

Ngā tohu o te ora:

The determinants of life satisfaction for Māori 2013



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1 Purpose, overview, and key findings

Te tū kāhikatea – awhi mai, awhi atu, tātou e.

Like the roots of the kāhikatea, whānau remain strong through supportive intertwined relationships.

Purpose

Ngā tohu o te ora: The determinants of life satisfaction for Māori 2013 provides a comprehensive understanding of the aspects of life that contribute to life satisfaction for Māori.

People have always pursued well-being. Governments are concerned with providing better lives for their citizens. They can do this by developing the conditions and selecting the interventions that enable people to live the lives they want. To do this, we need to better understand the areas of life that have the greatest impact on well-being.

Previous work on well-being tended to look at populations as a whole – only a few have examined smaller sections of the population.

Little analysis exists on the relationship between life satisfaction and culture. In this report we also look at whether a stronger connection to Māori culture is associated with higher levels of life satisfaction.

Overview

Maximising well-being has been a goal of individuals, groups, and governments for many years. A key aspect of individual well-being is life satisfaction. Much research has shown which aspects of life are most important in producing high levels of satisfaction in life for both individuals and society. This previous research lacks two important areas on life satisfaction for Māori: which aspects of life contribute greatly to this, and whether connection to Māori culture is associated with higher levels of life satisfaction.

Regression analysis shows that life satisfaction for Māori is significantly associated with the same aspects of life as other populations around the world, including New Zealanders. In particular, relationships, health, and income have the strongest associations. However, some evidence shows that relationships have a stronger association for Māori than for all New Zealanders.

For Māori, connecting with their culture is also associated with life satisfaction. The more important it is to be involved in things to do with Māori culture, the more likely their levels of life satisfaction are higher. However, this relationship is not strong – the most important factors for Māori remain relationships, health, and income.

Key findings

- In 2013, 4 of 5 (81 percent) Māori rated their life satisfaction at 7 or more out of 10.
- Māori who had not felt lonely in the last four weeks gave higher ratings for life satisfaction than those who felt lonely to some extent.
- Māori who are partnered gave higher ratings for life satisfaction than those who are not partnered.

- Māori who assessed their health status as good, very good, or excellent are more likely to have higher life satisfaction than Māori who assessed their health status as fair or poor.
- Māori who have 'more than enough' or 'enough' income to meet their everyday needs reported higher levels of life satisfaction than those who have 'only just enough' or 'not enough'.
- As the number of housing problems increases, overall life satisfaction decreases.
- As trust in others or institutions increases, life satisfaction also increases.
- The more important it is for Māori to be involved in Māori culture, the higher their levels of life satisfaction.



2 The pursuit of well-being

This chapter explains the importance of measuring Māori well-being, and why we used self-reported life satisfaction to measure it.

The policy interest in Māori well-being

Significant policy initiatives are aimed at enhancing the well-being of Maori. A number of these recognise the relationship between outcomes in multiple aspects of an individual's life, the role of whānau on individual's outcomes, and well-being models grounded in a Māori world view.

The most significant of these initiatives is [Whānau Ora](#) (Te Puni Kokiri, nd), an inter-agency approach providing inclusive health and social services to New Zealand whānau and families in need. The goal of Whānau Ora is to empower whānau to significantly improve the health, educational, and economic outcomes using the money invested by government agencies in social services.

Understanding the combinations of factors that affect Māori perceptions of well-being, and variations in the distribution of these factors across population groups, can help develop and implement policies aimed at enhancing Māori social and economic well-being.

Life satisfaction as a measure of well-being

In modern societies, we gauge progress by using economic indicators like gross domestic product and per capita income. However, evidence shows that self-reported life satisfaction is a credible approach to measuring people's subjective well-being, which is an important aspect of overall well-being.

Life satisfaction is a subjective open measure of well-being. It is subjective because we simply ask people whether they are satisfied with their life as a whole. It is open because we do not pre-define the components of well-being – it is up to each individual to judge whether they are satisfied or not.

Life satisfaction measures reflect the notion that people themselves are the best judges of the quality of their lives. Note that well-being might encompass a wider range of concepts than just life satisfaction, which is but one emotion that encompasses an individual's wider well-being.

Life satisfaction in Te Kupenga

In 2013, we carried out Te Kupenga, the first survey of Māori well-being. Te Kupenga collected information on a wide range of topics to give an overall picture of the social, cultural, and economic well-being of Māori in New Zealand.

See [Te Kupenga](#) for further information.

In Te Kupenga, we asked respondents one question on how they felt about their life as a whole (at the time of the interview). They answered on a scale of 0 to 10 – where 0 means 'completely dissatisfied' and 10 is 'completely satisfied'. This is the measure we used as the dependent variable in our analysis to determine what factors are associated with Māori well-being.



3 Te Kupenga has a broad framework of well-being

The aim of Te Kupenga was to gather information on the well-being of Māori, so we used a Māori world view to design the survey. A literature review and wide-ranging consultation with Māori stakeholders informed this. As such, the content of Te Kupenga provided a broad framework of Māori well-being that we used for this analysis.

We have also drawn on previous work

In developing a framework to explore the determinants of Māori life satisfaction, we also drew on research across many countries. In doing so we developed these themes.

Demographic characteristics

While many studies show mixed results for demographic characteristics (eg sex, having children, and location), one constant is the relationship between life satisfaction and age. Youths and older people consistently report higher levels of life satisfaction than those middle-aged. This 'u-shaped' relationship between age and life satisfaction does not change when controlling for other factors, such as income and health status (Dolan, Peasgood, & White, 2008).

Income

Income plays an important role in people's life satisfaction. The ability to control resources allows people to satisfy basic needs and pursue other goals they deem important to their life. Studies show that income has a strong positive relationship with life satisfaction (Sacks, Stevenson, & Wolfers, 2010; Brown, Smith, & Woolf, 2010). Higher income is associated with higher levels of life satisfaction, but with diminishing returns as income increases.

Employment

Not only does employment provide people with income, but it also has independent benefits to life satisfaction around self-esteem, sense of purpose, and creating social networks. Unemployment is associated with a large negative impact on life satisfaction (Dolan, Peasgood, & White, 2008). However, people without a job but are not unemployed (eg retired, students, and full-time parents), do not tend to report lower levels of life satisfaction than those who have a job (Blanchflower & Oswald, 2011).

Housing

Housing is a basic human need. As well as providing shelter from extreme weather, it offers privacy and security, and a suitable place to rest and raise a family. As such housing is valuable to people. While little literature exists on the relationship between housing and life satisfaction, analysis from the New Zealand General Social Survey (NZGSS) highlighted that satisfaction with the quality of one's home has a moderate independent relationship with life satisfaction for New Zealanders (Statistics NZ, 2013).

Health

The literature on the relationship between health status and life satisfaction is extensive. Analysis from the NZGSS highlighted the importance of good health to life satisfaction (Statistics NZ, 2013). Self-assessed health status has a large positive impact on life satisfaction (Dolan, Peasgood, & White 2008). This relationship holds for measures of both mental and physical health. Although some evidence shows high life satisfaction actually causes good health (Diener & Chan, 2011), a strong causal relationship also flows from health to life satisfaction (Lucas, 2007). Many studies find that self-assessed

health has the single largest relationship with life satisfaction (Office for National Statistics, 2013; Statistics NZ, 2013).

Education

No strong independent relationship seems to exist between **education** and life satisfaction. Bivariate analysis on NZGSS data showed that people with higher educational qualifications have higher levels of life satisfaction (Statistics NZ, 2013). However, we can explain this correlation through analysis that shows more educated people tend to have higher incomes, better health, and more social capital (Heliwell, 2008). Once these relationships are controlled for, the relationship often disappears. This suggests that rather than having no influence on life satisfaction, education influences it indirectly by increasing positive outcomes that directly influence life satisfaction.

Relationships

Relationships with others is a fundamental human need. They provide material and emotional support in times of need, and access to jobs and other opportunities. Social connections and human contact are strongly associated with life satisfaction (Brown et al, 2010; Statistics NZ, 2013). Other measures of social support and trust in others are also positively associated with life satisfaction (Helliwell & Wang, 2011). Living in a stable relationship is positively associated with life satisfaction (Heliwell, 2008). Formal aspects of social life and community relationships, such as volunteering, were less predictive of subjective well-being.

Civic engagement

Civic engagement refers to the various activities people perform to express their political voice and to contribute to the political functioning of society. Civic and political rights are a cornerstone of democratic societies – this involves confidence in our police and justice system and trust in our political systems. The available evidence suggests a weak but significant relationship between participation in civil society and life satisfaction. Internationally, perceptions that corruption is widespread have a strong negative correlation with average life satisfaction (Heliwell, 2008).

There is little evidence of a relationship between **safety and security** and life satisfaction. Studies that have looked at the impact of crime victimisation on life satisfaction have produced mixed results (Brown et al, 2010).

Connection to culture and life satisfaction

Separate schools of thought that support a Māori-centred approach are clear that **Māori culture** is fundamental to the well-being of Māori. This is consistent with Mason Durie's concept of four cornerstones of Māori health as presented in the Ministry of Health's [Te Whare Tapa Whā](#) (Ministry of Health, nd). Te Kupenga explored the connection to Māori culture through tikanga, te reo Māori, whanaungatanga, and wairuatanga.

There has been very little evidence on the relationship between life satisfaction and the connection to one's culture, including Māori culture. Te Kupenga provided the opportunity to explore this relationship through data for the first time.

Table 1 describes the variables we included in each domain of our framework.

Table 1**Te Kupenga variables by outcome domain**

Outcome domain	Variable
Demographic characteristics	Male
	Age
	Have children
	Urban/rural
Income	Household income
	Not enough money
Paid work	Unemployment
Housing conditions	Number of housing problems
Health status	Health status
Education and Skills	Highest qualification
Relationships	Social marital status
	Loneliness
	Contact with whānau
	Volunteering
Civic engagement and Governance	Trust in people
	Trust in courts
Personal security	Experience of crime
Cultural connections	Been to ancestral marae
	Importance of culture
	Te reo speaking proficiency
Source: Statistics New Zealand	

Our framework doesn't explain it all

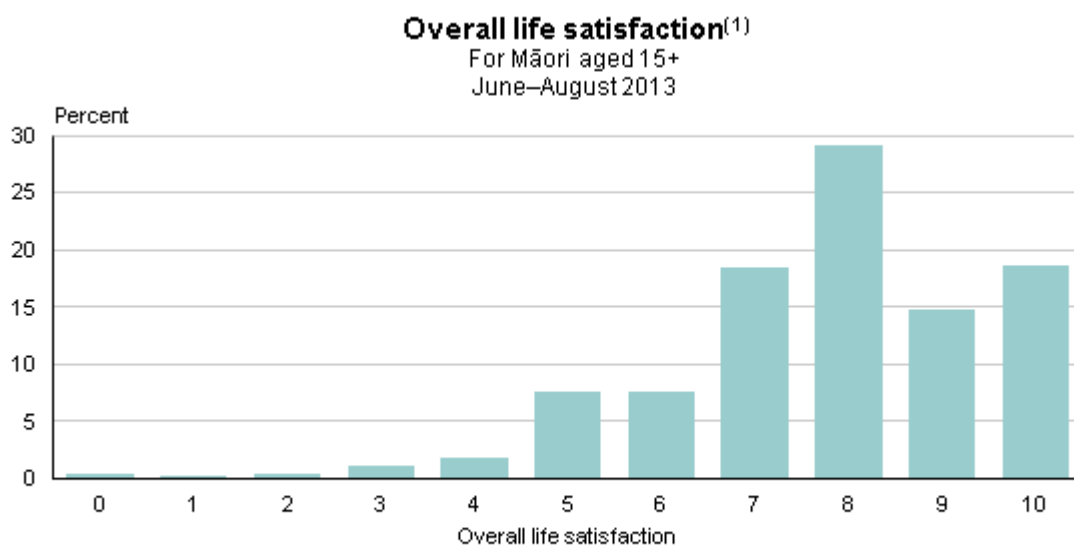
Previous studies show that you cannot fully explain the variation in people's reports of life satisfaction simply through the aspects of life in our framework. In 2013 the Office of National Statistics explained 10–19 percent of the variation in the levels of well-being among British people with a framework roughly similar to ours (Office for National Statistics, 2013).

Some aspects related to life satisfaction are not included in our framework because we did not collect them in Te Kupenga. For example, genes and personality explain much of the differences between people's levels of well-being. These differences may explain up to half the variations observed (Diener, 1996).

4 Most Māori are satisfied with their life

In 2013, 4 of 5 (81 percent) Māori rated their life satisfaction at 7 or more out of 10. This includes 19 percent who were completely satisfied (a rate of 10) with their life. Only 4 percent of Māori rated their overall life satisfaction between 0 and 4 (approximately 22,000 aged 15 and over).

Figure 1



1. Respondents were asked to rate their overall life satisfaction on an 11-point Likert scale, where 0 is completely dissatisfied, and 10 is completely satisfied.

Source: Statistics New Zealand

5 What contributes most to life satisfaction

This chapter discusses the measures that contribute to overall life satisfaction. These are measures, which are found to be significantly affecting overall life satisfaction and show the size/strength of its contribution.

Based on our model of the measures that contribute to life satisfaction, holding other variables equal, relationships had the strongest association with life satisfaction. This was followed by health and income (see table 2).

Table 2

Measures that contribute to overall life satisfaction

Subjective measure	Contribution	
	Percent ⁽¹⁾	Size/strength ⁽²⁾
Loneliness	7.45	Large
Health status	6.68	Large
Income adequacy	5.22	Large
Number of housing problems	3.08	Large
General trust	2.79	Large
Trust in courts	2.42	Large
Importance of culture	0.32	Small
Te reo Māori proficiency	0.21	Small

1. R-squared of model (1) and subjective measure

2. Large=contribution of 1.0 percentage point or more to R-square; moderate=contribution of 0.5<1.0 percentage point to R-square; small=contribution of 0.1<0.5 percentage point to R-square; very small=contribution of less than 0.1 percentage point to R-square.

Source: Statistics New Zealand

These results confirm findings from previous studies, and that Māori life satisfaction is driven by the same factors that drive the general population.

Relationships are important to Māori

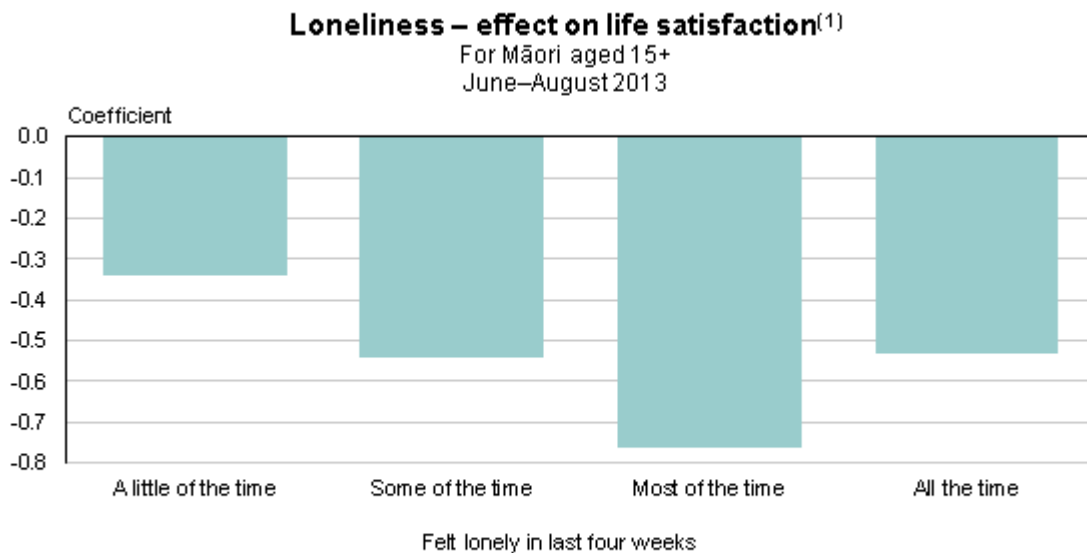
We included these aspects of our relationship in our model: partnership status, loneliness, regular contact with whānau who live outside the home, and volunteering. Holding other variables equal:

- Māori who had not felt lonely in the last four weeks gave higher life satisfaction ratings than those who felt lonely to some extent.
- Māori who are partnered gave higher life satisfaction ratings than those not partnered.
- Having regular contact with whānau who live outside the home was a huge factor for life satisfaction. However, when we considered the subjective measure of loneliness, contact with whānau has little significance.

- No significant association exists between doing voluntary work for a group or organisation in the last four weeks and life satisfaction.

Feeling lonely most of the time had the biggest impact on life satisfaction, compared with never feeling lonely (see figure 2). Māori who felt lonely all the time in the last four weeks reported lower levels of life satisfaction than those who never felt lonely (a difference of around 0.5 points).

Figure 2



1. Reference group: None of the time

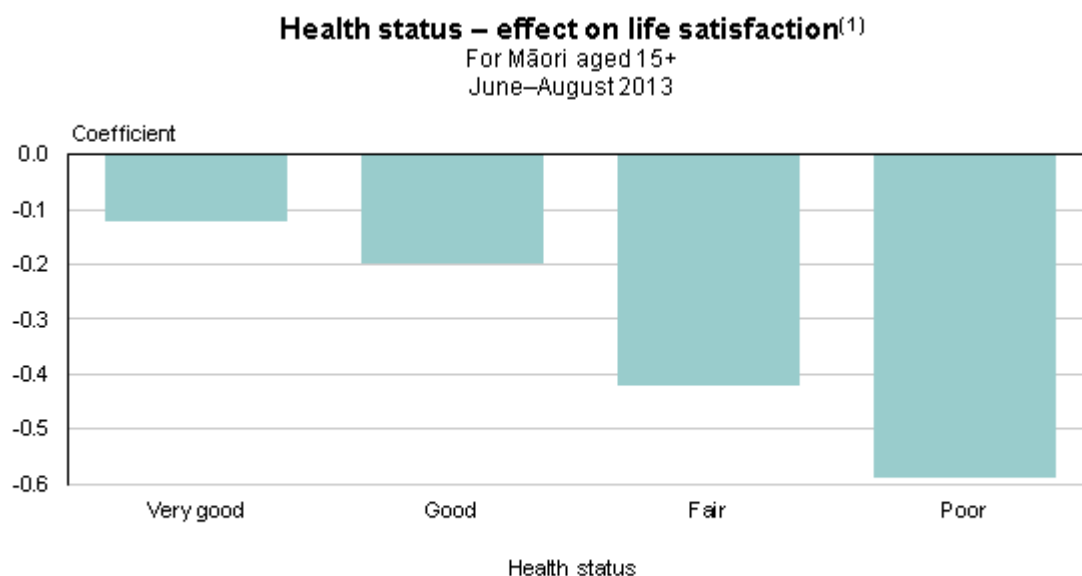
Source: Statistics New Zealand

These results are consistent with findings from other studies and confirm that relationships are important to life satisfaction. What is interesting however, is that in our model, relationships, through the loneliness measure, make the largest contribution to life satisfaction. In comparison, many other models (including the NZGSS model which looks at the New Zealand population) show that health followed by income make the largest contributions to life satisfaction. That relationships play a larger role in life satisfaction for Māori seems to support the importance of whanaungatanga (kinship with others) in te ao Māori. Whanaungatanga, an intrinsic aspect of Māori culture, values and prioritises interdependence with others to strengthen bonds of kinship, which in turn strengthens the individual.

Good health associated with higher life satisfaction

Health status is associated with overall life satisfaction. Māori who assessed their health status as good, very good, or excellent are more likely to have higher life satisfaction than Māori who assessed their health status as fair or poor. Holding other variables equal, the life satisfaction score of Māori with poor health is three times lower than Māori with good health (see figure 3)

Figure 3

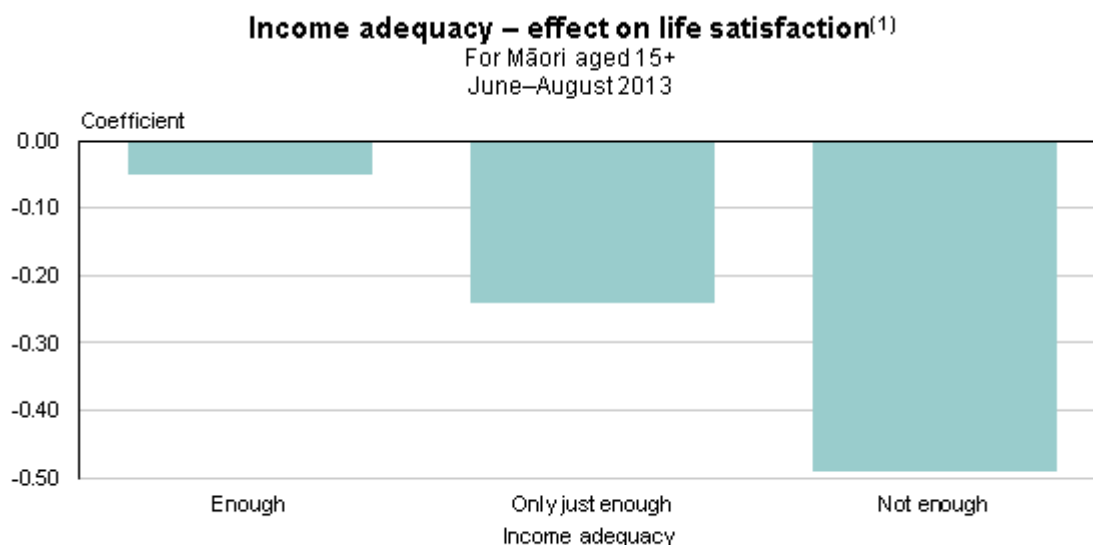


1. Reference group: Excellent
 Source: Statistics New Zealand

Having enough income associated with higher life satisfaction

Māori who have ‘more than enough’ or ‘enough’ income to meet their everyday needs report higher levels of life satisfaction than those who have ‘only just enough’ or ‘not enough’ (see figure 4). Holding all other variables equal, Māori who don’t have enough income rate their life satisfaction 0.5 points lower than those who have more than enough income.

Figure 4



1. Reference group: More than enough
 Source: Statistics New Zealand

Household income shows no independent relationship with life satisfaction. This is somewhat different from many other studies that have found a significant relationship. This may be partly accounted for by including income adequacy, unemployment, and education in our model, which are strongly correlated with household income.

Negative correlation between number of housing problems and life satisfaction

The number of housing problems makes a large contribution to life satisfaction variation. Results of regression analysis showed that as the number of housing problems increases, the overall life satisfaction of Māori decreases with a regression coefficient of -0.05.

Trust has significant association

Trust in other people has a large contribution to life satisfaction for Māori. Our modelling showed that as trust in others increases, life satisfaction also increases.

Trust in institutions also has a significant association with life satisfaction for Māori. We included a measure of trust in the courts in our model of life satisfaction. This showed that as trust in the courts increases, so too does life satisfaction.

Small association with unemployment and education

Both unemployment and highest educational qualification have a small but significant association with the life satisfaction of Māori.

Previous studies showed that unemployment has a large negative association with life satisfaction, but our model showed a much smaller association. This difference may be due to the inclusion of income adequacy in our model, a measure strongly correlated to unemployment.

Māori with a level 7 bachelor's degree or higher are more likely to report higher levels of life satisfaction than those with no qualification or a school-level qualification. This finding is consistent with previous studies.

Having children a positive association

Findings from the demographic measures in our model are consistent with those from previous studies. Life satisfaction is 'u-shaped' in age, with the lowest levels occurring in the mid-50s. A positive effect is associated with being female, and a small negative effect with living in the city.

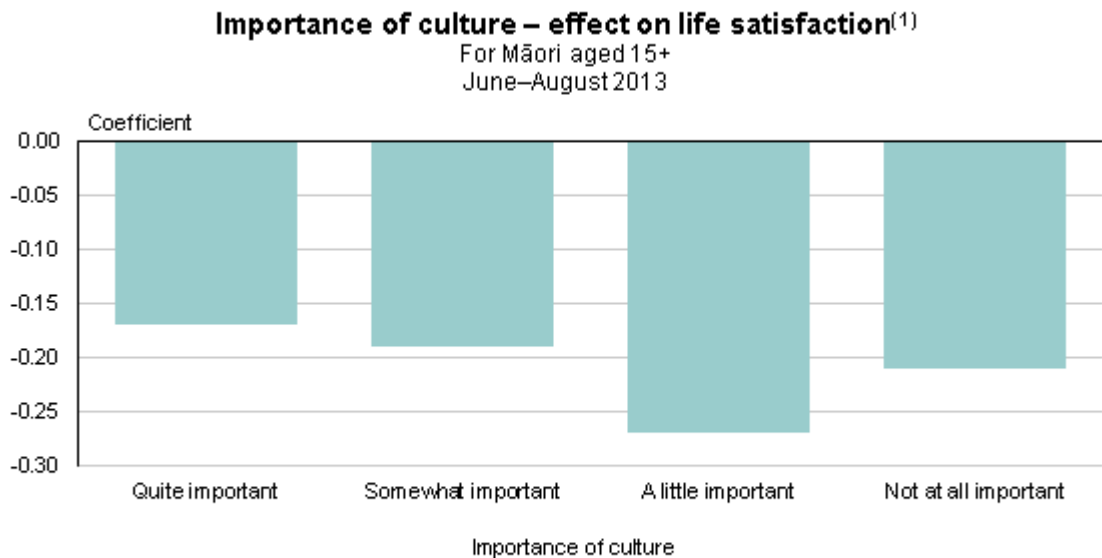
Living with children has a small positive association with life satisfaction. Holding other factors equal, Māori who live with dependent children rate their life satisfaction 0.1 points higher on average than those who did not live with dependent children.

This finding is interesting because many studies have not found an association between having children and life satisfaction (ONS, 2013), including New Zealand studies (Brown et al, 2010). This could indicate the relative importance of children in te ao Māori – the role of children in continuing the whakapapa line.

6 Connection to culture a small positive association

The more important Māori felt it was to be involved in Māori culture, the higher their levels of life satisfaction. Holding other factors equal, Māori who consider it 'quite important' or 'somewhat important' to be involved rated their life satisfaction 0.27 points higher on average than those who consider it a little important. The exception to this pattern is those who consider it not at all important. On average they have similar levels of life satisfaction to those who think it quite or somewhat important (see figure 5).

Figure 5



1. Reference group: Very important
Source: Statistics New Zealand

We found no significant association between life satisfaction and the other measures of connecting with Māori culture (te reo Māori speaking proficiency and if they had ever been to their ancestral marae). This suggests that the impact on life satisfaction that comes from Māori culture is through a way of thinking rather than any specific behaviour.



7 Conclusion

This report confirms that relationships, health, and income have the strongest association with the life satisfaction of Māori. Our findings are consistent with many earlier studies conducted internationally and in New Zealand. Life satisfaction for Māori is mainly driven by the same aspects as other population groups and nationalities, except for some unique aspects.

Relationships (whanaungatanga) play a greater role in the life satisfaction for Māori than we see in other populations. For Māori, relationships (through the loneliness measure) make the largest contribution. This compares with other results, including those from the NZGSS, which showed that health and then income make the largest contributions.

Our analysis also showed that living with children has a small positive association with life satisfaction. This compares with many other studies that have found no association with life satisfaction.

These findings are notable because they support how whanaungatanga, as a fundamental element of Māori culture, places importance on collectivism and interdependence with others. The value of culture comes from the importance of cultural knowledge, values, and behaviours that allow individuals to connect with each other.

It is perhaps through whanaungatanga that we see the greatest contribution of culture to life satisfaction, rather than through other more external expressions of culture. How people feel about the importance of involvement in Māori culture has a small, but positive, association with life satisfaction.



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Appendix 1: Data and definitions

Data from Te Kupenga

The data for this report is sourced from Te Kupenga, a survey of Māori well-being. It includes measures based on the Māori perspective of cultural well-being, including wairuatanga (spirituality), tikanga (Māori customs and practices), whanaungatanga (social connectedness), and te reo Māori. The survey also contains general social and economic well-being measures, such as paid and unpaid work, civil participation, and self-assessed health status. These measures give an overall picture of the social, cultural, and economic well-being of Māori in New Zealand.

This survey collected well-being information from 5,549 Māori aged 15 and over between June and August 2013.

[Te Kupenga Survey 2013](#) has more information.

Definitions

Here are the definitions of the main measures and terms used in this report.

Overall life satisfaction

Respondents were asked to rate their overall life satisfaction on an 11-point Likert scale, where zero is completely dissatisfied, and 10 is completely satisfied.

Sex

Respondents' answer could either be male or female.

Age

Respondent's age was included in the data analysis.

Household income

Respondents were asked of their household income. Their answer could be in one of the following:

1. loss
2. zero income
3. \$1–\$5,000
4. \$5,001–\$10,000
5. \$10,001–\$15,000
6. \$15,001–\$20,000
7. \$20,001–\$25,000
8. \$25,001–\$30,000
9. \$30,001–\$35,000
10. \$35,001–\$40,000
11. \$40,001–\$50,000
12. \$50,001–\$60,000
13. \$60,001–\$70,000
14. \$70,001–\$100,000
15. \$100,001–\$150,000
16. \$150,001 or more.

Employment status

Respondents were asked for their employment status. Their answer could be any of the following categories:

1. employed full time
2. employed part time
3. unemployed
4. not in the labour force.

Highest qualification

Respondents were asked for their highest qualification. Their answer could be any of the following categories:

1. no qualification
2. level 1 certificate gained at school
3. level 2 certificate gained at school
4. level 3 or 4 certificate gained at school
5. overseas secondary school qualification
6. level 1 certificate gained post-school
7. level 2 certificate gained post-school
8. level 3 certificate gained post-school
9. level 4 certificate gained post-school
10. level 5 diploma
11. level 6 diploma
12. bachelor's degree and level 7 qualifications
13. postgraduate and honour degree
14. master's degree
15. doctorate degree.

Social marital status

Respondents were asked about their social marital status. Their answer could be in one of the following categories:

1. partnered, nfd (not further defined)
2. spouse
3. civil union partner
4. de facto partner
5. non-partnered, nfd
6. non-partnered, separated (marriage or civil union)
7. non-partnered, divorced, or dissolved (marriage or civil union)
8. non-partnered, widowed, or surviving civil union partner
9. non-partnered, never married, and never in a civil union.

Contact with whānau

Respondents were asked if in the last four weeks, they have seen in person any of their whānau who do not live with them. Their answer could be in one of the following:

1. yes
2. no
3. don't have any whānau (that don't live with them).

Volunteering

A derived variable on volunteering was generated through the responses on the following questions:

1. In the last four weeks, did they provide any help without pay for, or through, a marae, hāpu or iwi.
2. In the last four week, did they provide any help without pay for, or through, a school, church, sports club, or other group or organisation.

If the response in one of the two questions was yes, then volunteering is yes. If the answers to both questions were no, then volunteering is no.

Crime in the last 12 months

Respondents were asked if any crimes have been committed against them. Their answer could be either yes or no.

Been to ancestral marae

Respondents were asked if they have been to any of their ancestral marae. Their answer could be either yes or no.

Te reo speaking proficiency

Respondents were asked how well they are able to speak Māori in day-to-day conversation. Their answer could be any of the following:

1. very well (I can talk about almost anything in Māori)
2. well (I can talk about many things in Māori)
3. fairly well (I can talk about some of the things in Māori)
4. not very well (I can only talk about simple/basic things in Māori)
5. no more than a few words or phrases.

Adequacy of income

Respondents were asked how well do their total income (or theirs and their partner's income combined) meet their everyday needs for such things as accommodation, food, clothing, and other necessities. Their answer could be in one of the following categories:

1. not enough
2. only just enough
3. enough
4. more than enough.

Housing problems

Respondents were asked if the following:

1. repairs
2. pests
3. small
4. damp
5. cold

were problems they have in their house or flat. Their answer to each of the housing problems could be in one of the following categories:

1. not a problem
2. a small problem
3. a big problem.

Self-assessed health status

Respondents were asked in general, how they would assess their health status. Their answer could be any of the following categories:

1. excellent
2. very good
3. good
4. fair
5. poor.

Loneliness

Respondents were asked how much of the time would they say they have felt lonely in the last four weeks. Their answer could be in one of the following categories:

1. all of the time
2. most of the time
3. some of the time
4. a little of the time
5. none of the time.

Trust in others

Respondents were asked using an 11-point Likert scale how much of the time they thought most of the people in New Zealand can be trusted, where zero is people can never be trusted, and 10 is people can always be trusted.

Trust in public institutions

Respondents were asked how much they trust the following institutions/systems in treating people fairly:

1. system of government
2. courts.

Their answer for each institution/system above could be between zero and 10, where zero is not at all trusted, and ten is completely trusted.

Importance of culture

Respondents were asked to think about their life as a whole and asked how important it is for them to be involved in things to do with Māori culture. Their answer could be in one of the following categories:

1. very important
2. quite important
3. somewhat important
4. a little important
5. not at all important.

Have children

This is a derived variable that is generated from the household composition variable. The answer could be

- 1—if with child(ren)
- 0—if without child(ren).

Urban/rural

Below is the derived urban/rural classification used in this report:

1. Main urban area
2. Secondary urban area
3. Minor urban area
4. Rural.

Appendix 2: Objective and subjective measures contributing to overall life satisfaction

This chapter discusses the results of the two regression models used in calculating the determinants of life satisfaction.

Model 1 – Objective measures

Model (1) contributes only 7 percent of the variation in Māori life satisfaction (see table 3). It does not provide a complete picture of the relationship between life satisfaction and many other relevant well-being outcomes. We thought it would be appropriate to include a range of more subjective variables that are proxy of the other aspects of well-being, such as health status, social connections, civic engagement and governance, and personal security.

Model 2 – Objective and subjective measures

In model (2), we found objective variables that were no longer significant but were significant in model (1). These were household income, employment status, volunteer work, experienced crime, and contact with whānau. It is possible that these measures were somehow correlated to some subjective variables identified in model (2).

In contrast, sex, presence of children, and highest qualification – which were not significant in model (1) – became significantly associated with life satisfaction in model (2).

Age, urban area, and social marital status were consistently significant in contributing to overall life satisfaction. Female Māori are more likely to have higher life satisfaction than male Māori. Partnered Māori are more likely to have higher life satisfaction than non-partnered Māori. Life satisfaction is ‘U-shaped’ in age.

The subjective variables we found to be significantly contributing to the overall life satisfaction of Māori are adequacy of income; number of housing problems; health status; loneliness; trust in people; trust in courts; and importance of culture. However, we found that te reo speaking proficiency did not significantly contribute to overall life satisfaction. Model (2) considers both objective and subjective measures of well-being, which contributed 24 percent to Māori overall life satisfaction.

Table 3

Regression results: life satisfaction

Outcome domain	Variable	Model	
		(1)	(2)
		Pr>F	
Demographic characteristics	Male	0.3096	0.0001
	Age	<0.0001	<0.0001
	Age ²	<0.0001	<0.0001
	With children	0.0801	0.0341
	Urban area	0.0051	0.0233
Income and wealth	Log household income	<0.0001	0.3735
	Not enough money	...	<0.0001
Jobs and earnings	Unemployment	0.0004	0.0800
Housing conditions	Number of housing problems	...	<0.0001

Outcome domain	Variable	Model	
		(1)	(2)
		Pr>F	
Health status	Health status	...	<0.0001
Education and skills	Highest qualifications	0.5790	0.0034
Social connections	Partnered	<0.0001	0.0001
	Loneliness	...	<0.0001
	Contact with whānau	0.0347	0.4011
	Volunteering	0.0028	0.1442
	Trust in people	...	<0.0001
Civic engagement and governance	Trust in courts	...	<0.0001
Personal security	Experienced crime	<0.0001	0.1209
Cultural connections	Importance of culture	...	<0.0001
	Been to ancestral marae	0.2277	0.7113
	Te reo speaking proficiency	...	0.5064
	Observations	5,549	5,549
	Observations used	4,225	4,065
	r ²	0.0736	0.2446
Symbol: ... Not applicable.			
Source: Statistics New Zealand			

Appendix 3: Results on model building

This appendix discusses the two ways of building the determinants of life satisfaction models.

As shown in table 1, we included 21 independent variables (ie including age squared) in the model of drivers of overall life satisfaction.

Two ways of building the model on the drivers of well-being are:

- ordinary least square (OLS) method
- logistic regression.

The most logical method to use for this study is the ordered logistic regression, since the dependent variable (overall life satisfaction) is ordinal. This means that 0, which means completely dissatisfied, is lower than 10, which means completely satisfied. Discrete steps are located between 0 and 10. The constraint in using this method is its complexity to interpret the results, especially if the ordered categorical responses have more than five levels that are in a clear order (eg levels of well-being with 0 as the lowest category and 10 the highest).

The main advantage of OLS is that interpreting the regression results is more simple and straightforward than the ordered logistic regression.

In this study we used both ordered logistic regression and OLS as a sensitivity check for the robustness of the OLS results, since some of the assumptions for OLS may not hold for the ordered well-being data.

This report adopted the methodology used in *What makes for a better life?* (Boarini, Comola, Smith, Manchin, & de Keulenaer, 2012) and *Measuring national well-being – What matters most to personal well-being?* (Oguz, Merad, & Snape, 2013).

Results of the ordered logistic regression were similar to those in OLS. The statistical significance, signs, and relative sizes of the regression coefficients were very similar. Choosing the regression method made little difference to the overall results.

Figures 2 to 5 used the results of the regression model found in table 4.

Table 4

Estimated regression coefficients

Parameter	Estimate	Standard error	t Value	Pr > t
Intercept	8.842629	0.546084	16.19	<.0001
sex 0	0.187181	0.04828	3.88	0.0001
sex 1	0	0	*	*
DUM_children 0	-0.11199	0.052781	-2.12	0.0341
DUM_children 1	0	0	*	*
urban_area 1	-0.21953	0.08914	-2.46	0.014
urban_area 2	-0.1102	0.121656	-0.91	0.3653
urban_area 3	-0.07387	0.103528	-0.71	0.4757
urban_area 4	0	0	*	*

Parameter	Estimate	Standard error	t Value	Pr > t
SOLEnoughIncome_r 11	-0.81782	0.1092	-7.49	<.0001
SOLEnoughIncome_r 12	-0.47014	0.082871	-5.67	<.0001
SOLEnoughIncome_r 13	-0.14718	0.071824	-2.05	0.0407
SOLEnoughIncome_r 14	0	0	*	*
DUM_unemployment 0	0.175988	0.100414	1.75	0.08
DUM_unemployment 1	0	0	*	*
HEAHealthStatus_r1 11	-1.1284	0.178825	-6.31	<.0001
HEAHealthStatus_r1 12	-0.79339	0.107737	-7.36	<.0001
HEAHealthStatus_r1 13	-0.43776	0.075463	-5.8	<.0001
HEAHealthStatus_r1 14	-0.19844	0.063727	-3.11	0.0019
HEAHealthStatus_r1 15	0	0	*	*
DV_highest_qualr 1 No qualification	0.294426	0.08086	3.64	0.0003
DV_highest_qualr 2 Level 1 - 4 cert	0.182567	0.065641	2.78	0.0055
DV_highest_qualr 3 Level 5 - 6 dipl	0.168811	0.119238	1.42	0.1572
DV_highest_qualr 4 Level 7 / bachel	0	0	*	*
DUM_partnered 0	-0.27409	0.070639	-3.88	0.0001
DUM_partnered 1	0	0	*	*
WHALoneliness_r 11	-0.90106	0.393102	-2.29	0.0221
WHALoneliness_r 12	-1.19607	0.179309	-6.67	<.0001
WHALoneliness_r 13	-0.8713	0.098859	-8.81	<.0001
WHALoneliness_r 14	-0.46253	0.0683	-6.77	<.0001
WHALoneliness_r 15	0	0	*	*
DUM_Contact 0	-0.06081	0.072392	-0.84	0.4011
DUM_Contact 1	0	0	*	*
DUM_Volunteering 0	-0.07144	0.04888	-1.46	0.1442
DUM_Volunteering 1	0	0	*	*
DUM_Crime 0	0.115977	0.074703	1.55	0.1209
DUM_Crime 1	0	0	*	*
DVImpOfCulture_r 11	-0.37197	0.114291	-3.25	0.0012
DVImpOfCulture_r 12	-0.47981	0.094258	-5.09	<.0001
DVImpOfCulture_r 13	-0.37409	0.080062	-4.67	<.0001
DVImpOfCulture_r 14	-0.33216	0.080427	-4.13	<.0001
DVImpOfCulture_r 15	0	0	*	*
DUM_AncestralMarae 0	-0.02043	0.055183	-0.37	0.7113
DUM_AncestralMarae 1	0	0	*	*

Parameter	Estimate	Standard error	t Value	Pr > t
DVSpeakTeReo_4grps_r 11_12	-0.11736	0.100578	-1.17	0.2436
DVSpeakTeReo_4grps_r 13	-0.11862	0.096239	-1.23	0.2181
DVSpeakTeReo_4grps_r 14	-0.1578	0.107853	-1.46	0.1438
DVSpeakTeReo_4grps_r 15	0	0	*	*
DV_agenbr	-0.05065	0.009063	-5.59	<.0001
age_sqrd	0.000586	0.000103	5.69	<.0001
log2_hhd_income_r	0.024467	0.027481	0.89	0.3735
HOUProblems	-0.0891	0.019055	-4.68	<.0001
qCDTTrust	0.080095	0.016971	4.72	<.0001
qCDTInstTrust_Courts	0.053979	0.012419	4.35	<.0001
Symbol: * No value for the reference group. Source: Statistics New Zealand				