Towards a longitudinal study of Ngāi Tahu financial literacy: a literature review of relevant longitudinal studies

by

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25 June 2012

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Acknowledgements: We gratefully acknowledge the assistance of Corey Bragg (Kaiārahi Māori, University of Otago School of Business).

1. Introduction

In October 2011, Te Rūnanga o Ngāi Tahu (hereafter 'Te Rūnanga'), the Commission for Financial Literacy and Retirement Income (CFLRI, formerly the Retirement Commission) and the University of Otago School of Business held a meeting[1] to discuss the possibility of executing a longitudinal study on financial literacy and knowledge among Ngāi Tahu[2]. Before that study was to be executed, the parties agreed that a literature review should be undertaken, from which the details of the longitudinal study would emerge. Two literature reviews have been undertaken, one on longitudinal studies and another concerned with financial literacy and its antecedents. This literature review constitutes the first of these reviews and is concerned with the use of longitudinal study research design.

In this literature review, many aspects of longitudinal studies are considered, with an aim to determine appropriate research methods and approaches for the proposed study. Firstly, types of longitudinal studies are considered, with benefits and problems of each of those outlined. Next, a range of completed studies are evaluated, with a focus on key aspects of those studies. Finally, research in a Māori (specifically Ngāi Tahu *whānui*) context is considered.

2. What are longitudinal studies?

A longitudinal study collects data from the same population at two or more points in time (Joshi, 2008). In doing so, the element of time is added to a cross-sectional study of a population, which allows for patterns of change to be measured and provides inferences of causation for those changes (Singleton & Straits, 2010). By comparing current data against historical data researchers are able to establish what changes have occurred over time. Longitudinal research helps to map the social world over time, allowing researchers to

[1] The University of Otago has a partnership with Ngāi Tahu, as *mana whenua* within this *takiwā*, by way of a Memorandum of Understanding with Te Rūnanga o Ngāi Tahu.

[2] Ngāi Tahu are the *iwi* comprised of Ngāi Tahu *whānui*; that is, the collective of the individuals who descend from the five primary *hapū* of Ngāi Tahu, Ngāti Māmoe and Waitaha, namely Kāti Kurī, Ngāti Irakehu, Kāti Huirapa, Ngāi Tūāhuriri and Ngāi Te Ruahikihiki (Te Rūnanga o Ngāi Tahu, 1996).

determine what changes take place over generations, within lifetimes, and through history (Elliott, Holland, & Thomson, 2008).

There are three major types of longitudinal study: panel studies, trend studies, and cohort studies (Ruane, 2005)[3]. Each of these has a different focus: panel studies measure changes in individuals over time, trend studies measure general social changes and cohort studies measure changes in age groups (Singleton & Straits, 2010).

If there is sufficient data on a particular topic in recorded studies, census data, or administrative data, researchers can use those records, without having to undertake research themselves, to come to conclusions on their research topic, through research known as record linkage studies (Singleton & Straits, 2010). Through analysing data of other completed studies, researchers attempt to create a picture of change over time. This is an unobtrusive way of undertaking longitudinal research, as subjects may not even be aware that they are a member of the panel (Elliott et al., 2008). This is only useful where there is sufficient data on the subject, and financial understanding and financial wellbeing are relatively untouched in studies in New Zealand. However, there is information available on social indicators such as mortality levels, fertility, education and income that can be used indirectly.

3. What types of longitudinal studies are available?

3.1. Panel studies

Panel studies involve collecting data from the same sample of respondents on more than one occasion (Sarantakos, 1998). This can involve repeated sampling over regular intervals, or interviews before and after significant events such as the launch of a new financial literacy training website by Te Rūnanga (Ruane, 2005). Each of the data collection points is known as a wave of the study. By repeatedly surveying an individual, a researcher is able to record much more detail on the individual's life history than if only a single survey is

[3] There are other less common types of longitudinal study, which were not considered relevant to the proposed research. Record linkage studies involve linking census or other administrative data, and are considered briefly. It is also possible to conduct retrospective longitudinal research, where respondents are asked to answer questions about events over their lifetime in one interview. However, it can be difficult for respondents to correctly recall some events, and it is difficult to gather meaningful qualitative evidence through this method.

undertaken (Singleton & Straits, 2010). With this, a more detailed picture of changes to that individual can be viewed than in cross sectional studies.

Panel studies can be done at an individual level or at a household level (the sampling unit), depending on the information sought by the researchers. Some information, such as attitudes towards investing, would need to be measured at an individual level, while other information, such as net household wealth or investment, needs to be measured at a household level. Which form the research takes is determined by the focus of the investigation. If the interest is in how financial education affects actions, then the study may need to be at an individual level, since each individual in a household would be subject to different levels of education. However, Tikanga Māori is underpinned by *kotahitanga* (collective action) and *whanaungatanga* (familiness) rather than individualistic action (Ritchie, 1992). Clearly the researcher must consider issues of culture, and particularly Kaupapa Māori research methodology (Bishop, 1999), when deciding on methods of collecting data.

3.1.1. Benefits of panel studies

Because panel studies follow the same individuals over a period of time, they are the best way to analyse change occurring in specific individuals (Robinson, Schmidt, & Teti, 2005). For example, a panel study could be used to determine the level of investments of an individual across many years, or their attitude towards investing over that time. Panel studies also allow more data to be collected about each individual, meaning stronger links for causation of changes can be found (Singleton & Straits, 2010). It is also possible to introduce new topics or focuses at any wave and then to follow those over time. Household panel studies allow for intergenerational changes to be analysed.

If sufficient data and respondents are covered in a panel study then it can be divided into cohorts for further analysis. However, achieving accurate results may require the panel study to include far more respondents than otherwise necessary, significantly increasing cost and effort.

3.1.2. Problems of panel studies

Although panel studies are the leading way to study individual change, they can be difficult to execute successfully. The major problem is attrition of the respondents over the course of the study, due to any number of factors such as death, moving countries or cities, or simple loss of interest in the study (Robinson et al., 2005). For example, in the British Household Panel Study, nearly half of the original sample was lost by the tenth annual re-interview (Payne & Payne, 2004). Keeping records of each respondent can be difficult and expensive, and is likely to prove more difficult in times of increased international travel. While respondents might inform friends and the electoral roll when they move, they are less likely to inform researchers of a study (Ruane, 2005). This means that researchers need to keep in touch with respondents, which can be costly and time consuming. However, Te Rūnanga may be able to mitigate problems such as this. Te Rūnanga's *whakapapa* tribal registration (Te Rūnanga o Ngāi Tahu, 1996) could be used to enhance the maintainance of contact with respondents. Further, if there is regular contact made and feedback sought then a survey may be able to be added to this. Finally, if the research is undertaken by or in conjunction with Te Rūnanga then respondents' attitudes towards the study are likely to be much more positive, as they can understand its benefit to them.

Elliot et al. (2008) list a number of further methods to combat attrition: targeted incentive payments; allowing respondents to choose the mode in which they are interviewed (phone, *kanohi ki te kanohi* etc); collecting 'stable addresses' such as parents or relatives unlikely to move; making regular contact with the respondents; and the relationship built up between the researchers and the participants.

Panel attrition is not necessarily fatal to a panel study. Since data is collected on each individual, the original information collected can be used to assess non-response bias in later waves[4], and with this, statistical adjustments can be made (Singleton & Straits, 2010). This controls the effects of attrition; however efforts still need to be made to maintain a significant percentage of original respondents in the study to enable statistical inferences to be made.

[4] Characteristics of non-respondents can be compared to those of respondents to assess if there is a significant difference between the two groups.

The need to keep in touch with respondents over the course of the study means that panel studies are resource intensive, and require a lot of time and money to be expended. In an effort to retain a high percentage of the original respondents in the National Longitudinal Survey of Youth (US), respondents were offered $10 for their time as an incentive. This was successful, as after 13 years, 90 percent of the original sample was still able to be interviewed (Singleton & Straits, 2010). In a Ngāi Tahu study a *koha* may also assist retention. Where the study is of a whole household, the problems of keeping in touch with all respondents is increased, and issues arise around new members becoming a part of each household and how they are treated in the study. This is amplified if a household consists of an intergenerational group, as may be the case with a number of Ngāi Tahu households.

Another issue can be the retention of the research team over a period of time. Relationships built up between respondents and researchers can decrease attrition of respondents so it is important to retain well-trained researchers in the study. Alternatively there must be appropriate succession procedures in place.

Repeated sampling of respondents can result in panel conditioning, where the respondents gradually learn more about the research study and can cause a distortion in the research findings as they are no longer a true representation of the population (Sarantakos, 1998). Repeated sampling can also result in 'time-in-sample bias' (Singleton & Straits, 2010). This can occur where surveys become so routine that the respondent simply repeats answers from previous waves rather than considering the question, or where the respondent determines that by answering in a particular way they will avoid follow up questions.

A further concern is around confidentiality and anonymity (Elliott et al., 2008). Researchers will have large quantities of information about each respondent, sometimes enough to identify individuals. There are also concerns around consent, so researchers need to continually consult respondents for their consent at various stages of the research. The ethical complexity of longitudinal research amplifies over time, particularly in relation to consent and privacy (McLeod & Thomson, 2009). At the University of Otago, this would be

considered through the University Ethics Approval and the Research Consultation with Māori Policy[5].

3.2. Trend studies

As in panel studies, in trend studies the research is also repeated several times. The key difference is that different respondents from the same population are sampled at each wave, so individuals cannot be tracked over time (Singleton & Straits, 2010). Since different individuals are sampled at each wave, trend studies only allow for the measurement of change of the entire population over the relevant period. It is possible to use record linkage studies to complete a trend study, as data from each census or other study could be linked to analyse changes over time.

If undertaken properly and a representative sample is selected for each wave, then a trend study can determine whether the population has changed as a whole (Ruane, 2005). While this is much simpler and cheaper than a panel study, it loses the ability to assess changes at an individual level, as no data is kept on individuals, and different people are surveyed at each wave.

There are two conditions that must be met for trend studies to be able to document population change: each wave of the study must be a representative sample of the same population, and the measurement process must be consistent (Ruane, 2005).

3.2.1. Benefits of trend studies

Trend studies avoid some of the major problems with panel studies. They do not require excessive record keeping, and are not affected by panel mortality or attrition (Menard, 2008).

[5] The policy provides the framework for an appropriate and mandated consultation process with Māori for research. It ensures an effective and efficient mechanism for managing the consultation process while acknowledging the needs and aspirations of Ngāi Tahu for Māori development and benefit as expressed in Ngāi Tahu Vision 2025.

Where research sampling needs to be undertaken, trend studies are the least resource heavy method of the three. There is no need to continue contact with the individuals from each wave, and therefore the cost of continual contact and attempts to mitigate attrition are removed. Trend studies also do not suffer from panel conditioning, and there are far fewer ethical issues involved, as there is much less information gained from each respondent. If completed as a record linkage study then it is possible to complete a trend study without actually conducting any original research, provided sufficient information is available.

3.2.2. Problems of trend studies

Trend studies cannot assess information at an individual level, and only changes at a population level can be measured (Robinson et al., 2005). This means that only changes such as the population's view as a whole on investing can be measured, rather than how a particular individual's view on investing has changed (and the circumstances affecting that change).

Depending on the study, the population can also change without the individuals sampled changing (Ruane, 2005). This occurs where the population sampled is limited. For example, if high school children were surveyed for their general financial understanding in 2005, then a new sample of the high school was taken in 2012, no children from the original sample would be left in the survey. The new children could come from a much more wealthy background, or much less, and that would affect the results of the study.

3.3. Cohort studies

Cohort studies are the third major type of longitudinal study. These study a specific cohort of persons or segment of a population at multiple points in time. This is usually defined as people who experience the same significant life event within a specified period of time (Ruane, 2005). The common event can be things such as birth dates, graduation from high school, or possibly even year of enrolment into a savings scheme. Cohort studies allow for analysis of the effects of aging, along with chronological changes (Singleton & Straits, 2010).

Cohort studies are useful where it is suspected that changes in a cohort will be different to the changes in the general population (Robinson et al., 2005). They enable the consideration of certain life events impacting on life change and development (Ruane, 2005). Examples could be people that started their working careers when KiwiSaver was introduced, or for Ngāi Tahu, those who have joined the Whai Rawa savings scheme.

3.3.1. Benefits of cohort studies

Cohort studies are beneficial as they allow researchers to study three different influences associated with the passage of time. These are life course (as people grow older their views or behaviour change), cohort (older or younger generations may behave differently or have different views), and historical period (over time the prevailing social culture may change, leading to a change in behaviour or views) (Singleton & Straits, 2010). This would mean that researchers could determine whether better financial understanding occurs because of being born in a certain cohort, or simply through aging.

Cohort studies are particularly useful where researchers hypothesise that changes in one cohort will be different to that of the general population (Ruane, 2005). This is generally due to significant life events impacting on life changes and development (Singleton & Straits, 2010).

Depending on the type of information sought, a cohort study can be completed either as a panel study or a trend study (Elliott et al., 2008; Ruane, 2005). Different respondents from the same cohort can be surveyed at each wave (like in a trend study), or the same respondents can be followed through for the entire period (as in a panel study).

3.3.2. Problems of cohort studies

Depending on the design of a cohort study, it will suffer from the same problems as panel studies or trend studies. If the study follows the same set of respondents, as in a panel study, then there will be problems of attrition, along with the other problems found with panel studies. If the study uses a new sample of the cohort at each wave then the problems found in trend studies will be inherent.

4. General benefits of longitudinal studies

Longitudinal studies are extremely useful when considering changes over time, or in analysing methods of behaviour (Sarantakos, 1998). They allow sequences of action and social changes over time to be analysed (Payne & Payne, 2004) as opposed to a 'one-shot' cross-sectional study. However, they also suffer a number of problems, which are covered at in Section 5.

Each of the three types of longitudinal studies outlined in Section 3 has a different focus, with different benefits and drawbacks for each. When the interest is changes in individuals over time, then a panel study is appropriate; where the interest is in general social changes over time, then a trend study is suitable; and where the interest is in a specific age group changing over time, a cohort study should be used (Singleton & Straits, 2010). The focus of the investigation needs to be considered by the researchers before coming to a conclusion on which of these is appropriate.

5. General problems with longitudinal studies

Despite being a valuable research tool, longitudinal studies suffer from several problems, although there are ways to mitigate these. One of the major problems with all forms of longitudinal research is the length of time that it can take. Some studies can take decades without having significant findings to report, unless they are designed particularly well (Payne & Payne, 2004). Funders of research generally want results of the research on a limited timeframe, and to have to wait years, if not decades, for findings can be a significant problem. This varies with the type of data being researched and the frequency of waves of the study.

It can be difficult to convince respondents to take part in the study (Sarantakos, 1998). This is amplified in panel studies, as the respondents have to commit to more than a single study. Te Rūnanga could be in a unique position here, as Ngāi Tahu *iwi* members may be more willing to partake in a study which would prove of benefit to them.

Motivating respondents to be accurate with their answers in the study can prove problematic, especially where questions are of a personal and sensitive nature (Sarantakos, 1998). The method of gathering data can have an effect on this. Where data is collected through face to face interviews, the interviewer may be able to build a positive relationship with the respondents, resulting in more accurate answers. There is much less that can be done where the data is gathered only through questionnaires filled out by the respondents.

To be an effective measure of change over time, the study needs to maintain the same structure and criteria at each stage (Sarantakos, 1998). This requires good planning and execution from the researchers and their successors. However, sometimes what is being researched becomes obsolete, or the information which becomes relevant in later years of the study is not measured or sufficiently recorded in the earlier years of the study (Payne & Payne, 2004). To this end, it is useful for the study to be as wide as possible in early years, and record as much information as possible. With the rapid changes undergone in the financial sector over the last decade maintaining relevancy of the study would be a major focus of initial planning.

The Hawthorne Effect can also distort the research findings, where respondents behave in a way they think the researchers want them to (Payne & Payne, 2004).

No panel studies have been conducted on financial understanding. There could be real problems with panelists gaining significant financial understanding through undertaking the study, which would distort the findings. This may make repeated cross-sectional study more appropriate.

6. Relevant studies

Internationally there are few longitudinal studies that look at financial wellbeing, and even fewer that focus on indigenous peoples. The following Sections (6.1 and 6.2) contain short descriptions of some completed longitudinal and cross sectional studies which may provide some guidance to the design of an appropriate research method for a longitudinal study of financial literacy and well-being of Ngāi Tahu. These studies will be discussed in further detail in Section 7.

6.1. Longitudinal studies

Footprints in Time: the Longitudinal Study of Indigenous Children (hereafter *Footprints in Time*) is a longitudinal panel study of two cohorts of indigenous children in Australia from 2007 to 2012. The study looks at the lives of Aboriginal and Torres Strait Islander children and their families in Australia (Department of Families, Housing, Community Services and Indigenous Affairs, 2009a). The main focus is on health and social development of children through their early years, however a range of other areas are touched on. It aims to improve understanding of the circumstances faced by Aboriginal and Torres Strait Islander children, their families and communities, and also the policy response of the government to this (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b). The results so far are limited, as only two waves of the study have been reported on, but it is envisioned that the study's value will increase as further waves are analysed (Department of Families, Housing, Community Services and Indigenous Affairs, 2010).

The Survey of Family, Income and Employment Dynamics (hereafter *SoFIE*) is a longitudinal panel study of households, and individuals living in those households, in New Zealand from 2002 to 2010. Among other objectives, this study looks into savings for retirement, patterns of income levels, effects of government support, education, and the effects of being unemployed, with a focus on factors impacting on social and economic wellbeing of individuals, families and households over time (Carter, Cronin, Blakely, Hayward, & Richardson, 2009). The purpose of the study is to provide information that will help shape government policy in areas of income support, employment, education, training, retirement provision and family support (Statistics New Zealand, 2001, p. 10). Of most relevance to the proposed study, retirement provision looks at income flows, saving behaviour and wealth accumulation of the respondents over time, along with the factors likely to affect this, such as family status, life cycle changes and labour market activity. There is an aim to have accurate estimates for the Māori population for each of these objectives, however since the sample size is limited it is not possible to have the same level of analysis for Māori as for non-Māori (Statistics New Zealand, 2001). Information presented from early waves of this study show alarming indications of Māori net worth falling far below the average for all New

Zealanders, with over 10 percent of all Māori having a negative net worth in 2004 (Cheung, 2007).[6]

The Dunedin Multidisciplinary Health and Development Study (hereafter *the Dunedin Study*) is an ongoing longitudinal cohort study of 1037 babies born in Dunedin between 1 April 1972 and 31 March 1973 at the Queen Mary Maternity Hospital, which began in 1973 (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). A huge number of findings have been made from the study, as it has been going on for almost 40 years, and has had many foci over that time. There has been a high importance placed on healthcare in the survey, however other aspects have been integrated over the course of the study, as study members grew from babies into adults (Poulton, Hancox, Milne, Baxter, Scott, & Wilson, 2006).

6.2. Cross sectional studies

The ANZ-Retirement Commission Financial Knowledge Survey (hereafter *the Retirement Commission Survey*) is a repeated cross sectional study of New Zealanders' financial knowledge which was undertaken in both 2006 and 2009. Its design was based on financial knowledge studies undertaken in Australia in 2003 (Colmar Brunton, 2006). It will be repeated again in 2012 or 2013 (ANZ - Retirement Commission, 2009). This was the first study to measure financial knowledge of adult New Zealanders. Previously financial knowledge research had only been conducted among New Zealand secondary school students (Colmar Brunton, 2006, p. 5).

The ANZ Ngāi Tahu Financial Knowledge Survey (hereafter *the Ngāi Tahu Survey*) is a single cross sectional study of Ngāi Tahu aged 18 and over, to measure financial knowledge levels, carried out in 2009. Questions and the format of the study were based on *the Retirement Commission Survey* so as to enable direct comparisons between the two studies (Colmar Brunton, 2010a). This study gave information on a range of financial matters, most of which

[6] It is however expected that Ngāi Tahu figures are closer to non- Māori figures due to, *inter alia,* higher employment than Māori in general (Statistics New Zealand, 2007)(pers.comm., A. Scott, March 2012), financial growth and distributions made since the Waitangi settlement and the existence of the Whai Rawa investment scheme (Te Rūnanga o Ngāi Tahu, 2011).

would be of relevance to the proposed study. There is a possibility that it could be used as an initial wave for a study, depending on the data that is required.

7. Key aspects of research studies

An analysis of specific aspects of the above studies follows, discussing which studies were successful or unsuccessful, and identifying possible explanations for these differences. For a summarised account of this analysis see the Appendix.

7.1. Subjects

The *Footprints in Time* sample was originally 1,677 Aboriginal and Torres Strait Islander babies aged between six and eighteen months old and children aged between three and a half and four and a half years old (Department of Families, Housing, Community Services and Indigenous Affairs, 2009a). Having two cohorts allows the researchers to obtain data covering the first ten years of children's lives in six years, and also allows for comparison of the two cohorts when their ages overlap to identify any changes due to different social conditions (Department of Families, Housing, Community Services and Indigenous Affairs, 2011).

The original sample in *SoFIE* was 11,500 households throughout the North, South and Waiheke Islands of New Zealand, and the 22,000 adults aged 15 years and over within those households (Statistics New Zealand, 2008). There was some targeting involved in the sample, including around 3,000 Māori adults (Statistics New Zealand, 2001).

The Dunedin Study sample consisted of 1037 babies born in Dunedin between 1 April 1972 and 31 March 1973 at the Queen Mary Maternity Hospital whose mothers lived within the Dunedin Metropolitan Health District at the time of the birth, and continued to live within the Otago region three years later (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). Children were first invited to enrol in the study when they turned three. Of the 1139 eligible children, 1037 participated in the study (Silva, 1990).

The Retirement Commission Survey has been repeated twice. In 2006, 856 adults throughout New Zealand were interviewed, including an extra 104 Māori and 96 Pacific people added to ensure statistically significant results for those groups (ANZ - Retirement Commission, 2006). In 2009, 850 adults throughout New Zealand were interviewed; however there were no additional samples of Māori or Pacific Island people for cost and timing reasons, meaning that statistically significant results for those groups are not possible in the 2009 study (Colmar Brunton, 2009).

A sample of 400 Ngāi Tahu aged 18 years or over was taken in *the Ngāi Tahu Survey* between April and June 2010, in nine different regions of New Zealand (Auckland, Waikato, Hawke's Bay, Manawatu-Whanganui, Wellington, West Coast, Canterbury, Otago and Southland) in approximate proportion to the number of Ngāi Tahu living in each region (Colmar Brunton, 2010b).

The longitudinal studies took larger samples than the cross sectional studies, because allowance needs to be made for attrition of respondents over the course of a longitudinal study. The size of the samples varied in size from 400 (*the Ngāi Tahu Survey*) to 22,000 (*SoFIE*).

The Dunedin Study has the smallest original sample size of the longitudinal studies at 1037; however it has had exceptional retention of members over the course of the study, with 972 responding in the latest wave (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). The other longitudinal cohort study, *Footprints in Time* took a similar sized sample of 1,677 children.

Some longitudinal studies also gain new respondents over the course of the study. In *Footprints in Time*, further children were added to the study at the second wave in order to maintain the viability of the sample (Department of Families, Housing, Community Services and Indigenous Affairs, 2011). In *SoFIE*, any child in a studied household turning 15 during the course of the study became a respondent, and any adult moving into a household also became a respondent (Carter, Cronin, Blakely, Hayward, & Richardson, 2009).

7.2. Sampling

In *Footprints in Time*, a non-representative purposive sampling design was implemented from which eligible families were approached and voluntary consent obtained (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b, p. 9). The study focused on 11 sites, chosen to cover the range of socioeconomic and community environments in which Aboriginal and Torres Strait Islander children live. The 11 sites were chosen to ensure approximately equal representation of urban, regional and remote areas, to enable some geographical comparison and to represent the concentration of Aboriginal and Torres Strait Islander people around Australia. The sample was designed to select approximately 150 children from each of the study sites, meaning around six percent of all indigenous children in each cohort would be included (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b). To determine which children should form a part of the sample, Medicare (a government healthcare provider) and Centrelink (the social welfare department) records were used to create a list of eligible children in the target age groups based on their postcodes. Children were also recruited through word of mouth, both through interviewers' knowledge and recommendations made by study families (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b).

A partition developed by Statistics New Zealand in household surveys was used in *SoFIE*. New Zealand is divided into around 19,000 small geographic areas. A sample of these was taken, and then a sample of households within those selected areas. All eligible people within those selected households were sampled. This use of clusters of houses reduces the cost of the survey by limiting interviews to a defined number of areas (although this could change when people move later in the survey) (Statistics New Zealand, 2001). There were 11,500 households in the original sample, including some targeting, such as around 3,000 Māori adults (Statistics New Zealand, 2008).

In *the Dunedin Study*, the eligible population was all babies born at the Queen Mary Maternity Hospital in Dunedin between 1 April 1972 and 31 March 1973 whose mothers lived within the Dunedin Metropolitan Health District at the time of the birth, and continued to live within the Otago region three years later (Dunedin Multidisciplinary Health and

Development Research Unit, n.d.). When those children turned three they were invited to enrol in the study. Of the 1139 eligible children, 1037 participated in the study (Silva, 1990). There was no targeting of any groups, as the cohort was simply based on birth date.

A multistage sample design was used in *the Retirement Commission Survey*. First, a stratified sample of Statistics New Zealand area units was drawn with probability of selection in proportion to size of the area unit. Eight interviews were conducted in each area unit, with households selected using a random route method. Within the household, a respondent was selected at random (using the last birthday method) from the eligible members of the household. (Colmar Brunton, 2009, p. 9). People were invited to take part in the study, however in 2006 only 60 percent chose to respond (ANZ - Retirement Commission, 2006), and in 2009 only 62 percent chose to respond (ANZ - Retirement Commission, 2009). In 2006, an extra 104 Māori and 96 Pacific people were added to ensure statistically significant results for those groups (ANZ - Retirement Commission, 2006). In 2009 there was no extra sample, meaning significant comparisons cannot be made (Colmar Brunton, 2009).

The Ngāi Tahu Survey involved random sampling of 400 Ngāi Tahu aged 18 years or older from a list provided by Te Rūnanga o Ngāi Tahu (Colmar Brunton, 2010a). The interviews were carried out in nine regions (Auckland, Waikato, Hawke's Bay, Manawatu-Whanganui, Wellington, West Coast, Canterbury, Otago and Southland) in approximate proportion to the number of Ngāi Tahu living in each region (Colmar Brunton, 2010b).

Two of the longitudinal studies looked only at cohorts of the population, using a much smaller sample size. In contrast, *SoFIE* analysed all of New Zealand, and accordingly took a much larger sample (20 times larger than that of *the Dunedin Study*). Having a smaller focus population allows for a smaller sample to be drawn.

All of the studies except *the Dunedin Study* and *the Ngāi Tahu Survey* used non-representative purposive samples of the population, adding in certain target groups to enable comparisons. This meant that smaller original samples could be drawn whilst still having statistically significant results for targeted groups.

7.3. Preliminary relationship building

Footprints in Time focused significant effort on building relationships before the study commenced. Agreement and approval to participate in the study was sought from communities and Elders in each of the 11 study sites before research within the communities began. Sites where pilots of the study were tested were used in the final study to build upon existing relationships. Initial participation was promoted though community engagement events, including one on one consultation with communities and service providers. Finally, prior to being interviewed, parents were provided with an introductory letter and a DVD describing the study and the consent process (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b).

Under the Statistics Act 1975 it is a legal requirement that respondents must provide information requested by Statistics New Zealand. This meant that minimal effort was put into preliminary relationship building in *SoFIE*. The result of this was that only approximately 77 percent of eligible households responded in the original survey (Statistics New Zealand, 2005). However, with a study of this size it would have proved exceptionally difficult to build meaningful relationships with respondents and their communities before undertaking the interviews.

The Dunedin Study built on relationships already in place from earlier studies. All the participants had already been studied at the Queen Mary Maternity Hospital, and the relationships from that study were used as the basis for continuing study (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). Parents were approached and asked to participate in the study, with only nine percent declining (Silva, 1990). This reinforces the value of building on existing relationships when conducting research.

In the two cross sectional studies, less time was spent building relationships, because each respondent was conducted only once. In *the Retirement Commission Survey* interviewers approached the house at random and asked for respondents (Colmar Brunton, 2009). In *the Ngāi Tahu Survey*, a letter outlining the purpose and benefit of the study was sent to each potential respondent, followed by a phone call by a member of Te Rūnanga o Ngāi Tahu (Colmar Brunton, 2010b).

7.4. Retention techniques and statistics

Footprints in Time was community based in order to gain support from families and to minimise attrition (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b). There were 1,677 children in the first wave, and 86 percent (1,436) of those remained in the second and third waves, with the intention to contact the missing 14 percent in future waves (Department of Families, Housing, Community Services and Indigenous Affairs, 2010). Attrition was highest in the more remote sites, with as low as 72 percent response in the second wave in some areas, although further children were added to the study at the second wave in order to maintain the viability of the sample (Department of Families, Housing, Community Services and Indigenous Affairs, 2011). Interviewers built relationships with participants, and other help was given to families wherever necessary and possible (Department of Families, Housing, Community Services and Indigenous Affairs, 2009a).

Despite it being a legal requirement to provide the information in *SoFIE*, only 77 percent of households responded in the initial sample (Statistics New Zealand, 2005). Of those, 89 percent responded in the second wave, 82 percent in the third, and 76 percent in the fourth (Statistics New Zealand, 2008). A strategy was developed before the survey was undertaken to try and maintain high response rates. This involved: allowing as many call-backs as necessary to gain a response; pre-notification letters of the interviewer calling; returning to households who refuse to survey with different interviewers; compulsory participation; and a range of respondent management procedures (including collecting details of up to three people the interviewers can contact if they are unable to reach the respondent; providing respondents with change of address cards; having an 0800 number available to notify of any changes of address; making three contacts in between waves; and using small non-monetary incentives to encourage participation) (Statistics New Zealand, 2001).

The Dunedin Study has seen exceptional retention over the lifetime of the study, with all but one of the 11 waves seeing over 90 percent of eligible respondents being assessed (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). A range of techniques have been used to improve retention. Members are flown back at no cost to Dunedin for the

study; babysitting expenses are paid; interviews are conducted overseas where necessary; relationships have been developed with members; thousands of letters have been written; and small gifts have been presented (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). Silva (1990, p. 84) states:

> The high rates of participation are believed to reflect several factors. Firstly, the University and Otago Medical School are highly regarded in the community and people in the community are willing to be of assistance. Secondly, all involved in the assessment programme have been courteous, sensitive and appreciative to the children and their families. For example, special care is taken over greetings and introductions, explanations, and the expression of thanks for assistance with the study. The staff have made special efforts to make involvement in the study a pleasant experience, the children have been awarded certificates of appreciation, endorsed by all involved, and other small gifts have been presented. Thousands of letters have been written over the years and each letter has been individual and personal to the children and to the parents and has been signed by the writer. Finally, the Unit has been and has been seen to be helpful to individual children and their families, and to be performing a useful role in terms of both scholarship and helping to improve health and development policies and practices.

In the cross sectional studies, no retention is necessary, as respondents are interviewed only once. In *the Retirement Commission Survey* respondents were offered $20 in MTA vouchers to participate (Colmar Brunton, 2006, 2009). Only 60 percent of eligible households responded in 2006 and only 62 percent responded in 2009 (ANZ - Retirement Commission, 2006, 2009). In *the Ngāi Tahu Survey* respondents were given a *koha* as a 'thank you' for their help in the study (Colmar Brunton, 2010a).

The studies that showed the highest level of retention of respondents and the highest initial level of response are those that took more time and effort building relationships before and during the studies. A range of techniques has proven to be successful through the different studies. Less effort was put into relationship building in the cross sectional studies[7] and

[7] Although involving members of Te Rūnanga o Ngāi Tahu in *the Ngāi Tahu Survey* was of value in this regard.

correspondingly low rates of response resulted. However this is of less importance in these studies as the sample can be widened to account for non response.

7.5. Pilots/trials

The *Footprints in Time* study was designed after extensive consultations with indigenous communities, organisations and service providers across Australia. The intention was to design research that would be genuinely beneficial to the children and their families (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b). The initial questionnaires were trialled in a limited number of sites two years before full research was started, and results of those trials allowed for adaption of certain questions and areas of the survey. Many of the respondents in the initial trial requested that they form a part of the final study (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b).

In *SoFIE*, two major field tests were undertaken in 1999 and 2000 to determine the appropriateness of the survey, and to estimate response rates (Statistics New Zealand, 2001).

An initial sample was run in *the Dunedin Study* with children born in the first three months of 1972, and the results of this were used to modify the interviewing process. These children have been revisited over the course of the study to help develop and refine measures and assessment techniques for the main study (Silva, 1990).

The Retirement Commission Survey was based on the first Australian ANZ study into financial knowledge, and the design of the study was similar (Colmar Brunton, 2006). Revisions were made, and pilots run with small numbers of respondents. Between the 2006 and 2009 samples slight changes were made to the questionnaire, and the revised questionnaire and survey processes were then piloted with 29 respondents (Colmar Brunton, 2009).

The Ngāi Tahu Survey was modelled on *the Retirement Commission Survey*, with financial knowledge questions the same in both so as to enable direct comparisons between the two (Colmar Brunton, 2010a). This meant that a trial of the questionnaire had already been run.

All of the studies had pilot studies before embarking on the final study. This allowed for questions and interviewing technique to be adapted in line with the results of the pilot. In *Footprints in Time*, members of the initial pilot study formed a part of the final study.

7.6. Consent process

In *Footprints in Time* the consent process was viewed as an integral part of the study, as it will be for the proposed research. The Department of Families, Housing, Community Services and Indigenous Affairs (2009b, p. 16) provides:

> Prior to being interviewed, parents were provided with an introductory letter and a DVD describing the study and the consent process. At the interview [the interviewers] went through each consent form with the participant/s and explained what permission was being sought. This enabled parents to make informed consent about their participation in the study. A plain language statement was also available for parents who preferred to read about the study. Parents gave consent on behalf of the Study child.
>
> As well as seeking permission to take part in the study participants were separately asked for consent to:
>
> - be voice recorded for the interview
> - allow the other parent or another carer to be interviewed
> - allow the child's teacher or child care worker to be contacted
> - allow the Study child to be photographed
> - allow Medicare to release the Study child's records for data linkage.
>
> At the conclusion of the consent process participants were given a summary sheet that recorded what they had agreed to. This sheet included contact details for the

ethics committee and the Department of Families, Housing, Community Services and Indigenous Affairs. Participants were informed that they could change their consent and are able to withdraw from the study at any time.

Much less effort was expended in the consent process in *SoFIE*, due to the legal requirement to provide information. Consent was sought at the start of the first interview, and only 77 percent of eligible respondents participated at the first wave.

In *the Dunedin Study* a promise was made that all information collected was for research purposes only. All individual information is confidential and never released unless requested by study members. All publications relating to the aggregated data must be approved by the director before it is submitted for consideration for publication (Dunedin Multidisciplinary Health and Development Research Unit, 1997). Full written explanations of all the procedures are provided, and written consent obtained from parents (where appropriate) and the participants before being invited to participate in each wave of research (Silva, 1990).

The cross sectional studies required a reduced consent process, as much less information is collected about each individual, and there is no need to repeatedly study each respondent. In *the Retirement Commission Survey* consent was gained at the time of interview, where less than two thirds of eligible respondents participated at each stage. In *the Ngāi Tahu Survey* 'each potential respondent was sent a letter which outlined the purpose and the benefit of the study and explained what would be involved if they took part. They were then phoned by a member of Te Rūnanga to determine willingness to participate in the study. Once willingness to participate was established, 'interviewers made arrangements with each respondent to organise a suitable time and venue for the face-to-face interview' (Colmar Brunton, 2010b, p. 14).

7.7. Length of study and frequency of surveying

Footprints in Time is six years long, running from 2007 to 2012, with each child being interviewed every year for the duration of the study. Having two cohorts allows the researchers to obtain data covering the first 10 years of children's lives in six years, and also

allows for comparison of the two cohorts when their ages overlap to identify any changes due to different social conditions (Department of Families, Housing, Community Services and Indigenous Affairs, 2011).

SoFIE ran for eight years, from 2002 to 2010, with each household surveyed every year for the duration of the study (Carter, Cronin, Blakely, Hayward, & Richardson, 2009).

The Dunedin Study has been running since 1972 with no intention of ceasing until study members reach old age. There have been 11 waves thus far, initially every two years until respondents reached 15 years of age, and then gradually reducing in frequency to the current rate of every six years (Dunedin Multidisciplinary Health and Development Research Unit, n.d.).

The Retirement Commission Survey was first conducted in 2006. It was repeated in 2009 and is intended to be repeated in 2012 or 2013 (ANZ - Retirement Commission, 2009). This allows comparisons to be made between the results in each sample. *The Ngāi Tahu Survey* was run only once, in 2010, meaning that comparisons can only be made against the general population.

The length of the study and frequency of surveying is dependent upon the goals of the researchers undertaking the study. Some information needs to be collected frequently due to rapid changes, whilst other changes may be slower, requiring less frequent surveying. Longer studies are more expensive, but can garner a greater picture of changes over lifetimes.

7.8. Method of data gathering

The method of data gathering in *Footprints in Time* is relevant to any proposed study, as the communities were spread across Australia, so techniques used here would be relevant in New Zealand. Data was gathered through interviews conducted by indigenous staff, and primarily recorded on portable electronic devices; although where this was not possible it was instead recorded in hard copy by the interviewers. Interviews were with the parent who spent the most time with the study child, but respondents could have other family members

or friends in the room if that made them feel more comfortable. The interviewer read aloud each question, the responses were verbal, and then recorded by the interviewer. Where necessary the interviews were done using an interpreter, or using interviewers who speak indigenous languages (Department of Families, Housing, Community Services and Indigenous Affairs, 2008). Further information was gathered through hard copy questionnaires given or posted to the child's teacher or child care provider to complete, with the parent's permission. These could be completed online if desired (Department of Families, Housing, Community Services and Indigenous Affairs, 2011).

SoFIE gathered data through face to face interviews conducted by experienced Statistics New Zealand interviewers using an electronic questionnaire on laptop computers, as the complexity of the content and degree of detail required made it unsuitable for telephone and self completion surveys (Statistics New Zealand, 2001).

At each wave of *the Dunedin Study*, respondents return to Dunedin for a one day assessment from wherever in the world they live, involving a full examination of physical and mental health along with face to face interviews about further topics (Dunedin Multidisciplinary Health and Development Research Unit, n.d.). Questionnaires were also filled out by parents and teachers of the study members in early years (Silva, 1990).

In *the Ngāi Tahu Survey* face to face interviews were conducted by trained interviewers who were Ngāi Tahu, using a predetermined questionnaire and electronic devices, and supervised by Colmar Brunton (Colmar Brunton, 2010b). Similarly, in *the Retirement Commission Survey* face to face interviews of around an hour were conducted by trained interviewers, using a predetermined questionnaire (ANZ - Retirement Commission, 2009).

All studies were conducted through face to face interviews with the respondents by trained interviewers due to the complex nature of the information required. Where the study had an indigenous focus, interviews were conducted by trained interviewers of that ethnicity.

7.9. Type of data gathered

Both qualitative and quantitative data was obtained in *Footprints in Time* (a mixed methods approach), focusing on health and social development through early years. Quantitative information was recorded in relation to the children, their caregivers and teachers using structured interview questionnaires. Qualitative information was recorded, where possible, on the stories and life incidents of the families of the studied children. There was a focus on positive factors, in an effort to balance out the negative impressions of indigenous peoples' lives (Department of Families, Housing, Community Services and Indigenous Affairs, 2009b).

In *SoFIE* both quantitative and qualitative data was collected. Three different types of data were collected: spell data (items/events over a period of time, such as receiving benefit payments from a start to end date); annual data (one value for a 12 month period, such as income); and point in time data (such as qualifications at the interview date) (Statistics New Zealand, 2001).

Qualitative and quantitative data has also been collected in *the Dunedin Study*, with a focus on physical and mental health. However a wide range of information has been gathered on the respondents over the almost 40 years that the study has been running.

As *the Ngāi Tahu Survey* was based on *the Retirement Commission Survey*, both sought to measure very similar things, and gathered the same types of data. The outline of what each study sought to measure is almost identical, with only very minor wording differences. Colmar Brunton (2010b, p. 12) provided the following on *the Ngāi Tahu Survey*:

> The study sought to measure knowledge and understanding, behaviour and attitudes as they relate to the following specific areas of interest:
>
> - Mathematical and standard literacy – essential mathematical, reading, and comprehension skills
> - Financial understanding – understanding of what money is and how it is exchanged; understanding of where money comes and goes from
> - Financial competence – understanding the main features of basic financial services; understanding financial records; understanding which type of payment is best to use and why; understanding mortgages; attitudes to

spending money and saving; awareness of the risks associated with some financial products, and appreciation of the relationship between risk and return

- Financial responsibility – ability to make appropriate personal life choices about financial issues; understanding consumer rights and responsibilities.

The survey tested the following areas of personal financial knowledge: money management, budgeting, goal setting, financial planning, debt management, home loans and mortgages, managing risk, savings, planning for retirement, and investing.

All of the studies obtained both qualitative and quantitative data on the participants, with varying levels of each. The focus of each study was varied, but the most relevant to any proposed research would be the two financial knowledge surveys.

7.10. Questionnaire structure

Parents were asked a series of questions about their household and the child in *Footprints in Time*. Each child also answered questions to determine their development. The questionnaires were developed based on the consultations with indigenous communities, organisations and service providers, combined with research from other Aboriginal surveys in Australia. Further topics and questions were added in the second wave, to garner more information about the children and their families (Department of Families, Housing, Community Services and Indigenous Affairs, 2011).

There were two separate questionnaires used in *SoFIE*. A household questionnaire was answered by one person in each household and collected household characteristics. A personal questionnaire was completed with each respondent in the household aged 15 years and over. A slightly shorter version of the personal questionnaire was completed by any adult entering the studied households from wave two onwards. Children aged less than 15 years were not interviewed; instead, a nominated parent or other adult was asked questions about them (Statistics New Zealand, 2005). Extra modules were added into the waves where they were deemed to be necessary.

Since *the Dunedin Study* is a health focused study, much of the interview consisted of physical and mental examination, along with face to face interviews about further topics. The questions asked have changed over the course of the study to reflect relevant concerns (Dunedin Multidisciplinary Health and Development Research Unit, n.d.).

Respondents in *the Retirement Commission Survey* were asked 42 questions testing financial knowledge and 51 questions on their attitudes and behaviours and on demographic factors. Ninety percent of the financial knowledge questions were the same in both the 2006 and 2009 surveys, with only minor wording changes to the others (ANZ - Retirement Commission, 2009). Some additional questions were also added (Colmar Brunton, 2009). 'It was agreed that, as financial knowledge reflects each person's circumstances and experiences, people should not be disadvantaged because they were not familiar with products and services they might never use or need (for example, those without the means to invest would not be expected to know about investing). Therefore, only the questions testing basic knowledge were used to determine the overall financial knowledge scores. 'The advanced questions, relating primarily to investment, were scored separately' (Colmar Brunton, 2006, p. 5).

Because *the Ngāi Tahu Survey* was modelled on *the Retirement Commission Survey*, the financial knowledge questions were the same as those in the 2009 wave of that study, so as to enable direct comparisons between the two (Colmar Brunton, 2010a). Slight modifications were made to the demographic section where necessary (to refer to *iwi* affiliation rather than ethnicity), and two further questions were added to gain understanding of what factors or situations would lead people to seek financial information, and how they prefer to receive financial information (Colmar Brunton, 2010b).

Many of the studies have copies of the questionnaires used available online[8].

[8] *Footprints in Time* questionnaires are available at http://www.fahcsia.gov.au/sa/indigenous/progserv/famchild/lsic/Pages/default.aspx.
The *SoFIE* questionnaires can be downloaded from http://www.stats.govt.nz/browse_for_stats/income-and-work/Income/sofie-objectives-flowcharts.aspx.
The Retirement Commission Survey questionnaire can be found at http://www.financialliteracy.org.nz/sites/default/files/webfm/Research/r-fksurvey-2009.pdf.

7.11. Feedback to participants

In *Footprints in Time* the information gained from each wave is returned to the participants in the form of booklets summarising the findings at each stage. Feedback is also given by the interviewers at each interview conducted (Department of Families, Housing, Community Services and Indigenous Affairs, 2010). In *SoFIE* reports are issued on the study, however these are delayed by months or even years. *The Dunedin Study* has expended much more energy giving feedback to members. Feedback of information has been made over the years, to participants through newsletters and multiple letters, and to the wider community through newspapers and television (Silva, 1990).

The Retirement Commission Survey gives feedback through national publications. *The Ngāi Tahu Survey* was much more proactive, issuing multiple reports and reporting results in Ngāi Tahu publications.

Varying amounts of feedback were given in the studies. More feedback was given in the studies where the researchers had spent more time building relationships with the respondents.

8. Research protocols for interviewing Ngāi Tahu whānui

Researchers need to pay close attention to the situation in which they are interviewing when designing their study. When researching in a Māori context, there are a number of specific matters that need to be considered when undertaking the design process. For example, the Dunedin Multidisciplinary Health and Development Research Unit (1997, p. 12) provides:

> The Dunedin Study 'Responsiveness to Māori Policy' has a commitment to the Treaty of Waitangi as its foundation. The policy, which has been lead by Māori researchers, in partnership with Dunedin Study directors, has been developed and built on over time. The policy includes: acknowledgement of the need to maximise the Study's contribution to Māori health; acknowledgement of Māori *tino rangatiratanga* over Māori analyses within the Study; active consultation with key Māori stakeholders; and a commitment to build and support a Māori workforce capacity within the Study.

The above policy supports a Kaupapa Māori research methodology (Bishop, 1999). Kaupapa Māori research is "collectivistic, and is orientated toward benefiting all the research participants and their collectively determined agendas, defining and acknowledging Maori aspirations for research, whilst developing and implementing Maori theoretical and methodological preferences and practices for research" (Bishop, 1999, p. 2). It is appropriate that such an approach would also be used in a study on Ngāi Tahu financial literacy. Therefore Te Rūnanga o Ngāi Tahu should determine the research process within their own cultural context, in consultation with the academic researchers (Begg, Brookland, Hope, Langley, & Broughton, 2003).

Many of the key aspects covered in Section 7 of this report will need to be considered by the research designers. Suggested issues and possibilities for Te Rūnanga to consider would include:

- Use of the *Whakapapa* Registration to identify and follow-up with potential participants.
- Undertaking a pilot study.
- Stratified sampling across the eighteen Papatipu Rūnanga of Ngāi Tahu or the nine geographical regions used in *The Ngāi Tahu Survey*, taking into account the concentration of Ngāi Tahu in different parts of New Zealand and Australia.
- The importance of *whakawhanaungatanga* to the success of the study (Derrett, et al., 2009; Duffy & Rigby, 2010). Use of Ngāi Tahu 'champions' to promote the research, use of existing media and structures to disseminate information and encourage engagement (*marae hui,* Ngāi Tahu *Pānui Rūnaka*, *Te Karaka*, Tahu Communications and the Te Rūnanga o Ngāi Tahu website).
- Consent process involving the University Ethics Approval and Research Consultation with Māori policies (http://www.otago.ac.nz).
- Interviewing issues such as the level of measurement (individual, household or whānau (McNicholas, 2009)); setting (home, *marae*); interviewer attributes (Ngāi Tahu, conversant in Te Reo Māori); interviewing protocol (greetings, introductions,

food to share, *koha*); feedback (Te Rūnanga publications, emailed/mailed/ oral reports).

- Flexibility of research design (to take into account individuals involved in the research process (Tipa & Panelli, 2009)).

9. Conclusion

In order to inform the design of a possible longitudinal study of financial literacy of Ngāi Tahu, a review of longitudinal research design issues and relevant longitudinal studies has been undertaken and described in the preceding pages. Design of such a study will need to take into account the issues outlined in this review and the theoretical relationships explored in the second literature review, *Towards a Study of Ngāi Tahu Financial Literacy*. It is evident that, in order to be successful, the proposed study requires careful planning and exploration of options for the most effective design (as in the development stage of the *Footprints in Time* study (Department of Family, Community Services and Indigenous Affairs, 2007)). There could also be potential to expand its scope to include other relevant information which Te Rūnanga o Ngāi Tahu might like to gather (as was done in *SoFIE*).

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Appendix 1 Glossary of Māori (Kāi Tahu dialect) terms

Hapū	Sub-tribe, extended whānau
Hui	Meeting, assembly
Iwi	Tribe
Kanohi ki te kanohi	Face to face exchange
Kaupapa	Matter for discussion, agenda, subject
Koha	Gift, present, offering, donation or contribution
Kotahitanga (Kotahitaka)	Collective action
Mana whenua	Customary authority exercised by an iwi or hapū in an identified area
Rūnanga (Rūnaka)	Governing council of hapū or iwi
Takiwā	Tribal area
Tikanga (Tikaka)	Lore, customary values and practices
Tino rangatiratanga (rakatirataka)	Māori control of all things Māori
Whakapapa	Geneology
Whakawhanaungatanga (Whakawhanaukataka)	Relationship building
Whānau	Family
Whanaungatanga (Whanaukataka)	Familial relationships, kinship
Whānui	Collective of tribal members

Appendix 2 Summary of Cited Studies

	Footprints in Time: The Longitudinal Study of Indigenous Children (Australia)	Survey of Family, Income and Employment Dynamics (New Zealand)	Dunedin Multidisciplinary Health and Development Study (New Zealand)	ANZ Ngāi Tahu Financial Knowledge Survey (New Zealand)	ANZ-Retirement Commission Financial Knowledge Survey (New Zealand)
Type of study:	Longitudinal cohort panel study of two cohorts of Aboriginal and Torres Strait Islander children in Australia	Longitudinal panel study of households in New Zealand and individuals living in those households from 2002 to 2010	Longitudinal cohort panel study of babies born in Dunedin between 1 April 1972 and 31 March 1973	Cross sectional study of Ngāi Tahu members aged 18 and over	Repeated cross sectional study of adult New Zealanders financial knowledge
Subjects:	1,677 Aboriginal and Torres Strait Islander babies aged between six and 18 months old and children aged between three and a half and four and a half years old	11,500 households from all over New Zealand, and all members of those households aged 15 years and over (22,000 adults)	1037 babies born at the Queen Mary Maternity Hospital in Dunedin whose mothers lived within the Dunedin Metropolitan Health District at the time of birth and continued to do so three years later	400 Ngāi Tahu *iwi* members in nine different regions of New Zealand	856 New Zealanders in 2006, 850 in 2009
Sampling:	A non-representative sample was drawn, using 11 sites, and selecting approximately 150 from each. This ensured approximately equal representation of urban, regional and remote areas, and the concentration of indigenous people around Australia.	New Zealand was divided into 19,000 small geographic areas, a sample of these areas was taken, and then a sample of households within those areas formed the original sample. There was some targeting, such as around 3,000 Māori adults	All 1139 eligible children were approached, with only 9 percent declining, leaving 1037 participating	New Zealand was divided into nine regions, and interviews were conducted in approximate proportion to the number of Ngāi Tahu living in each region	New Zealand was divided into areas, eight interviews were conducted in each area, with households selected using a random route method. Respondents were selected in each household based on the last birthday

Preliminary relationship building:	Prior to interviews, parents were provided with an introductory letter and a DVD describing the study and the consent process. Locations were chosen in which existing relationships could be built on. Community engagement events were also held	Under the Statistics Act 1975 it is a legal requirement that respondents must provide information requested by Statistics New Zealand.	Information had been collected on all the mothers as part of another study. Parents were approached, and asked to participate.	A letter outlining the purpose and benefit of the study was sent to each potential respondent, followed by a phone call by a member of Te Rūnanga	Interviewers approached the house at random and asked for respondents
Pilot/trials:	Initial questionnaires were trialled in a limited number of sites two years before research started, and adapted accordingly	Two major field tests were undertaken in 1999 and 2000 to determine the appropriateness of the survey and to estimate response rates	An initial sample was run with children born in the first three months of 1972, results of which were used to modify the interviewing process	Based heavily on the ANZ-Retirement Commission Financial Knowledge Survey	Pilot trials were run with small groups to ensure questions were appropriate
Consent process:	Interviewers went through each consent form and explained what was being sought. Consent was required for each part of the process. A summary of what was consented to was given to members	Under the Statistics Act 1975 it is a legal requirement that respondents must provide information requested by Statistics New Zealand.	A promise was made that all information was for research purposes only and is confidential. Written consent is obtained before participation in each wave of the study	Consent was gained after a phone call by Te Rūnanga, and was confirmed at the interview	Consent was gained at the time of the interview (limited, as only a cross sectional study)
Length of study:	Six years, running from 2007 to 2012	Eight years, running from 2002 to 2010	Ongoing since 1972, including 11 waves	Once only, undertaken in 2010	First conducted in 2006, repeated in 2009, intended to be repeated in 2012

Frequency of surveying:	Each child is interviewed every year for the duration of the study	Each household is surveyed every year for the duration of the study	Every two years until respondents reached 15 years old, gradually reducing in frequency down to every six years currently	Currently once only	Every three years
Method of data gathering:	Primarily through face to face interviews with the child's primary caregiver conducted by trained Aboriginal researchers using computer assistance. Hard copy questionnaires were also posted to the child's teacher or child care provider to complete	Face to face interviews conducted by trained interviewers using a predetermined questionnaire and computer assistance.	At each wave respondents return to Dunedin for a one day assessment, involving a full examination of physical and mental health along with face to face interviews about further topics	Face to face interviews conducted by trained interviewers who were Ngāi Tahu, using a predetermined questionnaire	Face to face interviews conducted by trained interviewers, using a predetermined questionnaire
Type of data gathered:	Both qualitative and quantitative data, focusing on health and social development through early years	Both qualitative and quantitative data, focusing on income, employment and family	Both qualitative and quantitative data, with a focus on physical and mental health	Both qualitative and quantitative data, with a focus on financial knowledge and understanding	Both qualitative and quantitative data, with a focus on financial knowledge and understanding
Retention techniques and statistics:	86 percent of the children remained in the second and third waves (offset by the addition of new study members). Attrition was highest in remote sites. The study was community based to	Despite it being a legal requirement to provide the information, only 77 percent of households responded in the initial sample. Of those, 89 percent responded in the second wave, 82	Exceptional retention, with all but one wave seeing over 90 percent of eligible respondents being assessed. A range of techniques have been used. Members are flown back at no cost to Dunedin for the	No retention necessary, respondents given a *koha* as a 'thank you' for their help in the study	No retention necessary, respondents offered $20 in MTA vouchers to participate. Only 60% of eligible households responded in 2006 and 62% in 2009

	promote retention. Relationships were built with interviewers, and other help was given to families wherever necessary and possible.	percent in the third, and 76 percent in the fourth. Letters are sent notifying of interviews, multiple call-backs can be made by interviewers, an 0800 number is available to inform of change of address, and three contacts are made between waves	study; babysitting is paid for; interviews are conducted overseas where necessary; relationships have been developed with members; thousands of letters have been written; and small gifts have been presented		
Questionnaire structure:	Parents were asked a series of questions about their household and the child. Each child also answered questions to determine their development. Questionnaires were developed based on consultations with indigenous communities. Further topics were added in the second wave	There are two separate questionnaires used. The Household Questionnaire is answered by one person in each household, while a personal questionnaire is completed by every adult in each household. Extra modules are added where necessary in waves.	Since this is a health focused study, much of the interview consists of physical and mental examination, along with face to face interviews. The questions asked have changed over the course of the study to reflect relevant concerns	42 questions on financial knowledge, 53 questions on attitudes and behaviours. Significant use of true/false questions and show cards to test understanding	42 questions on financial knowledge, 51 questions on attitudes and behaviours. Significant use of true/false questions and show cards to test understanding
Feedback to participants:	Information from each wave is returned to participants in the form of booklets summarising the findings at each stage	Reports are issued on the study, however these are delayed by months or even years	Through multiple letters to respondents and through newsletters, as well as newspapers and television	Through multiple reports and Ngāi Tahu publications	Through national publications