

How much happiness does money buy?

Income and subjective well-being in New Zealand

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The relationship of household income with multiple aspects of subjective well-being was examined in a New Zealand telephone probability sample conducted in 2008 (N = 5197). Consistent with previous research, household income had positive logarithmic associations with subjective quality of life and happiness. The logarithmic function was steeper for quality of life than for happiness, indicating that income is linked more strongly to people's evaluations of their life than to their happiness. Analyses also indicated that the income well-being association was strongest for people earning below the median (NZ\$ 65,000) and tended to plateau for people in the upper quartile (NZ\$ 125,000). Contrary to previous research, income was negatively correlated with self-reported daily stress, after adjusting for relevant demographics (e.g., age and household crowding). This association was also logarithmic, and income was more predictive of reductions in stress for those earning below the median. Finally, we tested a log-mediation model in which the relationship between income and multiple components of well-being were mediated by the perceived ability to meet everyday life necessities. This mediator explained 55–60% of the association of income with both happiness and life quality, and fully mediated the effect of income on reduced stress. These are some of the first results to document the relationship between household income and subjective well-being in New Zealand. They also come at a time when concerns about the ability to meet everyday needs are particularly relevant to many New Zealanders in the wake of the global financial crisis.

global financial crisis have brought monetary considerations to the forefront of people's minds. In this climate of economic uncertainty, the age-old question of whether earning more money makes one happier seems especially pertinent. Decades of research by economists and psychologists suggest that the answer to this question is far from straightforward (see Diener & Seligman, 2004; Fischer & Boer, 2010 for discussion). For example, Kahneman and Deaton (2010) recently found that although earning more was linked to higher life-satisfaction (general positive evaluations of one's life overall), the link between income and day-to-day emotional well-being was far weaker. They also found that once a certain level of income was reached (approximately US\$ 75,000), no further gains in emotional happiness were accrued. This suggests that the effect of income on happiness depends on what form of well-being is being investigated and on the income level at which the effect is being studied. It seems that money does 'buy' happiness, but only a certain kind of happiness, and only up to a point.

Despite the vast international literature, data on the effect of income on happiness in New Zealand remains scarce. We aim to fill this gap and extend the corpus of research in New Zealand by investigating the relationship between household income and four indicators

One of the shortcomings of modern civilization—ancient civilization too, for that matter—is that the average man never gets all he wants of the most desirable products, never makes his life fit his dreams.

—Jack Vance, "I'll Build Your Dream Castle" (1947)

He disliked him because he found the idea of someone who was not only privileged, but was also sorry for himself because he thought the world didn't really understand the problems of privileged people, deeply obnoxious.

—Douglas Adams, Dirk Gently's Holistic Detective Agency (1987)

The rising costs of living and unemployment in the wake of the

of subjective well-being: overall life-satisfaction, happiness, stress and self-evaluated ability to fulfill basic needs. We also examine whether the perceived ability to fulfill one's basic needs acts as a mechanism through which income affects happiness and life satisfaction. To explore these issues we analyzed data from a large national probability telephone sample ($N = 5197$) collected in 2008.

Income and the Fulfillment of Basic Needs

The research on income and well-being consistently shows that poverty undermines happiness. For example, it has been found that national income correlates strongly with well-being ($r = .70$; Inglehart & Klingemann, 2000). People in richer nations are significantly happier, on average, than those in poorer ones. Similarly, significant declines in national per capita income (as happened in Belgium in 1979) are accompanied by marked decreases in citizens' reported subjective well-being (Inglehart & Rabier, 1986).

At the individual level, financial strain and economic difficulties are strong predictors of depression (Wheaton, 1994). A comparison of subjective well-being between the rich and the poor in 19 nations showed that the poor were far less likely to be satisfied with their lives than were the rich (Diener & Oishi, 2000). The poor also report having fewer positive emotions and spending a greater proportion of time feeling unhappy than their wealthy counterparts (Bradburn, 1969). Thus, poverty is associated with multiple indicators of negative well-being. The impact that wealth has on well-being among those who are relatively well-off, however, is less certain and has been the subject of much debate (see Veenhoven & Hagerty, 2006).

A major source of contention in the literature is whether income predicts happiness among those who are already fairly well-off. Some studies (e.g. Easterlin, 1995; Myers, 2000; Oswald, 1997) provide compelling evidence to the contrary and show that large increases in income are not accompanied by corresponding increases in well-being among those living in wealthy nations. For example, using data from

the General Social Survey in the United States, Easterlin (1974) found that, though per capita income had doubled in the period between 1946 and 1974, levels of happiness were unchanged.

The inability of wealth to increase happiness among those who are well-off coupled with the known link between poverty and unhappiness is consistent with 'livability theory' (see Veenhoven, 1995, for a review). This theory states that income only enhances well-being to the extent that it facilitates the fulfillment of basic human needs. Once these needs are met, wealth accrues diminishing marginal returns on people's well-being. This perspective is corroborated by evidence showing that the effect of income on happiness is strongest at low levels of income (Diener & Oishi, 2000; Diener & Biswas-Diener, 2002). Under conditions of deprivation, the money people earn has a direct bearing on the fulfillment of their basic needs which could explain the relationship between income and well-being in these contexts. For example, the correlation between income and happiness is more than twice as strong in the slums of Calcutta as it is in the United States (Biswas-Diener & Diener, 2001). Indeed, studies across nations have found virtually no increase in well-being once per capita income rises above U.S. \$10,000 (Frey & Stutzer, 2002; Helliwell, 2003).

The diminishing returns of wealth have been explained with reference to the psychological principle of adaptation (Brickman & Campbell, 1971). According to this principle, as people's circumstances improve, so do their desires and expectations. In time, they habituate to their higher level of prosperity and are no longer satisfied with their current lot in life. Indeed, sometimes people's aspirations can increase more rapidly than their incomes, leading to frustration (Graham & Pettinato, 2002). Thus, while wealth may allow people to purchase positive experiences, it also brings with it problems that can jeopardize people's well-being. For example, the increased material desires that result from prosperity can oftentimes precipitate lower self-esteem, greater narcissism, less empathy, less intrinsic motivation, and more conflict-ridden relationships (Kasser, Ryan, Couchman, & Sheldon,

2004). These findings support the idea that money only increases well-being inasmuch as it helps fulfill basic human needs. Beyond that, people habituate to wealth and can become vulnerable to its negative effects.

Money Matters

Livability theory paints a comforting picture: Money does not buy happiness. There is some evidence, however, that tempers (or in some cases contradicts) this optimistic notion. For example, correlational studies within nations consistently find associations between income and life-satisfaction that are both statistically significant and practically meaningful (see Diener & Biswas-Diener, 2002; Diener & Oishi, 2000). Although these correlations are stronger in poorer nations, research has repeatedly revealed that even wealthy countries such as Switzerland (Frey & Stutzer, 2000), Germany (Schyns, 1997), and the United States (Hagerty, 2000) yield positive relationships between income and well-being.

The relatively modest sizes of these associations (typically between .17 and .21; see Lucas & Dyrenforth, 2006 for a meta-analysis) in the developed world has, in the past, been interpreted as confirmation of the relative unimportance of income in people's lives (e.g. Myers & Diener, 1995). However, there is an increasing consensus in the literature that these findings represent a nontrivial and robust effects (see Scollon & King, 2010, for a discussion). The fact that this effect persists in rich nations where the fulfillment of basic human needs is presumably not the primary concern for more people calls into question extreme forms of the livability theory. Moreover, it appears that money does matter even among those who are relatively well-off. For example, Diener, Horwitz and Emmons (1985) found that super-rich individuals (sampled from the Forbes' list of wealthiest Americans) were significantly more satisfied with their lives than were a matched control group from the same geographical area. Similarly, Easterlin (1999) found that a higher proportion of people from the richest group reported being "very happy" than did the next richest group.

As social psychologists often

emphasize, these findings belie pervasive societal stereotypes that the poor are happy whereas the rich are unhappy (e.g., Kay, Jost, Mandisodza, Sherman, Petrocelli & Johnson, 2007). Such stereotypes arise because of an inherent need to see society as fair (Jost & Banaji, 1994; Jost, Banaji & Nosek, 2004). As Kay and Jost (2003) argued, people are thus motivated to rationalize the unfairness of poverty by believing that the rich suffer for their wealth and that the poor are compensated by enjoying greater happiness. We want to believe that money does not buy happiness—a particularly comforting notion for those on a low income.

Income and Subjective Well-Being: A Logarithmic Function

The evidence reviewed here suggests that money can indeed buy happiness, and does so beyond the fulfillment of basic needs. How can these findings be reconciled with research (e.g. Helliwell, 2003) showing diminishing well-being dividends at progressively higher levels of income? According to Kahneman and Deaton (2010), the answer to this question lies in how the effects of income are analyzed. They suggest that life satisfaction should be plotted against the logarithm of income, rather than the dollar value. This is because according to Weber's Law, the perception of an external stimulus is directly proportional to the logarithm of its intensity. In other words, differences in perception (in this case subjective well-being) are related to the *percentage* differences in stimulus intensity (income level), rather than its absolute intensity.

Kahneman and Deaton (2010) have argued that the curvilinear effect observed when plotting life-satisfaction against *raw income* in dollars has led to the erroneous conclusion that people gain little or no benefit from income after a certain point. Instead, when well-being is plotted against the *logarithm* of income, a linear relationship is obtained (Kahneman, 2008; Diener, Ng, Harter & Arora, 2010). Therefore, the diminishing effects of increases in raw income merely reflect the diminishing marginal utility of each added dollar in absolute terms (of course \$10 means much less

to someone on a high salary than it does to someone earning minimum wage).

A key feature of logarithms is that they transform variables so that the doubling of any number in the sequence represents the same unit difference as the doubling of any other number in the sequence. This has the effect that a change in income from 2% to 4% reflects that same unit change (in logarithmic units) as a change from 4% to 8%, or from 8% to 16%. What is key in this context then, is not change in income by a given dollar amount, but rather, *change relative to an existing income*. A doubling of income from \$10,000 to \$20,000 should thus have the same effect on life-satisfaction as an increase from \$100,000 to \$200,000 (Kahneman & Deaton, 2010).

Aspects of Subjective Well-being

Kahneman (1999) identified two separate dimensions along which people evaluate their subjective well-being: day-to-day emotional happiness and global life-satisfaction. The judgments people make when reflecting on their lives (life-satisfaction) are distinct from the feelings they have while experiencing it (happiness). This is also supported by Lucas, Diener and Suh (1996) who found that life-satisfaction, positive emotions, and negative emotions showed discriminant validity from each other as well as from other related constructs.

Kahneman and Deaton (2010) tested whether income had different consequences for these distinct forms of well-being. Investigating a sample of nearly half a million American respondents, they found that income was more strongly associated with life-satisfaction than with emotional well-being. They also found that the effects of income on emotional well-being fully satiated at about \$75,000; beyond that, income bestowed no increases in happiness. These findings were corroborated by a study of 136,839 participants from 132 countries, described as "the first representative sample of planet Earth" (Diener et al., 2010, p. 52). Again, it was found that log income had a positive relationship with life-satisfaction, which was far stronger than the relationship between income

and emotional well-being.

Diener et al. (2010) also investigated potential mediators of these effects. They found that the fulfillment of basic needs was a weak mediator of the relationship between income and both forms of well-being. The strongest mediator of the income-life-satisfaction relationship was material desires, whereas the strongest mediator of the income-happiness relationship was the fulfillment of social psychological needs. People's emotional well-being appears to be more dependent on the fulfillment of their psychological than material needs (e.g. autonomy and belongingness), but their life-satisfaction is contingent on whether they can satisfy their material desires (e.g. luxury conveniences).

Among the many proposed drawbacks to wealth, its effects on people's stress levels have perhaps been those most frequently studied (see Ng, Diener, Arora & Harter, 2009). Initial indications that wealth precipitates stress were provided by income-maintenance experiments on welfare recipients in the United States (e.g. Thoits & Hannan, 1979). In these studies, select participants were provided with up to 20% more income over a five year period than they would have ordinarily been entitled to receive under governmental welfare programs.

Results from Thoits and Hannan's (1979) study indicated that individuals receiving higher welfare payments experienced greater stress than did the control group. Moreover, the impact of increased welfare payments on stress increased over time. More recently, Ng et al. (2009) found that (log) income was positively correlated with stress at both the national and individual level in a large sample drawn from 132 countries. They suggested that "people who have lots of money and modern conveniences may be stressed by trying to maintain their lifestyle, not having enough time for social activities and relaxation, meeting family expectations, or trying to juggle many tasks simultaneously" (p. 259). Therefore, we might expect stress to rise with income. As far as we are aware, this possibility has not been examined in detail within the New Zealand context.

The New Zealand Context

There is a lack of data on the effect of income on happiness within the New Zealand context. A few studies do, however, provide some indirect evidence that income is associated with well-being among New Zealanders. Between 2001 and 2007, median household incomes in New Zealand rose by 40% (Statistics New Zealand, 2011). Over this same timeframe, Denny et al. (2010) found that the well-being among adolescents living in New Zealand had improved. Specifically, relative to 2001, secondary school students in 2007 reported better mental health and higher quality interpersonal relationships. They also reported fewer depressive symptoms, suicidal behaviours, and drug abuse. Though there are many factors that might account for these corresponding trends, these findings suggest that increasing income at the national level covaries with increased well-being.

Another important line of evidence indicating that income is associated with well-being in New Zealand is found in research investigating differences in well-being between New Zealanders of European and Māori descent. Relative to the descendants of European settlers, Māori (the indigenous people of New Zealand) suffer considerable socioeconomic disadvantages including higher rates of unemployment and lower wages (NZ Ministry of Social Development 2008, 2009). Not surprisingly, Ganglmair-Wolliscroft and Lawson (2008) found that Māori also report lower well-being and life-satisfaction than do New Zealand Europeans.

Sibley, Harré, Hoverd and Houkamau (2011) investigated the well-being of Maori and New Zealand Europeans before (in 2005) and during (2009) the global financial crisis. They found that Māori reported lower well-being than New Zealand Europeans in 2005 and that this gap had widened by 2009. Notably, the well-being of New Zealand Europeans had remained relatively stable during this period, yet the well-being of Māori had decreased substantially. In one of the only other studies addressing this issue, Waldegrave

and Cameron (2010) reported that income was positively associated with life-satisfaction among middle-aged New Zealanders. While these results and others from the international literature suggest that income and well-being are correlated beyond this limited age range, there is a need for comprehensive assessment of the relationship between income and subjective well-being in the New Zealand context.

The Present Study

In the present study, we examine the relationship between income and four indicators of well-being: (a) life-satisfaction, (b) happiness, (c) stress, and (d) basic needs fulfillment. In doing so, we model these relationships as logarithmic functions utilizing a large representative sample of New Zealanders. We also test whether the perceived ability to meet basic needs (i.e. food, accommodation and clothing) mediates the effect of income on happiness, life-satisfaction and stress. Following Diener et al. (2010), this would provide supportive evidence for a possible mechanism through which income may partially influence well-being. If the fulfillment of needs fully mediates the effect of income on well-being, it would provide support for the theory that money only buys happiness to the extent that it enables the satisfaction of basic needs. If however, income still exerts a direct effect on well-being after accounting for people's ability to meet their basic needs, then money may also facilitate ephemeral factors that increase well-being (e.g., social group memberships). Based on the arguments presented here, we advance the following hypotheses:

Hypothesis 1: Household income should have a logarithmic association with different aspects of subjective well-being. Specifically, we predict that income will be positively correlated (in a negatively accelerating manner) with (a) evaluations of the quality of one's life, (b) levels of overall happiness, (c) the perceived ability to meet basic needs, and (d) also levels of overall stress.

Hypothesis 2: Household income should have a stronger logarithmic association with global evaluations of quality of life than with

ratings of happiness. Income should have the strongest effect, however, on people's perceived ability to meet basic needs.

Hypothesis 3: People's perceived ability to meet basic needs should mediate the logarithmic relationships between household income and (a) quality of life, (b) happiness, and (c) stress.

Method

Sampling strategy and data weighting

The Quality of Life Survey (QoLS) is a telephone interview jointly funded by the Ministry of Social Development and the Territorial Local Authorities of the 12 major cities in New Zealand. The 2008 QoLS was conducted between 16th July and 28th October 2008. The response rate was 37%. Full details regarding the QoLS sampling procedure and interview items are provided in the Quality of Life 2008 Survey National Report (2009). Participants over 18 years of age were selected from a telematched version of the New Zealand electoral roll. The QoLS sampled 500 people from each of the 12 major cities of New Zealand and a further 2000 residents from outside these city regions (56% of the New Zealanders live within the 12 city regions).

The sampling strategy included quotas that were within 2% of national proportions derived from the 2006 census data for gender, ethnicity and age range. Booster samples of area units with a high number of ethnic minority peoples were included in order to meet the ethnic group sampling quota. All analyses applied a weighting factor to adjust for sampling bias introduced by deliberately sampling equal numbers of people from different regions, given that the different regions and cities of New Zealand differ in population size.

Participants

Participants were 5197 members of the New Zealand population sampled as part of the 2008 QoLS. The study sampled a total of 8155 people. We limited our analyses to the 64% of the sample who provided complete data and were over 18 years of age. The vast majority of missing data was due to non-reports for household income.

Description of the sample characteristics is based on unweighted estimates.

The sample analyzed here comprised 2746 women and 2451 men. Participants' mean age was 49.52 years ($SD = 14.23$). In terms of ethnicity, 4214 participants identified as New Zealand European/Pākehā (81.1% of the sample versus 75.4% of the 2006 population); 676 identified as Māori (13.0% of the sample versus 14.0% of the population); 220 identified as being of Pacific Nations ancestry (4.2% versus 6.6% of the population); 421 identified with an Asian ethnic group (8.1% versus 8.8% of the population); and 48 were coded as other/unreported. Ethnic group categories were not mutually exclusive, as some participants selected multiple ethnic group memberships. As can be seen, the sample over-represented NZ European/Pākehā by roughly 5.5% and under-represented Māori, Pacific Nations and Asian peoples each by 1-2% relative to 2006 census figures (Statistics New Zealand, 2006).

The median household income in our sample was \$NZ 65,000, whereas the sample mean household income was \$NZ 79,143 ($SD = 48,801$). These figures are slightly higher than population estimates provided by statistics New Zealand. According to 2006 census figures, the median household income for New Zealanders in 2006 was \$NZ 59,000 (Statistics New Zealand, 2006). The 2008 Household Economic Survey indicated that the median annual household income in 2008 (the same year our data were collected) was \$NZ 57,947 with a mean household income of \$NZ 73,952 (Statistics New Zealand, 2008). Thus, the household income for our sample was roughly \$5000-\$6000 more than that estimated by statistics New Zealand. It is worth noting that this estimate may be inflated by the large number of missing values for household income in the QoLS.

With regard to maximum level of education, 11.2% ($n = 582$) of the sample either had (a) no formal qualification, (b) not completed school certificate or (c) achieved less than 80 credits for NCEA Level 1; 9.9% ($n = 513$) had completed school certificate or NCEA Level 1; 7.9% ($n = 408$) had completed NCEA Level 2 or a higher school certificate; 6.8% ($n =$

Table 1. Bivariate correlations between variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Log Household Income										
2. Gender (-.50 women, .50 men)	.13*									
3. Age	-.40*	-.01								
4. Age Squared	-.43*	-.01	.99*							
5. Education	.31*	.09*	-.21*	-.21*						
6. Household size	.30*	.03	-.46*	-.47*	.09*					
7. Quality of Life	.22*	-.05*	.04*	.03*	.08*	-.02				
8. Happiness	.07*	-.05*	.05*	.05*	-.03*	.03	.43*			
9. Ability to Meet Needs	.37*	.03*	.10*	.09*	.15*	-.10*	.39*	.19*		
10. Stress	.04*	-.07*	-.21*	-.22*	.07*	.11*	-.23*	-.31*	-.13*	

$N = 5197$, * $p < .05$

353) had completed NCEA Level 3 or 4, or a bursary or university entrance qualification; 34.9% ($n = 1814$) had achieved some form of post-secondary school (non-university) qualification; 18.2% ($n = 944$) had a university bachelors degree; and 11.2% ($n = 583$) had completed a post-graduate degree or diploma. We coded these education categories as an ordinal variable in the sequence listed.

Interview procedure and measures

Participants were mailed a pre-notification letter up to two weeks before being invited to complete the telephone interview (allowing three days for letter arrival). Several attempts were made to contact participants. Once initial contact had been made, a maximum of eight attempts were made to re-contact participants at a time suitable for the interview. Interviews took an average of 20.3 minutes to complete.

Subjective overall quality of life was measured using the item "The next question concerns your overall quality of life. Would you say that your overall quality of life is..." Responses were scored on a scale from 0 (extremely poor) 1 (poor) 2 (neither poor nor good) 3 (good) 4 (extremely good). The mean level of subjective quality of life on this scale was 3.19 ($SD = .62$).

Subjective overall happiness was measured using the item "In general how happy or unhappy would you say you are?" Responses were scored on a scale from 0 (very unhappy) 1 (unhappy) 2 (neither happy or unhappy) 3 (happy) 4 (very happy). The mean level of subjective happiness on this scale was 3.21 ($SD = .67$).

Subjective overall stress was measured using the item "At some time in their lives, most people experience stress. Can you tell me which statement best applies to how often, if ever, in the last 12 months you have experienced stress that has had a negative effect on you?" Responses were scored on a scale from 0 (never) 1 (rarely) 2 (sometimes) 3 (most of the time) 4 (always). The mean level of stress on this scale was 1.54 ($SD = .79$).

Subjective overall ability to meet everyday needs was measured using the item "Which of the following best

describes how well your total income meets your everyday needs for things such as accommodation, food, clothing and other necessities?" If participants asked for further information, the interviewer was instructed to clarify that necessities excluded leisure activities. Participants were asked to select from one of four responses, 'not enough money', 'just enough money' 'enough money' and 'have more than enough money.' We re-scaled these scores so that they were equidistantly distributed on a five-point 0-4 scale to match the scale range for the other measures. A minimum score of 0 thus represented 'not enough money' and a score of 4 represented 'more than enough money.' The mean level of ability to meet everyday needs was 2.08 ($SD = 1.19$).

Results

Results of regression models examining income

Bivariate correlations are presented in Table 1. We tested identical regression models predicting all four aspects of subjective well-being in turn (quality of life, happiness, stress and the perceived ability to meet everyday needs). Regression models testing the logarithmic association of household income with these four aspects of subjective well-being are presented in Tables 2 and 3.

We first tested baseline models of the bivariate logarithmic association between household income and each aspect of well-being. We then extended these models to adjust for the effects of demographic covariates (referred to as the covariate model). The covariate models adjusted for the following factors: ethnicity, gender, age, the possible exponential effect of age, education, and household size. Continuous covariates (age, age squared, and household size) were centered around their mean. Categorical covariates were contrast coded. This allowed us to interpret the constant for each logarithmic slope as the expected value at the mean for each covariate.

Likewise, we entered dummy coded (0 no, 1 yes) variables representing ethnic identification as Māori, Pacific and Asian. This adjusted for the effect of belonging to one or more of these

ethnic groups relative to identification as Pākehā/New Zealand European (and also included 'other' ethnic group memberships). A significant parameter for a given ethnic group would thus indicate that people identifying with that ethnic group were significantly different in the given well-being outcome relative to the reference group (Pākehā/New Zealand Europeans/'Other') after adjusting for all other covariates.

As shown in Table 2, the log of household income had a significant bivariate association with self-reported quality of life ($b = .19$). The covariate model indicated that this association was partially suppressed, as this effect was stronger when adjusting for covariance with other demographics ($b = .25$). This partial suppression effect indicates that failure to consider a model adjusting for other demographics that are also associated with income and subjective well-being may partly mask the association between income and well-being. The covariate model explained a total of 8.6% of the variance in quality of life ($R^2 = .086$, Adjusted $R^2 = .085$, $F(9,5181) = 54.23$, $p < .01$).

As can also be seen in Table 2, the log of household income had a significant bivariate association with happiness ($b = .07$). The covariate model, however, indicated that this association was also partially suppressed. Specifically, the log of household income was more strongly associated with happiness after ruling out error variance associated with other demographic characteristics ($b = .12$) than it was in the simple bivariate relationship. Overall, the association between the log of household income and happiness was roughly half the magnitude of more general evaluations of quality of life ($b = .12$ for happiness versus $b = .25$ for quality of life). The covariate model explained a total of 2.4% of the variance in happiness ($R^2 = .024$, Adjusted $R^2 = .022$, $F(9,5181) = 14.01$, $p < .01$).

As shown in Table 2, the log of household income appeared to have a significant weak positive bivariate association with stress ($b = .05$). The covariate model however, revealed a quite different pattern. After adjusting for shared variance attributable to other demographic characteristics, the model indicated that the log of household

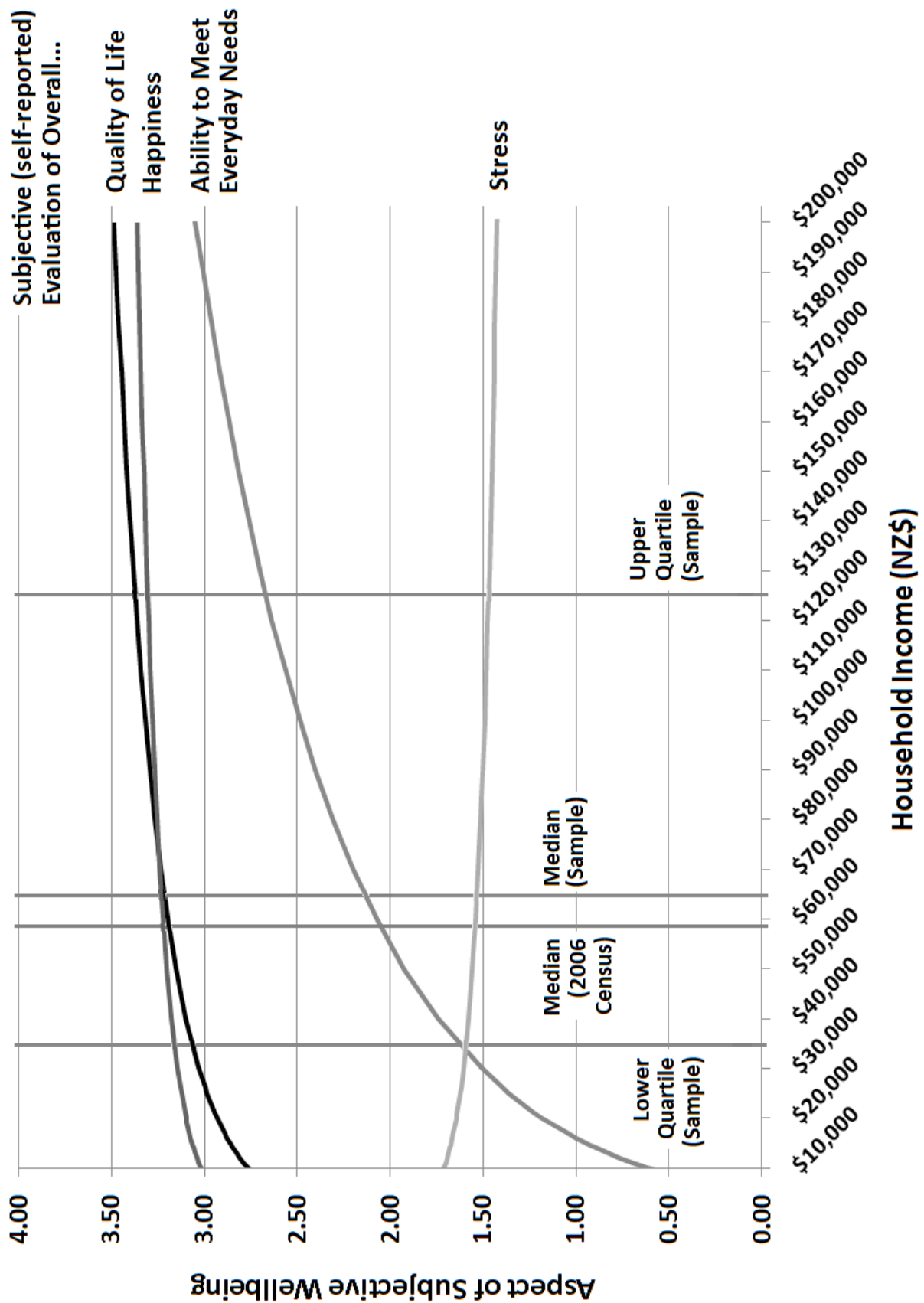
Table 2. Multiple regression models assessing the association between (log) household income and subjective (self-reported) evaluation of overall quality of life and happiness with and without demographic covariates.

	Quality of Life				Happiness			
	<i>b</i>	<i>se</i>	β	<i>t</i>	<i>b</i>	<i>se</i>	β	<i>t</i>
Baseline Model								
Constant	1.09	.13		8.61*	2.48	.14		17.49*
Log Household Income	.19	.01	.22	16.50*	.07	.01	.07	5.14*
Covariate Model								
Constant	.44	.15		3.02*	1.89	.17		11.37*
Log Household Income	.25	.01	.29	18.74*	.12	.02	.13	8.00*
Gender (-.50 women, .50 men)	-.10	.02	-.08	-5.77*	-.08	.02	-.06	-4.16*
Age (mean centered)	-.01	.00	-.17	-1.92	-.01	.00	-.24	-2.60*
Age Squared (mean centered)	.00	.00	.30	3.39*	.00	.00	.35	3.73*
Education (ordinal contrast code)	.01	.00	.04	2.79*	-.01	.01	-.04	-2.39*
Household size (centered)	-.01	.01	-.03	-1.68	.02	.01	.05	2.83*
Māori Ethnicity (0 no, 1 yes)	-.04	.03	-.02	-1.47	.02	.03	.01	.71
Pacific Ethnicity (0 no, 1 yes)	.01	.04	.00	.23	.04	.05	.01	.87
Asian Ethnicity (0 no, 1 yes)	-.20	.03	-.09	-6.56*	-.13	.03	-.05	-3.63*
<i>N</i> = 5197, * <i>p</i> < .05								

Table 3. Multiple regression models assessing the association between (log) household income and subjective (self-reported) evaluation of overall ability to meet everyday needs and stress with and without demographic covariates.

	Stress				Ability to Meet Needs			
	<i>b</i>	<i>se</i>	β	<i>t</i>	<i>b</i>	<i>se</i>	β	<i>t</i>
Baseline Model								
Constant	1.01	.17		6.03*	-4.60	.23		-19.74*
Log Household Income	.05	.02	.04	3.15*	.60	.02	.37	28.69*
Covariate Model								
Constant	2.47	.19		12.83*	-6.93	.26		-26.69*
Log Household Income	-.08	.02	-.08	-4.86*	.82	.02	.50	34.82*
Gender (-.50 women, .50 men)	-.11	.02	-.07	-4.95*	-.06	.03	-.03	-2.20*
Age (mean centered)	.02	.01	.31	3.47*	-.01	.01	-.17	-2.06*
Age Squared (mean centered)	.00	.00	-.54	-5.96*	.00	.00	.41	4.98*
Education (ordinal contrast code)	.02	.01	.05	3.36*	.05	.01	.07	5.37*
Household size (centered)	.02	.01	.03	1.78	-.10	.01	-.12	-8.58*
Māori Ethnicity (0 no, 1 yes)	-.05	.03	-.02	-1.47	-.04	.04	-.01	-0.85
Pacific Ethnicity (0 no, 1 yes)	-.02	.06	-.01	-.38	-.14	.08	-.02	-1.79
Asian Ethnicity (0 no, 1 yes)	-.04	.04	-.01	-.89	-.28	.05	-.07	-5.20*
<i>N</i> = 5197, * <i>p</i> < .05								

Figure 1. Logarithmic functions for relationship between household income and various aspects relating to subjective well-being in a national probability sample of New Zealanders in 2008 (N = 5,197). Horizontal lines median and quartile values of household income.



income was *negatively* associated with stress ($b = -.08$). The covariate model explained a total of 6% of the variance in self-reported stress ($R^2 = .060$, Adjusted $R^2 = .059$, $F(9,5181) = 36.97$, $p < .01$).

The suppression effect for the income-stress association is similar in magnitude to those observed for the other indicators of well-being discussed above. In this case, however, controlling for demographic factors was necessary for the accurate interpretation of the *direction of the relationship* between household income and well-being. Without accounting for demographic factors, one would falsely infer that income was positively correlated with stress. As we've shown here, however, earning a higher income predicts lower levels of self-reported stress *after adjusting for demographic factors* that are associated with income and stress (i.e., household crowding and age).

Our final model examined the relationship between the log of household income and perceptions of one's ability to meet everyday needs (see Table 3). As can be seen, the log of household income also has a significant bivariate association with perceptions of one's ability to meet everyday needs ($b = .60$). The covariate model, however, indicated that this association was also partially suppressed. Specifically, the log of household income was more strongly associated with happiness after ruling out error variance associated with other demographic characteristics ($b = .82$) than it was in the simple bivariate relationship. The covariate model explained a total of 23.5% of the variance in perceptions of one's ability to meet everyday needs ($R^2 = .235$, Adjusted $R^2 = .234$, $F(9,5181) = 176.94$, $p < .01$).

Graphing the association between income and aspects of well-being

We graphed the slopes for the logarithmic association between household income and each of the four aspects of subjective well-being using the parameters from the covariate models. These slopes are presented in Figure 1. We estimated these slopes for household income values ranging from \$5,000 to \$200,000, which was entirely within the range of values in our sample. We also plotted quartile values for household income and the

median household income as reported in the 2006 census. Quartile values are represented by horizontal lines in Figure 1.

As can be seen in Figure 1, looking first at happiness, household income predicted a steeper increase in happiness at lower (relative to higher) income levels, and the relationship between income and happiness reached a plateau at around the median household income. For people with an above-median household income, greater increases in wealth had only a trivial incremental effect on increased happiness.

Household income had a stronger association with overall evaluations of one's quality of life than with happiness. As shown in Figure 1, household income also predicted a steeper increase in subjective quality of life at lower (relative to higher) income levels, but this slope was steeper than that of happiness. Moreover, the slope did not plateau as early as it did for happiness. Right up to household incomes of \$200,000, an increase in income predicted an incremental increase in quality of life. The size of this incremental increase, however, is not as dramatic at \$200,000 as it was at \$40,000.

The slopes graphed in Figure 1 also outline the relationship between household income and stress, *after adjusting for other demographics*. As shown, household income predicted a steeper drop in self-reported stress at lower (relative to higher) income levels. However, right up to household incomes of \$200,000, an increase in income predicted an incremental decrease in stress. This clearly shows the nature of this relationship: an increase in income for those with household incomes below the median should lead to a relatively greater decrease in levels of subjective stress than it does for those above the median. However, even for those earning well above the national median, an increase in income still predicts an incremental decrease in stress. It is clear that, *after we control for demographic factors*, the more people earn, the less stress they experience.

By far the strongest association was between the log of household income and perceptions of the ability to meet everyday needs. As shown in Figure

1, an increase in household income for those below the lower quartile predicted a dramatic increase in perceptions of the ability to meet everyday needs. This association flattened off somewhat (predicting a less dramatic increase in ability to meet needs with an increase in income) for those above the income median. However, *at no point* did this effect plateau. Even among those who earn around \$200,000, an incremental increase in household income still led to an increase in perceptions of the ability to meet everyday needs.

Of course, the measurement of everyday needs was based on subjective (self-reported) perceptions, so the needs thought about when completing this question by those in the upper income quartile may differ from those thought about by people in the lower income quartile. What this suggests is that people shift their reference point for what constitutes everyday needs and life necessities. Though the association between household income and ability to meet needs was strongest for those on a low income, the relationship was still readily apparent for those with a far higher income.

Modelling a mechanism: Income and the ability to meet everyday needs

We tested a path model using Mplus to assess the extent to which people's perceived ability to meet their everyday needs mediated the logarithmic associations between household income and (a) quality of life, (b) happiness, and (c) stress. Because indirect (mediated) effects tend to be positively skewed and kurtotic in tests of mediation (MacKinnon, 2008), we estimated all parameters using 5000 bootstrapped re-samples to correct for this possible bias. The path model testing the extent to which the logarithmic associations between household income and (a) quality of life, (b) happiness, and (c) stress could be explained by intermediary perceptions of having enough to meet everyday needs is presented in Figure 2.

As shown in Figure 2, the path model identified the same logarithmic effect of household income on ability to meet the needs discussed above (this effect is identical to that graphed in Figure 1 based on the regression

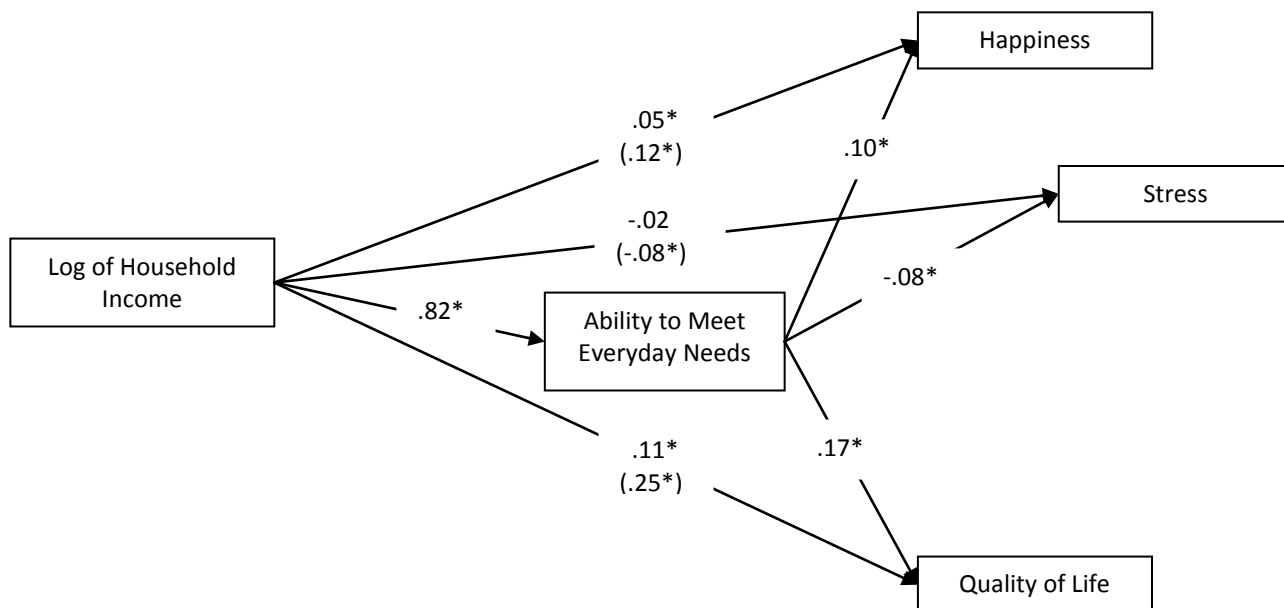


Figure 2. Path model testing the indirect logarithmic association of household income on happiness, stress and quality of life mediated by the ability to meet everyday needs. (Note. Coefficients represent unstandardized beta weights estimated using 5000 bootstrapped resamples. Coefficients in brackets represent the total unstandardized effect without the mediator. All parameters were estimated using the covariate model, and adjusted for the effects of gender, age, age squared, education, household size, Māori ethnicity, Pacific ethnicity, and Asian ethnicity. $N = 5197$, * $p < .05$).

analyses). The ability to meet everyday needs had, in turn, a positive linear association with happiness ($b = .10$, $se = .01$, $t = 10.45$, $p < .01$) and quality of life ($b = .17$, $se = .01$, $t = 20.39$, $p < .01$), but a negative linear association with stress ($b = -.08$, $se = .01$, $t = -7.69$, $p < .01$). In other words, as perceptions to the ability to meet everyday needs increased, happiness and quality of life also increased, whereas stress decreased.

As predicted, the log of household income had a significant partial indirect effect on happiness via perceptions of the ability to meet everyday needs ($b = .08$, $se = .01$, $t = 10.00$, $p < .05$). Nevertheless, Figure 2 also shows that the ability to meet everyday needs only partially mediated the relationship between household income and happiness. Specifically, income retained a direct logarithmic effect on happiness after accounting for people's perceived ability to meet their basic needs ($b = .05$, $se = .02$, $t = 2.95$, $p < .05$).

The log of household income also had a significant partial indirect effect on subjective perceptions of quality of life via the perceived ability to meet everyday needs ($b = .14$, $se = .01$, $t = 17.57$, $p < .05$). Again, the perceived

ability to meet everyday needs only partially mediated this effect as income retained a direct logarithmic effect on quality of life after accounting for this perception ($b = .11$, $se = .02$, $t = 6.66$, $p < .05$)

As shown in Figure 2, the perceived ability to meet everyday needs mediated the logarithmic effect of household income on stress ($b = -.07$, $se = .01$, $t = -7.43$, $p < .05$). This constituted full mediation, as the direct logarithmic effect of income on stress was reduced to non-significance after adjusting for the ability to meet everyday needs ($b = -.02$, $se = .02$, $t = -1.02$, $p = .31$).

Taken together, these results indicate that the logarithmic associations between household income and (a) increased happiness, (b) increased quality of life, and (c) decreased stress are mediated by perceptions that one has enough to manage everyday life necessities. As one might expect, an increase in income increases the perception that one can meet everyday needs. This function is strongest for those whose income is particularly low and where an increase in earning will have the most dramatic effect on their ability to meet basic needs. Indeed, increases in the perceived ability to meet

these needs explains roughly 55-60% of the total logarithmic effect of income on quality of life and happiness, whereas it completely accounts for the effect of income on decreased stress. With regard to stress then, our model suggests that a higher household income decreases stress because earning more increases people's confidence that they will be able to meet their everyday needs and life necessities.

Discussion

It is an axiom that money can't buy love. Our results, however, show that, to a certain extent, it can buy happiness and good health (as gauged by low stress levels). Importantly, this is the first study to investigate the relationship between income and subjective well-being in a large representative sample of New Zealanders. Consistent with our hypotheses (and a substantive body of research conducted elsewhere in the world), we found that household income was positively correlated with life-satisfaction, happiness, and self-perceived ability to meet one's basic needs. In short, people who earned more money were happier. They were also more satisfied with their lives and felt more capable of fulfilling their

requirements for food, clothing and accommodation.

Also as expected, our analyses indicated that the relationship between income and well-being was logarithmic in nature. This means that an effective doubling of income produced the same increase in of well-being at every income level. To give a concrete example, our models indicate that an increase in household income from \$10,000 per year to \$20,000 per year would result in the same increase in subjective well-being as would an increase from \$100,000 to \$200,000. Thus, absolute change in income predicted increased well-being *even among those who were already well-off*.

Our study replicated and extended findings from the international literature and in doing so has provided important data on the relationship between income and well-being in New Zealand. Such cross-cultural replication is useful because New Zealand differs from the United States (where most prior research has been conducted) along one dimension that might be especially pertinent to the relationship between income and happiness: income inequality. The United Nations Human Development Report (2010), for example, reported that New Zealand had a Gini coefficient of 36.2 whereas the coefficient for the United States is 40.8. This is a reasonable size difference in absolute terms, and indicates that incomes are more evenly distributed in New Zealand than in the United States.

National differences in income inequality are an important factor in the study of subjective well-being. This is because the norms within a given society provide people with the standards by which they evaluate their personal satisfaction with life (Diener & Biswas-Diener, 2002). The level of income inequality within a nation should therefore affect the standards people use to evaluate their own life. There is even evidence that income inequality affects aggregate levels of happiness and satisfaction in society (Wilkinson & Pickett, 2010), which further emphasizes the importance of analyzing these variables in diverse cultural contexts (see also Fischer & Boer, 2011, for a recent discussion of other important cross-cultural differences in the links

between wealth and subjective well-being).

Our results replicate the findings of Kahneman and Deaton (2010) and Diener et al. (2010) by showing that income is more strongly related to global evaluations of life-satisfaction than to happiness. This supports Kahneman's (1999) theory that there are two distinct dimensions along which people evaluate their subjective well-being. When thinking about how satisfied people are with their lives, Kahneman (1999) argued that economic considerations become particularly salient. When evaluating their experiences in life, however, people focus on their social relationships. Moreover, as Diener et al. (2010) demonstrated, the strongest predictor of life-satisfaction is the fulfillment of material desires (and in our data, what we could describe as *material necessities* such as food, clothing and transport). Money greatly facilitates people's ability to satiate these needs. On the other hand, the strongest predictor of emotional happiness is the fulfillment of social psychological needs (such as meaningful social relationships). Money seems to be less important although still relevant in this domain. This explanation is consistent with our finding that income is more strongly associated with life-satisfaction than with happiness among New Zealanders.

The weaker effect of income on happiness may also be partly explained by the fact that wealth can—at least in some situations—be associated with certain negative emotional consequences (e.g. worsened mood and more conflict in relationships; Csikszentmihalyi & Schneider 2000; Kasser et al., 2004). This may partly be due to the fact that wealth can hinder the savoring of simple pleasures. In a novel study, Quoidbach, Dunn, Petrides and Mikolijczakm (2010) found that wealthier people evidenced a reduced ability to prolong and enhance positive experiences. In a second experimental study, they found that priming wealth reduced the time respondents spent savoring a chocolate bar. Wealth, it seems, reduces the extent to which people savor the simple pleasures in life. Thus, the positive experiences that wealthy people can purchase (e.g. luxury travel) may be

short-lived. That said, we suspect that the negative effects of wealth should only attenuate the positive effect of income on the *emotional* dimension of well-being and not the life-satisfaction dimension. It is critical to note, however, that for all the possible drawbacks to wealth, richer people are still happier, on average, than the poor and are certainly more satisfied with their lives.

Income was negatively associated with stress after adjusting for other demographic factors. Past research suggests that one of the detrimental consequences of wealth is the increased stress that accrues from trying to maintain a particular lifestyle (Ng et al., 2009). When entered into a regression model as the only predictor, the logarithm of income did indeed correlate positively with stress. After controlling for the effects of other demographic variables, however, the direction of this effect flipped. This reversal suggests that that the positive relationship between income and stress identified in past work may be artificial and emerges—at least in part—from the failure to control for demographic confounds (e.g., age, education, and household crowding). Indeed, we showed that—at least in New Zealand—once these factors are accounted for, higher incomes are associated with *lower* levels of stress. This is consistent with research showing that economic deprivation increases stress in extreme situations. For example, Lantz, House, Mero and Williams (2005) found that poor people are exposed to negative life events and chronic stressors more frequently than their wealthy counterparts. Further, lower socioeconomic status is associated with higher levels of stress hormones (Cohen, Doyle & Baum, 2006).

Of the well-being-related aspects we examined, income was by far most strongly associated with people's evaluations of their ability to meet their basic needs. As shown in Figure 1, the effect was strongest at low levels of income, but remained substantial even at the higher income levels. This suggests that although the importance of income for the fulfillment of basic needs diminishes somewhat as people get richer, it does not satiate once a certain income level is reached. This may be cause for concern in the current

economic context as the cost of basic commodities continues to rise sharply in New Zealand. For example, food prices rose by nearly 8% between July 2010 and July 2011 (Statistics New Zealand, 2011c). Our findings indicate that these increasing costs will be detrimental to the well-being of all New Zealanders, but especially among the 50% of the population falling below the median household income.

Concerns about the income of the average New Zealander and their lack of ability to meet subjective everyday needs are all the more pertinent in the light of the mediating role these needs play in predicting other aspects of well-being. We found that the ability to meet needs for food, clothing and accommodation partially mediated the effect of income on both life-satisfaction and happiness. This suggests that higher income predicts greater well-being partly because more money enables people to meet the basic requirements of their lives. However, the effect of income on well-being was not limited to its role in fulfilling basic needs— income continued to have an effect on life-satisfaction and happiness after accounting for people's perceived ability to meet their basic needs. This calls into question the hypothesis that once certain core human needs are met, income bestows no additional benefit to a person's well-being. If this were the case, then we would expect full mediation. On the other hand, the effect of income on stress was fully mediated by the ability to meet everyday needs. This suggests that the higher levels of stress precipitated by lower incomes are attributable to concern over being unable to acquire adequate food, shelter and clothing.

A key strength of our study is that it was large and nationally representative. The study was also conducted using telephone interviews. This is rare in psychological research and adds a novel set of results that substantiate previous self-reported pen-and-paper or online surveys. However, the use of telephone interviews of a large number of New Zealand residents ($n = 8155$) does introduce other cost-benefit considerations into the survey design which may have other limitations. These relate primarily to our use of

single item measures of life-satisfaction, happiness, stress and ability to meet basic needs. These single item measures act as marker items for the constructs, and represent the core content that is consistent across many of the multi-item inventories.

The use of marker items is a common approach in large national studies of subjective wellbeing, many of which have used Cantrill's single-item self-anchoring scale (Kahneman & Deaton, 2010; Diener et al., 2010). Cantrill's item, for example, asks participants to rate their lives such that 0 would indicate the "worst possible life for you" and 10 the "best possible life." Our quality of life measure used a similar format, and asked people 'Would you say that your overall quality of life is...' with responses on a five-point scale from 'extremely poor' to 'extremely good.' No single study can do it all. On the one hand, the use of single item measures means that our effect sizes risk being attenuated due to potentially low reliability. On the other hand, the use of a national probability sample and telephone interview strategy avoids potential sampling biases often present in studies that use less representative sampling strategies.

A Concluding Comment on Lay Perceptions of Wealth and Happiness

Our findings highlight not just the negative consequences of being extremely poor, but the negative consequences of being among the 50% of people who fall below the median level of household income. Poorer people tended to report more stress, less happiness, lower levels of satisfaction with their lives, and a lower ability to meet basic needs and life necessities relative to their wealthier counterparts. That poorer people are disadvantaged across the board in terms of subjective well-being may be an uncomfortable notion for many people to accept. Part of the discomfort in accepting these findings may arise because we tend to be motivated to see the systems and societies we live in as being fair and just (see Jost & Banaji, 1994; Jost, Banaji & Nosek, 2004). We want to believe in a just world. This is an important point, and one that we feel is

often underemphasized in the research literature on subjective well-being.

In the face of inequality, research consistently shows that people subscribe to ideologies that allow them to rationalize the negative outcomes experienced by the disadvantaged by arguing that there are other benefits to their situation. One such ideology (called the Panglossian ideology) involves ascribing compensatory positive attributes to disadvantaged groups and negative attributes to advantaged groups (Kay et al., 2007). In the case of income inequality, people are motivated to subscribe to the pervasive (and factually incorrect) notion that the poor are happier than the rich. Lerner (1980, pp 20-21) aptly summarized this notion when proposing the theory of just world beliefs more than three decades ago:

"It is virtually a cliché in our culture to consider the poverty-stricken, or even the relatively deprived, as having their own compensating rewards. They are actually happy in their own way—carefree, happy go-lucky, in touch with and able to enjoy the 'simple pleasures of life'..."

In a pertinent demonstration of the power of Panglossian ideology, Kay and Jost (2003) demonstrated that people who were primed with a description of an individual being either, "poor and happy" or "rich and unhappy" showed higher support for the social system than did those who were exposed to a stereotype of "poor and unhappy" or "rich and happy." Compensatory rationalizations, or the tendency to believe that the poor and rich have their own compensatory rewards, help people feel comfortable about economic inequality. Indeed, system-justifying ideologies have been found to bestow emotional benefits, reducing the collective guilt and moral outrage experienced by the advantaged while simultaneously alleviating the frustration of the disadvantaged (Wakslak, Jost, Tyler, & Chen 2007). Justifying economic inequality by endorsing the view that the poor are happy may in fact help perpetuate inequality by reducing any guilt or justice-concerns that might motivate the wealthy to work towards closing, rather

than widening, the gap between rich and poor, and discouraging collective action on behalf of people living in poverty.

Our research demonstrates that the comforting belief that poorer people are compensated by increased happiness and less stress is a delusion in the New Zealand context, and a potentially dangerous one at that. Scholars who argue that income has little or no bearing on well-being only add fuel to this system-justifying fire, making it less likely that income inequality will be challenged and remedied. The importance of challenging income inequality was powerfully demonstrated by Wilkinson and Pickett (2010) in their recent book *The Spirit Level*. They showed that nations with lower levels of income inequality enjoy far greater well-being than highly unequal societies. Their analyses show that the benefits of greater equality include higher life-expectancy, lower child mortality, better self-rated health, reduced risk of mental illness and drug abuse, lower incarceration rates, higher social mobility, greater interpersonal trust and lower rates of violent crime, among other things. This suggests that improving the lot of the poor will not only increase their subjective well-being, it will greatly benefit everyone within a given society.

Though it is commonly accepted that the rich can only triumph at the expense of the poor, the reverse is certainly not true. By closing the gap between the rich and the poor, we would increase the health, happiness and prosperity of all New Zealanders.

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