), Number Smoke/Day (r = -.090, p<.05), and Exercise (r = .478, p<.01). This suggests that

those who are more involved in sport were younger, better educated, better paid, lived with more people, rated their health better, drank more alcohol, smoked less, and exercised more.

Sporting Involvement also showed significant differences across Gender (t = 4.86, p<.001) and Job Status (t = 6.83, p<.001). Examining the means for these groups shows that males were more involved in sport than females, while those with jobs were also more involved in sport than those not currently employed.

Number Smoke/Day

Number Smoke/Day showed no significant relationships with other variables.

Table 17. Pearson correlations between demographics, sports involvement, cultural identity, and health indicators, for those variables included in the regression analysis.

	N	1	2	3	4	5	6	7	8	9	10	11
1 Age	776											
2 Education	776	-.210**										
3 Total Income	776	.148**	.035									
4 Housing Status	776	.424**	.023	.177**								
5 Mobility	776	-.294**	.079*	-.109**	-.407**							
6 Crowding	776	-.212**	-.025	-.028	-.087*	-.009						
7 Sporting Involvement	776	-.273**	.168**	.084*	-.026	-.003	.085*					
8 Cultural Identity	776	.209**	.009	.098**	.066	-.036	.060	-.033				
9 self rated health	776	-.157**	.105**	.034	.075*	-.015	.089*	.268**	.007			
10 Drink Alcohol/month	772	-.252**	-.023	.051	-.122**	.082*	-.019	.210**	-.109**	.049		
11 Number Smoke/Day	378	.031	-.062	.094	-.073	.024	.064	-.018	.022	-.008	.081	
12 Exercise	766	-.148**	.154**	.059	.037	-.015	.028	.478**	-.039	.254	.129**	-.049

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

Table 18. t-test statistics, means and standard deviations for continuous Health Indicators across Gender.

		Gender					
		Male			Female		
	t	N	M	SD	N	M	SD
CI	-1.82	257	18.55	4.51	519	19.18	4.61
SRH	0.29	257	3.591	1.04	519	3.57	1.07
Drink AlcoholMonth	4.35***	257	2.85	1.38	519	2.40	1.31
Number Smoke/Day	1.91	105	27.87	14.78	273	24.46	15.89
Exercise	2.25*	257	3.29	1.84	519	2.97	1.88
Sporting Involvement	4.86***	257	1.70	1.10	519	1.31	1.00

***p<.001, *p<.05

Table 19. t-test statistics, means and standard deviations for continuous Health Indicators across Health Insurance.

		Health Insurance					
		Yes			No		
	t	N	M	SD	N	M	SD
CI	2.18*	192	19.60	4.84	581	18.77	4.49
SRH	2.24*	192	3.72	.96	581	3.52	1.08
Drink AlcoholMonth	0.62	192	2.60	1.33	581	2.53	1.36
Number Smoke/Day	-0.29	73	4.76	1.48	304	4.82	1.55
Exercise	1.34	192	3.23	1.84	581	3.02	1.88
Sporting Involvement	1.21	192	1.52	1.03	581	1.42	1.06

*p<.05

Table 20. t-test statistics, means and standard deviations for continuous Health Indicators across Job Status.

		Job Status					
		Working			Not Working		
	t	N	M	SD	N	M	SD
CI	-1.67	434	18.73	4.61	342	19.28	4.54
SRH	3.73***	434	3.70	.97	342	3.42	1.13
Drink Alcohol/Month	3.71***	434	2.71	1.32	342	2.35	1.37
Number Smoke/Day	-1.22	195	4.71	1.57	183	4.90	1.50
Exercise	3.41***	434	3.28	1.87	342	2.82	1.84
Sporting Involvement	6.83***	434	1.67	1.01	342	1.16	1.04

***p<.001, *p<.05

Do You Smoke

Do You Smoke showed significant differences across Gender (χ^2 = 11.68, p<.001), Health Insurance (χ^2 = 7.55, p<.05), and Job Status (χ^2 = 5.78, p<.001). Examining graphs (Figure 6) of these relationships, it appears that females are more likely to smoke than males, those who have Health Insurance are more likely to smoke, and that those who have a job are less likely to smoke. Age (t = -3.21, p<.001), Education (t = -4.09, p<.001), Housing Status (t = -6.70, p<.001), Mobility (t = 3.15, p<.01), Crowding (t = 2.26, p<.05), Sporting Involvement (t = -3.10, p<.01), and Exercise (t = -4.69, p<.001) also proved significant. Looking at how the means differ between those who smoke and those who don't: younger participants were more likely to smoke than older participants; those with a higher education were less likely to smoke; participants who owned their own home were less likely to smoke; those who changed address frequently were more likely to smoke; higher levels of Crowding was related to a greater chance of smoking; those participants who exercised more or were more involved in sport were also less likely to smoke.

Table 21. t-test statistics, means and standard deviations for continuous demographics across Do You Smoke.

<table>
<tr><td></td><td colspan="7" align="center">**Do You Smoke**</td></tr>
<tr><td></td><td></td><td colspan="3" align="center">**Yes**</td><td colspan="3" align="center">**No**</td></tr>
<tr><td></td><td>**t**</td><td>**N**</td><td>**M**</td><td>**SD**</td><td>**N**</td><td>**M**</td><td>**SD**</td></tr>
<tr><td>**Age**</td><td>-3.21***</td><td>391</td><td>33.07</td><td>10.82</td><td>380</td><td>35.88</td><td>13.43</td></tr>
<tr><td>**Education**</td><td>-4.09***</td><td>391</td><td>0.97</td><td>1.01</td><td>380</td><td>1.29</td><td>1.18</td></tr>
<tr><td>**Income**</td><td>-1.28</td><td>391</td><td>4.31</td><td>2.02</td><td>380</td><td>4.51</td><td>2.34</td></tr>
<tr><td>**Housing Status**</td><td>-6.70***</td><td>391</td><td>0.34</td><td>0.50</td><td>380</td><td>0.60</td><td>0.57</td></tr>
<tr><td>**Mobility**</td><td>3.15**</td><td>391</td><td>0.89</td><td>0.88</td><td>380</td><td>0.70</td><td>0.80</td></tr>
<tr><td>**Crowding**</td><td>2.26*</td><td>391</td><td>2.12</td><td>0.42</td><td>380</td><td>2.05</td><td>0.43</td></tr>
<tr><td>**Sporting Involvement**</td><td>-3.10**</td><td>391</td><td>1.33</td><td>1.03</td><td>380</td><td>1.57</td><td>1.06</td></tr>
<tr><td>**Exercise**</td><td>-4.69***</td><td>391</td><td>2.77</td><td>1.84</td><td>380</td><td>3.40</td><td>1.86</td></tr>
<tr><td>**CI**</td><td>1.378</td><td>391</td><td>19.19</td><td>4.30</td><td>380</td><td>18.74</td><td>4.85</td></tr>
</table>

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

Table 22. Chi-square statistic for Gender, Health Insurance, and Job Status across categorical Health Indicators.

	Gender	Health Insurance	Job Status
Do You Smoke	11.68***	7.55**	5.78***

***p<.001
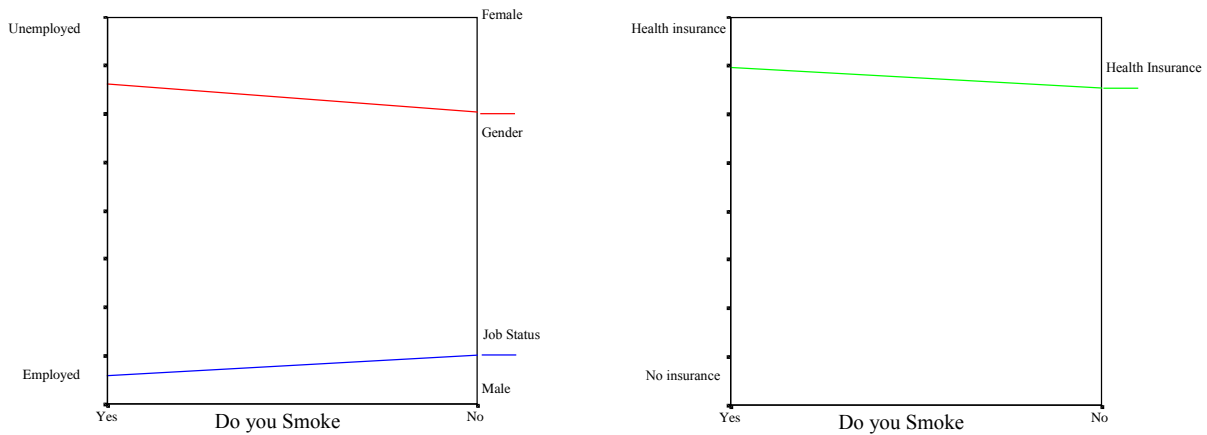
Figure 6. Graphs showing how Job Status, gender, and Health Insurance vary over Do You Smoke.

Regression Analyses

As none of the variables in the regression analyses reached correlations greater than .5, collinearity issues were not deemed to threaten the validity of the regression results. Additionally, a note of any large variance inflation factors (VIF) is included with the regression summary to indicate unusually large correlations between any single predictor and linear combinations of the other predictors in the regression model. While it is difficult to obtain a 'threshold' value with which to determine how large the VIF value must get before being labelled a problem (when there is no correlation, $VIF_j = 1.00$, where j is the predictor of interest in the model), Hocking (1996) suggests that an indication of a near-linear relationship between predictors is a VIF of greater than 10 for the measure being examined. Given these criteria, the removal of any predictor for collinearity issues was on a case-by-case basis and was based on the size of the VIF, and its relationships to other predictors in the model.

A series of hierarchical linear regressions were used to assess the contribution of the independent variables (demographics and cultural identity) to the health indicator variables (SRH, Sporting Involvement, smoking behaviour, and alcohol consumption). Sporting Involvement had a special role in the regressions, as it was employed as a predictor for the regressions upon SRH, and smoking behaviour, and then was regressed upon as a DV (and removed from the predictors). Hierarchical linear regression allowed the researcher control over the order of entry of independent variables. By calculating the change in R^2 when blocks of IVs are entered into the regression, an estimate of the variance accounted for can be found (Norusis, 1992). While this method does allow control of variables to ascertain the unique contribution of a variable(s) on a given dependent variable, a causal (or theoretically driven) model is absolutely essential in governing the order of entry of the variables (Pedhazur, 1997). In addition, while valid comparisons can be made between the amount of variance accounted for with the addition of each block of variables, it is not valid to make comparisons between variables to assess their effect size or relative importance (Pedhazur). For all of the regressions performed, the demographic variables were entered first (holding these variables constant), followed by the cultural indicators, and finally the interaction terms were added. The order of entry was determined by the research questions raised on page 51. Firstly, the influence of the demographic variables on the health indicators was ascertained at step one. Secondly, CI was added, giving an estimate of the amount of variance accounted for by CI and its significance when controlling for demographics. Finally, moderating relationships were tested for with the addition of the interaction terms.

Pedhazur (1997, p.289) notes that variables omitted from the model (which are represented by the error term) are assumed to be uncorrelated with the variables that are in the regression. The exclusion of a correlated variable will lead to bias in the estimation of the coefficient for the other correlated variables still in the regression. A common strategy in dealing with this problem is the inclusion of all variables (despite having no theoretical

grounds for doing so). This also has consequences - a reduction in the degrees of freedom (and the consequent increase in the standard error), and larger coefficients for relevant variables that are correlated with irrelevant variables (than when the irrelevant variables are not included in the regression). When deciding whether to include a particular interaction term in the regression, an assessment should be made of whether the interactions between the variables "add meaningfully and significantly to the proportion of variance accounted for by the variables themselves" (Pedhazur, p.496). This is generally done by adding in the interaction term as the final step in a hierarchical analysis, and examining the increment in variance the addition of the interaction term brings, if significant the interaction remains in the model. Pedhazur notes that when an interaction proves significant, it is no longer meaningful to interpret the main effects (that is, the main effects contained in the interaction term), leaving only contrasts between the factors in the interaction term to be interpreted.

For the present study, only those interactions deemed theoretically probable were included (refer page 49). As the primary purpose of the analysis was not to account for the largest amount of variance in the health indicator variables, but rather to assess whether there existed a relationship between the cultural indicators, health indicators and the demographic variables, the omission of other possible interaction terms (and the consequent reduction in variance accounted for) from the model was considered acceptable.

The generation of a small maximum model is particularly important when the primary purpose of the model is to assess the importance of a few variables. Kleinbaum, Kupper, Muller and Nizam (1998) suggest several constraints on the number of predictors in the regression model, the weakest being that the error degrees of freedom must be positive. This is written as d.f. error $= n - k - 1 > 0$, or $n > k + 1$. As this is too weak to be of practical use, a minimum requirement of $n \geq 10 + k + 1$ (where n is the sample size, and k is the number of predictors) is suggested, while a stronger form exists of $n \geq 10k$. A suggested rule of thumb is $n \geq 5k$. The problem in reducing the number of predictors in the model is a greater

likelihood of making a Type II error (saying there is no effect or relationship when there is one). The benefit in reducing the number of predictors (from the maximum model containing all the variables in the study) is to avoid including "practically unimportant but statistically significant predictors" (Kleinbaum, Kupper, Muller & Nizam, p.389). Adapting the stronger formula for the present study (Figure 7) shows that the sample size is more than adequate.

$$\rightarrow n \geq 10k \qquad \text{where} \quad n = \text{sample size}$$

$$\rightarrow 772 \geq 10 \times 20 \qquad k = \text{number of predictors}$$

$$\rightarrow 772 \geq 200$$

Figure 7. Equation showing minimum sample size.

Therefore, the requirement for the minimum number of predictors is met. Unfortunately, the measures Used to Smoke and Used to Smoke/Day had a sample size of only 104, (reflecting how many used to smoke and have now stopped smoking), and so were not used in the regressions.

In the present study, a series of regressions were performed; the first was an all-in linear regression assessing the impact of the demographic, Sporting Involvement and Exercise measures on CI. The following regressions were hierarchical multiple linear regressions on the health indicators with demographics, Sporting Involvement (except the regression on Sporting Involvement), and Exercise entered first, then CI, with the interactions entered last. The Sporting Involvement and Exercise measures were entered with the demographics as they were factors related to most areas of health, and as Pedhazur (1997) noted, the exclusion of any correlated variables may lead to bias in the estimation of the predictors.

A summary of the results from the regressions is provided, which includes R, R^2, Adjusted R^2, R^2 change (where appropriate), significance levels, Betas, and a note of the

largest variance inflation factors (VIF) obtained. The regressions on Alcohol Consumption, Exercise and Number Smoke/Day are not included in the summary of the results, as they did not show any significant relationship with CI or the hypothesised interaction effects (they are included in Appendix E for reference purposes).

A power analysis[5] revealed that all regressions performed had a power of 0.999 or better, meaning the regression analyses had less than a 0.1% chance of making a Type II error (saying there is no effect, when there is one).

Cultural Identity Regression

In order to assess the contribution of demographics on Cultural Identity, an all-in multiple regression was performed. Table 23 provides a summary of the results of the hierarchical regression using this model.

The results from the regression found that demographics were significantly related to cultural identity, adjusted $R^2 = 6.8\%$, $\underline{F}(11,761) = 6.15$, $p<.001$. Of these Age, Job Status, Income, and Crowding were significantly related to CI. As the largest VIF obtained was only 1.51, collinearity was not considered a problem.

Interpreting the significant betas revealed that increasing age, not having paid work, higher income, and more Crowding were all related to a higher CI.

Summary

Research aim one was to investigate the relationship between demographic factors and CI. Increasing age, higher income, and greater Crowding were related to higher CI, although only 6.8% of the variance of CI was accounted for the demographic factors. This differed from the bivariate analyses where Health Insurance was also found to be significantly

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[5] Power analyses were performed using GPOWER (Faul & Erdfelder, 1992).

correlated with CI, while Crowding which was not significant at the bivariate level was found to be significantly related in the regression to CI.

Hypothesis one was supported, more people living in the household was significantly related to a higher CI.

Table 23. Multiple regression of demographics on CI showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=772).

	Model
Predictors	**1**
Demographics	
Age	.256***
Gender	.066
Health Insurance	-.027
Education	.066
Paid job or business or farm	-.112**
Total Income	.110**
Board/rent, mortgage, freehold	-.024
Times in last 3 years have moved	.026
How many Live In the Household	.114**
Sporting Involvement	.052
Exercise	-.029
R	.286***
Total R^2	.082
Adjusted R^2	.068
R^2 change	.082***

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

Note: The largest VIF obtained was $VIF_{Age} = 1.51$

Health Indicator Regressions

In order to assess the contribution of each block of variables on the health indicators, a combination of hierarchical and stepwise regression analyses were employed. After controlling for the demographic variables, Sporting Involvement and Exercise, the impact of CI was assessed. Finally, the theorised interaction effects (refer page 49) were entered.

Detailed below (Figure 8) is a summary of the interaction effects to be tested for in the regression analyses. This was done, as the number of interaction effects possible from a model containing 26 variables is huge. Rather than calculating every possible (2-way) interaction, bringing the danger of spurious correlations, only those deemed theoretically possible were included (refer to page 48 for the rationale).

CI x Crowding

CI x Mobility

CI x Housing Status

CI x Income

CI x Job Status

CI x Age

Age x House Status

Age x Job Status

Age x Crowding

Figure 8. Theorised interaction effects.

Standardised beta coefficients for each variable within the blocks are then reported. Total variance (R^2 and adjusted R^2) explained by each step of the equation is listed, as well as the additional variance explained by each step (R^2 change) while controlling for the variables added in previous steps. The beta coefficients at each step allow the effect of individual variables on the dependent variable within each block of variables to be assessed, and with each step, how this relationship changes.

The regressions for Drink Alcohol/Month, Number Smoke/Day, and Exercise showed no significant increase in variance accounted for with the addition of the CI measure or the interaction measures. As the purpose of the study was to examine the relationship of CI with

these health indicators, summaries of these regressions are not included in the results and are provided in Appendix E. SRH was included with the results, despite showing no significant relationship with CI, because of the valuable information the regression gave about the relationship of the demographics to the only global measure of health in the analyses.

Self Rated Health

Table 24 provides a summary of the results of the regression. For this regression, R was significantly different from zero at each step. Additionally, as the largest VIF obtained was only 1.97, collinearity was not considered an issue.

After step one, 11.1% of variance (adjusted R^2) in SRH was accounted for by the demographic variables, $\underline{F}(11,756) = 9.68$, p<.001. Following step two, with the addition of CI, total variance explained (adjusted R^2) did not change, R^2 change = 0.1%, $\underline{F}(1,755) = 1.20$, p<.273. Finally, with the addition of the interaction effects, total variance explained rose to 12.0%, which was a non-significant increase ($\underline{F}(10,746) = 2.84$, p<.057). Accordingly, the significant relationships with SRH from step one of the regression were Age, Housing Status, Sporting Involvement, and Exercise. All showed relationships in the expected directions: being younger, improved housing (home ownership), more exercise, and more involvement with sport were all correlated with a better SRH.

Summary

Hypothesis Two was not supported; a higher CI was not positively correlated with a higher SRH.

Hypotheses 3.1, 3.5, 3.7 and 3.8 were supported. A better SRH was related to being younger, owning a home, more exercise, and a greater involvement in sport. Similar relationships were found in the bivariate results, except that SRH was also positively correlated with Education and Crowding, and showed no relationship with exercise.

Table 24. Hierarchical multiple regressions of demographics, cultural identity, and interaction effects on self rated health showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=767).

	Steps		
Predictors	**1**	**2**	**3**
Demographics			
Age	-.128**	-.138***	-.137**
Gender	.049	.046	.043
Health Insurance	-.042	-.041	-.041
Education	.012	.009	.013
Job Status	.061	.066	.075
Total Income	-.007	-.012	-.009
Housing Status	.111**	.112**	.089*
Mobility	.017	.017	.008
Crowding	.060	.055	.046
Sporting Involvement	.141***	.138***	.124**
Exercise	.161***	.162***	.158***
Cultural indicators			
Cultural identity		.039	.040
Interactions			
CI x Crowding			.025
CI x Mobility			.008
CI x Housing Status			-.069
CI x Income			-.089*
CI x Job Status			.015
CI x Age			.016
Age x House Status			.067
Age x Job Status			-.044
Age x Crowding			.020
R	.351***	.353***	.379***
Total R^2	.123	.125	.144
Adjusted R^2	.111	.111	.120
R^2 change	.123***	.001	.019

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

Note: The largest VIF obtained was $VIF_{Housing\ Status}$ = 1.97

Do You Smoke

Table 25 provides a summary of the results of the regression of demographics, CI, and interaction effects on Do You Smoke. For this regression, R was significantly different from zero at each step. Additionally, as the largest VIF obtained was only 1.98, collinearity was not considered an issue.

After step one, 10.5% of variance (adjusted R^2) in Do You Smoke was accounted for by the demographic measures, $\underline{F}(11,753) = 9.17$, p<.001. With the addition of CI at step two, total variance explained rose to 10.8%, $\underline{F}(12,757) = 8.72$, p<.001, however this was not significant ($\underline{F}(1,752) = 3.48$, p<.06.) The addition of the interaction effects significantly increased variance accounted for ($\underline{F}(22,742) = 5.88$, p<.001) to 11.8%, R^2 change = 2.0%, $\underline{F}(9,743) = 1.96$, p<.042.

At step one Age, Gender, Education, and Housing Status were significant. By step three, Exercise, CI, and CI x Age had become significant, with Gender, Education, Housing Status, and Exercise also remaining significant. The effect of Age appears to be primarily due to its interaction with CI, as Age became non-significant with the addition of the CI x Age interaction, and CI became significant.

Examining the significant beta coefficients in more detail, females were more likely to smoke, and a higher education meant there was a greater likelihood of not smoking. Owning your own home was also related to a greater chance of not smoking. With increasing levels of exercise, there was again a lower chance of smoking. The significant beta for CI would be due to the significant interaction between CI and Age, where those aged 14 to 38[6] with a higher CI tended not to smoke compared to the same age group with a low CI. Participants

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[6] The grouping criteria used was a percentage split, with approximately a third of the participants in each age group. The age groups being: 14 to 27, 28 to 38, & 39+.

older than 38 years of age showed no difference in smoking behaviour between low and high CI scores (Figure 9 shows the relationship most clearly, graphs with smaller and more age groupings showed the same trends, though less clearly).

Summary

Again, in line with research aim three Gender, Education, Housing Status, and Exercise were significantly related to "Do You Smoke", supporting hypotheses 3.2, 3.5, and 3.8. Where being female, being less educated, and renting meant a greater likelihood of smoking. Those who exercised more often were also less likely to smoke. The bivariate analyses found similar relationships between Gender, Education, Housing Status, and Exercise, although the bivariate relationships between Do You Smoke and Mobility, Crowding and Sporting Involvement were not significant in the regression on Do You Smoke. Age, while significant at the bivariate level, appears to be a function of the interaction effects and the relationship between Age and CI on Do You Smoke in particular.

Hypothesis 2.1 was not supported; any relationship that exists between CI and Do You Smoke is spurious and due to the moderating effect of CI on the relationship between age and current smoking behaviour (research sub-aim 4.1). For younger participants, having a high CI meant a greater chance of not smoking, while older (39 years of age or more) respondents did not show any differences between high and low CI.

CI and the interaction effects only increased variance accounted for by 2%. While this was a significant increase, it is relatively trivial.

Table 25. Hierarchical multiple regressions of demographics, cultural indicators, and interaction effects on "Do You Smoke" showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=764).

	Steps		
Predictors	**1**	**2**	**3**
Demographics			
Age	.104*	.121**	.082
Gender	-.113***	-.109**	-.109**
Health Insurance	-.002	-.004	-.010
Education	.139***	.143***	.147***
Job Status	-.020	-.028	-.020
Total Income	-.033	-.026	-.011
Housing Status	.181***	.179***	.175***
Mobility	-.021	-.019	-.020
Crowding	-.054	-.047	-.052
Sporting Involvement	.052	.058	.065
Exercise	.122	.120**	.111**
Cultural indicators			
Cultural identity		-.066	-.089*
Interactions			
CI x Crowding			.058
CI x Mobility			.054
CI x Housing Status			.003
CI x Income			.034
CI x Job Status			.026
CI x Age			.120**
Age x House Status			-.009
Age x Job Status			.058
Age x Crowding			-.029
R	.344***	.350***	.377***
Total R^2	.118	.122	.142
Adjusted R^2	.105	.108	.118
R^2 change	.118***	.004	.020*

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

Note: The largest VIF obtained was $VIF_{Housing\ Status}$ = 1.98
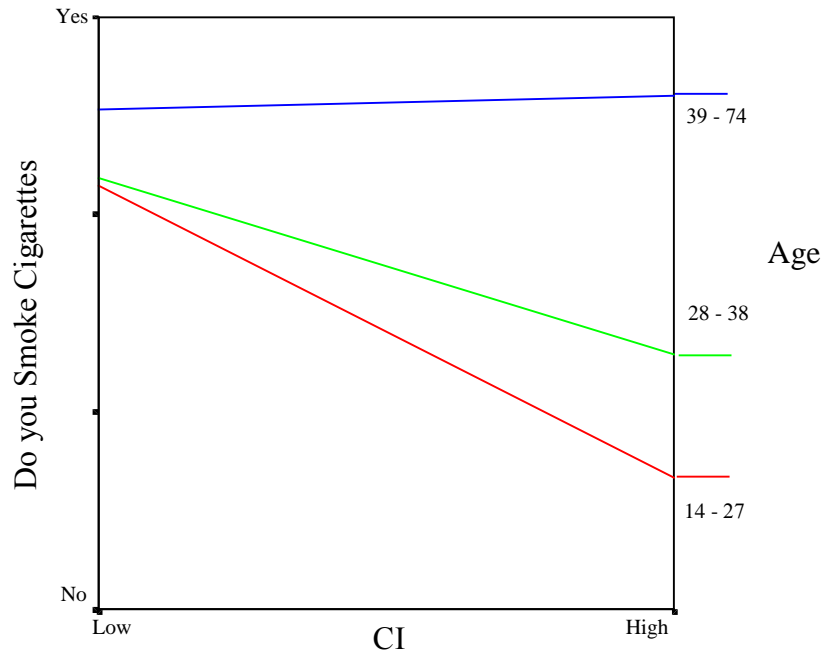
Figure 9. The interaction between CI and Age on Do You Smoke.

Sporting Involvement

Table 26 provides a summary of the results of the regression of demographics, CI, and interaction effects on Sporting Involvement. For this regression, R was significantly different from zero at each step. Additionally, as the largest VIF obtained was only 1.95, collinearity was not considered an issue.

After step one, 26.7% of variance (adjusted R^2) in Sporting Involvement was accounted for by the demographics, $F(10,757) = 23.54$, $p<.001$. The addition of CI at step two, brought no change to adjusted R^2, $F(1,756) = 3.52$, $p=.061$. The addition of the interaction effects ($F(20,747) = 16.204$, $p<.001$) at step three brought an R^2 change of 2.3%, $F(9,747) = 2.70$, $p<.01$.

By step three, after CI and the interaction effects had been added; the main effects Age, Gender, Education, Job Status, Exercise, CI were all significant. The moderating effects of CI and Housing status on Sporting Involvement, and Age and Crowding on Sporting Involvement, were also significant.

The bivariate analyses also found significant correlations between Age, Gender, Education, Job Status, and Exercise.

Examining the significant beta coefficients in more detail, a higher involvement in sport was associated with being younger, higher Education, having paid employment, and exercising more frequently. Males were also more likely to be involved in sport than females. A higher CI was positively correlated with more Sporting Involvement, but as the moderating effect CI x Housing Status was also significant, it is more likely that the main effect for CI is a spurious correlation. Additionally, a higher level of Exercise was positively correlated with a higher level of Sporting Involvement.

Interpreting the interaction effects, the relationship between CI and Housing Status (Figure 10) indicates that those who owned their own home without a mortgage and who had a low CI, were more involved in sport than those with a higher CI. In contrast, those renting or with a mortgage showed little difference in Sporting Involvement between low and high CI. The moderating relationship between Age and Crowding on Sporting Involvement showed that while there was little difference between the two age groups (14-32 and 32+) at low levels of Crowding (1 to 4 people living in the same household), this difference was much greater at higher levels of Crowding (more than 4 people living in the same household). The difference was such that younger participants were more involved in sport at higher levels of Crowding, while older participants were less involved in sport at higher levels of Crowding.

Summary

Hypothesis 2.3 was not supported; a higher CI was not related to more involvement in sport.

Research aim three was to investigate how demographics were related to health status. For Sporting Involvement, hypotheses 3.1, 3.2, 3.3, and 3.8 were significant. This showed that those who were more involved in sport were younger, more educated, had paid employment, and exercised more frequently. Males were also more likely to be involved in sport than females. As would be expected, a higher level of Exercise was positively correlated with higher levels of Sporting Involvement.

Sub-aim 4.4 was to investigate how CI moderated the relationship between Housing status and the health indicators. Those who owned their own home without a mortgage and who had a low CI, were more involved in sport than those with a higher CI. Those with a mortgage or who were renting showed little difference in Sporting Involvement between low and high CI levels.

Sub-aim 4.8 was to investigate how Age moderated the relationship between Crowding and Health. The regression on Sporting Involvement found that younger participants were more involved in sport at higher levels of Crowding than at lower levels of Crowding. While older participants were less involved in sport at higher level of Crowding when compared to lower levels of Crowding.

The addition of CI and the interaction effects only explained an additional 2.6% of variance accounted for.

Table 26. Hierarchical multiple regressions of demographics, Exercise, & CI on Sporting Involvement showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=767).

	Steps		
Predictors	**1**	**2**	**3**
Demographics			
Age	-.199***	-.214***	-.226***
Gender	-.102***	-.105***	-.106***
Health Insurance	-.021	-.019	-.016
Education	.087**	.083*	.086**
Job Status	.165***	.171***	.174***
Total Income	.015	.008	.021
Housing Status	-.030	-.028	-.036
Mobility	-.048	-.049	-.050
Crowding	.024	.018	.031
Exercise	.349***	.349***	.343***
Cultural indicators			
Cultural identity		.060	.072*
Interactions			
CI x Crowding			.028
CI x Mobility			-.061
CI x Housing Status			-.092*
CI x Income			-.060
CI x Job Status			-.048
CI x Age			-.001
Age x House Status			.060
Age x Job Status			-.002
Age x Crowding			-.095**
R	.526***	.529***	.550***
Total R^2	.277	.280	.303
Adjusted R^2	.267	.269	.284
R^2 change	.277***	.003	.023**

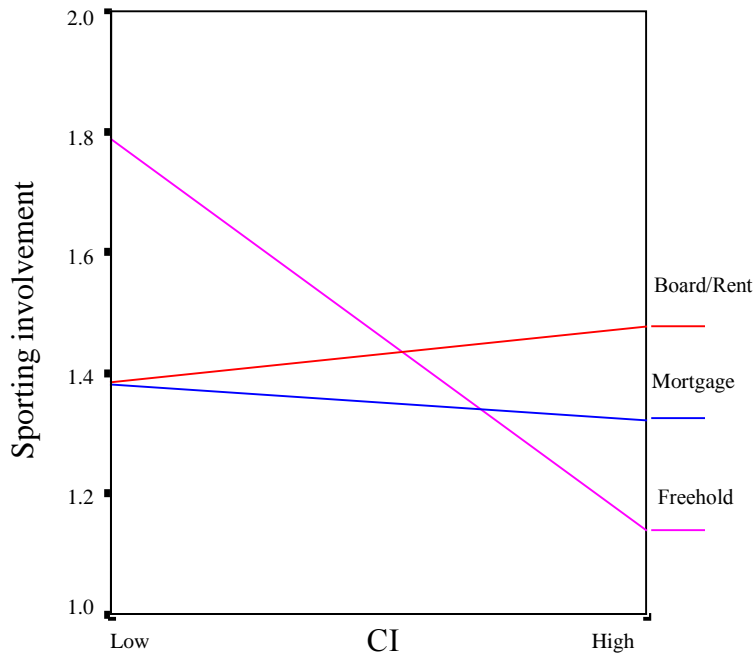*p<.05, **p<.01, ***p<.001

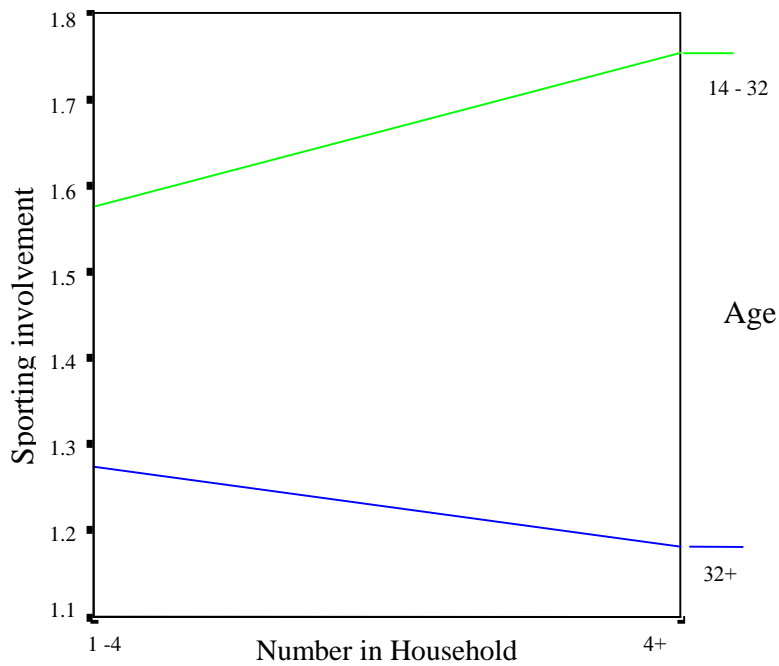**Figure 10. The interaction between CI and Age on Sporting Involvement.**

Figure 11. The interaction between Crowding and Age on Sporting Involvement.

Summary of Analyses

There were four main aims in the present study: to investigate how demographic factors were related CI, in particular, that a higher level of Crowding would be positively correlated with a higher CI (Hypothesis One); to investigate how CI was related to the health measures, in particular that a higher level of Crowding would be positively correlated with a higher CI (Hypothesis Two); to investigate how the demographic measures were related to the health measures; and to investigate how CI and the demographic measures interacted with the health measures.

Research Aim One:

To investigate how demographic factors were related to Cultural Identity.

Hypothesis one was supported, more people living with the participant was positively correlated with a higher CI.

The bivariate findings were such that older participants, those with Health Insurance and a higher income had a higher CI. The regression analyses found that 6.8% of variance in the Cultural Identity measure was explained by the demographic factors, Sporting Involvement, and Exercise. The significant measures from the regression revealed that increasing age, not being in paid work, a higher income, and more people living in the same household were all positively correlated with a higher CI. Health Insurance was not significant in the regressions and this may be due to the high bivariate correlations Health Insurance had with the majority of the demographics[7] (particularly Job Status and Income).

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[7] Health Insurance was significantly correlated with Age, Education, Job Status, Income, Housing Status and Mobility in the bivariate analyses.

Research Aim Two:

To investigate how Cultural Identity is related to health. In particular, it is hypothesised that **a higher CI is positively correlated with improved health indicators** (Hypothesis Two).

At the bivariate level, a higher CI was correlated with lower alcohol consumption and a higher rate of smoking. This was not borne out by the regression analyses. CI showed no relationship with SRH or the number of cigarettes being smoked per day. While CI showed significant relationships with the measures Do You Smoke and Sporting Involvement, these are most likely spurious correlations, which arose as a result of the moderating effects of CI on the relationship between Age and Do You Smoke and CI on the relationship between Housing Status and Sporting Involvement. Therefore CI showed no relationship with the health indicators used in the present study.

Research Aim Three:

To investigate how demographic factors are related to health status.

The bivariate analyses found that better education, home ownership, having Health Insurance, having paid employment, more Crowding, and a higher involvement in sport were positively correlated with a higher SRH. A lower Alcohol consumption was positively correlated with older participants, home ownership, changing address less frequently, less Sporting Involvement, being female, and those without paid employment. More Exercise was positively correlated with being younger, having a better education, being male and having paid employment. While a greater Involvement in Sport was related to being younger, better educated, having paid employment, having a higher income, more Crowding, and being male. A greater likelihood of smoking was related to being older, having a higher education, being in paid employment, not having Health Insurance, owning your own home, changing

address less frequently, and living with fewer people. It was also found that females were more likely to smoke than males

The regressions demonstrated that being male, having a higher education, owning your own home, and undertaking more exercise were all related to a greater likelihood of not smoking. While being younger, having a higher education, having paid employment, being male, and exercising more frequently were all positively correlated with more Sporting Involvement. Being younger, owning your own home, a greater involvement in sport, and exercising more frequently were all positively correlated with a higher SRH. For the two health indicators, Do You Smoke and SRH, demographics, Sporting Involvement, and Exercise measures explained 10.5% and 11.1% of variance respectively. Due primarily to the strong correlation relationship between Exercise and Sporting Involvement[8], demographics and Exercise explained 26.7% of the variance in Sporting Involvement.

Research Aim Four:

To investigate the interactions between particular demographic factors, CI, and the health indicators.

CI and the interaction effects explained only 2.3% of the variance in Sporting Involvement, and a trivial 2.0% of variance in current smoking behaviour (Do You Smoke). The significant findings from these two regressions were that CI moderated the relationship between age and Do You Smoke, as well as the relationship between Housing Status and Sporting Involvement. Also found was that age moderated the relationship between Crowding and Sporting Involvement. For younger participants (14 to 38 years old) a higher CI was positively correlated with a greater chance of not smoking - participants older than 38

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[8] A confirmatory regression was run, which showed that the demographics explained 15.2% (adjusted R^2) of variance ($F(9,758) = 16.31$, $p<.001$), while demographics and Exercise explained 26.7% - a difference of 11.5%.

showed no difference in smoking behaviour between levels of CI. For participants who owned their own home without a mortgage, a low CI was positively correlated with a higher Involvement in Sport. For those renting or with a mortgage, CI made little difference in the level of Sporting Involvement. A higher level of Crowding was linked with a greater involvement in sport for younger participants. The relationship was reversed for older participants, where a higher level of Crowding was related to less Sporting Involvement.

Chapter 6

Discussion

There has been a tendency for the literature on ethnicity and health to explain health differences in terms of social class (e.g. Syme & Berkman, 1997). Typical explanations of the health of ethnic groups involve descriptions of reduced access to health care, and local social problems (such as drug and alcohol use) by those in lower social classes, when compared to members of the same ethnic group who are in a higher social class. While these issues are undoubtedly salient to health, those members of an ethnic group who are in a high social class may take on characteristics of the dominant culture (ethnic groups are often defined relative to the dominant culture, e.g. American Indian health compared to American health status). A person's culture (which is associated with their ethnicity) is a function of the environment that an individual was raised in. Comparing the health status between members of an ethnic group will be confounded with the issue of which ethnic group an individual belongs to. This may be overcome to some extent by measuring the degree to which an individual identifies with a specific culture (their cultural identity), allowing that the same individual may identify with a number of other cultures.

The development of a cultural identity measure for the present study proved particularly complex. A review of the literature on cultural identity indicated that there were few empirically useful measures of Māori cultural identity (measures of identity either consisted of tests of general knowledge or were discursive theoretical models), apart from a profile developed by Te Hoe Nuku Roa (1996) that categorised Māori into four groups (compromised, notional, positive, and secure). Internationally, there was a scarcity of

cultural identity measures, although one of these (the Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA) Scale; Ownbey & Horridge, 1998) proved similar to the identity scale proposed in the present study (summarised in Appendix B). To create a measure of Māori CI, culturally specific practices and behaviours were identified and appropriate questions from the Te Hoe Nuku Roa survey combined to give sub-scales measuring: Whakapapa (ancestry), Marae Participation, Whanaū associations (extended family), Whenua Tipu (ancestral land), contact with Māori people, Use of te Reo (Māori language), and kai (food preferences). These sub-scales were then weighted and added together to form a single, continuous measure of CI. The weightings of the cultural indicators used in the CI measure were based on Mathews (2000) theories of cultural identity, where identity has a fundamental 'core' (and so weighted the most heavily), consisting of the language and social practices of their culture. This unconscious level of identity is largely unobtainable for analysis – we cannot step outside of the way we think, there is no higher level of cognitive organisation than that brought about by language. At an intermediate level is the 'it can't be helped' level, characterised by social roles (e.g. gender roles), which are can be obtained for analysis, but usually are not. At the top-most level is the conscious choice of identity from the 'cultural supermarket', where choices are made about how to dress, what music to listen to, and often what religion to follow. This level had the lowest weightings.

The measures of health used in the present study were self-rated-health (SRH), smoking behaviour (do you smoke & number smoked per day), alcohol consumption, and Sporting Involvement. Measures of age, gender, Health Insurance, income, Mobility, Crowding and level of exercise were used to assess demographics, and the construction of several measures (Education, Job Status, housing status, cultural identity, and Sporting Involvement) was also necessary.

There were four main aims in the present study. In order, these were to investigate the relationship between demographics and CI (research aim one), CI and health (research aim two), demographics and health (research aim three), and more complex interactions between demographics, CI, and health (research aim four). Research aims two and four are presented together as they both deal with the relationship between CI and health. These aims and related hypotheses are detailed below along with interpretations of the findings.

Research Aim One

Research aim one was to investigate how demographic factors were related to CI. In particular, the hypothesis that a higher level of Crowding is related to a higher CI was supported. Additional findings were that a higher CI was related to being older, not being in paid work, a higher income, and higher levels of Crowding.

While several significant relationships were found between CI and demographics, the overall impact of these relationships was weak. Of particular interest was the relationship of CI to two measures of Socioeconomic Status[9] (SES) – Job Status and income. The results of the analysis found that a higher CI was related to not being in paid work and a having higher income. No other SES indicators were related to CI. Of the other demographics measured, only Crowding was related to CI, where the more people living with the participant, the higher the CI.

The finding that older Māori tended to have a higher CI was very similar to findings by Durie et al. (1996) that older Māori have a more secure cultural identity. Also found was a small relationship between having more people living in the same household and a higher CI; a likely explanation is that Crowding was related to the Whanaū associations subscale in the CI measure (which measured how much contact the participant had with family), where whanaū stay for extended periods of time, inflating the size of the household. Previous

research has found a relationship between high levels of household crowding and poor health (Evans, Palsane, Lepore & Martin, 1989). The present study found no such evidence, and it is suggested that what stressors are operating in crowded Māori households are offset by the value that is placed on increased contact with whanaū.

Investigating why Maori are consistently over represented in lower SES groups can be accomplished in many ways; from a historical perspective the reasons for such disparities in SES between Māori and Pākehā existing have been framed as a consequence of the colonisation of Aotearoa, and the continuing effects of the decimation of the Māori population, the repression of Māori culture, and the loss of traditional lands. While within the last 150 years there have been vast changes across the globe: mass production, two world wars, Rock and Roll, and the information technology revolution have impacted all people.

At the whanaū level, cycles of disadvantage often exist (Howden-Chapman & Cram, 1998), with families having a history of success and others a history of failure (often a history of land dispossession and cultural repression; Durie, 1994). Poorer families lack the resources to afford decent health care, better nutrition, or the ability to send their children on to higher education. Less education means reduced employment opportunities, and a lower SES profile (New Zealand Council for Educational Research, 1988).

Another explanation for the lower SES position of Māori in Aotearoa is that there exists a level of racism and prejudice in New Zealand culture, which discriminates against Māori, preserving their position in the lower SES groups. Walker (1994) talks about the power relations of domination and subordination present in such institutional structures as the media (e.g. newspapers, television), which construct the popular perception of Māori, "reinforcing the stereotype of Māori as school dropouts, street-kids, violent rapists, and prison inmates"

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[9] Socioeconomic Status indicates economic and social position within society. Those within lower SES

(pp. 107-108). The stereotypes associated with this prejudice depict Māori negatively, portraying Māori as lazy (explaining their higher unemployment rate), and less intelligent (explaining their lower achievement in mainstream education). If such views are correct, then the beliefs, attitudes and behaviour of Māori are keeping them at the bottom of the health and SES statistics – thinking and behaving Māori is keeping Māori poor. Using the constructs of the present study, it would then be speculated that a higher CI (i.e. being more Māori) would be related to worsening SES indicators.

This was not shown in the findings. The only SES measures to show a relationship to CI were Job Status and income; a higher CI was related to both a higher income and being unemployed. An explanation for these contradictory findings may be in the quality of the participant's CI. There will be differences between those who learn their culture and those who live their culture. Those learning their culture may be doing so at a tertiary level (e.g. polytechnics, wananga, or universities) needing sufficient disposable income to do so, while those who live their culture may live in a rural area close to their Marae (where they socialise with Māori more often, are on their Marae more often, and have easier access to traditional foodstuffs). Alternately, as part of the sample derived from areas with high rates of unemployment and a large Māori population (for example Gisborne has a Māori unemployment rate of 21.2% and a Māori population of 44.9%, while the average for the rest of the country is 17.5% and 15% respectively; Statistics New Zealand, 1996b), there would be a relationship between unemployment and a higher score on the Māori Contact subscale of CI.

At the level of the individual, issues such as how health behaviours (e.g. smoking or exercise) are distributed across Māori, and whether Māori living under particular conditions are more prone to particular illnesses (e.g. diabetes, asthma, CVD) than other Māori need to

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groupings tend to be poorer, less educated, reside in inadequate housing and are less likely to be employed.

be addressed. The focus here is on the differences within Māori, what makes some Māori healthier than others may provide solutions to these issues that are appropriate and effective for Māori.

Research Aim Two

Research aim two was to investigate the relationship between CI and health. It was hypothesised that a higher CI would be related to better health. Simple analyses indicated that a higher CI was related to lower alcohol consumption and a higher rate of smoking. After accounting for the influence of such things as age, education and income, this relationship disappeared. It appears therefore, that CI was not directly related to any of the present study's health indicators.

An additional method of examining how a Māori CI influences health is to compare the differences in smoking behaviour between Māori and Pākehā, to smoking behaviour at differing levels of SES. A nationally representative survey in New Zealand by the Ministry of Health (1999) involving 7862 adults found that 34.3% of those with family incomes below $20,000 and 36.4% of all those with no qualifications smoked[10]. In the present study 38.3% of those earning $20,000 or less and 22.6% of those with no formal education smoked. Thus, participants displayed similar smoking characteristics to the national sample for lower income levels, and much improved smoking behaviours for those with no formal education compared to those in the national sample. The result for education is surprising as 50.7% of participants in the present study smoked (24.9% of adults in the national sample smoked) and the results from the regression indicated that a better education was related to not smoking. It is likely that the distribution of smoking behaviour across education is different in the present study from that which exists in the general population and so not comparable to the Ministry

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[10] Adjusted for age and gender.

of Health survey. Given that a lower income is an indicator of a lower SES, any differences in smoking status between Māori and Pākehā are because proportionately more Māori are in lower SES groupings.

Culture influences how people perceive health; it gives us a framework with which to attach meaning to all that happens to us through our life. And so with health, every symptom, pain and emotion that we experience will be uniquely interpreted. There are as many ways of viewing health, as there are people. To say that Māori view health from a single perspective, disregards the diverse realities Māori exist within.

Traditional Māori models of health include the health of Whanau, and their spiritual health (Taha Wairua) in their assessment of personal health (SRH). This differs from the western model of health that are more individual oriented and have little place for spirituality. While the present study did not include measures of spirituality, it is believed that a higher CI would be correlated with a stronger Taha Wairua. There was some support for Taha Whanaū, throughout the analyses a higher level of Crowding was related to improved health indicators (at the bivariate level) or showed no relationship (as found in the regressions). Because the literature related higher levels of crowding to poorer health, that Crowding showed precisely the opposite relationship in the present study suggested that what deleterious effects crowding had on health, were more than compensated by Taha Whanaū. Taha Tinana describes the physical health of the individual; in the analyses better physical health (as evidenced by more involvement in sport and greater efforts to exercise) was consistently related to better health. Taha Hinengaro (the mental and emotional health of the participants) was not measured by the present study. A stronger Taha Whanaū and Taha Tinana then, was positively related to the health of the participants. Taha Wairua and Taha

Hinengaro were not measured in the present study, although it is believed that a higher CI would be related to a stronger Taha Wairua.

The interpretation of any findings from a Māori health perspective may be particularly appropriate for older Māori, given the present study's findings that older Māori tend to have a higher CI, and findings by Scott, Sarfati, Tobias, and Haslett (1999) that older Māori showed less of a distinction between mental and physical health than others in that study - reflecting the more holistic nature of Māori models of health.

Research Aim Four

Research aim four investigated the hypothesised interactions between demographic factors, CI, and the health indicators. For the health indicators Sporting Involvement and do you smoke, the interaction effects explained a trivial 2 - 2.3% of variance. The significant interactions found, were that CI moderated the relationships between age and Do You Smoke, and between housing status and Sporting Involvement, while age moderated the relationship between Crowding and Sporting Involvement. For younger participants, a higher CI was related to a lower likelihood of smoking. Again, this effect may be due to the quality of their CI. Younger Māori who are actively learning their culture may be exercising more control over their lives (or at the very least have some choice about their cultural education). Such choice is reflected in the dramatic increase in the number of Māori education institutions operating in Aotearoa. For preschool children the number of Kohunga Reo (where children are in a Māori language only environment) has increased from none before 1982 to 704 today, teaching around 13,000 children. While the number of Kura Kaupapa Māori (schooling based on Māori knowledge, language and tradition) has gone from one in 1985 to 54 in 1997, with over 3,800 students enrolled (Ministry of Education, 1998). A sense of control over one's own destiny is conceptually similar to locus of control. An internal locus of control has been related to smoking cessation and increased use of exercise programs

(Weitan, 1992), and indicates a belief by the respondent that they have more control over their health than those with an external locus of control.

Conversely, those who owned their own home and had a high CI were less involved in sport than those with a lower CI. As home ownership has been used as a measure of SES (Lewis et al., 1998), it may be that those in higher SES groupings are improving aspects of their CI through learning institutions at the expense of other activities (such as Sporting Involvement). However, as both relationships had only small effects on current smoking behaviour and Sporting Involvement, any effect may actually be due to the effect of other unmeasured variables or relationships, and should be interpreted with caution.

Summarising these interactions: younger participants with a high CI were less likely to smoke (CI made no difference for participants older than 38), while for those who owned their home without a mortgage, a high CI meant a lower involvement in sport. At higher levels of crowding (more than 4 people living in the same household), older participants (38+ years old) were less involved in sport, when compared to younger participants (14-38 years old). It is quite likely that this relationship reflects the difference between a family situation (the participant being a parent with at least three children in the household) and young adults flatting together (who have more opportunity to engage in sporting activities).

Therefore, while CI did have some influence on those measures of health in the present study, the effect was almost negligible. Of far more importance to the health of Māori in the present study were income, Education, housing, and employment.

Research Aim Three

Research aim three investigated the relationships between the demographic factors and the health indicators. As has been consistently demonstrated in the health literature, two of the more significant influences on health are SES and age. These relationships were also

found in the present study, with improving SES (shown by Education, house ownership, and paid employment) related to better health. The remaining factors showed that older participants exercised less, rated their own health lower and were less involved in sport. On the other hand, older participants were less likely to smoke. Males were also less likely to smoke (reflecting 1996 census findings), although the benefit of this was offset by a tendency to drink more alcohol when compared to females. Males also exercised more, and were more involved in sport than females. After allowing for gender differences in exercise and smoking behaviour, those who exercised more often were less likely to smoke.

Throughout the analyses, it was found that Sporting Involvement (and its conceptual companion - Exercise) had a positive influence on health. This finding is not unexpected, as any form of exercise will have a positive influence on physical health. That Sporting Involvement had a beneficial influence on smoking and SRH was of note, and may be related to the concept of locus of control. Shepard (1997) cited studies by Greendale, Hisch, & Hahn (1993), and Perri & Templar (1984/1985), which demonstrated that habitual exercise shifted locus of control inwards. As stated earlier, an internal locus of control has also been related to cessation of smoking.

A report by the Hillary Commission (1998) on Māori sport defines "sport, fitness and leisure as all physical activity that enhances whanaū/wairua/tinana/hinengaro and respects tikanga Māori" (p. 9). This definition implies causality, that sport has a beneficial effect on all aspects of Māori health, influencing Māori beliefs and behaviours for the better, which is supported by the evidence outlined earlier. A further benefit of more Sporting Involvement is an increase in the number and quality of the individual's social interactions; improving social networks has been shown to be related to better health (House, Landis, & Umberson, 1997), and is an essential aspect of CI (the social subscales of CI were Whanaū associations and Contact with Māori).

Limitations of the Present Study

It should be noted that the current study was not attempting to uncover the relationships present in the general Māori population. What the present study was attempting to do was assess whether a relationship between CI and health existed, and investigate the nature of this relationship. Although the weightings derived in the Te Hoe Nuku Roa study were not used in the present analysis, given the size of the sample (the smallest power coefficient for any of the analyses was 0.9993, meaning a .07% chance of saying there is an effect present, when there is not), and the close correspondence of the sample demographics to the 1996 census data, it is not unreasonable to suggest that similar relationships exist in the general Māori population.

Measurement

As the present study was a secondary analysis of Te Hoe Nuku Roa data, the measures chosen were limited to what was asked in the original survey. This meant a limited selection of measures appropriate for the present study's analyses. For the health measures, only questions dealing with smoking behaviours, alcohol consumption, exercise to improve health, and self-rated-health (SRH) were well documented and valid measures of health.

From a selection of these questions measures of Job Status, Education, housing status, Sporting Involvement, and CI were constructed. Unfortunately, such a-priori constructed measures may not measure the construct domain as well as a question specifically designed for the purpose. The Job Status, housing status, and Sporting Involvement measures were relatively straightforward, appearing to measure what they were supposed to (face validity). The Education measure on the other hand had some difficulty in classifying responses, due to the specificity of the original questions asked (which provided a large number of response categories). Hopefully though, such mis-ranking was minimal and the essential sense of the

measure (tertiary is better than secondary, which is better than none) was robust enough for the present study.

There may also be some ambiguity in the housing status response category "You are not paying any form of board, rent or mortgage", which in the housing measure was classed the same as those paying rent or board. Being in the position of not having to pay any money to live in the current house, could confer additional financial benefits to that participant. It is likely that the majority in such a position are at school (35 participants gave this response, of which 20 were 19 or younger). The influence of this effect will have been controlled for by the interaction term age x housing status.

The cultural identity measure in particular requires further validation. Given the paucity of cultural identity measures of any kind, the development of a comprehensive measure of Māori cultural identity would be of great use in any research involving Māori, and the comprehension of the diverse realities that Māori[11] exist within. This would entail further refinement and validation of the questions used to form the cultural indicators (for example using item-total correlations to assess the contribution of any single question to the indicator), The present study's development of a CI measure and a theoretical framework for assessing the contribution of the cultural indicators is a start. The contribution of the indicators to the CI measure also needs to be examined in more detail. For example, the rationale behind the weighting of the cultural indicators insisted language was the foundation of cultural identity, which in the present study meant Use of te Reo was weighted the most heavily. However, as Use of te Reo was only one indicator of seven, the importance of language may have been underestimated in the CI measure (item-total correlations between the cultural indicators suggested that reo contributed around 14.5% of the variance in CI).

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[11] A phrase coined by Mason Durie in describing the variability of Māori.

There was also some speculation that there was a difference between those who learn and those who live their culture. Such a distinction would be particularly useful in assessing how the identity of Māori is formed in Aotearoa and how the difference in the quality of CI is related to SES and health. There were several questions that measure precisely such a distinction (e.g. Question 18 was "How did you acquire your ability with Mäori language? Learned as a first language (ie. as a child), you taught yourself, learned as a second language from family/whanau, learned as a second language at an educational institution").

Controversy exists over the use of SES as a means of assessing the health of Māori. Ratima et al. (1996) point out that measuring individual SES is not appropriate for Māori; where wealth may be distributed amongst whanau, and those employed in the household contribute to the entire whanau. Using SES as an indicator of individual health can hide the influence of whanau - inflating (or deflating) individual SES. This may mean that the unit of analysis for Māori should be the household or Whanau, and appropriate aggregations of individual SES indicators within the whanau developed.

Future Directions

The Te Hoe Nuku Roa database was designed with generalisability issues in mind; accordingly, weightings and information on clustering were calculated for all participants. A more detailed analysis of the relationship between CI, health, and SES using this information and the appropriate statistical tools (e.g. SUDAAN) would be a necessary next step in assessing whether these relationships exist for all Māori. Such analyses may also control for the differing distribution of Māori realities across regions, for example the suggested relationship between a higher CI and areas with high Māori unemployment.

There are several research questions that could be focused upon in such analyses: Further development of the CI scale. This would involve studying the distribution of the CI subscales across SES indicators and other demographic factors (e.g. regional differences) and

assessing whether differences exist in the quality of CI (learning your culture versus living your culture).

If SES is the primary influence on health and a Maori CI has little or no impact, do those Māori who are acculturated into Pākehā culture[12] at the expense of their Māori Identity raise their SES? Such a question requires a longitudinal approach, examining the relationship between CI and SES over time.

Māori models of health emphasise the importance of taha whanaū and taha wairua to health, in addition to the more mainstream physical and mental health constructs. It may be speculated that the relevance of a Māori health model may vary with CI. For those with a high CI, taha whanaū and taha wairua may become more important or have greater influence upon their health then those with a lower CI. Given measures of taha whanaū and taha wairua, it would be possible to see how pertinent models of Māori health are over varying levels of CI. However, it should be noted that taha whanaū and taha wairua are additional dimensions of Māori CI, and should be incorporated into any measure of CI – giving a truly holistic measure of Māori cultural identity.

Given the positive health outcomes associated with an internal locus of control in the literature, the relationship of CI to locus of control needs to be studied, i.e. does the choice (and opportunity) to learn one's own culture, or be educated within a Māori worldview influence locus of control. And if so, how?

As the 1996 census found that young Māori tended to smoke more than other groups (the present study also found that younger participants smoked more), this finding is worthy of

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[12] Acculturation into Pākehā society does not necessarily mean the loss of Māori identity. The brain forms separate cognitive structures for each language (Kim, Relkin, Lee, & Hirsch, 1997) and associated cultural practices learned under bilingual conditions. It is the unemployment of an identity (particularly language) that weakens these structures, not the addition of another (Segalowitz, 1981; Romaine, 1995).

further research – preventing young Māori from beginning to smoke would prevent a large number of health problems in later life.

The development of statistical strategies using the household or whanaū as the unit of study may also be developed. This would involve appropriate aggregations of individual demographic and health behaviour data of all those living in the household.

The large influence of the Sporting Involvement and Exercise measures on the health measures is also worth further study. Particularly how levels of exercise and Sporting Involvement vary across the regions surveyed, and their economic and social realities. Such information may potentially provide new avenues for effective health interventions tailored for the communities that need such intervention.

Conclusion

The present study was first and foremost a study of the relationship between the cultural identity (CI) of Māori and their health. Consequently, a large portion of the study was dedicated to defining culture, and developing a coherent measure of CI. The ability to assess the degree of membership of a culture allows the avoidance of a common pitfall of many studies of culture and health, where individuals are placed into a cultural category on the basis of vague and often misleading criteria such as ethnicity or nationality. A scale of cultural identity allows the possibility that an individual may identify with other cultures, while focusing on the culture in question.

However, no study involving culture can be meaningfully interpreted in isolation from the broader context within which that culture is embedded. The present study examines the health and cultural identity of 776 adult Māori in Aotearoa. The present study is particularly important as Māori are consistently over represented in the statistics on unemployment, low income, early school leaving, poor housing, and poor health. These inequalities exist between Pākehā and Māori, and within Māori. Those Māori who are within low SES

groupings display worse health characteristics than those Māori within higher SES groups, while Māori as an ethnic group, are over represented both in lower SES groupings and in the health statistics when compared to Pākehā.

The present study used various statistical methods to examine the relationship between CI, demographic factors (e.g. age, gender, SES indicators), and health (as measured by self-rated-health, smoking behaviour, alcohol consumption, and Exercise/Sporting Involvement). Sporting Involvement and Exercise demonstrated strong beneficial relationships with all the health indicators. The Hillary commission for sport, fitness and leisure (1998) stated that while most Māori are involved in sports and exercise, it is often not at a high enough level to be beneficial. Given the confirmatory findings of the present study, there are obvious opportunities for effective strategies to improve the health of Māori.

The analyses showed that CI had little or no relationship to health measures in the present study (apart from a very weak beneficial relationship for young smokers). CI did demonstrate a relationship with SES, but the exact nature of this relationship needs to be determined - it is speculated that there is a difference in the quality of the participants CI. The CI measure did not distinguish between those who learn their culture and those who live their culture (each group tending to be in differing social and economic positions).

Because the analyses showed that a higher CI had a weak relationship with an improved SES (or no relationship at all), it can be said that it is not acting or thinking Māori that has many Māori trapped within the lower SES groupings of Aotearoa. The reasons for such an unenviable position lies more at history's door, in cycles of disadvantage, in racism and prejudice, in the lingering effects of the loss of their Papakāinga (their connection to the land) and the active repression of their culture.

Cultural Identity was found by the present study to have at worst, no relationship to health or Socioeconomic Status, and at best a small positive relationship. Additional findings

of the benefits of sport and exercise were also found for all the health indicators in the present study.

The present study recommends studying how cultural identity is distributed across rural and urban areas, Socioeconomic Status, health status and age in order to assess such things as the quality of participant's cultural identity (learned versus lived). Additionally, the Whanaū orientated perceptions of many Māori raised the issue of the unit of study. In the present study the individual was the focus, but Ratima et al. (1996) suggest that this may not be appropriate. Therefore, it is suggested further analyses also be run utilising the household as the unit of analysis (and developing appropriate aggregations of household demographic data), in order to assess the difference between individual and household level analyses. The question of how acculturation into Pākehā culture affects SES (i.e. does taking on the characteristics of the mainstream Pākehā culture improve SES) was raised, and whether this is at the expense of a Māori CI.

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Statistics

	N	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Age	776	.727	.088	.148	.175
Gender	776	-.719	.088	-1.487	.175
Health Insurance	773	-1.167	.088	-.640	.176
Education	776	.551	.088	-.510	.175
Job Status	776	-.239	.088	-1.948	.175
Income	776	.275	.088	.504	.175
Housing Status	776	1.071	.088	-.097	.175
Square of Housing Status	776	.509	.088	-1.418	.175
Mobility	776	2.002	.088	4.912	.175
Square of Mobility	776	.567	.088	-.762	.175
Crowding	776	.754	.088	.954	.175
Square of Crowding	776	.081	.088	.253	.175
Sporting Involvement	776	.117	.088	-1.187	.175
CI	776	.080	.088	-.163	.175
SRH	776	-.373	.088	-.434	.175
Alcohol	776	.465	.088	-.797	.175
Exercise	776	.128	.088	-1.573	.175
Number Smoke/Day	378	1.159	.125	2.012	.250
Square of Smoke/Day	378	.247	.125	.022	.250

Appendix B

The author of the present study created the following scales after consultation with the manager of Te Hoe Nuku Roa research project (Eljon Fitzgerald), and the head of Te Pūtahi ā Toi/Māori studies, Massey University (Mason Durie).

When creating the cultural indicators, it was decided to keep all summaries of the questions relating to each indicator within a close numerical range. However, individual indicators were weighted slightly.

Use of te Reo was afforded the heaviest weighting. Arguments for this approach include: Kāretu (1993) quoted the late Sir Apirana Ngata as saying "'Ki te kore koe e mōhio ki te kōrero Māori ehara koe i te Māori' (if you do not speak Māori you are not Māori)" (p. 223), as Mathews (2000) puts it, "because we think in language, we can't easily comprehend how that language shapes our thinking" (p. 12). Mathews called this the taken-for-granted level of shaping, where our language and the social practices surrounding us (reflecting essential elements of culture), condition our comprehension of self and the world. This level occurs largely below that of consciousness, and is largely unobtainable for analysis. Accordingly, Use of te Reo had a theoretical range of 0 to 8 (actually 0 to 5).

Whenua Tipu, Whakapapa, Marae Links, and Whanaū were considered intermediate predictors of CI (0 to 4). These measures fitted into Mathews second level (between the taken-for-granted level and the conscious choices made in the cultural supermarket), and was called the "it can't be helped" level, and is characterised by social and institutional expectations such as gender roles and taxation

Kai and Māori contact were weighted slightly lower as these were considered weaker predictors of CI (0 to 3), and related to Mathews third, conscious level, where people choose their beliefs and actions – what food we eat, and who we socialise with are conscious choices and are less related to a fundamental Māori CI.

All cultural indicators were rounded off (e.g. 1.4 becoming 1 and 1.5 becoming 2) after being created.

Table 27. Whenua Tipu.

Variable	Current Values	Transformation	Range
Māori land interest	1: (Yes) 2: (No)	1 = 1 2 = 0	0 - 1
Marae Tangihanga	1: (Most Important) : 5: (Least Important)	(5-Value)/2	0 – 2
Whanaū prefer urupa/cemetery	1: (Urupa) 2: (Cemetary)	1 = 1 2 = 0	0 – 1

Possible range 0 – 4
Actual range   0 – 4

Table 28. Marae Links.

Variable	Current Values	Transformation	Range
How often do you go to a Marae	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	(Value – 1)/2	0 – 2
How often do you go to a Marae	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	(Value – 1)/2	0 – 2
Knowledge of Marae Tikanga	1: Excellent 2: Very Good 3: Fair 5: Poor	5 – Value	0 – 4
Comfort at a Hui	1: Very comfortable 2: Comfortable 3: Uncomfortable 4: Very uncomfortable	4 – Value	0 – 3
Comfort at a Tangi	1: Very comfortable 2: Comfortable 3: Uncomfortable 4: Very uncomfortable	4 – Value	0 – 3

Value/4
Possible range 0 – 4
Actual range   0 – 3

Table 29. Whakapapa.

Variable	Current Values	Transformation	Range
Number of Generations respondent can name	1: Generation 2: 2 Generations 3: 3 Generations 4: More than 3	(Value – 1)	0 – 3
Know Iwi	1: Yes 2: No	1 = 1 2 = 0	0 – 1

<div align="right">

Possible range 0 – 4
Actual range   0 – 4

</div>

Table 30. Maori Contact.

Variable	Current Values	Transformation	Range
Māori contact at work	1: Mainly Māori 2: Some Māori 3: Few Māori 4: No Māori	4 - Value	0 – 3
Māori contact at sport	1: Mainly Māori 2: Some Māori 3: Few Māori 4: No Māori	4 - Value	0 – 3
Māori contact at church	1: Mainly Māori 2: Some Māori 3: Few Māori 4: No Māori	4 - Value	0 – 3
Māori contact at school	1: Mainly Māori 2: Some Māori 3: Few Māori 4: No Māori	4 - Value	0 – 3
Māori contact at home	1: Mainly Māori 2: Some Māori 3: Few Māori 4: No Māori	4 – Value	0 – 3

<div align="right">

Value/5
Possible range 0 – 3
Actual range   0 – 3

</div>

Table 31. Whanaū.

Variable	Current Values	Transformation	Range
Yearly frequency of visiting Whanaū	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Yearly frequency of Whanaū contact	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Yearly frequency of Whanaū visits	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Attended a Whanaū hui	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Whanaū links	1: Very strong links 2: Strong links 3: Weak links 4: Very links	4 – Value	0 – 3
Whanaū support	1: Very supportive 2: Supportive 3: Unsupportive 4: Very unsupportive	4 – Value	0 – 3
Part Whanaū plays in life	1: Very large part 2: Large part 3: Small part 4: Very small/no part	4 – Value	0 – 3

Value/6
Possible range 0 – 4
Actual range   0 – 4

Table 32. Kai.

Variable	Current Values	Transformation	Range

Gather shellfish this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Gather kina this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Pick puha this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Make rewana bread this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Preserve kanga-piro; karengo this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4
Prepare hangi this year	1: Not at all 2: Once 3: A few times 4: Several times 5: More than once a month	Value – 1	0 – 4

Value/8
Possible range 0 – 3
`   **Actual range   1 – 3**

Table 33. Use of te Reo.

Variable	Current Values	Transformation	Range
Overall reo ability	1: No ability 2: Some basic Māori 3: Understand, don't speak 4: Basic knowledge 5: Advanced knowledge 6: Fluent 7: Native speaker	Value – 1	0 – 6
Speaking ability	1: Cannot speak any Māori 2: Few words/short greetings 3: Basic sentences 4: Many words/sentences 5: Confidently speak Māori 6: Fluent	Value – 1	0 – 5
Understanding of reo	1: Cannot understand Māori 2: Few words/short greetings 3: Basic sentences 4: Many words/sentences 5: Confidently understand Māori 6: Fluent	Value – 1	0 –5
Te reo on Marae	1: Never 2: Hardly ever 3: Sometimes 4: Often	Value – 1	0 – 3
Reo at home	1: Never 2: Hardly ever 3: Sometimes 4: Often	Value – 1	0 – 3
Reo at work	1: Never 2: Hardly ever 3: Sometimes 4: Often	Value – 1	0 – 3
Reo around children	1: Never 2: Hardly ever 3: Sometimes 4: Often	Value – 1	0 - 3
Reo with Kaumatua	1: Never 2: Hardly ever	Value – 1	0 – 3

	3: Sometimes		
	4: Often		
Reo with Whanaū	1: Never	Value – 1	0 – 3
	2: Hardly ever		
	3: Sometimes		
	4: Often		
Reo at school	1: Never	Value – 1	0 – 3
	2: Hardly ever		
	3: Sometimes		
	4: Often		
Reo elsewhere	1: Never	Value – 1	0 - 3
	2: Hardly ever		
	3: Sometimes		
	4: Often		

Value/5
Possible range 0 – 8
Actual range   0 – 5

Appendix C

Criteria for inclusion into the secure, positive, notional, and compromised identity

categories, originally used by the Te Hoe Nuku Roa research team.

Question Responses	Secure Identity	Positive Identity	Notional Identity	Compromised Identity
ID Maori	1	1	1	2
Whakapapa	3,4	2	1	1,2,3,4
Marae Visits	4,5	3	1,2	1,2,3,4,5
Whanaū	1,2	3	4	1,2,3,4
Land Interest	1	1,3	2,3	1,2,3
Socialisation	1,2	3	4	1,2,3,4
Reo	5,6,7	2,3,4	1	1,2,3,4,5,6,7
Minimum Criteria	ID=1 and 4 appropriate responses	ID=1 and 3 appropriate responses	ID=1 and 4 appropriate responses	ID=2 and an appropriate response

Table 34. Showing how Sporting indicator questions were combined to form Sporting Involvement Variable.

	Not at all	*Only once a month*	*A few times a month*	*Once a week*	*A few times a week*	*Everyday*
Actively involved in an individual sport	0	1	2	3	4	5
Actively involved in a team sport	0	1	2	3	4	5

	No involvement	Social only	Competitive only	Both social & competitive
Personal involvement in sport	0	1	1	2
Sporting Involvement	The score from each of the above questions were added together to form a scale from 0 to 12			

Table 35. Education Scale.

Education scale	Qualification
0	None/ Access
1	NZ School Cert/ Other
2	6th Form Cert/UE/ Polytechnic/Marae Based
3	Bursary/Scholarship/ Wananga Based
4	University/Teaching Qualification

Table 36. Job Status.

Job Status Value	*Do you have a paid job, or a business or farm in which you have worked for pay, profit or income?*
2	No, you are still at school
2	No, you are retired
2	No
1	Yes

Table 37. Hierarchical multiple regressions of demographics, cultural identity, and interaction effects on drink alcohol/month showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=767).

Predictors	Steps 1	2	3
Demographics			
Age	-.256***	-.244***	-.262***
Gender	-.109**	-.106**	-.103**
Health Insurance	-.081*	-.082*	-.082*
Education	-.127***	-.124***	-.121***
Job Status	.102**	.097*	.106**
Total Income	.016	.021	.032
Housing Status	-.054	-.056	-.082
Mobility	.024	.025	.023
Crowding	-.097**	-.092**	-.086*
Sporting Involvement	.124**	.128***	.117**
Exercise	.033	.031	.031
Cultural indicators			
Cultural identity		-.047	-.052
Interactions			
CI x Crowding			-.011
CI x Mobility			.021
CI x Housing Status			.010
CI x Income			-.023
CI x Job Status			.014
CI x Age			-.028
Age x House Status			.072
Age x Job Status			.007
Age x Crowding			-.049
R	.374***	.377***	.389***
Total R^2	.140	.142	.152
Adjusted R^2	.127	.128	.128
R^2 change	.140***	.002	.010

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

Table 38. Hierarchical multiple regressions of demographics, cultural identity, and interaction effects on number smoke/day showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=376).

	Steps		
Predictors	**1**	**2**	**3**
Demographics			
Age	.048	.043	.030
Gender	-.099	-.102	-.101
Health Insurance	-.007	-.007	.001
Education	-.037	-.043	-.032
Job Status	-.088	-.086	-.083
Total Income	.093	.090	.103
Housing Status	-.099	-.099	-.116
Mobility	-.070	-.069	-.080
Crowding	.038	.035	.015
Sporting Involvement	.000	-.001	.005
Exercise	-.038	-.039	-.038
Cultural indicators			
Cultural identity		.032	.004
Interactions			
CI x Crowding			.121*
CI x Mobility			-.002
CI x Housing Status			-.032
CI x Income			-.001
CI x Job Status			.016
CI x Age			.099
Age x House Status			.038
Age x Job Status			.031
Age x Crowding			-.008
R	.197	.199	.243
Total R^2	.039	.040	.059
Adjusted R^2	.010	.008	.004
R^2 change	.039	.001	.019

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

Table 39. Hierarchical multiple regressions of demographics, cultural identity, and interaction effects on Exercise showing standardised regression coefficients, R, R^2, Adjusted R^2, and R^2 change for subjects (N=767).

	Steps		
Predictors	**1**	**2**	**3**
Demographics			
Age	-.065	-.057	-.076
Gender	-.010	-.008	-.010
Health Insurance	-.011	-.012	-.012
Education	.060	.062	.061
Job Status	-.001	-.005	-.010
Total Income	.014	.017	.032
Housing Status	.068	.067	.061
Mobility	-.006	-.006	-.010
Crowding	-.009	-.006	-.005
Sporting Involvement	.391***	.393***	.391***
Cultural indicators			
Cultural identity		-.031	-.033
Interactions			
CI x Crowding			-.026
CI x Mobility			-.003
CI x Housing Status			-.059
CI x Income			.037
CI x Job Status			.092*
CI x Age			.046
Age x House Status			.021
Age x Job Status			.029
Age x Crowding			.032
R	.435***	.436***	.452***
Total R^2	.189	.190	.205
Adjusted R^2	.178	.178	.183
R^2 change	.189***	.001	.015

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

LIFESTYLE INDICATORS

We would like to begin by asking you some questions about certain activities

that you may have been involved in over the past month.

USE PINK SHOWCARD 1

1   Over the past month how often did you...

                                          1   2   3   4   5   6

   attend church or a religious ceremony ☐☐☐☐☐☐

    (not including a funeral or tangi)

2   What is your religion?

   1☐Anglican / Mihinare   2☐   Baptist   3☐   Catholic

   4☐Latter Day Saints / Mormon 5☐   Presbyterian   6☐   Methodist

   7☐Ratana   8☐   Ringatu   9☐   no religion

   10☐   other religion   please

   state_____

3   Are you <u>actively</u> involved in sport as a player, coach, administrator or supporter?

   1☐yes

   2☐no

3.1 How often did you exercise or participate in a fitness program in the past month?

(We want to record the regularity of efforts to improve ones health/fitness through exercise)

1   2   3   4   5   6

☐ ☐ ☐ ☐ ☐ ☐

4   Which electoral roll are you on ?

1 ☐   not eligible   *GO TO QUESTION 6*

2 ☐   general

3 ☐   Mäori

4 ☐   not on roll   why not ?_____

5   Did you vote in the :

                           yes   no

last general election   1 ☐   2 ☐   If no, why not ?_____

CULTURAL INDICATORS

This section deals with items related to Mäori culture and identity.

6   Do you identify as Mäori ?

1 ☐   yes

2 ☐   no

7   If you had to choose <u>one</u> of these options that best describes you,

which would you choose ?

1☐   a kiwi

2☐   a New Zealander

3☐   Mäori/Pakeha

4☐   part Mäori

5☐   a Polynesian

6☐   a Mäori

7☐   other   Please describe_____

8   How many generations of your Mäori ancestry can you name?

(e.g. actually knows at this point in time, does not have to refer elsewhere)

1☐   1 generation (parents)

2☐   2 generations (grandparents)

3☐   3 generations (great grandparents)

4☐   more than 3 generations

9   Do you know the name(s) of your

          yes   no

iwi   ☐   ☐name_____

hapü   ☐   ☐name_____

waka   ☐   ☐name_____

USE BLUE SHOWCARD 2

10   Have you ever been to a marae?

1☐   yes   ➤   how often over the past 12 months?

<pre>
        1   2   3   4   5

      □ □ □ □ □

2 □   no   *GO TO QUESTION 12*
</pre>

11 Is there at least one marae that you regard as <u>your</u> marae?

1 □   yes   ➤   how often did you go to your marae in the past 12 months?

<pre>
            1   2   3   4   5

          □ □ □ □ □
</pre>

2 □   no

11.1   How would you rate your knowledge of marae tikanga?

1 □   excellent

2 □   very good

3 □   good

4 □   fair

5 □   poor

12 From your own personal point of view what type of funeral arrangement

is preferable. (Tick only one)

1☐   marae tangihanga

2☐   funeral chapel service

3☐   house service

4☐   service in a church

5☐   other   _____

12.1   Generally, does your whanau prefer to use urupa or a town/city cemetery?

1☐   urupa

2☐   town/city cemetery

3☐   no preference

The next set of questions are to do with whanau (blood relations)

outside of this household.

USE BLUE SHOWCARD 2

13 In terms of <u>your</u> involvement with <u>your</u> whanau,

would you say that <u>your</u> whanau plays…

1☐   a very large part in your life

2☐   a large part in your life

3☐   a small part in your life

4☐   a very small part/ no part in your life

13.1   Do you have other whänau in the wider community?

1☐   yes

2 ▢ no

If yes, please describe

_____

14 Do you have a financial interest in Mäori land

(i.e. as an owner, part/potential owner or beneficiary ?

1 ▢   yes

2 ▢   no   *GO TO QUESTION 14.3*

3 ▢   not sure/don't know   *GO TO QUESTION 14.3*

14.1   If you have an interest in Mäori land, is the land...

1 ▢   owned solely by you

2 ▢   ownership shared with other members of your family/whänau

3 ▢   owned by an incorporation, that you have shares in

4 ▢   owned by a trust and you are a beneficiary (receive benefits)

5 ▢   ownership, likely to be realised in the future

6 ▢   ownership, something you don't know about

14.2   If you have an interest in Mäori land, do you...

	yes	no
attend owners meetings	☐	☐
visit the land regularly	☐	☐
attend Mäori land court hearings	☐	☐
keep well informed about your land	☐	☐
live on the land	☐	☐

14.3   Over the past 12 months did you...

	yes	no
(a) receive monies from Mäori land	☐	☐
(b) receive any benefit from Mäori land	☐	☐
(c) receive monies from Mäori fisheries	☐	☐
(d) receive any benefit from Mäori fisheries	☐	☐
(e) receive monies from Mäori forestry	☐	☐
(f) receive monies from minerals or	☐	☐
geothermal resources		

USE BLUE SHOWCARD 2

15 Over the past 12 months how often did you

	1	2	3	4	5
go to a beach to gather shell-fish	☐	☐	☐	☐	☐
go out to pick puha	☐	☐	☐	☐	☐
make rewana bread	☐	☐	☐	☐	☐
perserve kanga-piro; karengo	☐	☐	☐	☐	☐
help prepare a hangi	☐	☐	☐	☐	☐

go out to catch tuna/eels   ☐☐☐☐☐

16 This question considers your contacts with people.

In general, would you say that your contacts are with...

☐ mainly Mäori

☐ some Mäori

☐ few Mäori

☐ no Mäori

TE REO MÄORI - MÄORI LANGUAGE

Now I would like to ask you some questions about you and Maori language.

17 How would you rate your overall ability with Mäori language?

1 ☐   excellent

2 ☐   very good

3 ☐   good

4 ☐   fair

5 ☐   poor

6 ☐   not applicable   *GO TO QUESTION 21*

18 How did you acquire your ability with Mäori language?

1 ☐   learned as a first language (ie. as a child)

2 ☐   you taught yourself

3 ☐   learned as a second language from family/whänau

4 ☐   learned as a second language at an educational institution

5 ☐   other specify _____

19 Please rate your level at <u>speaking</u> Mäori from purple Showcard 8.

      1   2   3   4   5   6

    ☐☐☐☐☐☐

20 Please rate your level at <u>understanding</u> Mäori from grey Showcard 9.

      1   2   3   4   5   6

    ☐☐☐☐☐☐

21 How satisfied are you with your level of Mäori language?

      1   2   3   4

    ☐☐☐☐

22 Is your overall ability with Mäori language...

    1☐   better now than 3 years ago

    2☐   poorer now than 3 years ago

    3☐   about the same as 3 years ago

23 How often do you use Mäori as your main language of communication?

          1   2   3   4   5

at home   ☐☐☐☐☐

at work   ☐☐☐☐☐

when dealing with   □□□□□

counter staff at shops, banks, libraries, public institutions, eg. in everyday life

with your own children   □□□□□

with other children   □□□□□

with family/whänau   □□□□□

with friends   □□□□□

with kaumatua   □□□□□

24 How important do you think it is for Mäori language to be used within...

<table>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>your household</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>your whänau</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>your hapü</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>your iwi</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
</table>

25 How important do you think it is for people to be able to access

the following services using Mäori language ?

<table>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>health care services</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>public library services</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>local council services</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
<tr><td>government agency</td><td colspan="4">☐ ☐ ☐ ☐</td></tr>
</table>

services   eg. Income support, IRD

26 If you wanted to increase your ability to speak or understand Mäori language,

what would you do ?

1 ☐   teach yourself

2 ☐   learn from your kaumatua

3 ☐   learn from whänau who know Mäori

4 ☐   enrol in a Mäori language course at polytech or university

5 ☐   enrol in some other Mäori language course (please specify) _____

6 ☐   other (please explain) _____

27 How often do you read written Mäori?

1   2   3   4   5

□□□□□

what sort of material/books ?   _____

28 How often do you write Mäori ?

1   2   3   4   5

□□□□□

whatsort of writing ?_____

29 How often do you listen to and/or watch ?

                              1   2   3   4   5

Mäori language television   □□□□□

Mäori language radio   □□□□□

USE YELLOW SHOWCARD 3

30 In general, how satisfied are you with the choice of <u>Mäori language</u>

broadcasting available to you ?

        1   2   3   4 don't know/no position

31 Are you listening to or watching <u>Mäori language</u> programmes

    1☐   more often now than 3 years ago

    2☐   less often now than 3 years ago

    3☐   about the same amount of time as 3 years ago

    4☐   not applicable (eg. Mäori language programmes are not watched or listened to in your

household)

32 In your household, is Mäori spoken :

    1☐   more often now than 3 years ago

    2☐   less often now than 3 years ago

    3☐   about the same now as 3 years ago

    4☐   not applicable (eg. Mäori is not spoken in your household)

33 Up until you were 15 years old, what language did adults in your home mostly

use when talking amongst themselves ?

    1☐   English

    2☐   Mäori

    3☐   both

    4☐   other

33.1   Up until you were 15 years old, what language did adults in your home mostly

use when talking to you ?

1☐   English

2☐   Mäori

3☐   both

4☐   other

34 Do you think the number of <u>Mäori language</u> speakers is

1☐   increasing

2☐   decreasing

3☐   staying about the same

4☐   don't know

34.1   Do you think the quality of <u>Mäori language</u> is

1☐   improving

2☐   declining

3☐   staying about the same

4☐   don't know

35 In the year 2050 do you think <u>Mäori language</u> will be used..

1☐ more than it is today

2☐ less than it is today

3☐ about the same amount as it is today

4☐ only on special occassions or at marae

5☐ other   specify _____

36 In 3 years time, do you think your overall ability with <u>Mäori language</u> will be

1☐ better than it is now

2☐ worse than it is now

3☐ about the same as it is now

4☐ don't know

HEALTH

Now I would like to ask you some questions about your health and your views on health

36 How would you rate your present state of health?

1☐ excellent

2☐ very good

3☐ good

4☐ fair

5☐ poor

37 In comparison to 3 years ago, would you say your health, in general is...

1☐ much better now than 3 years ago

2☐ a little better now than 3 years ago

3☐ about the same as 3 years ago

4☐ a little worse than 3 years ago

5☐ much worse than 3 years ago

38 In relation to the next 3 years, do you think that your health will...

1☐ improve

2☐ stay about the same

3☐ deteriorate

4☐ decline seriously

USE RED SHOWCARD 5

39 How important to you being healthy?

1 2 3 4

☐☐☐☐

40 Over the past 12 months did you need any form of medical treatment?

1☐ yes *GO TO QUESTION 40.1*

2☐ no *GO TO QUESTION 41*

40.1　Were you able to get treatment when you needed it?

1☐　no

2☐　sometimes

3☐　yes, usually

4☐　yes, always

41　At present, do you...

	yes	no	
have a major or minor disability	☐	☐	If yes, please explain＿＿＿＿＿
have a medical condition which requires medication	☐	☐	If yes, please explain＿＿＿＿＿
have a mental health problem which requires expert help	☐	☐	If yes, please explain＿＿＿＿＿
have any other health related conditions	☐	☐	If yes, please explain＿＿＿＿＿

USE WHITE SHOWCARD 6

42　If you had a health problem that you knew needed treatment, who would you usually see first ?

1　2　3　4　5　6　7　8

☐☐☐☐☐☐☐☐

USE BLUE SHOWCARD 2

43　Over the past 12 months, in reference to your <u>own</u> health, how often did you...

1　　2　3　4　5

receive treatment from a GP   ☐☐☐☐☐

receive treatment at A & E   ☐☐☐☐☐

see a medical specialist   ☐☐☐☐☐

visit a naturopath   ☐☐☐☐☐

get admitted as an

in-patient to hospital   ☐☐☐☐☐

receive treatment from

a chiropractor   ☐☐☐☐☐

receive advice or treatment

from a nurse   ☐☐☐☐☐

receive advice or treatment from

a community health worker   ☐☐☐☐☐

receive treatment from a

Mäori healer   ☐☐☐☐☐

receive dental treatment   ☐☐☐☐☐

44   Are you currently involved or enrolled in a kaupapa Mäori health program?

    1 ☐   yes

    2 ☐   no

USE PINK SHOWCARD 1

45   How often did you drink alcohol in the past month?

     1   2   3   4   5   6

    ☐☐☐☐☐☐

46   Do you smoke cigarettes regularly (that is, one or more per day)?

(count ONLY tobacco cigarettes, not pipes, cigars or cigarillos)

1☐   yes   If yes how many have you smoked in the past 2 days?

_____

2☐   no

47 Do you have a high users health care card?

1☐   yes

2☐   no

48 Do you have health/sickness insurance? (e.g. Southern Cross, Medicare)

1☐   yes

2☐   no

49 Over the next 3 years what aspects of your health would you like to change ?

_____

_____

_____

EDUCATION

I would now like to ask some questions about you and education

50 How would you rate your current level of education?

1☐   excellent

2☐   very good

3☐   good

4☐ fair

5☐ poor

USE YELLOW SHOWCARD 3

51 How satisfied are you with your level of education?

     1   2   3   4

☐☐☐☐

52 Are you currently attending an educational institution?

1☐   yes *GO TO QUESTION 52.1*

2☐   no *GO TO QUESTION 53*

52.1   Are you studying...

1☐   fulltime

2☐   part-time

52.2   Are you attending…

1☐   a secondary school

2☐   a night school

3☐   a tertiary institution

4☐   other   please describe _____

53   Were you educated at ...

                                yes no

preschool   ☐☐please describe_____

primary school   ☐☐please describe_____

secondary school   ☐☐please describe_____

post secondary   ☐☐please describe_____

54 If you had the choice of the following options, where would you now,

prefer to have been educated ? (Tick only one option from each group)

<u>PRE-SCHOOL</u>

1☐   creche or

2☐   play centre or

3☐   kindergarten or

4☐   kohanga reo or

5☐   other   please describe_____

<u>PRIMARY SCHOOL</u>

1☐ mainstream class in state primary school

2☐ bilingual class in state primary school

3☐ kura kaupapa Māori or

4☐ home school or

5☐ private school (primary) or

6☐ other   please describe_____

SECONDARY SCHOOL

1☐ mainstream class at state secondary school or

2☐ bilingual class in state secondary school or

3☐ private school (secondary) or

4☐ Māori boarding school

5☐ other   please describe_____

POST SECONDARY SCHOOL

1☐ university or

2☐ polytechnics or

3☐ tribal wananga or

4☐ teacher training or

5☐ correspondence courses or

6☐ marae based training programmes or

7☐ other   please describe_____

55 Do you have a secondary school qualification?

1☐ yes

2☐ no *GO TO QUESTION 55.2*

55.1   What was your highest secondary school qualification?

1☐ NZ School Certificate in one or more subjects

2☐ NZ Sixth Form Certificate in one or more subjects

3☐ NZ University Entrance before 1986 in one or more subjects

4☐ NZ Higher School Certificate or Higher Leaving Certificate

5☐ NZ University Bursary or Entrance, or Scholarship

6☐ other NZ secondary school qualification

Please describe _____

7☐ overseas secondary school qualification

Please describe _____

55.2 Do you have any other qualification that has taken at least 3 months to complete

such as trade cert, a diploma or a degree?

1☐ yes

2☐ no

56 When you were at school, or if you are attending school,

what is or was the subject you ..

like(d) learning most ?_____

like(d) learning least ?_____

57 Do you think there are enough choices today for Mäori people who are

seeking an education for themselves or their children?

1☐ yes

2☐ no

58 Where would you go to get help with your learning of things Mäori?

(e.g. Mäori history, whakapapa, tikanga Mäori, ...)

1 ☐ whänau

2 ☐ kaumatua

3 ☐ education institution

4 ☐ wänanga

5 ☐ marae

6 ☐ other   please describe_____

60 What goals do you have for your own education? (tick as many as appropriate)

1 ☐ to complete a secondary school qualification

2 ☐ to complete a tertiary qualification

3 ☐ to pursue personal interest or development (what area?)_____

4 ☐ to pursue whanau and/or iwi development (what area?)_____

5 ☐ I have no goals for my education

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┌─────────────────────┐
│ EMPLOYMENT          │
└─────────────────────┘
```

Now I would like to ask you some questions about your employment.

61 Do you have a paid job, or a business or farm in which you

worked for pay, profit or income?

   1☐   yes   ➤   ☐fulltime

                ➤   ☐part-time

   2☐   no   *GO TO QUESTION 64*

   3☐   no, you are retired   *GO TO QUESTION 66*

   4☐   no, you are still at an

        educational institution   *GO TO QUESTION 66*

62 In that job, what was your main occupation, for example:

(Shoe shop manager, builder's labourer, primary school teacher)

_____   ☐☐ code

USE YELLOW SHOWCARD 3

63 How satisfied are you with your job?

        1   2   3   4

        ☐☐☐☐*GO TO QUESTION 66*

64 Which of the following situation(s) apply to you?

   1☐   choose not to work

   2☐   looking for work   _____how long?

---

3 ☐ home executive

4 ☐ full-time child care

5 ☐ other _____comment

USE YELLOW SHOWCARD 3

65 How satisfied are you with this situation?

1   2   3   4

☐☐☐☐

66 Over the next 3 years, do you think your present employment situation will...

1 ☐ improve

2 ☐ stay about the same

3 ☐ come under threat

4 ☐ lead to unemployment or further unemployment

5 ☐ don't know

Comment _____

```
┌─────────────┐
│ INCOME      │
└─────────────┘
```

Now I would like to ask you some questions about your income

67 Over the past 12 months did you get income from :

    1☐   wages, salary, commissions, bonuses, etc. paid by an employer

    2☐   self-employment, or business you own and work in

    3☐   interest, dividends, rent, other investments

    4☐   National Superannuation or Veterans Pension

    5☐   other Government income support payments (benefits etc)

        (e.g unemployment benefit, DPB, ACC regular payments, Student Allowance)

    6☐   superannuation, pensions, annuities

        (do not include, National Super or Veterans Pension)

    7☐   income support not from Government

        (e.g. maintenance from ex-spouse)

    8☐   other sources of income

68 From all of the sources of income above, what is the total income that you

    got for the past 12 months, before tax or anything else was taken out ?

    _____

USE YELLOW SHOWCARD 3

69 How satisfied are you with your level of income?

      1   2   3   4

    ☐☐☐☐

70 What sort of financial plans have you made for your old age? (tick any appropriate)

1 ☐   shares in stock market

2 ☐   insurance investment

3 ☐   business investments

4 ☐   a super scheme

5 ☐   regular savings

6 ☐   nothing at all

7 ☐   other   _____

70.1   Do you think this will be adequate?

1 ☐   yes

2 ☐   no

71 Over the last 4 weeks have you given money to:

	no	<$20	$20-$50	$50-$100	$100 +
help your whanau	☐	☐	☐	☐	☐
a church	☐	☐	☐	☐	☐
your marae	☐	☐	☐	☐	☐
other Mäori causes	☐	☐	☐	☐	☐

please specify kohanga, kura etc _____

| other causes | ☐ | ☐ | ☐ | ☐ | ☐ |

please specify red cross etc___ _____

72 When you had your last family hui, (tangi, unveiling, 21st, etc)

    did you contribute to it by :

	yes	no
taking out a loan from a bank	☐	☐
taking out a loan from elsewhere	☐	☐ please specify_____
just giving what you could	☐	☐
borrowing from friends/family	☐	☐
saving up for it	☐	☐
fundraising	☐	☐
delaying payment of bills	☐	☐

other (comment)   _____

73 How many people are receiving an income in this household?

    (Other than just interest or dividends)

    _____

73.1   What is the total income for the household?

   (Is this before tax or after tax, and for what period, per week, fortnight or year?)

   amount _____   before tax/after tax

   frequency _____   annually/monthly/fortnightly/weekly/etc

HOUSEHOLD

Now I would like to ask you some questions about accommodation & housing

USE YELLOW SHOWCARD 3

74 How satisfied are you with your accommodation?

        1   2   3   4

        ☐☐☐☐

74.1   Which of the following best describes your housing situation.

  1☐   you are paying board   *GO TO QUESTION 75*

  2☐   you are paying rent/lease   *GO TO QUESTION 75*

  3☐   you are not paying any form of board, rent or mortgage   *GO TO QUESTION 76*

  4☐   you are paying a mortgage to buy a house   *GO TO QUESTION 76*

  5☐   you own a house without a loan or mortgage   *GO TO QUESTION 76*

  6☐   other (please explain _____)

75 Who is the landlord or leaser?

  1☐   a private individual, group or agency - please state agency/group _____

  2☐   Housing New Zealand (Housing Corporation)

  3☐   Te Puni Kökiri (Mäori Affairs)

  4☐   a whänau member

  5☐   a member of your immediate family

  6☐   don't know

  7☐   other   please explain _____

USE RED SHOWCARD 5

75.1   How important is it for you to buy or own a house?

        1   2   3   4

        ☐☐☐☐☐

75.2   Have you got any plans to buy or own a house?

  1☐   yes

  2☐   no why not _____   *GO TO QUESTION 77*

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75.3   Within which of the following price ranges will the house that you

will be buying fall ?

1☐ $25, 000 - 49,000

2☐ $50, 000 - 74, 000

3☐ $75, 000 - 99, 000

4☐ $100, 000 - 124, 000

5☐ $125, 000 - 149, 000

6☐ $150, 000+

75.4   Given that most lending institutions require that you provide 20% deposit before they

will grant a mortgage, do you feel you could save for a deposit....

1☐   within next 2 years

2☐   within next 5 years

3☐   within next 10 years

4☐   more than 10 years *GO TO QUESTION 77*

76 If you own a home or are purchasing a home who provided

the major part of the finance ? *OTHERWISE GO TO QUESTION 77*

1☐ yourself and/or spouse/partner

2☐ a bank (please name _____)

4☐ a finance company

5☐ Te Puni Kōkiri (Māori Affairs)

6☐ Housing Corporation

7☐ an insurance company (please name _____)

8☐ family or whänau

9☐ from savings

10☐ other (please name _____)

76.1 Did you need a deposit to purchase the home?

1☐ yes

2☐ no why not? _____ *GO TO QUESTION 77*

76.2 How did you get the deposit to purchase the home?

_____

77 Do you think that over the next few years your housing situation will...

1☐ improve

2☐ stay about the same

3☐ deteriorate

4☐ decline seriously

78 Do you have any of the following insurances?

	yes	no
mortgage repayment insurance	☐	☐
house insurance	☐	☐
contents insurance	☐	☐

79 How many times have you changed address in the past 3 years?

_____

80 How long have you lived in this house?

1☐　　less than 1 year

2☐　　between 1-5 years

3☐　　between 5-10 years

4☐　　> 10 years

81 How many people live in this household?

☐☐

81.1   How many are of...

Mäori descent ☐☐ ➤   permanent residents ☐☐

                    ➤   temporary residents ☐☐

non-Mäori ☐☐ ➤   permanent residents ☐☐

                    ➤   temporary residents ☐☐

82 What situation below best describes your current household ?

    1 ☐ a sole person

    2 ☐ a sole parent

        (number of children ☐)

    3 ☐ a couple (married/defacto) no children

    4 ☐ a couple (married/defacto) with children

        (number of children ☐)

    5 ☐ a shared house/flat

        (number of children if applicable)

    6 ☐ other please describe _____

        (number of children if applicable ☐)

RELATIVES

82.1   Do you have any other relatives including in-laws

    living in this home ?

    1 ☐ no

    2 ☐ yes ➤ 3 ☐ whängai

                    4 ☐ older relatives

5 ☐ younger relatives

6 ☐ other relatives

OTHER RESIDENTS

82.2 Do you have any other people living in this home?

1 ☐ no

2 ☐ yes ➤ 3 ☐ friends

4 ☐ boarders

5 ☐ flatmates

6 ☐ other people

83 Over the next 3 years, do you expect that the membership of this

household will :

1 ☐ remain about the same

2 ☐ have a few changes

3 ☐ have many changes

4 ☐ don't know

84 Who normally completes the following tasks?

	shared	male	female
grocery shopping	☐	☐	☐ _____
housework	☐	☐	☐ _____
washing clothes	☐	☐	☐ _____
ironing clothes	☐	☐	☐ _____
cooking	☐	☐	☐ _____
meal planning	☐	☐	☐ _____
outdoor maintenance	☐	☐	☐ _____
house maintenance	☐	☐	☐ _____

Thank you for participating in this important project. I would now like to ask you for some general comments on the questionnaire, such as good points, bad points and criticisms etc

Comments on T.H.N.R. questionnaire:_____

_____

_____

FUTURE INVOLVEMENT

85 As this project is a longitudinal study that is it is studying the same group of people over a long period of time, we would like to contact you again in three years time to invite you to participate again in our study, would you be interested ?

1 ☐   yes

2 ☐   no

86 Would you be interested in participating in other studies related to this study?

1 ☐ yes

2 ☐ no

87 Could you please provide the names of people/family who would be able

to assist us in locating you if you were to move from this address ?

NAME   ADDRESS   PHONE