Relative Standing and Subjective Well-Being in South Africa: The Role of Perceptions, Expectations and Income Mobility

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Abstract

Most studies that explore the impact of relative standing on subjective well-being use objective measures of the individual's relative position, such as the mean income of the reference group or the individual's ranking in the relevant income distribution. In this paper, using a new household survey from South Africa, we are able to derive subjective measures of relative standing, as information is collected on individuals' *perceptions* of where they rank in the income distribution. We find considerable differences between objective and subjective measures of an individual's relative ranking. Furthermore, our results suggest that an individual's perceived relative status has a significantly larger effect on subjective well-being than objective measures of relative status based on reported income. We also examine the effects on subjective well-being of how individuals perceive their relative position in the income distribution to have changed since childhood, and what they expect their relative position to be in the future. We find that future upward mobility has a smaller effect than upward mobility compared to one's past, suggesting that life satisfaction is influenced more by what has been achieved than by anticipated achievements.

Keywords: subjective well-being; relative standing, perceptions, expectations, income mobility, South Africa

1. Introduction

Since the 1990s, a large and burgeoning economics literature has developed on self-reported happiness or subjective well-being. Much of the empirical literature in this field has explored the determinants of subjective well-being at an individual level or across countries. One of the main themes to emerge from this research has been how relative standing, or relative income more specifically, affects an individual's level of life satisfaction or happiness (Easterlin 1974; 1995; McBride 2001; Ferrer-i-Carbonell 2005; Luttmer 2005; Kingdon and Knight 2007; Bookwalter and Dalenberg 2009). The general finding from a range of studies is that while absolute income matters, how we rank compared to others has a more important effect on subjective well-being.

A key question explored in these studies is how to measure an individual's relative standing and in particular, how to choose the appropriate reference group. Measures commonly used have included the mean or median income (or expenditure) of the country, district, local neighbourhood, race or ethnic group for example, or the individual's actual position in the relevant distribution. However, these objective measures assume that individuals are able to rank themselves accurately in the income distribution of their reference group. Our main contribution to this literature is to explore how individuals' *perceptions* of where they rank relative to others impact on their self-assessed levels of well-being. Individual perceptions of relative standing may differ considerably from their relative standing based on reported income. For example, individuals may think that they are worse off than their reference group, and hence feel relatively deprived, even if they actually are better off. If this is the case, we would expect individual perceptions of relative standing to be a stronger predictor of subjective well-being than how individuals are actually ranked compared to others based on objective measures.

In this paper we use South African data from the recently released National Income Dynamics Survey (NIDS) of 2008 to explore the effects of relative standing on subjective well-being. These data are unique in that they collect information on where individuals

think they rank in the national income distribution as well as in the income distribution of their village or suburb. In addition to their perceived current rank in the income distribution, individuals are asked to assess the relative economic position of their household when they were 15 years old and where they expect to rank in the future. Thus, with only one wave of data, we can identify the effects on subjective well-being of changes in perceived economic ranking over time.

Our paper makes a further contribution to the South African literature on subjective well-being in that we are able to explore the correlates of *individual* self-assessed well-being. Most of the national-level econometric studies of subjective well-being in South Africa (Bookwalter and Dalenberg 2004; 2009; Kingdon and Knight 2006; 2007; Powdthavee 2007a; b) have used data provided by the 1993 Project for Statistics on Living Standards and Development (PSLSD) which asked a single respondent to report on how satisfied the *household* was "with the way it lives these days". These studies have to assume, first, that the subjective well-being of individual household members can be aggregated into a household measure of subjective well-being and, second, that the individual respondent reported this level of well-being and not his/her own. In our study of the individual-level NIDS data, we find significant differences in subjective well-being among individuals within the same household, raising some doubts about what a measure of household subjective well-being represents.

In the national data which we analyse, individuals are asked to assess their overall satisfaction with their lives on an ordinal scale of one (very dissatisfied) to ten (very satisfied). We therefore estimate the determinants of subjective well-being using an ordered probit model. In addition, we control for unobservable characteristics at the community level using cluster fixed effects estimation. Given the history of racial discrimination and segregation in South Africa, and very different distributions of reported subjective well-being between Africans and Whites, we also estimate separate regressions by race group.

The main findings of our study are that among all South Africans and among Africans in particular, there are large differences between individuals' perceptions of their relative economic rank and their economic rank based on reported income, and that perceived economic rank is a far better predictor of subjective well-being than actual economic rank. We find further that individuals' perceptions of their relative economic position in their village or suburb have a larger impact on well-being than their perceived position in South Africa as a whole. Compared to their household when they were 15 years old, individuals who assessed their economic rank as having improved, report significantly higher levels of satisfaction than those who perceived their economic position as having remained unchanged. Similarly, those who expect to be upwardly mobile in the future report higher subjective well-being. However, future upward mobility has a smaller effect than upward mobility compared to one's past, suggesting that life satisfaction is influenced more by what has been achieved (or thought to have been achieved) than by anticipated achievements. Some of these findings differ by race group, and we comment on plausible reasons for these differences between Africans and Whites in the light of South Africa's racial history.

2. Review

While widely researched in the psychology and sociology literatures, the study of 'happiness' has traditionally been underdeveloped in the field of economics, where the focus has been largely on the study of utility identified through individuals' revealed preferences. In recent years, however, there has been a proliferation of studies on the measurement and determinants of happiness or subjective well-being (often used interchangeably in the literature). A common conclusion from this literature is that individual subjective assessments of happiness or life satisfaction are meaningful and valid indicators of well-being, and they provide a more inclusive and holistic picture of welfare than traditional objective measures, such as income or consumption (Frey and Stutzer 2002; Kahneman and Krueger 2006; Angner 2010; Stutzer and Frey 2010; van Hoorn et al 2010). Studies have also shown that subjective well-being measures are

highly correlated in mostly predictable ways with a variety of demographic, economic and societal-level characteristics, and that these relationships often have important implications for public policy (the review article by Stutzer and Frey 2010 provides a useful summary).

One of the main themes explored in this literature is how income influences levels of subjective well-being. A well-established hypothesis in economics is that absolute income enters positively in an individual's utility function through its ability to increase consumption levels. In the subjective well-being literature, there is also substantial empirical evidence that own income levels positively influence subjective well-being, although the effect recorded is often quite small (Diener and Biswas-Diener 2002; Frey and Stutzer 2002; Helliwell 2003; Kahneman and Krueger 2006). Increasingly, however, both in economics and more specifically in the research on subjective well-being, it has been recognised that individual utility or welfare functions may be interdependent, and that relative or comparison income may play an important role in determining well-being. In particular, individual subjective well-being is predicted to be diminished by the higher income of relevant others, through feelings of relative deprivation or reduced status.

Attention was first drawn to what is now referred to as the relative income hypothesis, in a classic piece by Easterlin (1974). In this study, Easterlin pointed to the seemingly contradictory finding that although income has a positive effect on happiness within countries at any point in time, economic growth has not been accompanied by increased levels of happiness over time in developed countries. This has been explained by changing norms or standards in the face of rising average incomes of others. Easterlin (1995: 36) summarises these arguments as follows:"[r]aising the incomes of all does not increase the happiness of all, because the positive effect of higher income on subjective well-being is offset by the negative effect of higher living level norms brought about by the growth in incomes generally". A number of empirical studies have subsequently tested the impact of relative income on subjective well-being at the individual level (Diener et al 1993; McBride 2001; Ferrer-i-Carbonell 2005; Luttmer 2005; Kingdon and Knight 2007; Bookwalter and Dalenberg 2009). The most common finding is that, while

absolute income has a positive but small effect on subjective well-being, relative income tends to have a large and negative effect, in that when the income of others is relatively higher, then individual subjective well-being is lower.[1]

A key question that has been investigated in these studies is what constitutes the relevant reference group; in other words, when individuals make income comparisons, who do they compare themselves to? In most studies it is assumed that individuals compare themselves to those who are similar to them in terms of geographical proximity, employment status, race, age, gender, education, or some combination of these factors. McBride (2001) labels these 'external' or 'outwardly-oriented' norms, as individuals compare themselves to others in their cohort. In addition, some studies have explored the idea of an 'internal norm' which captures an individual's personal or 'inwardly-oriented' income experience (McBride 2001; Powdthavee 2007b; Bookwalter and Dalenberg 2009). For example, individuals may make comparisons with some past income level of their own or of their family.

Most studies use objective measures of the individual's relative position, such as the mean income or expenditure of the reference group or the individual's ranking in the relevant distribution based on reported values in surveys. These measures assume that individuals know what the income of the reference group is, or how they rank in the overall distribution. Our main contribution to this literature is to explore the impact of relative standing on well-being, using *subjective* measures of relative income. We use data from a recent South African household survey in which individuals are asked to report both on their income and on their *perceptions* of where they rank in the income distribution. This allows us to compare how people perceive themselves to be ranked and how they actually rank in terms of economic status, as well as the differential impact that these measures have on subjective well-being.

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[1] The corollary of course is that if individuals rank higher than others in the income distribution, their subjective well-being will be greater.

We would expect perceived ranking to be a better predictor of subjective well-being than actual[2] ranking. Individuals are unlikely to have direct and accurate information about their neighbours' or cohort's income. Rather, knowledge of the standard of living of others is likely to be derived predominantly from various observable characteristics or behaviours, such as the type of house an individual lives in, the car they choose to drive, the type of job they have, or their consumption of particular goods and services (Bookwalter and Dalenberg 2009). In addition, people will be influenced by what they read in newspapers, what they see on television and who they interact with. Therefore, measures of how individuals perceive their position relative to others are likely to capture feelings of relative deprivation or relative advantage more meaningfully than measures based only on reported income in surveys.[3]

In our study we are also able to explore the effect of an 'internal' norm on subjective well-being, as our dataset includes information on how individuals perceive their relative ranking in the income distribution to have changed since they were 15 years old. In addition, individuals are asked to report on where in the income distribution they expect to be ranked in the future. We are therefore able to test how an individual's perceived mobility in the past affects subjective well-being compared to their expectations of the future.

A number of studies on the correlates of subjective well-being have been conducted for South Africa (cf. Bookwalter and Dalenberg 2004; 2009; Møller 2005; 2007; Bookwalter et al 2006; Kingdon and Knight 2006; 2007; Hinks and Gruen 2007; Neff 2007;

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[2] Although we use the term 'actual' here to refer to income measures based on reported values in the household survey, we do recognize that these reported values may not represent the 'true' values if there is misreporting of income by respondents. We comment further on this issue in Section 4.

[3] It is possible that people's perceptions of where they rank in a particular income distribution are coloured by their attitude towards life in general. For example, individuals who are pessimistic about life, or who tend to consider themselves 'hard done by', may be more likely to report being in a lower position in the income distribution than their actual position (and conversely for those who are more optimistic about life). If this is the case, then in a subjective well-being regression our measure of people's perceptions of their relative rank would also be capturing in part the effect of attitude towards life, if attitude towards life also influences individual's reporting on overall life satisfaction. In the absence of panel data, we are unable to control for this unobservable characteristic using fixed effects estimation. However, as we discuss in Section 4, our results remain robust to controls for current feelings of happiness, depression and optimism, variables that are likely to be highly correlated with an individual's general attitude to life.

Powdthavee 2007a; b).Many of these studies use national data from the 1993 PSLSD (Bookwalter and Dalenberg 2004; 2009; Kingdon and Knight 2006; 2007; Neff 2007; Powdthavee 2007a; b) and some research makes use of national data collected in the October Household Survey from 1998 (Bookwalter et al 2006).[4] A common limitation of this work is that researchers have not had information on subjective well-being at the individual level for all adults.[5] In these earlier surveys, a respondent (which may or may not have been the head of the household) was asked to report on "how satisfied the household is with the way it lives these days?". In most of the studies, this problem is partially side-stepped by assuming that the individual respondent reported on the household's level of satisfaction and not on his/her own. However, although not explicitly recognised anywhere, using household level reports on subjective well-being also relies on the more fundamental assumption that a unified subjective well-being function exists for a household.[6]

The data that we use are drawn from a national survey in South Africa that asks all adults in the household to report on their own individual level of life satisfaction. In addition to being able to explore the correlates of *individual* self-assessed well-being, we are also able to test (indirectly) the validity of the assumption that a unified household subjective

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[4] Since the late 1970s, quality of life surveys have also been conducted in South Africa, where adults have been asked to assess their overall satisfaction with life. In the post-apartheid period, the Human Sciences Research Council has conducted the South African Social Attitudes Survey which also collects information on subjective well-being. These surveys typically sample between 2000 and 3000 adults. See, for example, Møller (1989, 2001) and Pillay, Roberts and Rule (2006),

[5] Møller (2007) analyses national individual-level data on life satisfaction from the General Household Survey of 2002. However this survey only collected information on one individual per household (the person who chose/was chosen to respond to the questions in the household module). Møller (2005) and Hinks and Gruen (2007) also have individual-level measures of subjective well-being, but their studies use regionally specific survey data, so their results cannot be generalized for South Africa. Møller (2005) explores the impact of criminal victimization on quality of life using a 2002 dataset of households in the Nelson Mandela Metropolitan Municipality of the Eastern Cape. Hinks and Gruen (2007) use pooled data from the 1999, 2003 and 2004 Quality of Life Surveys conducted in the Durban Metropolitan region of KwaZulu-Natal to examine the relationship between subjective well-being and a range of personal characteristics.

[6] Some studies have addressed this concern by controlling for individual characteristics of the respondent as well as household characteristics (cf. Bookwalter et al 2006; Kingdon and Knight 2006; 2007). But this presumes that the problem lies only with whether or not one member can reliably report on the household's subjective well-being rather than his/her own subjective well-being. It still assumes that the individual subjective well-being of household members can be aggregated into a unified measure of household subjective well-being. Other studies have interpreted the responses on subjective well-being as reflecting the assessment of the respondent's own individual level of satisfaction (Neff 2007).

well-being function exists. We do this by examining whether, within the household, an individual's position in relation to the household head has a differential impact on subjective well-being.

Although not directly comparable because of different specifications, one common finding from much of the earlier work in South Africa is that household level characteristics, such as the dwelling type and access to certain basic services, seem to have the largest impact on subjective well-being (although this may have to do with the measure of 'household' life satisfaction used as the dependent variable). In addition, these studies generally find that education has a positive (although mostly weak) effect, while belonging to the African race group, unemployment, ill health and crime victimization or lack of perceived safety have the expected negative effects (whether the respondent's individual responses or the average for the household are included as explanatory variables). In terms of absolute income, the most common finding is that total or per capita household income (or expenditure) has a small but positive effect. One study also includes a squared term on income and finds that there are diminishing returns at higher levels (Hinks and Gruen 2007).

A few of the South African studies explore measures of relative income, although the results are not consistent (Kingdon and Knight 2006; 2007; Hinks and Gruen 2007; Powdthavee 2007b; Bookwalter and Dalenberg 2009). Using data for one metropolitan area in South Africa, Hinks and Gruen (2007) report the expected negative and significant coefficient on a variable representing whether the household's income fell below the mean for the whole sample. Powdthavee (2007b) finds no effect of household monthly income measured as a proportion of the cluster average (although this result is not robust across specifications). Kingdon and Knight (2007) report a positive effect of cluster mean income, but a negative effect of race-specific district mean income or position in the national race-specific income distribution. They conclude that "whereas close spatial proximity (the same cluster) creates a sense of community, close social proximity (the same race) creates feelings of relative deprivation or sets goals and aspirations" (2007: 86). Using cluster median household expenditure as their measure of

relative standing, Bookwalter and Dalenberg (2009) also find a positive and significant impact on subjective well-being, although when separate regressions are estimated for Whites and non-Whites this effect is only significant for the latter group. They argue that this is not so unusual in the South African context as "having wealthier neighbours likely means more public goods and other types of positive spillovers from the community" (2009: 353). All studies that included position relative to the respondent's parents found that being richer than one's parents improved life satisfaction (Powdthavee 2007a; b; Bookwalter and Dalenberg 2009).[7]

As in Powdthavee (2007b) and Bookwalter and Dalenberg (2009), we also investigate the determinants of subjective well-being for Africans and Whites separately. The structure of well-being equations is likely to be different for the two population groups as decades of discriminatory apartheid rule in South Africa until the early 1990s permeated almost every aspect of socio-economic life. In addition to being stripped of political power, Africans had limited access to quality education, were barred from accessing certain skilled jobs and were forced to live in different neighbourhoods. These factors will have affected the life opportunities, aspirations and expectations of Africans. Furthermore, Ferrer-i-Carbonell (2005: 1006) points out that "subjective well-being is better comparable between individuals with the same cultural background for whom meaning of well-being and life satisfaction is fairly similar."[8]

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[7] The unit of analysis in the quality of life questions in the PSLSD is not consistent. Although respondents are asked to report on the household's level of satisfaction, they are also asked: "When you compare your situation with that of your parents, do you think that you are richer, about the same, or poorer than they were?", so that this comparison is at the level of the individual and not the household.

[8] Africans and Whites together make up approximately 90 percent of the South African population. We do not explore the determinants of subjective well-being among the remaining 10 percent of the population, comprised predominantly of Indians and Coloureds. This is partly due to sample size concerns, but also because the experiences of Africans and Whites represent the two extremes of a society polarized by apartheid legislation.

3. Data, variables and descriptive statistics

The data which we analyse come from the baseline wave of the National Income Dynamics Study (NIDS), conducted in 2008 by the Southern African Labour and Development Research Unit. NIDS is designed as a nationally representative household panel survey, which will track approximately 7,300 households or 28,000 individuals at two-year intervals. The survey is particularly useful for a study of subjective well-being in South Africa as, in addition to collecting a wealth of socio-economic and demographic information, it asks all resident adults in the household to report on their own subjective well-being (rather than on the well-being of the household). Individuals are asked the following question: "Using a scale of 1 to 10 where 1 means "very dissatisfied" and 10 means "very satisfied", how do you feel about your life as a whole right now?"

Figure 1 describes the responses to this question among the national sample of adults, while Figure 2 compares responses for African and White adults. Among all adults, the modal level of reported satisfaction is 5. The distribution of responses for African adults, who comprise 77 percent of the weighted sample, mirrors the national distribution. However, reported levels of satisfaction are considerably higher among White adults (who account for only 11 percent of the sample): the distribution of responses lies to the right of that for Africans, and the modal level of satisfaction is 8.

Figures 1 and 2 about here

Due to the wide array of information captured in the NIDS survey, we are able to estimate the determinants of subjective well-being using a range of individual and household level controls. In particular, we consider four sets of explanatory variables: individual demographic characteristics; household characteristics; social capital measures; and income measures, the latter including our main variables of interest. These are described below, with further detail of the specific variables included in these broad categories provided in Table 1.

Table 1 about here

Individual demographic characteristics include the individual's age, years of education, marital status (whether married, cohabiting with a partner, divorced/widowed, or never married), employment status (employed, unemployed and searching for work, unemployed but not searching, and not economically active), and whether the individual is the head of the household. NIDS also includes an extensive set of questions about the individual's health, not typically included in official national surveys in South Africa. We use information on self-reported health status to distinguish between adults who assess their health status as being "excellent"/"very good"; "good"/"fair"; or "poor". We also create a binary variable equal to 1 if adults reported that they could not dress, bath, eat, or use the toilet without assistance.

The characteristics of the individual's household are measured by the type of dwelling the household lives in (formal, informal, or rural)[9], by the composition of the household (the numbers of children and pensioners in the household)[10], and by the household's access to services (summarized by the kind of toilet facility to which the household has access).

We measure social capital characteristics using information collected in a range of questions in NIDS. All adults are asked how important religious activities are in their lives, with four response options provided. We create a binary variable equal to 0 if the individual reported response options 1 or 2 ("not important at all" or "unimportant") and equal to 1 for responses 3 and 4 ("important" or "very important"). The survey also asks adults whether they belonged to any kind of social group (including a sewing group, study group, sports group, youth group or savings club). We generate a binary variable equal to 1 if any group membership is identified. Questions are included on the nature of social interactions between household members and their neighbours, and on whether

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[9] A formal dwelling is a house or an apartment which is typically a brick structure; an informal dwelling is a shack typically made of cardboard, plastic or corrugated iron; a rural dwelling is a traditional dwelling (hut) made of traditional materials (mud and thatch).
[10] Children are aged 14 years and younger and pensioners are defined as adults older than 64 years.

crime is common in the neighbourhood, with five response options provided (from 1, "never happens" to 5 "very common"). We classify the responses into three binary variables which equal 1 if it is "fairly common" or "common" that 1) "neighbours help each other out"; 2) "people in the neighbourhood are aggressive" and 3) "burglary and theft (occur) in the neighbourhood". Finally, we include a variable indicating whether the individual owns a cellular phone to capture connectivity, which we believe is particularly relevant in a country such as South Africa where telephone landlines are not universally available and public transport systems are underdeveloped.

We turn now to our main variables of interest, those which allow us to investigate the impact of income on subjective well-being. A key objective of the study is to explore the effects of relative standing on subjective well-being, and in particular, to investigate whether perceptions of relative standing are stronger predictors of subjective well-being than actual relative standing. The dataset which we analyse is distinctive in that it includes information not only on the income which individuals receive but also on where individuals think they rank in the income distribution. In NIDS, all adults are asked to assess their relative economic rank in South Africa by identifying their position on a six-rung ladder from poorest (1) to richest (6). We group these individual responses into three groups: "richest" (if individuals placed themselves on rungs 5 and 6 of the economic ladder); "middle" (rungs 3 and 4); and "lowest" (rungs 1 and 2). To identify the actual class position of individuals, we divide the distribution of reported income[11] also into thirds. For example, individuals will be identified as being in the richest group if they live in households where average per capita household income falls within the top third of the national income distribution.

Table 2 describes how perceived class status varies by actual class status among all South African adults older than 17 years. The table shows that individuals typically underestimate their relative economic status. For example, only six percent of all

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[11] In NIDS, information is collected on all sources of labour and non-labour income. Non-labour income is reported as point values. Wages and earnings are also collected as point values except where respondents did not or would not provide this information, in which case, earnings were reported in brackets. To generate a continuous income variable, earnings in brackets were assigned the mid-point of the bracket.

individuals ranked in the richest third of South Africans, in terms of actual per capita household income, perceive that they are among the richest third. The majority (almost 63 percent) perceive that they are ranked in the middle of the distribution and 32 percent think that they are among the poorest third of South Africans. The highest correspondence between actual and perceived class status is among the poorest third: 69 percent of those ranked in the lowest third perceive their relative economic position as corresponding to the bottom two rungs of the economic ladder.

More than 90 percent of White adults live in the richest third of households in South Africa, compared to 28 percent of African adults (Table 1). Interestingly, Table 2 shows that the underestimation of class position is considerably larger among Africans than among Whites. Only four percent of Africans in the richest third perceive that they are on the top two rungs of the economic ladder, and almost forty percent think they rank amongst the poorest third of South Africans (the corresponding percentages for White South Africans in the richest third are 11 percent and 13 percent). One of the legacies of apartheid may be that even relatively rich Africans still perceive their economic status as being inferior, particularly in comparison to Whites. Because individuals do not have complete information about the income of others, we would expect perceived relative standing to have a larger effect on subjective well-being than actual relative standing, and more so among Africans, where the divergence between actual and perceived economic status is larger.

Table 2 about here

We also investigate different comparison groups in the measurement of perceived relative standing. First, we test how inwardly-oriented comparisons affect subjective well-being by using information on how the individual's perceived current economic status compares to that in the past, and to what they anticipate in the future. All adults in NIDS are asked to identify what the relative economic position of their household was when they were 15 years, and what they anticipate their economic position to be two years after the survey, again based on the six-rung income ladder. Individuals who reported being on

a higher (lower) rung of the ladder when they were 15 years old compared to at the time of the survey are identified as having been downwardly (upwardly) mobile. Analogously, individuals who expect to be on a higher (lower) rung in two years time compared to their current position are classified as anticipating upward (downward) mobility.

The statistics presented in Table 1 show that there are large differences in how Africans and Whites responded to these questions. Although average income is significantly lower for Africans than for Whites, a larger percentage of African adults perceive their economic position as having improved since they were 15 years old (56 percent compared to 46 percent, Table 1). Furthermore, African adults are significantly more likely than White adults to expect their economic status to improve in the future (77 percent compared to 39 percent). These results are not surprising given that we would expect Africans to be the main beneficiaries of political and economic changes in the post-apartheid period after 1994.

Second, we investigate how the comparison with another outwardly-oriented reference group, but one that is more geographically proximate, affects reported levels of satisfaction. In NIDS, all adults are also asked to assess their economic status in relation to other households in their village or suburb. In this question, five graded response options are provided, from option 1 corresponding to "much above average income" to option 5, representing "much below average income". We group these responses into three categories: "richest" if individuals perceive their relative income as being "much above average income" or "above average income" in their village or suburb; "middle" corresponding to "average income"; and "lowest" for individuals who reported "below average income" or "much below average income".[12] It is difficult to predict the impact of using this local comparator; the international literature suggests "neighbours as negatives" (Luttmer 2005), while the South African research, although not directly

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[12] We cannot compare the effects of perceived versus actual ranking in the village or suburb. We are not able to identify directly the village or suburb to which the individual would have referred in answering the question and although household clusters may be a reasonable approximation, the number of households within each cluster in NIDS is too small (approximately 20 households per cluster on average) to generate a reliable distribution of income. More robust measures would be generated using Census data but the most recent Census for South Africa was conducted seven years prior in 2001.

comparable to ours, finds a positive effect of income among those who are geographically similar (Kingdon and Knight 2007; Bookwalter and Dalenberg 2009).

4. Empirical results

To investigate the determinants of subjective well-being, we use ordered probit regressions, where the dependent variable ranges from 1 (most dissatisfied) to 10 (most satisfied).[13] We first run regressions for the pooled sample of all adults aged 18 years and older in South Africa. The estimated coefficients and their standard errors are reported in Table 3. The table also includes the marginal effects on the probability that an individual reports a satisfaction level of 7 or higher.

Before we turn to a detailed discussion of the income variables, we begin by commenting on some of the standard correlates of subjective well-being. Our findings on a range of demographic, social capital and household characteristics are generally consistent with those commonly reported in the empirical literature (see Specification I). Subjective well-being is significant and U-shaped in age and the individual's self-assessed health status has the expected large and significant effect. In comparison to individuals who assess their health status as poor, the probability of reporting a subjective well-being level of 7 or higher is 12.5 percentage points greater among individuals who identify being in very good or excellent health. The employment status of the individual is also a significant predictor of an individual's level of satisfaction. Those who are unemployed and actively searching for work are 5 percentage points less likely than the employed to report satisfaction levels of 7 or above. Similar to findings in several other studies (Helliwell 2003; Ferrer-i-Carbonell 2005), education has only a small and weakly significant effect on reported levels of satisfaction, suggesting that the benefits of higher education have mostly been captured through other controls such as employment, health status and income.

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[13] The cut-points in the probit estimations are relatively equally spaced and our findings are robust also to Ordinary Least Squares regressions which treat the dependent variable as a linear measure of subjective well-being.

The effects of the household level characteristics and the social capital variables are also of the expected direction and are mostly significant. Subjective well-being is lower for individuals living in traditional (mud and thatch) dwelling places and in households without flush toilets.[14] Subjective well-being is significantly higher among individuals who report that religious activities are important or very important in their lives and among individuals who are members of a social group. Individuals who identify neighbours as helping each other out report significantly higher levels of well-being, and although not significant, crime and aggression are negatively related to well-being. In addition, owning a cellular phone has a large and positive effect on subjective well-being.

Our results with respect to headship highlight the importance of measuring subjective well-being at the level of the individual rather than the household, and provide an indirect test of whether a unified household subjective well-being function is likely to exist. Individuals who are the head of their household report significantly lower levels of well-being compared to other household members. We tested further for differences in well-being within the household using a more expansive set of variables which identify the individual's relationship to the household head. Using head as the omitted category, we included binary variables for whether the individual, in relation to the head, was the spouse, biological child, non-biological child, parent, sibling, grandchild, in-law, other family member, or a non-family member. Although we do not show the results here, we find that among all adults in South Africa, spouses and grandchildren report significantly higher levels of satisfaction than the head of household while "other family" members report significantly lower levels on average.[15] These findings, which indicate considerable variation in well-being among household members, suggest that it would be difficult to identify, or report on, an aggregate measure of household well-being.

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[14] In contrast to what has generally been found in studies of subjective well-being for developed countries (Shields and Wooden 2003), we find that the presence of children in the household has a positive and significant effect on subjective well-being (similar results were obtained for South Africa in Kingdon and Knight 2006; 2007). As the disaggregated regression results in Table 4 indicate, this is being driven by the effect of children in African households, as the presence of children in White households has a negative although insignificant effect.

[15] The results of these estimations are available from the authors.

Turning to the income variables, we find the expected signs on both per capita household income and the individual's actual rank in the national income distribution. Individual subjective well-being is significant and non-linear in per capita household income, first rising and then falling, but as typically found elsewhere, these coefficients are very small. Objective measures of the individual's class status are also significant predictors of subjective well-being. Compared to individuals whose per capita household income ranks among the poorest third of all households in the country, individuals in the middle or richest third are 4.6 and 5.6 percentage points more likely, respectively, to report satisfaction levels of 7 or higher. These findings are consistent with those from other international studies, which suggest that individuals whose income is larger than that of a relevant comparator experience greater life satisfaction (McBride 2001; Ferrer-i-Carbonell 2005).

However, our estimations show further that perceived relative income has a far greater effect on subjective well-being than actual relative income. This is so particularly among individuals who perceive their class status as being among the richest third of South Africans, where the marginal effect of 25.3 percentage points is the largest among all the explanatory variables.[16] Pair-wise comparisons of coefficients show that the estimated coefficients for perceived ranking are significantly larger than those for actual ranking - the Wald χ^2-statistic for perceived versus actual richest third is 31.3, while that for perceived versus actual middle third is 5.48. Furthermore, whereas the difference in coefficients for actual ranking in the richest and middle third is not significantly different, individuals who perceive that they are in the richest class report significantly higher levels of subjective well-being than individuals who perceive that they are in the middle class ($\chi^2 = 35.4$). These findings confirm the divergence between actual and perceived class status reported in the previous section and they suggest that perceptions of class status provide a more meaningful measure of an individual's relative standing and its effect on subjective well-being, than actual class status.

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[16] We find very similar sized coefficients when the variables representing actual and perceived relative status are included on their own rather than in the same regression as they are here.

We further explore perceptions of relative standing by investigating how inwardly-oriented comparisons affect subjective well-being. In comparison to individuals who believed that their ranking had not changed since they were aged 15, those who perceived their position as having improved report significantly higher levels of satisfaction, while well-being levels are significantly lower among those who perceived their position to have worsened. Expectations about future income mobility also have the expected signs, although the coefficients are far smaller and only the variable identifying individuals who expect to be better off two years hence is significant.[17] Our estimations also suggest an asymmetry in these relative income effects. Both in past and future comparisons, perceptions of being better off have a larger effect on subjective well-being than perceptions of being worse off. One possible explanation for this asymmetry is that in a country with a long history of discrimination against the majority of the population, being better off than one's parents, or anticipating one's position to improve in the future, may be viewed as more of an achievement than being worse off is viewed as a "failure".

In a second regression (specification II in Table 3), we include variables which identify individuals' perceptions of where they rank in their village or suburb. This allows us to investigate how the geographical proximity of the individual's external reference group affects subjective well-being. Consistent with our results on perceived ranking in the national distribution, we find that the higher the individual's relative standing in the village or suburb, the greater his/her subjective well-being, and that the effect is significantly larger for the richer, than the middle, third ($\chi^2 = 34.2$). In addition, the coefficients for the more locally defined reference group are larger than those for the national comparison, although this difference is significant only for individuals who perceive their households to be in the middle of the relevant income distribution.

It is possible that these estimates are biased by unobserved characteristics at a local level. For example, the quality of infrastructure and schools in a local area may be correlated

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[17] In NIDS, individuals are also asked how they anticipated their position to change 5 years hence. We tried including variables for anticipated upward and downward mobility based on this question. However, our results were not significant suggesting that it is difficult to capture meaningful expectations about a more distant future.

both with self-reported satisfaction and with a number of explanatory variables (Luttmer 2005). To control for this endogeneity we also estimate the regressions with cluster fixed effects, by including a set of cluster dummy variables (these results are reported in the Appendix). The explained variation in subjective well-being increases from 7 percent (specification II in Table 3) to almost 11 percent (specification II in the Appendix table). Our findings on the key income variables remain robust indicating that the results are not driven by local area characteristics.

An important difference between the regressions with and without cluster fixed effects concerns the race variables. In both sets of estimations subjective well-being is significantly lower among Africans than among Whites (the omitted group). However, the coefficient falls by more than 50 percent when the estimations control for unobserved characteristics in the cluster. These results suggest that racial differences in subjective well-being are highly correlated with unobserved local circumstances that differ across the races (similar findings are reported in Kingdon and Knight 2006).

Nonetheless, even with cluster fixed effects, we find that subjective well-being remains significantly lower among Africans than Whites. To explore possible racial differences also in the determinants of subjective well-being, we estimate separate regressions for the African and White sub-samples. We use the specification which includes both the variables for relative standing in the national distribution and in the individual's village or suburb. However, because there is very little variation in household characteristics among Whites (evident in Table 1), we exclude variables on dwelling and toilet type when estimating subjective well-being for the sample of White adults (specification III). For purposes of comparability we also report the results for this reduced equation among Africans. The coefficients, standard errors and marginal effects of these regressions are presented in Table 4.

The estimations reveal a number of important differences in how absolute income and relative income affect the well-being of Africans and Whites. Among Africans, our findings mirror those identified for the national sample. Absolute income has a small but

positive effect on subjective well-being; perceptions of relative income are significantly larger predictors than actual ranking in the income distribution; and perceived ranking in the individual's village or suburb has a larger effect than perceived ranking in the national distribution. Perceptions of past mobility and expectations about future mobility are also consistent with those found for the national sample: among Africans, satisfaction is influenced more by what has been achieved than by expected achievements; and the asymmetry between the relative income effects is particularly pronounced (the negative effects of being worse off than at age 15, or anticipating being worse off in the future, are not significant).

In contrast, among Whites, absolute income has a very small, weakly significant but negative effect on subjective well-being. Furthermore, although the estimated coefficients for perceptions of relative standing are larger than those for actual ranking, the differences by class status are not statistically significant. Perceived ranking in the village or suburb also has no significant effect on the levels of satisfaction reported by Whites. Being worse off than at age 15 does have a negative effect on subjective well-being among Whites, but being better off has no significant effect; and subjective well-being is lower among those who perceived that their economic status would change, regardless of whether these changes were positive or negative.

These contrasting results likely reflect differences in the socio-economic characteristics of the samples. Overall, Whites enjoy a far higher standard of living than Africans; they have higher levels of education and are more likely to be proficient in English, the dominant language of business, politics and communication in the country (Casale and Posel 2010). Consequently Whites would be expected to have access to more information when assessing their relative economic status. This helps explain why differences between actual and perceived relative ranking were found to be larger among Africans than Whites in our descriptive analysis, and why perceptions of relative income are stronger predictors of subjective well-being than actual relative income among Africans but not among Whites. Africans, who historically have faced more limited opportunities, may also be more likely to benchmark themselves against a geographically close group

whose achievements or successes are deemed attainable, helping to explain why perceptions of relative standing in the village or suburb matter more for Africans but not for Whites.[18]

The negative relationship between absolute income and subjective well-being among Whites is puzzling, as is the significant negative coefficient on anticipated future upward mobility.[19] A possible explanation could lie with the income aspirations of Whites. Stutzer and Frey (2010) suggest that subjective well-being falls as the gap between aspired income and actual income rises. If the income aspirations of Whites on average exceed their actual income, and if the size of this gap is positively related to income, then increases in absolute income could have a negative effect on the subjective well-being of Whites. Analogously, the lower levels of reported subjective well-being among Whites who anticipate being upwardly mobile, may signal dissatisfaction with the individual's current position compared to where the individual aspires to be.

To test the robustness of our findings, we first ran a number of sensitivity tests that attempt to control for possible measurement error in the individual's actual relative standing. We considered two alternative measures of the individual's actual ranking in the national distribution. First we used per capita household expenditure, given the possibility that respondents may be more willing to disclose, or have more knowledge about, expenditure in the household than income received. Second, we derived an objective measure of relative standing using total household income which is not adjusted by household size, as individuals may base their perceptions of relative standing on total household income rather than on per capita measures. The results for the relative income measures are reported in Table 5. We find that our results remain robust, both for the national sample and for the sub-samples of Africans and Whites. Among all South Africans and among Africans specifically, subjective measures of relative standing

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[18] It is also possible that the village or suburb is the more relevant reference group for Africans than Whites because Africans are more likely to know their neighbours and be integrated into local community structures. The descriptive statistics in Table 1 provide some evidence of this: Africans are much more likely to report that their neighbours help each other out and they are also more likely to be a member of a social group.

[19] These unexpected results are found to be robust in all the sensitivity tests that we discuss below.

remain stronger predictors of subjective well-being than objective measures, and perceived ranking in the village or suburb has a larger effect than perceived ranking in the national distribution, while these comparisons do not hold for Whites.[20]

Second, we tested for the possibility that the individual's personal traits or attitudes to life are correlated both with perceptions of relative standing and with reported levels of satisfaction. Although we do not have panel data to control for individual unobserved characteristics, we use information collected in NIDS on the individual's emotional state during the week prior to the survey. We tested separately the effects of three variables: whether the individual reported being happy, depressed or optimistic about the future for most or all of the week prior to being interviewed. These results are reported in Table 6.[21] The coefficients on all three variables for the individual's emotional state have the expected signs, and they are significant in the regression for the national sample and among Africans, but only "being happy" has a significant effect on the subjective well-being of Whites. Furthermore, all the results and specifically those for actual and perceived relative ranking remain robust across the samples.

5. Conclusion

This paper explored the impact of relative standing on subjective well-being using data from a recent national survey for South Africa that collects individual-level information on the subjective well-being of all resident adults in the household. Our main contribution to the growing body of literature examining the relative income hypothesis has been to investigate subjective measures of relative standing, using both external and internal

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[20] We generally found very little difference in the match between actual and perceived standing in descriptive comparisons using per capita household expenditure and total household income. It is therefore not surprising that our results are robust to using these alternative measures of actual standing.

[21] We do not include the variables representing emotions in the earlier specifications due to some concern over the direction of causality in a subjective well-being regression. To give one example, feeling happy in the previous week may have a positive impact on subjective well-being, but one's feelings of satisfaction with life more generally may also affect happiness in the short-term. Nonetheless, we use these variables here simply to illustrate that once we control for emotional state, the findings with regard to perceived relative standing are robust.

comparisons. Specifically, we were able to study the impact on subjective well-being of individuals' perceptions of where they are positioned in the national income distribution as well as the income distribution of their village or suburb. Information on how individuals perceive their relative standing to have changed since the age of 15, and where they think they will rank in the future, also allowed us to compare how past mobility and future expectations affect reports of subjective well-being.

Our findings suggest that both comparisons with others and with oneself over time have important effects on satisfaction with life. Individuals who believe themselves to be in the middle and richest thirds of the national income distribution have significantly higher levels of subjective well-being than those who rank themselves in the poorest third. These average effects are also very large; ranking oneself in the middle of the income distribution has a similar effect to reporting being in good or excellent health or living in a house with a flush toilet (two of the other largest contributors to subjective well-being), while ranking oneself in the richest third has more than double this effect. The individual's perceived ranking in the village or suburb had an even larger impact on subjective well-being than the individual's ranking in the national distribution, suggesting that individuals may care more about their status among people who are in a geographically proximate area.

Because the survey we use collected comprehensive information on individual income as well as on individuals' perceptions of where they rank in the income distribution, we were able to compare objective and subjective measures of relative standing at the national level. Interestingly, we found a very poor match between actual and perceived ranking. For instance, a majority of individuals who are in the richest third of the income distribution based on reported income perceive themselves to be in either the middle or the lowest third. As we predicted, perceived ranking in the national income distribution has a larger effect on subjective well-being than actual ranking; for the richest third for example, the effect is between four and five times larger. The substantial impact that feelings of relative deprivation have on satisfaction with life resonates strongly in a

country such as South Africa, which has one of the highest levels of inequality in the world.

Our findings with respect to internal comparisons highlight the importance that individuals also place on doing better over time. Those who felt they ranked higher in the national income distribution compared to when they were 15 years old are significantly more likely to be satisfied with life, with a marginal effect in the region of the health status effect. Expecting to do better two years hence is also related to higher levels of subjective well-being, although the effect is only a third of the size of that due to past income mobility. As we might expect, life satisfaction seems to be influenced more by what has been achieved (or believed to have been achieved) than by anticipated achievements.

Unsurprisingly given South Africa's political history, race also plays an important role in subjective well-being outcomes. Africans, the majority population group in South Africa and the most affected by racial segregation and oppression under apartheid, report much lower levels of subjective well-being than Whites, even after controlling for many other correlates of life satisfaction. In addition, there are differences in the structure of the well-being equations by race. Consistent with our finding that Africans are more likely to underestimate their class position, we find a larger gap between the effects on subjective well-being of actual and perceived ranking among Africans than Whites. Furthermore, while Africans seem to view their ranking in the village or suburb as the more relevant comparator, among Whites, only ranking in the national distribution has an effect on subjective well-being. The impact on subjective well-being of past and future mobility among Africans mirrors what is found for the full sample. For Whites however, we identify some unexpected results. Perceptions of being better off than at age 15 have no significant effect on subjective well-being, and expectations of doing better in the future have a negative effect. Given that most Whites are already at the upper end of the income distribution in South Africa (and would most likely have been at age 15), this may reflect the difficulty in the post-apartheid climate of doing even better. Among the minority of

Whites who do expect to rank higher in the income distribution in the future, this result may signal a disappointment with their current position relative to their aspirations.

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Figures and Tables

Figure 1. Measures of subjective well-being among South African adults, 2008
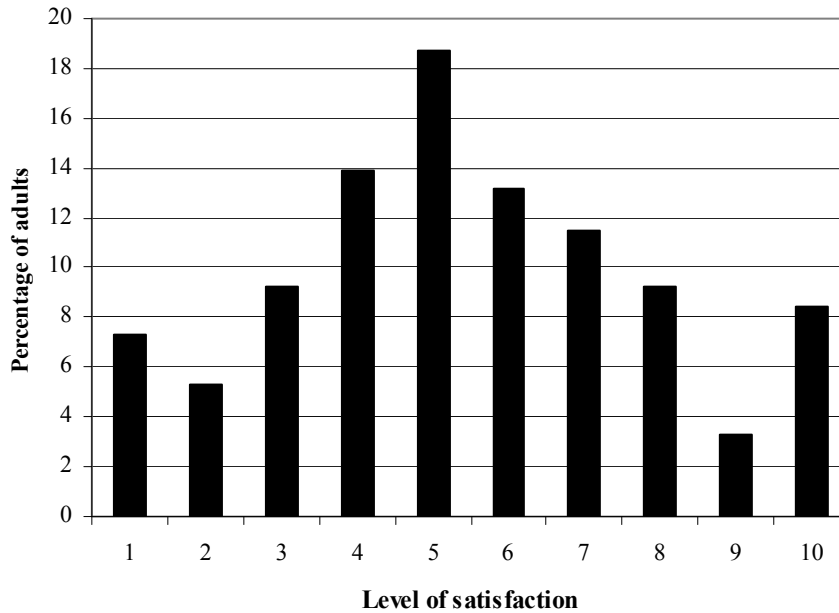
Figure 2. Measures of subjective well-being among African and white adults, 2008
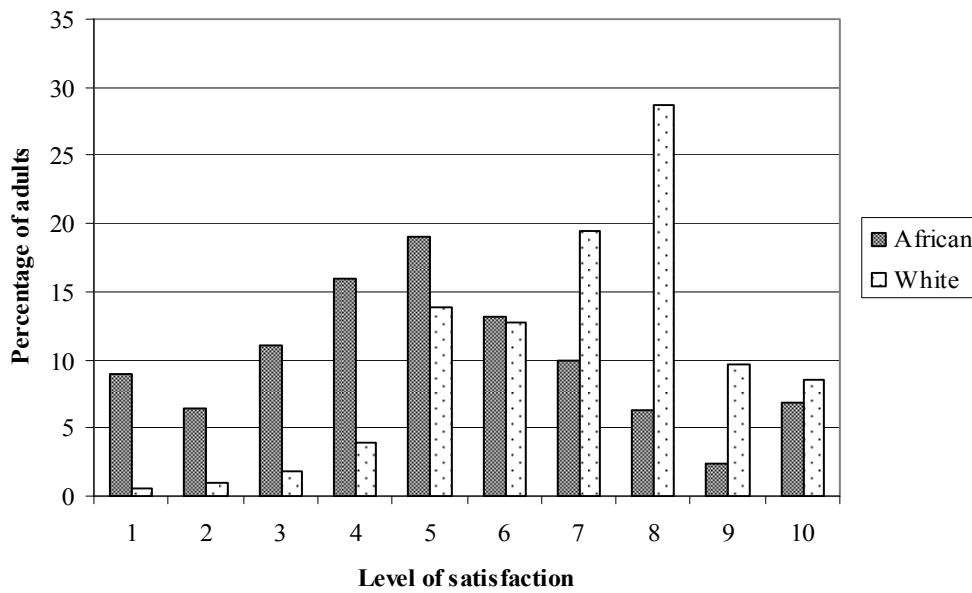
Source: Own calculations, NIDS 2008.
Notes: Sample includes all adults older than 17 years.

Table 1. Means and standard errors of explanatory variables

	All adults		Africans		Whites	
	Average	Standard error	Average	Standard error	Average	Standard error
Individual characteristics						
African	0.77	0.007	--		--	
Indian	0.03	0.003	--		--	
Coloured	0.09	0.004	--		--	
White*	0.11	0.006	--		--	
Head	0.46	0.008	0.46	0.008	0.51	0.030
Age	38.24	0.221	36.77	0.214	46.63	0.980
Years of schooling	8.90	0.060	8.39	0.062	12.21	0.165
Male	0.43	0.008	0.43	0.008	0.45	0.030
Married	0.35	0.007	0.29	0.007	0.62	0.029
Cohabiting	0.09	0.004	0.10	0.005	0.03	0.008
Divorced or widowed	0.11	0.005	0.10	0.004	0.18	0.023
Never married*	0.45	0.007	0.51	0.008	0.17	0.021
Health status is excellent/very good	0.57	0.007	0.55	0.008	0.68	0.028
Health status is good/fair	0.36	0.007	0.38	0.008	0.28	0.027
Health status is poor*	0.07	0.003	0.07	0.004	0.04	0.012
Has difficulty with daily care	0.03	0.002	0.03	0.002	0.03	0.009
Unemployed, searching for work	0.05	0.003	0.06	0.003	0.03	0.012
Unemployed, not searching	0.15	0.006	0.18	0.006	0.07	0.018
Not economically active	0.32	0.007	0.32	0.007	0.34	0.029
Employed*	0.48	0.008	0.45	0.008	0.56	0.031
Household characteristics						
Number of children	1.48	0.024	1.64	0.027	0.57	0.050
Number of pensioners	0.19	0.006	0.18	0.006	0.29	0.033
Informal dwelling place	0.11	0.005	0.13	0.006	0.02	0.011
Formal dwelling place	0.77	0.006	0.72	0.007	0.98	0.011
Rural dwelling place (mud and thatch)*	0.12	0.004	0.15	0.005	0	0
Flush toilet	0.56	0.007	0.44	0.008	1.00	0.002
Chemical toilet/pit latrine	0.34	0.007	0.44	0.008	0.00	0.002
Bucket toilet/no toilet*	0.10	0.004	0.12	0.005	0.00	0.000
Toilet shared with other households	0.22	0.007	0.24	0.008	0.01	0.017
Social capital variables						
Involved in religious activities	0.89	0.005	0.88	0.005	0.90	0.017
Neighbours help out	0.58	0.008	0.61	0.008	0.45	0.030
Neighbours are aggressive	0.24	0.006	0.26	0.007	0.10	0.019
Crime in the neighbourhood	0.40	0.007	0.40	0.008	0.34	0.029
Member of a group	0.37	0.007	0.41	0.008	0.20	0.022
Owns a cellular telephone	0.68	0.007	0.67	0.007	0.84	0.023
Income variables						

Per capita household income (Rands)	2069.46	81.50	1180.43	39.262	7766.59	476.01
Actual rank in SA – richest third	0.39	0.008	0.28	0.008	0.93	0.017
Actual rank in SA – middle third	0.31	0.007	0.34	0.007	0.05	0.016
Actual rank in SA – poorest third*	0.31	0.006	0.37	0.007	0.01	0.006
Perceived rank in SA – richest	0.03	0.003	0.02	0.003	0.08	0.015
Perceived rank in SA – middle	0.50	0.008	0.45	0.008	0.75	0.027
Perceived rank in SA – poorest*	0.47	0.008	0.52	0.008	0.17	0.024
Perceived rank in village/suburb – richest	0.12	0.005	0.10	0.005	0.22	0.024
Perceived rank in village/suburb – middle	0.41	0.008	0.36	0.008	0.61	0.029
Perceived rank in village/suburb – poorest*	0.48	0.008	0.55	0.008	0.17	0.022
Perceived to be better off than at age 15	0.55	0.008	0.56	0.008	0.46	0.030
Perceived to be the same as at age 15*	0.31	0.007	0.30	0.007	0.37	0.029
Perceived to be worse off than at age 15	0.13	0.005	0.13	0.005	0.17	0.022
Expect to be better off 2 years hence	0.72	0.007	0.77	0.007	0.39	0.030
Expect to be the same 2 years hence*	0.26	0.007	0.21	0.007	0.59	0.030
Expect to be worse off 2 years hence	0.02	0.002	0.02	0.002	0.02	0.006
N	10509		8068		705	

Source: Own calculations from NIDS 2008.

Notes: * Omitted category in the estimations. Sample includes adults older than 17 years. Estimates are weighted.

Table 2: Actual versus perceived economic rank in South Africa, 2008

Actual rank:	Perceived richest	Perceived middle	Perceived lowest	Total
		All		
Richest third	0.059	0.625	0.316	100
	(0.004)	(0.008)	(0.007)	
Middle third	0.016	0.417	0.567	100
	(0.002)	(0.007)	(0.007)	
Lowest third	0.008	0.304	0.688	100
	(0.001)	(0.006)	(0.006)	
		Africans		
Richest third	0.038	0.566	0.396	100
	(0.004)	(0.010)	(0.010)	
Middle third	0.015	0.411	0.574	100
	(0.002)	(0.008)	(0.008)	
Lowest third	0.007	0.309	0.684	100
	(0.001)	(0.007)	(0.007)	
		Whites		
Richest third	0.105	0.764	0.131	100
	(0.011)	(0.015)	(0.012)	
Middle third	0.056	0.528	0.417	100
	(0.039)	(0.084)	(0.083)	
Lowest third	0	0.400	0.600	100
	(0)	(0.163)	(0.163)	

Source: Own calculations, NIDS 2008.

Notes: Sample includes adults older than 17 years. Standard errors are in parentheses.

Table 3: Ordered probits of subjective well-being, all adults

	I			II		
	Coefficient	*SE*	*ME*	*Coefficient*	*SE*	*ME*
Individual characteristics						
African	-0.442***	0.052	-0.160	-0.467***	(0.055)	-0.166
Indian	-0.083	0.098	-0.028	-0.110	(0.104)	-0.035
Coloured	0.136**	0.061	0.047	0.144**	(0.062)	0.049
Head	-0.046*	0.026	-0.016	-0.046*	(0.027)	-0.015
Age	-0.010***	0.004	-0.003	-0.009**	(0.004)	-0.003
Age^2	0.013***	0.004	0.004	0.012***	(0.004)	0.003
Male	0.043*	0.025	0.014	0.053**	(0.026)	0.018
Years of schooling completed	0.008**	0.004	0.002	0.002	(0.004)	0.001
Married	0.044	0.033	0.015	0.018	(0.032)	0.006
Cohabiting	0.013	0.039	0.004	0.004	(0.041)	0.001
Divorced or widowed	0.030	0.045	0.010	0.012	(0.045)	0.004
Health status is excellent/very good	0.366***	0.058	0.125	0.275***	(0.054)	0.092
Health status is good/fair	0.185***	0.046	0.064	0.135***	(0.046)	0.045
Has difficulty with daily care	-0.242***	0.056	-0.078	-0.207***	(0.059)	-0.065
Unemployed, searching for work	-0.149***	0.047	-0.049	-0.111**	(0.049)	-0.036
Unemployed, not searching	-0.048	0.038	-0.016	-0.046	(0.037)	-0.015
Not economically active	0.025	0.034	0.008	0.015	(0.035)	0.004
Household characteristics						
Number of children < 15 years	0.026***	0.010	0.009	0.024**	(0.010)	0.007
Number of pensioners > 64 years	0.028	0.032	0.009	0.032	(0.032)	0.010
Informal dwelling place	0.144**	0.073	0.051	0.151**	(0.071)	0.052
Formal dwelling place	0.104*	0.061	0.035	0.116*	(0.060)	0.038
Flush toilet	0.310***	0.065	0.106	0.239***	(0.066)	0.080
Chemical toilet/pit latrine	0.176***	0.054	0.061	0.154***	(0.056)	0.052
Toilet shared with other households	-0.066	0.042	-0.022	-0.064	(0.045)	-0.021
Social capital variables						
Involved in religious activities	0.119***	0.041	0.039	0.141***	(0.040)	0.045
Neighbours help out	0.136***	0.034	0.046	0.163***	(0.033)	0.054
Neighbours are aggressive	-0.059	0.038	-0.020	-0.058	(0.040)	-0.019
Crime in the neighbourhood	-0.039	0.030	-0.013	-0.039	(0.031)	-0.012
Member of a group	0.071***	0.027	0.024	0.070**	(0.027)	0.023
Owns a cellular telephone	0.101***	0.029	0.034	0.107***	(0.026)	0.035
Income variables						
(Per capita household income)/1000	0.025***	0.007	0.008	0.015**	(0.008)	0.005
(Per capita household income)^2/1000	-0.000**	0.000	-1.1E^{-07}	-0.000	(0.000)	-5.3E^{-08}
Actual rank in SA – richest third	0.155***	0.049	0.054	0.128***	(0.049)	0.043
Actual rank in SA – middle third	0.134***	0.038	0.046	0.121***	(0.037)	0.040
Perceived rank in SA – richest	0.662***	0.074	0.253	0.548***	(0.082)	0.205

Perceived rank in SA – middle	0.249***	0.030	0.086	0.192***	(0.031)	0.065
Perceived rank in village/suburb – richest	-	-	-	0.704***	(0.058)	0.263
Perceived rank in village/suburb – middle	-	-	-	0.437***	(0.036)	0.150
Perceived to be better off than at age 15	0.329***	0.037	0.112	0.279***	(0.036)	0.092
Perceived to be the worse off than at age 15	-0.122***	0.040	-0.041	-0.083**	(0.040)	-0.027
Expect to be better off 2 years hence	0.115***	0.034	0.039	0.117***	(0.033)	0.038
Expect to be worse off 2 years hence	-0.046	0.097	-0.015	-0.124	(0.107)	-0.040
Cut 1	-0.702	0.122		-0.745	0.125	
Cut 2	-0.364	0.121		-0.399	0.125	
Cut 3	0.054	0.122		0.042	0.125	
Cut 4	0.540	0.122		0.556	0.125	
Cut 5	1.100	0.123		1.151	0.126	
Cut 5	1.501	0.123		1.566	0.127	
Cut 7	1.909	0.123		1.996	0.127	
Cut 8	2.330	0.124		2.441	0.128	
Cut 9	2.529	0.124		2.652	0.128	
Number of observations	11129			10509		
Pseudo R^2	0.0562			0.0707		
Log-pseudolikelihood	-23218.524			-21537.011		
χ^2	2874.41			3136.09		

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults older than 17 years.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 4: Ordered probits of subjective well-being by race

	African (II)			African (III)			White (III)		
	Coefficient	SE	ME	Coefficient	SE	ME	Coefficient	SE	ME
Individual characteristics									
Head	-0.021	0.031	-0.006	-0.028	0.032	-0.008	0.063	0.104	0.078
Age	-0.011**	0.004	-0.003	-0.011**	0.004	-0.003	-0.042**	0.017	-0.051
Age^2	0.013**	0.005	0.003	0.012**	0.005	0.003	0.053***	0.017	0.066
Male	0.082***	0.029	0.023	0.091***	0.028	0.026	-0.147	0.112	-0.183
Years of schooling completed	-0.001	0.004	-0.000	0.002	0.004	0.000	0.042*	0.025	0.052
Married	0.014	0.038	0.003	0.013	0.036	0.003	0.094	0.156	0.117
Cohabiting	0.012	0.046	0.003	0.007	0.047	0.002	0.023	0.225	0.028
Divorced or widowed	0.035	0.051	0.010	0.011	0.050	0.003	0.018	0.194	0.022
Health status is excellent/very good	0.251***	0.062	0.072	0.252***	0.060	0.073	0.863***	0.264	1.089
Health status is good/fair	0.121**	0.053	0.035	0.130**	0.051	0.038	0.421*	0.245	0.512
Has difficulty with daily care	-0.162**	0.068	-0.043	-0.167**	0.067	-0.045	-0.641***	0.248	-0.843
Unemployed, searching for work	-0.102**	0.054	-0.028	-0.093*	0.055	-0.026	-0.212	0.292	-0.271
Unemployed, not searching	-0.020	0.042	-0.005	0.002	0.042	0.000	-0.280	0.237	-0.359
Not economically active	-0.000	0.041	-0.000	0.013	0.041	0.003	-0.016	0.124	-0.020
Household characteristics									
Number of children < 15 years	0.027**	0.011	0.007	0.023**	0.011	0.006	-0.017	0.056	-0.020
Number of pensioners > 64 years	0.029	0.036	0,008	0.021	0.035	0.006	-0.095	0.118	-0.118
Informal dwelling place	0.144*	0.075	0.043	-			-		
Formal dwelling place	0.127**	0.062	0.035	-			-		
Flush toilet	0.223***	0.072	0.065	-			-		
Chemical toilet/pit latrine	0.170***	0.058	0.049	-			-		
Toilet shared with other households	-0.076	0.050	-0.021	-			-		
Social capital variables									
Involved in religious activities	0.140***	0.042	0.038	0.166***	0.042	0.045	0.119	0.127	0.150
Neighbours help out	0.189***	0.039	0.053	0.174***	0.040	0.049	0.000	0.074	0.001
Neighbours are aggressive	-0.055	0.043	-0.015	-0.049	0.043	-0.014	-0.341**	0.160	-0.438
Crime in the neighbourhood	-0.007	0.035	-0.001	-0.002	0.035	-0.000	-0.073	0.096	-0.091
Member of a group	0.076**	0.032	0.022	0.096***	0.032	0.027	0.015	0.083	0.018
Owns a cellular telephone	0.103***	0.029	0.029	0.106***	0.028	0.030	0.210**	0.104	0.267
Income variables									
(Per capita household income)/1000	0.037**	0.015	0.010	0.044***	0.014	0.012	-0.019*	0.012	-0.023
(Per capita household income)^2/1000	-0.000	0.000	-7.2E^{-08}	-0.000	0.000	-1.5E^{-07}	0.000	0.000	3.33E^{-07}
Actual rank in SA – richest third	0.086	0.058	0.025	0.121**	0.055	0.035	0.729*	0.419	0.962
Actual rank in SA – middle third	0.095**	0.039	0.027	0.114***	0.038	0.033	0.473	0.519	0.546
Perceived rank in SA – richest	0.645***	0.127	0.224	0.620***	0.124	0.216	1.140***	0.210	1.194
Perceived rank in SA – middle	0.189***	0.033	0.055	0.204***	0.033	0.060	0.479***	0.164	0.613
Perceived rank in village/suburb – richest	0.799***	0.068	0.279	0.778***	0.069	0.272	0.134	0.132	0.165
Perceived rank in village/suburb – middle	0.449***	0.041	0.136	0.453***	0.041	0.138	0.060	0.123	0.075

Perceived to be better off than at age 15	0.335***	0.043	0.095	0.348***	0.043	0.099	-0.136	0.103	-0.169
Perceived to be the worse off than at age 15	-0.046	0.045	-0.013	-0.045	0.045	-0.012	-0.272**	0.133	-0.346
Expect to be better off 2 years hence	0.162***	0.040	0.044	0.172***	0.038	0.048	-0.263***	0.096	-0.329
Expect to be worse off 2 years hence	-0.051	0.149	-0.014	-0.015	0.153	-0.004	-0.312*	0.180	-0.401
Cut 1	-0.262	0.128		-0.389	0.144		-1.761	0.730	
Cut 2	0.093	0.128		-0.036	0.143		-1.105	0.677	
Cut 3	0.553	0.128		0.422	0.145		-0.598	0.684	
Cut 4	1.084	0.128		0.949	0.147		-0.035	0.682	
Cut 5	1.662	0.129		1.527	0.149		0.766	0.686	
Cut 5	2.089	0.130		1.953	0.151		1.230	0.689	
Cut 7	2.502	0.131		2.367	0.154		1.805	0.692	
Cut 8	2.865	0.131		2.737	0.158		2.763	0.696	
Cut 9	3.049	0.131		2.919	0.162		3.258	0.697	
Number of observations	8068			8340			737		
Pseudo R^2	0.0554			0.0533			0.0716		
Log-pseudolikelihood	-16589.301			-17177.839			-1303.89		
χ^2	1810.31			1163.78			193.43		

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults older than 17 years.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 5. Sensitivity tests: using alternative measures of actual income

	All			African			White		
	Coefficient	*SE*	*ME*	*Coefficient*	*SE*	*ME*	*Coefficient*	*SE*	*ME*
A: Using per capita household expenditure to rank households									
Actual rank in SA – richest third	0.092*	0.052	0.031	0.147***	0.053	0.044	0.371	1.081	0.142
Actual rank in SA – middle third	0.039	0.038	0.013	0.067*	0.038	0.020	-0.240	1.095	-0.091
Perceived rank in SA – richest	0.540***	0.082	0.201	0.601***	0.125	0.209	1.108***	0.215	0.294
Perceived rank in SA – middle	0.189***	0.030	0.063	0.196***	0.033	0.058	0.445***	0.169	0.167
Perceived rank in village/suburb – richest	0.705***	0.058	0.264	0.777***	0.069	0.272	0.116	0.132	0.041
Perceived rank in village/suburb – middle	0.442***	0.036	0.151	0.454***	0.042	0.138	0.044	0.123	0.016
B: Using total household income to rank households									
Actual rank in SA – richest third	0.179***	0.049	0.061	0.155***	0.053	0.046	0.632*	0.376	0.244
Actual rank in SA – middle third	0.112***	0.039	0.038	0.124***	0.038	0.036	0.297	0.439	0.100
Perceived rank in SA – richest	0.544***	0.082	0.204	0.614***	0.124	0.214	1.143***	0.210	0.299
Perceived rank in SA – middle	0.190***	0.030	0.064	0.203***	0.033	0.060	0.479***	0.165	0.180
Perceived rank in village/suburb – richest	0.698***	0.058	0.262	0.773***	0.069	0.271	0.125	0.132	0.044
Perceived rank in village/suburb – middle	0.432***	0.036	0.148	0.447***	0.041	0.136	0.049	0.121	0.018

Source: Own calculations from NIDS 2008.
Notes: Sample includes adults older than 17 years. Estimates for Africans and Whites exclude controls for dwelling type and access to services.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 6. Sensitivity tests: including controls for emotional state

	All			African			White		
	Coefficient	*SE*	*ME*	*Coefficient*	*SE*	*ME*	*Coefficient*	*SE*	*ME*
A: Including 'happy'									
Happy	0.116***	0.028	0.039	0.108***	0.029	0.031	0.284*	0.152	0.106
Actual rank in SA – richest third	0.123**	0.049	0.042	0.116**	0.055	0.035	0.697*	0.417	0.270
Actual rank in SA – middle third	0.118***	0.037	0.040	0.111***	0.038	0.033	0.443	0.515	0.142
Perceived rank in SA – richest	0.525***	0.083	0.196	0.600***	0.126	0.208	1.114***	0.205	0.294
Perceived rank in SA – middle	0.189***	0.031	0.064	0.200***	0.033	0.059	0.484***	0.161	0.182
Perceived rank in village/suburb – richest	0.725***	0.059	0.272	0.801***	0.070	0.281	0.168	0.133	0.059
Perceived rank in village/suburb – middle	0.442***	0.036	0.152	0.458***	0.042	0.139	0.062	0.122	0.022
Perceived to be better off than at age 15	0.284***	0.035	0.094	0.354***	0.042	0.101	-0.130	0.104	-0.047
Perceived to be the worse off than at age 15	-0.074*	0.039	-0.024	-0.033	0.045	-0.010	-0.277**	0.139	-0.103
Expect to be better off 2 years hence	0.116***	0.033	0.038	0.171***	0.038	0.048	-0.285***	0.095	-0.104
Expect to be worse off 2 years hence	-0.106	0.106	-0.034	0.020	0.150	0.006	-0.312*	0.182	-0.118
B: Including 'depressed'									
Depressed	-0.087**	0.036	-0.029	-0.065*	0.039	-0.018	-0.151	0.142	-0.056
Actual rank in SA – richest third	0.130***	0.049	0.044	0.122**	0.055	0.036	0.736*	0.434	0.286
Actual rank in SA – middle third	0.121***	0.037	0.041	0.113***	0.038	0.033	0.463	0.529	0.147
Perceived rank in SA – richest	0.545***	0.082	0.204	0.619***	0.124	0.216	1.147***	0.211	0.300
Perceived rank in SA – middle	0.192***	0.030	0.065	0.204***	0.033	0.060	0.477***	0.163	0.179
Perceived rank in village/suburb – richest	0.705***	0.059	0.264	0.782***	0.069	0.274	0.125	0.133	0.044
Perceived rank in village/suburb – middle	0.433***	0.036	0.149	0.451***	0.041	0.137	0.049	0.124	0.018
Perceived to be better off than at age 15	0.280***	0.036	0.093	0.351***	0.043	0.100	-0.136	0.103	-0.049
Perceived to be worse off than at age 15	-0.077*	0.040	-0.025	-0.038	0.045	-0.011	-0.261*	0.135	-0.097
Expect to be better off 2 years hence	0.119***	0.033	0.039	0.172***	0.038	0.048	-0.265***	0.095	-0.097
Expect to be worse off 2 years hence	-0.121	0.107	-0.039	-0.010	0.153	-0.003	-0.327*	0.186	-0.124
C: Including 'hopeful about future'									
Hopeful about the future	0.082***	0.030	0.028	0.088**	0.036	0.026	0.126	0.101	0.046
Actual rank in SA – richest third	0.126**	0.049	0.043	0.117**	0.055	0.035	0.736*	0.413	0.286
Actual rank in SA – middle third	0.120***	0.037	0.041	0.112***	0.038	0.033	0.539	0.534	0.167
Perceived rank in SA – richest	0.533***	0.082	0.199	0.600***	0.124	0.208	1.136***	0.206	0.298
Perceived rank in SA – middle	0.185***	0.031	0.062	0.196***	0.033	0.058	0.478***	0.164	0.179
Perceived rank in village/suburb – richest	0.713***	0.057	0.267	0.791***	0.068	0.278	0.134	0.132	0.047
Perceived rank in village/suburb – middle	0.446***	0.036	0.153	0.461***	0.041	0.140	0.065	0.121	0.023
Perceived to be better off than at age 15	0.281***	0.036	0.094	0.353***	0.043	0.101	-0.146	0.102	-0.052
Perceived to be the worse off than at age 15	-0.085**	0.039	-0.028	-0.048	0.045	-0.014	-0.278**	0.133	-0.104
Expect to be better off 2 years hence	0.112***	0.033	0.037	0.166***	0.038	0.046	-0.282***	0.096	-0.103
Expect to be worse off 2 years hence	-0.124	0.107	-0.040	-0.017	0.154	-0.005	-0.309*	0.182	-0.117

Source: Own calculations from NIDS 2008.

Notes: Sample includes adults older than 17 years. Estimates for Africans and Whites exclude controls for dwelling type and access to services.

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table A1: Ordered probits of subjective well-being, controlling for cluster fixed effects, all races

	I		II	
	Coefficient	*SE*	*Coefficient*	*SE*
Individual variables				
Head	-0.036	0.024	-0.030	0.025
Age	-0.011***	0.004	-0.009**	0.004
Age^2	0.014***	0.004	0.011**	0.005
African	-0.191**	0.080	-0.201**	0.083
Indian	-0.073	0.187	-0.101	0.198
Coloured	-0.038	0.107	-0.030	0.108
Male	0.025	0.024	0.023	0.026
Years of schooling completed	0.011***	0.004	0.005	0.004
Married	0.045	0.032	0.018	0.031
Cohabiting	-0.024	0.044	-0.055	0.045
Divorced or widowed	0.012	0.042	-0.004	0.043
Health status is excellent/very good	0.351***	0.056	0.284***	0.056
Health status is good/fair	0.218***	0.045	0.174***	0.045
Has difficulty with daily care	-0.222***	0.060	-0.181***	0.063
Unemployed, searching for work	-0.193***	0.049	-0.146***	0.051
Unemployed, not searching	-0.108***	0.037	-0.080**	0.038
Not economically active	0.048	0.031	0.051	0.032
Household variables				
Number of children < 15 years	0.031***	0.009	0.026***	0.009
Number of pensioners > 64 years	0.039	0.030	0.034	0.030
Informal dwelling place	0.133	0.083	0.080	0.087
Formal dwelling place	0.024	0.066	-0.017	0.067
Flush toilet	0.412***	0.080	0.300***	0.082
Chemical toilet/pit latrine	0.138**	0.066	0.110	0.067
Toilet shared with other households	-0.078	0.050	-0.037	0.051
Social capital variables				
Involved in religious activities	0.097**	0.042	0.101**	0.041
Neighbours help out	0.135***	0.035	0.156***	0.034
Neighbours are aggressive	-0.049	0.040	-0.035	0.041
Crime in the neighbourhood	-0.011	0.034	-0.021	0.035
Member of a group	0.052*	0.028	0.052*	0.028
Owns a cellular telephone	0.122***	0.026	0.112***	0.025
Income variables				
(Per capita household income)/1000	0.018**	0.008	0.003	0.009
(Per capita household income)^2/1000	-0.000	0.000	0.000	0.000

Actual rank in SA – richest third	0.161***	0.050	0.118**	0.050
Actual rank in SA – middle third	0.154***	0.037	0.132***	0.037
Perceived rank in SA – richest	0.697***	0.083	0.589***	0.091
Perceived rank in SA – middle	0.250***	0.033	0.193***	0.032
Perceived rank in village/suburb – richest	-	-	0.825***	0.065
Perceived rank in village/suburb – middle	-	-	0.504***	0.037
Perceived to be better off than at age 15	0.327***	0.035	0.260***	0.035
Perceived to be the worse off than at age 15	-0.116**	0.048	-0.071	0.045
Expect to be better off 2 years hence	0.124***	0.036	0.123***	0.036
Expect to be worse off 2 years hence	-0.050	0.101	-0.147	0.112
Cut 1	-1.617	0.151	-0.262	0.128
Cut 2	-1.238	0.151	0.093	0.128
Cut 3	-0.774	0.150	0.553	0.128
Cut 4	-0.240	0.151	1.084	0.128
Cut 5	0.369	0.151	1.662	0.129
Cut 6	0.802	0.151	2.089	0.130
Cut 7	1.239	0.151	2.502	0.131
Cut 8	1.682	0.152	2.865	0.132
Cut 9	1.892	0.152	3.049	0.133
Number of observations	11129		10509	
Pseudo R^2	0.0920		0.1059	
Log-pseudolikelihood	-22336.987		-20720.992	
χ^2	9507.73		9186.44	

Source: Own calculations from NIDS 2008.
Notes: Sample includes adults older than 17 years. A set of dummy variables representing clusters are included in each regression.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%