

First draft – please do not quote

Community, Comparisons and Subjective Well-being in a Divided Society

Geeta Kingdon and John Knight

March 2004

Paper for presentation at the CSAE conference,
St. Catherine's college, 21-22 March 2004

Keywords: Subjective well-being; comparator groups; altruism; envy; relative deprivation; race; South Africa.

JEL classifications: D60, D62, D63, D64, A12, I30

Acknowledgements:

We are very grateful to John Helliwell for interesting conversations that inspired this paper and to Marcel Fafchamps for perceptive comments on an earlier draft. We are also grateful to participants at a CSAE seminar and at a GPRG workshop at which an earlier draft was presented. Any errors are ours.

1. Introduction

The idea that relative position matters to individual utility has substantial theoretical support in the social science literature, particularly in sociology (for instance, Runciman 1966) and psychology (for instance, Diener and Biswas-Diener 2000). By contrast, microeconomic theory textbooks generally describe utility as a function of own absolute income. However, some economists have advocated models in which the income of others enters the individual's utility function (for instance, Duesenberry 1949; Easterlin, 1995; Akerlof 1997). Indeed, Frank (1985), Akerlof and Yellen (1990), Frank and Sunstein (2001) and Layard (2003a) argue that many well-established ideas about economic policy would be overturned if relative income were to matter.

There is now also a good deal of empirical support for the notion that subjective well-being depends on relative income (Clark and Oswald 1996; Watson et. al. 1996; Tsou and Liu 2001). In some of the studies, utility depends more importantly - or even only - on relative than on absolute income (Groot and van den Brink, 1999). One study finds that pay satisfaction depends not only on relative income but also on ranked position within a comparison set (Brown et. al. 2003).

Analysis of this sort requires that the comparison set - the group with whom individuals compare themselves when judging their relative position - be specified. Candidates for an individual's reference group are: the individual's own past; her aspiration or desired future; others in her family; her spouse; others with similar characteristics; and others in her residential vicinity or workplace. Since individuals have multiple identities, they may also have multiple comparators.

Various definitions of comparator group are found in the literature. Many studies have used 'others with similar characteristics'. For instance, an individual may match with others on the basis of educational level, occupation, region, gender, social background and parental characteristics. If people take many characteristics into account when making comparisons, the multiple dimensions involved present a matching problem for researchers¹. One solution that has been attempted is to borrow an idea from the propensity-score matching literature: it is

¹ This is similar to the dimensionality problem in creating control-groups to match a treatment group on the basis of observed characteristics of the treated and non-treated individuals. One solution to this problem is to use a propensity score matching method, whereby a control group is created for the treated group on the basis of matching individuals' predicted probabilities of receiving the treatment.

assumed that people compare their income with the income of others like themselves, and it is assumed that their own predicted income is a good measure of the income of others like themselves. This approach is used in Clark and Oswald (1996) and Watson et. al.(1996)².

What is the expected sign of the relationship between relative income (or other relative measures) and individual happiness? In general it is posited that subjective well-being varies inversely with the incomes of others (Easterlin, 1995; Falk and Knell, 2000). In much of the applied literature that tests it, relative income is indeed found to have a negative effect on the subject's happiness level. However, the explanations for a negative relationship are not immediately clear. It could be because of feelings of relative deprivation (Runciman, 1966) or due to feelings of envy, rivalry or competition with others in the comparison set. Karl Marx said (quoted in Lipset, 1960, p. 63): "A house may be large or small; as long as surrounding houses are equally small it satisfies all social demands for a dwelling. But if a palace rises beside the little house, the little house shrinks into a 'hut'. However, a negative relationship between subjective well-being and others' incomes could have more benign motivations than envy or rivalry. For instance, it is possible that people look for a comparable group to provide them their reference standard and they see the achievements (income, education level etc.) of this group as the goal to which they aspire. The greater the distance between own achievement and the goal level of achievement, the lower will be subjective well-being.

However, a negative relationship is not inevitable and there are a number of reasons why a positive relationship may be expected. One such reason is altruism. In his *Theory of Moral Sentiments*, 1759, Adam Smith asks whether the typical individual would be more disturbed by the loss of a hundred million lives in China or by the loss of his own little finger. Smith argues that sympathetic feelings would be aroused by a great loss of life in a faraway country, but maintains that those feelings would be attenuated by the great physical and social distance (Raphael and Macfie, 1976 p. 136-7). The media coverage of famines and disasters in our own day suggests that even relatively insignificant local losses are perceived to be of greater concern. Smith believed that there is an order in the exercise of human benevolence, an order in which Nature recommends individuals and societies to our care and attention. Thus, Nature directs us first to take care of ourselves, then of members of our family, and then others. Similarly Nature

² One problem in such studies is the issue of identification: it is usually not possible to find identifying variables that belong in the income-predicting first-stage equation but are excludable from the subjective well-being equation.

prompts us to have care of our own country before others. Every nation is divided into "orders and societies", and Smith suggests it is natural to care most about the order or class to which one belongs. "That wisdom which contrived the system of human affections, as well as that of every other part of nature, seems to have judged that the interest of the great society of mankind would be best promoted by directing the principal attention of each individual to that particular portion of it, which was most within the sphere both of his abilities and of his understanding". (Smith quoted in Raphael and Macfie, 1976, p. 229).

If there is greater empathy with local than with more distant people, there may be positive externalities in happiness within the local community and smaller positive or zero externalities outside, e.g. one person's income within a community will raise not only her own utility but also that of others in the local community for reasons of benevolence or altruism, but this will not happen in a wider geographical area.

The idea that altruism operates is supported in the findings of an experimental study by Charness and Grosskopf (2001) which finds little concern with relative payoffs among a group of university students, given that their own payoffs are fixed³. The authors find "a surprisingly low propensity to prefer lower payoffs: people generally choose to maximize the material payoffs to others, even when these are greater than their own... It appears that people are more concerned with the aggregate social payoff or the minimum payoff received by anyone than with relative payoffs". The authors speculate that the motivational strength of relative payoffs will be greatest for local, rather than global comparisons and that negative feelings are likely to be much stronger for adverse comparisons with our immediate associates than for adverse comparisons with people who are distant in place or time. They also speculate that fairness and equity are very closely linked to the concept of local status.

³ The authors conducted a variant of the 'dictator game' in which participants make unilateral choices which have little or no effect on the chooser's own material payoff but a substantial effect on a second person's material payoff, thus affecting the chooser's relative position. Participants were undergraduate students at Barcelona university who first met each other briefly in one room and then were split into two groups on the basis of a random draw, and one of the groups was sent to a different room. While players' pairings were anonymous (players were not told which particular individual they were 'partnering'), meeting each other was important to make it credible that another real person's actual monetary payoff was dependent on a player's decision. When told that they would receive 600 and given an opportunity to select a payoff for a second person from the range of 300-1200, 74% chose 1200 and only 10% chose 600 for the other person. By opting for a low payoff (below 600) for the second person, the chooser could in principle have improved his/her own relative position.

Apart from altruism – which may operate more strongly towards local than more distant others – another reason why own happiness may be positively related to other people’s income may be due to risk-sharing within a community, i.e. others in a community may provide mutual social insurance (Ligon, Thomas and Worrall, 2002). In developing countries, there is frequently an absence of formal insurance mechanisms. This lack of formal instruments to deal with risk is particularly important in high unemployment economies and economies with high dependence on rain-fed (rather than irrigation based) agriculture. The literature on risk-sharing in developing country contexts dwells on what is the household’s insurance or risk-pooling group. Since the cost of enforcement and monitoring of contracts increases with the size of and distance between members of the group, an obvious unit in which to observe insurance is the village or neighborhood (which, in our data, corresponds roughly to a cluster). Townsend (1994) finds that the village is the relevant insurance group in rural India within which households pool risk, though others have considered alternatives. For instance, Grimard (1997) uses anthropological literature on Cote d’Ivoire to propose that the insurance group is probably not the village but rather a spatially diversified network among members of the same ethnic group⁴. While it is plausible to suppose that people pool risks within a small community – where people know each other - and thus others’ favourable outcomes would be positively related to own happiness, this is unlikely to apply within the wider geographical area, for example, the district or province.

In line with these hypotheses, we shall ask how the degree of physical proximity affects the importance of relative income, i.e. whether relative concepts matter more to an individual’s happiness when her comparison set is defined in terms of others in the locality or community than when more distant people are included in the comparison set. We shall also ask whether the sign of the relationship between others’ income and individual happiness is positive or negative, and whether and how the sign changes when the comparison set is spatially expanded.

Whether the relationship is positive or negative may depend on the relative concept being used. Helliwell (2001), citing the psychological literature, has argued that social capital (defined as “networks, norms and understandings that facilitate cooperative activities...”) can have a direct effect on subjective well-being. For instance, it is possible that social capital, or indeed education, in a community creates positive externalities for its members (if well-being is raised

⁴ Our data are from South Africa in 1993. In the racially segregated apartheid South African society, non-white households’ location – usually determined by policy makers – was based largely along race and ethnicity lines, implying little heterogeneity along race or ethnicity within most clusters. Thus, the cluster may well constitute the appropriate insurance group in South Africa.

by networking with people with higher levels of community involvement or education). On the other hand, community income might generate negative externalities if it exposes the inferiority of one's own income (Putnam, 2001).

Race and ethnicity can be one of the strongest bases of identity, possibly because of their innateness and immutability. In a society with sharp racial divisions, it is likely that people's aspirations will be linked to the states perceived to be achievable by persons of their own race. Thus, race- or ethnicity-based relativities may be important. If comparisons are made more with people of the same race than with people of other races, this is unlikely to mean that a person is more envious of people of her own race; it is more likely to mean that she sees people of her own race as providing the relevant standard for herself. Relative income can thus be referred to as 'comparison' or 'reference' income. We shall examine the importance of race-based relativities for individual happiness.

As well as exploring the importance of geographical and race-based reference groups, the paper asks whether relative income matter equally at all levels of absolute income. To the extent that happiness depends on the gratification of certain biological and physiological needs, it is not relative (Veenhoven, 1991). By contrast, Pigou (1920) reasoned that since the rich derive much of their satisfaction from relative rather than absolute income, satisfaction would not be reduced if the incomes of all rich people were diminished at the same time. In a similar vein, others have posited that, in affluent societies, spending increasingly becomes a means to achieve social status rather than to meet economic needs (Veblen, 1949), or that perceived needs change with the general level of affluence of others (Schor, 1998). Easterlin (1995) argues that absolute income levels matter up to a certain point, after which relative income increasingly matters. We shall investigate whether the importance of relative factors varies with own absolute income⁵.

Much of the economic literature on the importance of relative outcomes treats people's reference groups as given. However, these could be endogenously chosen by individuals in the pursuit of certain goals (Falk and Knell, 2000). For instance, if competition with others more successful than oneself provides the motivation for improving one's own performance and if

⁵ It is likely that the importance of relative income varies not only with the level of absolute income but also with a number of other factors. For instance, the extent to which conspicuous consumption is important may vary with religiosity (which may change life's goals to less materialistic ones), age (which may change the importance attached to conformity with others), and social capital (for more well-integrated people, 'keeping up with the Joneses' may not be as important). We do not have information on social capital and religiosity.

self-improvement is important to an individual, she will tend to choose ‘upward comparison’, i.e. her chosen reference group will be others superior to herself. On the other hand, if self-enhancement is an important goal, then the person will tend to select for comparison others who are inferior than herself as that will make her feel better (e.g. she may choose to live in a locality where most others are worse-off than herself). The feeling of relative deprivation may itself induce self-selection into particular groups, for instance via migration (Stark and Taylor, 1991). Nesse (2003) also rejects genetic and cultural determinism, namely that our ‘salient others’ are shaped by our culture and genes, and instead suggests close attention to how individuals trying to satisfy particular desires create social groups that, in turn, instill motivational structures within individuals that lead to some satisfactions and to some unending, unrewarded, striving. However, in order to analyze the endogeneity of comparator groups, one would require information on individuals’ goals, either from attitude surveys or from revealed preferences such as migration, e.g. to poor or affluent neighbourhoods. Unfortunately we do not have such information and cannot pursue this aspect further.

While much of the economic literature on comparison income is concerned with job or pay satisfaction, we are concerned with the effect of comparison income (and other relative concepts) on overall life satisfaction. We utilise a question about satisfaction with life and not with job or with pay.

The paper addresses the following five issues:

- (i) To what extent is it absolute income, to what extent relative income, and to what extent income rank that determines happiness?
- (ii) Insofar as relative concepts matter, is it only relative income that matters or are comparisons made in other dimensions as well, such as employment status or educational level?
- (iii) If relative income matters, who are the relevant others with whom people compare themselves? We explore the importance of comparator groups which, to our knowledge, have hitherto not been considered in the literature, namely race-based and space-based comparison groups. We also combine race-, education- and employment-based criteria with the spatial criterion for defining relevant comparator groups.
- (iv) Does low relative income reduce or raise happiness, i.e., does the income of relevant others enter own utility negatively or positively, and does the sign change as the

comparator group is broadened to include more distant people? We consider the potential explanations for the sign of the relationship.

- (v) Does the importance of relative income vary with absolute income, i.e. is the relationship between relative income and utility stronger at higher levels of absolute income?

2. The South African context

Our data come from the SALDRU national household survey of 1993 in South Africa carried out by the South African Labour and Development Research Unit (SALDRU) of the University of Cape Town. Patterned on the World Bank's Living Standards Measurement Studies, the dataset contains information on about 8800 households, with modules on household demographics, employment, health, income and expenditure, etc. as well as community information.

In South Africa race was the defining feature of society until the end of apartheid, with most aspects of life being governed by racial segregation. For instance, different education departments catered for the education of the four races – black, coloured, Indian, and white – and there was a marked racial hierarchy in resource allocations to schools⁶. There were restrictions on the movement and migration of non-whites and they were debarred from entering certain higher positions within firms. In such a racially divided society, race may be an even greater source of identity than elsewhere, and it is very likely that people's aspirations are or, at the time of the 1993 survey (just before the formal end of apartheid) were, linked to what they believed to be the range of states attainable for persons of their own race.

We shall test for race-relative effects in two ways: firstly, income relative to that of others of the same race within the district and, secondly, the same concept applied at the national level. In other words, we shall combine space-based and race-based criteria. in defining the relevant comparator group of a household,

⁶ For example, taking schools for non-homeland blacks as unity, per pupil funding for whites, Asians, coloureds, and blacks in 'homelands' were, respectively, 1.85, 1.61, 1.59, and 0.67 (South African Institute of Race Relations, 1997).

3. Data and method

Section 9 of the SALDRU survey is on perceived quality of life. It contains, *inter alia*, the question: “Taking everything into account, how satisfied is this household with the way it lives these days?” The five options available in the pre-coded response were ‘very satisfied’, ‘satisfied’, ‘neither satisfied nor dissatisfied’, ‘dissatisfied’, and ‘very dissatisfied’. This question forms the basis of our empirical analysis.

While an individual household respondent to the survey answered the question, the question itself related to the satisfaction of the household as a whole rather than to that individual’s personal well-being. This raises the possibility that the individual was giving the answer mostly with his own personal satisfaction level in mind rather than that of the household as a whole. In order to address this concern, we check the robustness of the findings to inclusion of the individual respondent’s own personal characteristics in the analysis. Appendix Table 1 shows that, controlling for household characteristics, individual characteristics are generally unimportant in our subjective well-being equations. This is not surprising given that the question was related to the satisfaction of the household as a whole and not that of the individual respondent. It is also unsurprising if, as is likely, there are interdependencies in perceived well-being among members of the household.

We begin with the subjective well-being function

$$W_i = \alpha + \beta X_i + \gamma Z_i + \varepsilon_i \quad (1)$$

where W_i represents reported well-being of the i th individual or household and X is a vector of socio-economic variables and Z a vector of various relative concepts (such as relative income, employment and education). Our measure of W_i is available as a multiple choice variable (effectively, “are you 1. very unhappy; 2. unhappy; 3. so-so; 4. happy; 5. very happy?”). Since there is an inherent ordering, the appropriate estimation procedure is by means of an ordered probit or logit model.

4. Results

Table 1 sets out the definitions of variables used in the analysis.

The first column of Table 2 presents a general specification of the ordered probit equation of subjective well-being. Column (2) provides our preferred, parsimonious specification, together with the marginal effects of the variables on the probability of well-being poverty, i.e. of being ‘dissatisfied’ or ‘very dissatisfied’ with life (marginal effects column). The means, standard deviations and the full set of marginal effects of the variables are in Appendix Table 2.

Province dummies are included but not reported. The variables are divided up by type. The first is a set of control variables (age and gender composition of the household). The others are variables representing money income/ assets, basic needs, social needs and security variables. In several respects, the well-being equation is quite similar to that found in other countries (Helliwell, 2002; Graham and Pettinato, 2002; Di Tella, MacCulloch, and Oswald, 2001; Winkelmann and Winkelmann, 1998): perceived well-being falls with age and then rises; is increasing in health, education and income; and falls sharply with unemployment.

What is the size of these effects? An increase in absolute household income (log of household per capita income – *lnhhpci*) from one standard deviation below to one standard deviation above the mean reduces the probability of being dissatisfied or very dissatisfied with life by 12 percentage points. Considering that overall probability of being dissatisfied/very dissatisfied is 55%, this is not a large increase. The African probability of being dissatisfied or very dissatisfied is 22.7 percentage points higher than that of whites, even after controlling for observed income, education and employment, etc. Those who live in metropolitan cities are 11.2 percentage points more likely to be in the lowest two well-being categories than are rural-dwellers. The household’s own unemployment rate has a smaller effect on the probability of being in the bottom two happiness categories than does the cluster unemployment rate. Going from one standard deviation below to one standard deviation above the household unemployment rate increases that probability by 4.1 percentage points, but doing the same for the cluster unemployment rate reduces it by 9.8 percentage points. The effects of higher education, health, crime and debt are also small, compared with the effect of household income, household assets, and race.

Geographical comparator groups

Table 3 explores the role of relative concepts in determining happiness. This is done by including, in the happiness equation, the average income, unemployment rate and years of education of households in the cluster (and the district), calculated by averaging household characteristics – e.g. income, education, and unemployment - within the cluster (and the district) but net of each household's contribution to the average. Although our usual control variables (from Table 2) and also province dummies and community characteristics (*impass* and *pubtran*) are not shown, all equations standardise for these variables. *Column (a)* presents the parsimonious specification from the last column of Table 2, where household's own income and unemployment rate are included as well as the cluster unemployment rate.

The household's absolute income (*lnhhpci*) raises and household unemployment rate (*hhurateb*) depresses happiness very significantly. The first relative concept we consider is relative unemployment, defined as the unemployment rate of others in the cluster and then in the district. The cluster unemployment rate (*curateb*) reduces happiness significantly, suggesting either that risk of unemployment lowers perceived well-being, or that the community's welfare enters the household's own utility positively, or both. *Column (b)* adds the district unemployment rate (*durateb*). This has no relationship with household happiness but the cluster unemployment rate continues to reduce household happiness significantly. The second relative concept considered is others' income. *Column (c)* adds the log of average household per capita income of the community (*lcchhpci*). This enters positively and significantly. *Column (d)* adds district average income (*lddhhpci*), and this enters negatively and weakly significantly. The final relative concept considered is others' education. *Column (e)* adds cluster and district average years of education (net of the household's contribution to the average). Cluster education (*cedyrs*) enters positively and significantly and district education (*dedyrs*) negatively but insignificantly. An interesting and consistent pattern thus emerges: within the cluster, households are altruistic or receive mutual support but within a wider area, the district, they compete with others. When all three dimensions – unemployment, education and income - are added together in *column (f)*, the locality education and unemployment rates do not matter, conditional on income. Only the income dimension is significant: income has positive spill-overs within the cluster and negative spill-overs within the district.

These are fascinating results: Within the local cluster, other people's income has positive externalities on the household's utility. Only when the comparator group is widened to include

more distant others, i.e. those in the district as a whole, do other people's incomes have negative externalities on the household's utility. The results are in line with Charness and Grosskopf's (2001) explanations of their own experimental findings. Certain other researchers have also found that small-community characteristics have a positive effect on household outcomes. For example, Narayan and Pritchett (1999) found that when they regress household incomes on social capital of the village and of the household, the entire effect is due to village-level social capital and none is due to the household's own measured social capital.

The results have three alternative potential explanations. One is that people are altruistic towards others in their own clusters, i.e. that clusters are treated like extended families, but that people compete when the geographical orbit is widened to the district. It is pertinent to note here that the cluster is a geographically small unit within which households are likely to know each other at least to some extent⁷. A second explanation is that households within a cluster share risks with each other, i.e. provide mutual insurance. As discussed in the Introduction, this would not be surprising in a high unemployment economy with little unemployment insurance such as South Africa's. A third potential explanation is that cluster income serves as a proxy for the 'social wage', i.e. in better-off clusters, the level of public and other amenities such as education, health, sanitation etc. is higher. However, we found little empirical support for the last explanation: inclusion of cluster averages of amenities such as availability of water, electricity connection, etc., as well as the cluster characteristics, showed that these variables were mostly insignificant but that cluster income remained significant⁸.

⁷ The documentation for the SALDRU survey (SALDRU, 1994) states: "The sampling frame was drawn up on the basis of small, clearly demarcated area units [clusters], each with a population estimate ...For most of the country, census ESDs [Enumeration Sub-Districts] were used. Where some ESDs comprised relatively large populations as for instance in some black townships such as Soweto, aerial photographs were used to divide the area into blocks of approximately equal population size. In other instances, particularly in some of the former homelands, the area units were not ESDs but villages or village groups". As a robustness test, we divided households into two groups, those living in smaller clusters (≤ 200 households) and those in larger clusters (> 200 households). The results in Table 3 are estimated on the sample of all households, i.e. living in both small and large clusters. Compared to the coefficient on the cluster mean income variable in column (c) of 0.199 (robust $t=4.0$) when all clusters are included, the coefficient increases to 0.308 (robust $t=4.6$) for the small clusters and falls to 0.058 (robust $t=0.69$) for the large clusters. That is, the positive effect of community mean income on subjective well-being exists only in smaller communities - where people are more likely to know each other - and is absent in the large clusters.

⁸ This explanation is further tested by regressing the cluster fixed effects (coefficients on the cluster dummy variables) on community amenities (Appendix Table 3). Whereas cluster average income (excluding the household's contribution to the average) is significantly positive, the cluster variables - averages of household's distance to water, iron roof, and electricity connection - are jointly insignificant. Similarly, the ten cluster and district amenity variables that are excluded in the second column of Appendix Table 3 are jointly insignificant in the first column [$F(10,299)=0.90$; p -value of F test= 0.534].

Race-based comparator groups

Next we examine the role of race-relative concepts in determining happiness, i.e. the hypothesis that the relevant comparator group for the household is other households of the same race. As stated before, systematic racial segregation in apartheid South African society made it likely that people's aspirations were linked to what they believed to be the highest states attainable for persons of their own race. We tested for race-relative effects in two ways: firstly income relative to that of others of the same race within the district and, secondly, the same concept applied at the national level.

Column (g) includes the natural log of race-specific district mean income (*lrdm_inc*). This enters negatively and has a large coefficient, though it is only weakly significant. It suggests that relative deprivation or rivalry does play a part in the determination of happiness.

Controlling for household income, the higher the income of others of the same race in the district, the lower is perceived well-being. The marginal effect (not reported) of *lrdm_inc* on the probability of being satisfied or very satisfied is -0.2145. Thus, if race-specific district mean income increases by one standard deviation above its mean (mean=5.946; sd=0.9889), the probability of being satisfied or very satisfied with life falls by a large 21.2 percentage points.

Column (h) includes the household's quintile position in the race-specific national distribution of income (*r_pciq2* to *r_pciq5*), households in the poorest race-specific income quintile (*r_pciq1*) being the base category. There is a near monotonic increase in happiness as the household's relative quintile position in the national race-specific income distribution increases and, interestingly, the household's absolute income (*lnhhpci*) falls to complete insignificance for the first time. The implication is that, for instance, a white household and an African household with the same income can differ in their subjective well-being because they belong to different race-specific income quintiles. An increase in the income of each household has its effect on happiness solely by improving its race-specific relative income. Apparently people compare themselves only with others of their own race.

Contrast this with the case where we include the household's position in the national distribution of income, rather than in the race-specific national distribution of income. This is done in *column (i)*, which includes the household's quintile position in the national distribution of income (*lpci2* to *lpci5*, the base category being households in the lowest per capita income quintile, *lpci1*). These dummy variables have small coefficients and are not at all significant,

suggesting that after controlling for own income, the household's relative position in the national distribution of income does not matter to its perceived well-being. When we include the household's position in the district distribution of income (irrespective of race), the results are very similar. In other words, in a racially divided society, the relevant others are not 'all others' in society but rather others of one's own race.

The importance of relative income was also tested by including household's rank in the national, provincial, district and cluster distributions of income (separately and then altogether), and including the household's rank in the *race-specific* distributions at the same four levels of aggregation. The results are set out in Table 4 and are similar to those above: while location-specific income rank (using any of the four definitions of location) does not matter to happiness (column 1), household's rank in the race-specific distribution matters positively at high levels of aggregation (i.e. at the national and provincial levels) in column 2. When all four race-specific income rank variables were included together, they were invariably small with insignificant coefficients. This reinforces the conclusion that feelings of relative deprivation relate mainly to others of one's race who are outside of one's local community.

Other comparator groups

Finally, we also explore the importance of two other comparator groups: (1) one's own past and (2) those seen on TV. The SALDRU survey asked the question "when you compare your situation with that of your parents, do you think you are richer, about the same, or poorer than they were?". The answer yields the variable 'parents_' which is coded as follows: richer than parents=1; the same=2; poorer than parents=3. The sample households were distributed across these categories as follows: 24% were richer, 23% were the same, and 52% were poorer than their parents. The results in Table 5 show that those who are poorer compared to their parents (assumed equivalent to one's own past) have very significantly lower subjective well-being than others.

It is also possible that the others one sees on the television provide people with the standards they then aspire to. If this is the case, and if the existence of an opulent/affluent comparator group can be proxied by the presence of a television set in the household, we would expect the dummy variable for whether or not the household has a TV to have a negative sign. Table 5 shows, however, that there is no relationship between the possession of a TV and happiness. This may suggest that people are realistic (opulent lifestyles seen on TV do not lead people to

aspire to unreachable goals) but other interpretations are also possible. If the content of South African TV in 1993 and before was mainly about whites, it may have had little relevance for blacks since it appears that people compare themselves to others of the same race. Hence we estimated the subjective well-being equations separately for blacks and whites. In the equation for blacks, the TV variable had a positive though insignificant coefficient, suggesting that TV ownership was proxying wealth. Interestingly, for whites, there *was* a negative coefficient on the TV dummy variable, though the effect of the variable was not well determined since there was little variation in the variable: only 6% of sample white households did not own a TV.

Does the importance of relative income change with absolute income?

We ask whether relative income affects subjective well-being differently among poor and non-poor households, i.e. whether the importance of relative income varies with absolute income. Households whose per capita income falls below the household supplementary level poverty-line of Rand 251 per month in 1993 – a measure of what is required for basic subsistence - are defined as ‘poor’ households and the rest as ‘non-poor’, so that the poverty variable is a 0/1 dummy. Experimentation with other poverty-lines, such as the supplementary living level (Rand 220 per month in 1993) (Julian May, 1998), makes little difference to the results. We use the split-sample approach, which is equivalent econometrically to the conventional approach of interacting the poverty dummy variable with the regressors. Table 6 presents ordered probit models of subjective well-being.

The two columns of Table 6 compare determinants of happiness for the poor and non-poor. Poverty is more detrimental to the perceived well-being of the elderly than of the young: elderly persons (aged 66 or over) are significantly happier than 36-45 year-olds only if they are above the poverty line, but poverty status does not matter much to the young (aged 16-25), who are happier than the 36-45 year-olds irrespective of whether their households are below or above the poverty line. The apparent difference in the effect of race is spurious since there are virtually no whites (only 0.58% of the poor) below the poverty line, i.e. in the base race category in the first column. Vicissitudes such as sickness (*hhdaysic*), crime (*n_victim*), and indebtedness (*debt*) matter more to the poor than they do to the non-poor. However, unemployment (*hhurate1*) matters significantly more to the non-poor than to the poor. This apparently counter-intuitive result may be due to the fact that the poor mostly live in high unemployment areas where one’s own unemployment appears less blameworthy or more acceptable because a high proportion of acquaintances are also unemployed. This explanation was tested by fitting happiness equations

separately for low and high unemployment areas; it showed that unemployment depressed perceived well-being significantly only in lower than mean unemployment rate areas (the coefficient and robust t-value of *hhurate1* in high and low unemployment areas were -0.097 (t=-1.5) and -0.399 (t=-4.0) respectively). This result is similar to that in other studies that find that the unemployed suffer less in high unemployment areas. (Clark, 2003; Kingdon and Knight, 2003; Powdthavee, 2003).

The most interesting results concern the differential effects of absolute and relative income. Log of household per capita income (*lnhhpci*) is significantly positive for the poor but not for the non-poor, for whom the coefficients on the race-specific income quintiles are significant instead, rising with the quintile⁹. For people in income-poverty, absolute income matters, but for those above the poverty line, it is relative position in the relevant income distribution that matters to perceived well-being. This may be because people's perceived 'needs' increase with income (Schor, 1998).

5. Conclusions

In this paper, we explored the role of relative income and other relative concepts in determining happiness. We considered the importance of three relative outcomes: unemployment, income and education, defining 'relevant others' with respect to physical proximity and race. We asked whether there are positive spill-overs on well-being, suggesting altruism or risk-sharing, or negative spill-over effects on well-being, suggesting standard-setting, envy, rivalry or relative deprivation. We also asked whether the importance of relative income changes with absolute income.

Our results confirm that subjective well-being is indeed partly dependent on relative outcomes. The relevant others with whom comparisons are made were defined in terms of locality and of race. The findings suggest that comparator relevance declines with distance, whether distance is measured geographically or racially.

⁹ Similar results are obtained when we divide all households into income terciles and note the results for the lowest and highest terciles.

The results show that incomes of same race persons and past incomes of own parents have a negative relationship but that incomes of others have no relationship with subjective wellbeing. This suggests that when setting goals for themselves, people look for a comparable group such as parents and those with similar demographic characteristics. Given their goals, subjective wellbeing is higher the greater the extent to which a person meets those goals. Conversely, subjective wellbeing is lower the greater the shortfall between a person's own achievement and this goal or reference standard. However, the results also suggest that people directly value the well-being of nearby others (those in the cluster). But such altruism (or mutual insurance) declines with distance. Thus, the comparator group with the negative sign in the subjective wellbeing equation is the group that is farther way in space (than the local cluster) but close in comparability (of same race). That group provides a person with the goal or reference standard to which she aspires. The greater the shortfall between own income and that standard, the less happy the individual is. Thus, a negative sign on the incomes of distant others of own race in the happiness equation does not necessarily imply relative deprivation or envy but rather that they provide the relevant standard for the individual. There is much literature in psychology and psychiatry about the utility of choosing comparator groups that spur one on without dragging one down, i.e. choosing something attainable and abandoning fruitless ventures. For envy, rivalry and relative deprivation to be plausible motivations, we would expect that incomes of *all* distant others (and not only of same race persons) should lower subjective wellbeing. While these motivations may well be present, they are unlikely to be as important an explanation of the negative relationship between relative income and subjective wellbeing as the role of aspiration towards one's reference standard.

The findings also show that the importance of relative income varies with absolute income: relative income is more important to subjective well-being at higher incomes than at lower incomes. In particular, we found absolute income to be an important determinant of the well-being of people who are below the poverty line, but relative income (defined in terms of race) to be important for those above the poverty line.

References

- Akerlof, George, "Social Distance and Social Decisions", *Econometrica* 65 (September 1997), pp.1005-1027.
- Akerlof, George and Rachel Kranton, "Economics and Identity", Paper presented to Brookings Center on Social and Economic Dynamics/MacArthur Foundation Social Interactions Networks Meeting, Washington,D.C., 9-10 April 1999.
- Akerlof, G. A. and J. L. Yellen (1990) "The Fair Wage – Effort Hypothesis and Unemployment", *Quarterly Journal of Economics*, 105, 255-84.
- Brown, G., J. Gardner, A. Oswald and J. Qian (2003) "Rank Dependence in Pay Satisfaction", paper presented at the Warwick-Brookings Conference in Washington DC, 5-6 June, 2003.
- Clark, Andrew and Andrew Oswald (1996) "Satisfaction and Comparison Income", *Journal of Public Economics*, 61, No. 3: 359-81.
- Clark, Andrew (2003) "Unemployment as a Social Norm: Psychological Evidence from Panel Data", *Journal of Labor Economics*, 21 (2003): 323-351.
- Diener, E. and R. Biswas-Diener (2000). "New Directions in Subjective Well-Being Research: The Cutting Edge", mimeo, University of Illinois.
- Di Tella, R., R. MacCulloch, and A. Oswald (2001). "Preferences over inflation and unemployment: evidence from surveys of happiness", *American Economic Review*, 91, 335-41.
- Duesenberry, James S. (1949). *Income, Savings and the Theory of Consumer Behavior*, Cambridge: University of Harvard Press.
- Easterlin, Richard (1995) "Will Raising the Incomes of all Increase the Happiness of All?", *Journal of Economic Behavior and Organization*, 27: 35-47.
- Easterlin, Richard A. (2001). "Income and happiness: Towards a unified theory", *Economic Journal*, 111, 465-84.
- Falk, Armin and Markus Knell (2000) "Choosing the Joneses: On the endogeneity of reference groups", Working Paper No. 53, Institute for Empirical Research in Economics, University of Zurich.
- Frank, Robert H. (1985) *Choosing the right pond: Human behaviour and the quest for status*, London: Oxford University Press.
- Frank, Robert H. and C R Sunstein (2001) "Cost-Benefit Analysis and Relative Position," *University of Chicago Law Review*, Vol. 68, No. 2: 323–374.

- Graham, Carol and Stefano Pettinato (2002) "Frustrated Achievers: Winners, Losers and Subjective Well-being in New Market Economies", *Journal of Development Studies*, Vol. 38, No. 4: 100-140.
- Grimard, F. (1997) "Household consumption smoothing through ethnic ties: Evidence from Cote d'Ivoire", *Journal of Development Economics*, 53: 391-422.
- Helliwell, John F. (2001). "Social capital, the economy and well-being", *The Review of Economic Performance and Social Progress*, 43-60.
- Helliwell, John F. (2002). "How's life? Combining individual and national variables to explain subjective well-being", *Economic Modelling*, 20: 331-60.
- Kingdon, Geeta and John Knight (2003) "Well-being poverty versus income poverty and capabilities poverty?", mimeo, Centre for the Study of African Economies, University of Oxford. July.
- Layard, R. (2003a) "Rethinking Public Economics: The Implications of Rivalry and Habit", mimeo, Centre for Economic Performance, London School of Economics.
- Layard, R. (2003b) "Happiness: Has social science a clue?", Lionel Robbins Memorial Lectures 2002/3, London School of Economics; 3, 4, 5 March.
- Ligon, E., J. Thomas and T. Worrall (2002) "Informal Insurance Arrangements with Limited Commitment: Theory and evidence from village economies", *Review of Economic Studies*, 69: 209-44.
- Lipset, Seymour M. (1960) *Political Man: The Social Bases of Politics*, Garden City, New York: Doubleday.
- May, Julian (1998) "Poverty and Inequality in South Africa", Report prepared for the Office of the Executive Deputy President, University of Natal.
- Narayan, D. and L. Pritchett (1999) "Cents and Sociability: Household Income and Social Capital in Rural Tanzania", *Economic Development and Cultural Change*, p.871-97.
- Nesse, Randolph (2003) "Natural selection and the elusiveness of well-being", mimeo, Department of Psychiatry and Institute for Social Research, University of Michigan, Ann Arbor. Presented at Royal Society Discussion Meeting, 19-20 Nov. 2003.
- Pigou, A.C. (1920) *The Economics of Welfare*, London: Macmillan.
- Powdthavee, N.S. (2003) "Are there Regional Variations in the Psychological Cost of Unemployment in South Africa? Evidence from SALDRU93", Department of Economics: University of Warwick, manuscript.
- Putnam, R.D. (2001). "Social capital: measurement and consequences", in J.F. Helliwell (ed.), *The Contribution of Human and Social Capital to Sustained Economic Growth and Well-Being*, Ottawa: HRDC, forthcoming.

- Raphael D.D. and A.L. Macfie (1976) eds. *The Theory of Moral Sentiments*, Oxford: Clarendon Press, 1976.
- Runciman, W.G. (1966). *Relative Deprivation and Social Justice*, Berkeley: University of California Press.
- SALDRU (1994) "South Africans Rich and Poor: Baseline Household Statistics", South African Labour and Development Research Unit, School of Economics, University of Cape Town. August.
- Schor, Juliet (1998) *The Overspent American*, New York, NY: Basic Books.
- Stark, Oded and J. E. Taylor (1991) "Migration Incentives, Migration Types: The Role of Relative Deprivation", *Economic Journal*, 101(408): 1163-78.
- Townsend, R. (1994) "Risk and insurance in village India", *Econometrica*, 62(3): 539-92.
- Tsou, M. W and J. T. Liu (2001) "Happiness and Domain Satisfaction in Taiwan", *Journal of Happiness Studies*. 2001; 2(3): 269-88.
- UNDP (2000). *Human Development Report 2000*, Oxford University Press: New York.
- Veblen, Thorstein (1949) *The Theory of the Leisure Class*, London: George Allen and Unwin. Originally published 1899 by Macmillan, New York.
- Veenhoven, Ruut (1991). "Is happiness relative?", *Social Indicators Research*, 24, 1-34.
- Watson, Robert, D. Storey, P. Wynarczyk, K. Keasey and H. Short (1996) "The Relationship between Job Satisfaction and Managerial Remuneration in Small and Medium-Sized Enterprises: An Empirical Test of 'Comparison Income' and 'Equity Theory' Hypotheses", *Applied-Economics*, 28(5): 567-76.
- Winkelmann, Liliana and Rainer Winkelmann (1998). "Why are the unemployed so unhappy? Evidence from panel data", *Economica*, 65, 1-15.

Table 1
Variable Definitions

<i>Control variables</i>	
age16-25	proportion of persons within the household aged 16-25
age26-35	proportion of persons within the household aged 26-35
age36-45	proportion of persons within the household aged 36-45 (omitted category)
age46-55	proportion of persons within the household aged 46-55
age56-65	proportion of persons within the household aged 56-65
age>=66	proportion of persons within the household aged 66 and older
hhsizem	household size
hhnchild	number of children below age 16 within the household
male	proportion of males in household
migrate	whether household migrated to its current area within the past 5 years
<i>Basic needs variables</i>	
primary	proportion of household members with primary level education
junior	proportion of household members with junior level education
secondary	proportion of household members with secondary level education
higher edu	proportion of household members with higher level education
hhdaysic	total number of person days that household members were sick in the past 14 days
ironroof	Whether house has an iron roof
pipeint	Whether house has piped water internally
wdist	Distance to nearest source of water in meters
personpr	Persons per room in the house
connecte	Whether house has an electricity connection
hhurate1	household unemployment rate, i.e. proportion of household labour force participant members that are unemployed. .
	hhurate1 is undefined (missing) for households with no labour force participants, so for these households, the included variable hhurate1 takes value 0 and the indicator variable nolfpb takes the value 1. nolfpb=0 for households with >=1 labour force participant
nolfpb	
impass	whether community roads become impassable at certain times of the year
pubtran	whether community has public transport
<i>Income/assets variables</i>	
lnhhcpi	natural log of household per capita income
assetval	value of assets owned by the household, calculated as follows: $assetval = (ncar*8)+(nphone*3) + (nkettle*0.5)+(nradio*0.2)+(nfridge*5)+(nbike*1)+(nestove*0.5)+(ngstove*1)+(ntv*3) + (ngeyser*2)$, where the preface 'n' before each variable means 'number of'. Thus, ncar is number of cars, nbike means number of bikes, ntv means number of TVs, nestove is number of electric stoves and ngstove is number of gas stoves, etc
<i>Social functioning variables</i>	
african	race dummy=1 if household is of African race, 0 otherwise
colored	race dummy=1 if household is of coloured race, 0 otherwise
indian	race dummy=1 if household is of Indian race, 0 otherwise
racialm	household is a racial minority in its cluster
metropol	household lives in metropolitan city
urban1	household in urban non-metropolitan area (base category is rural)
homeland	household lives in a former 'homeland'/Bantustan
<i>Security variables</i>	
n_victim	number of times in the past 12 months that household members have been victims of crime (robbery, assault, rape, murder, and abduction and 'other')
ownship_	whether household lives in owned home
debt	whether household owes any debt: yes=1; no=0
curateb	cluster unemployment rate

Table 2
Ordered Probit of Perceived life satisfaction

	<u>Column 1</u>			<u>Column 2 (parsimonious specification)</u>			Marginal effect*
	Coeff	Robust t value		Coeff	Robust t value		
<i>Control variables</i>							
age16-25	0.322	3.7	***	0.339	3.9	***	-0.133
age26-35	0.060	1.1		0.067	1.1		-0.026
age46-55	0.031	0.4		0.036	0.5		-0.014
age56-65	0.117	1.2		0.128	1.2		-0.050
age>=66	0.253	2.3	**	0.266	2.4	***	-0.104
hhsizem	-0.014	-1.2		-0.018	-1.6		0.007
hhnchild	0.051	2.9	***	0.052	3.1	***	-0.020
male	0.000	0.0					
migrate	0.213	2.1	**	0.213	1.9	*	-0.084
<i>Basic needs variables</i>							
primary	-0.031	-0.4					
junior	-0.036	-0.6					
secondary	0.018	0.3					
higher edu	0.199	2.2	**	0.218	2.8	***	-0.086
hhdaysic	-0.005	-2.3	**	-0.005	-2.2	**	0.002
ironroof	-0.123	-2.0	**	-0.120	-1.9	*	0.047
pipeint	-0.047	-0.4					
wdist	0.000	0.8					
personpr	-0.023	-1.1					
connecte	0.041	0.6					
hhurate1	-0.152	-3.2	***	-0.145	-3.0	***	0.057
nolfpb	-0.010	-0.2		0.001	0.0		-0.001
impass	-0.072	-1.2		-0.057	-0.9		0.023
pubtran	0.103	1.7	*	0.107	1.7	*	-0.042
<i>Income/assets variables</i>							
lnhhcpi	0.105	5.2	***	0.110	5.0	***	-0.043
assetval	0.014	5.4	***	0.014	5.9	***	-0.006
<i>Social functioning variables</i>							
african	-0.597	-5.3	***	-0.576	-5.0	***	0.227
colored	-0.225	-2.0	**	-0.228	-1.9	*	0.087
indian	-0.193	-1.8	*	-0.209	-2.0	**	0.080
racialm	0.246	2.7	***	0.249	2.6	***	-0.099
metropol	-0.244	-1.9	*	-0.291	-2.8	***	0.112
urban1	-0.212	-2.2	**	-0.251	-3.0	***	0.097
homeland	0.103	1.0					
<i>Security variables</i>							
n_victim	-0.091	-2.3	**	-0.089	-2.3	**	0.035
ownership_	0.079	1.8	*	0.097	2.2	**	-0.038
debt	-0.065	-1.6	*	-0.062	-1.5		0.024
curateb	-0.581	-3.2	***	-0.529	-2.7	***	0.208
Province	yes			yes			
LogL	-11111.19			-11117.50			
Restr. LogL	-12199.69			-12199.69			
Pseudo R^2	0.0892			0.0887			
N	8279			8279			

* Marginal effect of a variable on the probability of being dissatisfied or very dissatisfied.

Table 3
Community, comparison and subjective well-being

	(a)		(b)		(c)		(d)		(e)	
	Coeff	Robust t	Coeff	Robust t	Coeff	Robust t	Coeff	Robust t	Coeff	Robust t
higher	0.218	2.8 ***	0.218	2.8 ***	0.199	2.7 ***	0.190	2.5 ***	0.199	2.6 ***
hhdaysic	-0.005	-2.2 **	-0.005	-2.2 **	-0.005	-2.0 **	-0.005	-2.0 **	-0.005	-2.2 **
ironroof	-0.120	-1.9 *	-0.120	-1.9 *	-0.103	-1.6	-0.098	-1.6	-0.114	-1.9 *
hhurate1	-0.145	-3.0 ***	-0.145	-3.0 ***	-0.179	-3.6 ***	-0.178	-3.6 ***	-0.160	-3.2 ***
nolfpb	0.001	0.0	0.001	0.0	-0.009	-0.2	-0.012	-0.2	-0.009	-0.2
lnhhpci	0.110	5.0 ***	0.110	4.9 ***	0.091	4.2 ***	0.093	4.2 ***	0.102	4.6 ***
assetval	0.014	5.9 ***	0.014	5.9 ***	0.013	5.6 ***	0.013	5.6 ***	0.014	5.7 ***
african	-0.576	-5.0 ***	-0.576	-5.1 ***	-0.468	-4.1 ***	-0.460	-4.0 ***	-0.524	-4.5 ***
colored	-0.228	-1.9 *	-0.228	-2.0 **	-0.093	-0.8	-0.090	-0.8	-0.178	-1.5
indian	-0.209	-2.0 **	-0.209	-2.0 **	-0.148	-1.4	-0.145	-1.4	-0.193	-1.9 *
racialm	0.249	2.6 ***	0.249	2.6 ***	0.222	2.6 ***	0.217	2.6 ***	0.244	2.6 ***
metropol	-0.291	-2.8 ***	-0.290	-2.6 ***	-0.364	-3.2 ***	-0.304	-2.7 ***	-0.374	-3.3 ***
urban1	-0.251	-3.0 ***	-0.251	-2.9 ***	-0.290	-3.1 ***	-0.276	-3.1 ***	-0.320	-3.5 ***
n_victim	-0.089	-2.3 **	-0.089	-2.3 **	-0.092	-2.4 ***	-0.090	-2.3 **	-0.088	-2.3 **
ownship_	0.097	2.2 **	0.097	2.2 **	0.117	2.8 ***	0.118	2.8 ***	0.084	1.9 *
debt	-0.062	-1.5	-0.062	-1.5	-0.057	-1.4	-0.059	-1.4	-0.063	-1.5
<i>Relative concepts</i>										
curateb	-0.529	-2.7 ***	-0.533	-2.2 **	-0.130	-0.5	0.103	0.4	-0.362	-1.4
durateb			0.006	0.0	-0.032	-0.1	-0.402	-0.9	-0.112	-0.3
lcchhpci					0.199	4.0 ***	0.284	4.1 ***		
lddhpci							-0.132	-1.7 *		
cedyrs									0.050	1.9 *
dedyrs									-0.011	-0.4
Controls+	Yes		Yes		Yes		Yes		Yes	
Province	Yes		Yes		Yes		Yes		Yes	
Log L	-11117.50		-11117.50		-11092.12		-11087.37		-11104.77	
Pseudo R^2	0.0887		0.0887		0.0908		0.0912		0.0896	

Note: Variable definitions as in Tables 1 and as follows: durateb=district unemployment rate; lcchhpci=log of mean cluster income excluding income of index household; lddhpci= log of mean district income excluding income of index household; ccedyrs=cluster mean of the household average years of education excluding index household; ddedyrs= district mean of the household average years of education excluding index household; d_pciq2 etc.= district per capita income quintile; lrdm_inc=natural log of district mean of household per capita income of index household's race; r_pciq2 etc.=per capita income quintile of the national distribution of income for the index household's race.

+Control variables include age, hhsizem, hhchild, and migrate, as well as impass and pubtran. Column (a) here repeats results from the parsimonious specification column (2) of Table 2. N = 8279 ; Restricted LogL = -12199.69

Table 3 (continued)
Community, comparison and subjective well-being

	(f)		(g)		(h)		(i)	
	Coeff	Robust t	Coeff	Robust t	Coeff	Robust t	Coeff	Robust t
higher	0.184	2.5 ***	0.189	2.5 ***	0.167	2.1 **	0.186	2.5
hhdaysic	-0.005	-2.0 **	-0.005	-1.9 *	-0.005	-1.9 *	-0.005	-1.9
ironroof	-0.103	-1.7 *	-0.113	-1.8 *	-0.097	-1.5	-0.097	-1.5
hhurate1	-0.181	-3.7 ***	-0.189	-3.7 ***	-0.188	-3.7 ***	-0.201	-4.0
nolfpb	-0.016	-0.3	-0.024	-0.5	-0.015	-0.3	-0.027	-0.5
lnhhpci	0.091	4.2 ***	0.104	5.3 ***	0.010	0.3	0.104	3.5
assetval	0.013	5.5 ***	0.014	5.7 ***	0.013	5.2 ***	0.013	5.5
african	-0.452	-3.9 ***	-0.617	-4.0 ***	-0.710	-5.8 ***	-0.466	-4.3
colored	-0.082	-0.7	-0.203	-1.5	-0.250	-2.0 **	-0.081	-0.7
indian	-0.153	-1.5	-0.198	-1.7 *	-0.236	-2.2 **	-0.135	-1.3
racialm	0.220	2.6 ***	0.214	2.5 ***	0.205	2.3 **	0.209	2.3
metropol	-0.341	-3.0 ***	-0.344	-3.1 ***	-0.329	-2.8 ***	-0.325	-2.8
urban1	-0.305	-3.4 ***	-0.278	-3.1 ***	-0.277	-3.1 ***	-0.278	-3.0
n_victim	-0.089	-2.3 **	-0.093	-2.4 ***	-0.095	-2.4 ***	-0.093	-2.4
ownship_	0.109	2.7 ***	0.114	2.7 ***	0.101	2.4 ***	0.108	2.6
debt	-0.060	-1.5	-0.059	-1.4	-0.058	-1.4	-0.060	-1.5
<i>Relative concepts</i>								
curateb	0.107	0.4						
durateb	-0.421	-0.9						
lcchhpci	0.278	3.3 ***	0.296	5.2 ***	0.260	4.6 ***	0.263	4.6
lddhpci	-0.161	-1.7 *	0.003	0.0	-0.069	-1.2	-0.070	-1.2
ccedyrs	0.006	0.2						
ddedyrs	0.020	0.6						
Lrdm_inc			-0.170	-1.9 *				
r_pciq2					0.105	2.2 **		
r_pciq3					0.105	1.8 *		
r_pciq4					0.276	3.6 ***		
r_pciq5					0.319	2.8 ***		
lpciq2							-0.060	-1.3
lpciq3							-0.073	-1.1
lpciq4							-0.026	-0.3
lpciq5							-0.069	-0.7
Controls+		Yes		Yes		Yes		Yes
Province		Yes		Yes		Yes		Yes
Log L		-11083.20		-11081.38		-11080.52		-11089.09
Pseudo R^2		0.0913		0.0917		0.0917		0.0910

Table 4
Coefficient on the variable ‘Household’s rank’ in the income distribution within each geographical area

Geographical area	Rank in the distribution of income within the geographical area	Rank in the <i>race-specific</i> distribution of income within the geographical area
National	0.0013 (0.6)	0.0056* (3.7)
Provincial	0.0034 (1.8)	0.0050* (3.7)
District	-0.0009 (-0.7)	0.0016 (1.2)
Cluster	-0.0018 (-1.6)	0.0008 (0.7)

Note: t-values in parentheses. The basic preferred specification was used from Column 2 of Table 2 and then the household’s rank in the national, provincial, district and cluster distributions of income were included as an extra explanatory variable, one at a time. Similarly with the household’s position in the race-specific distributions of income at each of the four levels of aggregation.

Table 5
Subjective well-being: Exploring the importance of other comparator groups

	With Dummy variable 'TV'			With variable 'Parents_'		
	Coeff	Robust t		Coeff	Robust t	
<i>Control variables</i>						
age1625	0.339	3.9	***	0.313	3.5	***
age2635	0.068	1.2		0.061	1.0	
age4655	0.039	0.5		0.043	0.6	
age5665	0.129	1.2		0.115	1.2	
age_66	0.266	2.4	***	0.284	2.6	***
hhsizem	-0.019	-1.7	*	-0.020	-1.8	*
hhnchild	0.053	3.1	***	0.050	2.9	***
migrate	0.214	2.0	**	0.217	2.0	**
<i>Basic needs variables</i>						
higher	0.218	2.8	***	0.179	2.3	**
hhdaysic	-0.005	-2.2	**	-0.004	-1.9	*
ironroof	-0.120	-1.9	*	-0.139	-2.3	**
hhurate1	-0.145	-3.0	***	-0.130	-2.7	***
nolfpb	0.001	0.0		-0.013	-0.3	
<i>Income/assets variables</i>						
lnhhpci	0.109	4.8	***	0.079	3.5	***
assetval	0.013	5.5	***	0.012	5.2	***
<i>Social functioning variables</i>						
african	-0.583	-4.9	***	-0.617	-5.4	***
colored	-0.238	-2.0	**	-0.273	-2.3	**
indian	-0.218	-2.0	**	-0.283	-2.9	**
racialm	0.248	2.6	***	0.236	2.5	***
metropol	-0.298	-2.9	***	-0.278	-2.7	***
urban1	-0.258	-3.2	***	-0.234	-2.9	***
<i>Security variables</i>						
n_victim	-0.087	-2.2	***	-0.081	-2.0	**
ownship_	0.097	2.2	**	0.067	1.6	
debt	-0.063	-1.5	*	-0.068	-1.7	*
Urateb	-0.525	-2.6	***	-0.508	-2.6	***
TV	0.040	0.8				
Parents_				-0.256	-11.6	***
province		Yes		Yes		
N		8279		8244		
LogL		-11116.82		-10926.585		
Restr LogL		-12199.69		-12148.927		
Psuedo R^2		0.0888		0.1006		

Note: Province dummies included as well as cluster controls (impass and pubtran).

Table 6
Subjective well-being, by poverty status

	Below poverty line		Above poverty line	
	Coeff	Robust t	Coeff	Robust t
<i>Control variables</i>				
age1625	0.272	2.3 **	0.348	3.3 ***
age2635	0.141	1.1	0.022	0.4
age4655	-0.070	-0.4	0.060	0.7
age5665	0.178	1.0	0.088	0.7
age_66	0.128	0.6	0.362	2.5 ***
hhsizem	-0.010	-0.9	-0.008	-0.4
hhnchild	0.045	2.4 ***	0.043	1.5
migrate	0.150	2.0 **	0.196	1.7 *
<i>Basic needs variables</i>				
higher	0.039	0.1	0.169	2.3 **
hhdaysic	-0.008	-2.9 ***	-0.001	-0.4
ironroof	-0.039	-0.7	-0.152	-1.8 *
hhurate1	-0.117	-2.1 **	-0.345	-3.5 ***
nolfpb	0.031	0.5	-0.052	-0.5
<i>Income/assets variables</i>				
lnhhpci	0.071	2.2 ***	-0.087	-1.0
assetval	0.018	4.5 ***	0.011	4.1 ***
<i>Social functioning variables</i>				
african	-0.089	-0.3	-0.920	-5.7 ***
colored	-0.042	-0.1	-0.328	-2.1 **
indian	-0.048	-0.1	-0.262	-2.1 **
racialm	-0.012	-0.1	0.304	2.8 ***
metropol	-0.494	-3.4 ***	-0.265	-1.9 *
urban1	-0.178	-1.8 *	-0.264	-2.1 **
<i>Security variables</i>				
n_victim	-0.188	-3.1 ***	-0.039	-0.8
ownship_	0.127	2.0 **	0.048	1.0
debt	-0.080	-2.0 **	-0.054	-1.0
<i>Relative income variables</i>				
lcchhpci	0.164	2.1 **	0.259	4.2 ***
lddhhpci	0.029	0.4	-0.030	-0.4
r_pciq2	0.072	1.3	0.071	0.8
r_pciq3	0.038	0.6	0.149	1.3
r_pciq4	0.103	1.0	0.449	3.3 ***
r_pciq5	--	--	0.536	2.7 ***
province	Yes		Yes	
N	4142		4137	
LogL	-5301.9212		-5641.9665	
Restr LogL	-5540.3536		-6238.7515	
Pseudo R^2	0.0430		0.0957	

Note: Province dummies included as well as cluster controls (impass and pubtran). Poverty line used is the Household Supplementary Level, which was Rand 251 per month in 1993.

Appendix Table 1
Subjective well-being equation with individual respondent's personal characteristics

	Parsimonious Equation from Table 4 (a)		(a) with personal characteristics of the household respondent (b)	
	Coeff	Robust t	Coeff	Robust t
<i>Control variables</i>				
age16-25	0.339	3.9 ***	0.267	2.9 ***
age26-35	0.067	1.1	0.020	0.3
age46-55	0.036	0.5	0.084	1.1
age56-65	0.128	1.2	0.200	1.8 *
Age>=66	0.266	2.4 ***	0.331	2.7 ***
hhsizem	-0.018	-1.6	-0.012	-1.0
hhnchild	0.052	3.1 ***	0.044	2.5 ***
migrate	0.213	1.9 *	0.218	2.0 **
<i>Basic needs variables</i>				
higher	0.218	2.8 ***	0.250	2.8 ***
hhdaysic	-0.005	-2.2 **	-0.005	-2.2 **
ironroof	-0.120	-1.9 *	-0.114	-1.8 *
hhurate1	-0.145	-3.0 ***	-0.140	-2.7 ***
nolfpb	0.001	0.0	0.013	0.2
impass	-0.057	-0.9	-0.062	-1.0
pubtran	0.107	1.7 *	0.111	1.8 *
<i>Income/assets variables</i>				
lnhhcpi	0.110	5.0 ***	0.115	5.1 ***
assetval	0.014	5.9 ***	0.015	6.2 ***
<i>Social functioning variables</i>				
african	-0.576	-5.0 ***	-0.566	-5.0 ***
colored	-0.228	-1.9 *	-0.210	-1.8 *
indian	-0.209	-2.0 **	-0.197	-1.9 *
racialm	0.249	2.6 ***	0.247	2.6 ***
metropol	-0.291	-2.8 ***	-0.300	-2.8 ***
urban1	-0.251	-3.0 ***	-0.255	-3.2 ***
<i>Security variables</i>				
n_victim	-0.089	-2.3 **	-0.092	-2.3 **
ownship_	0.097	2.2 **	0.099	2.3 **
debt	-0.062	-1.5	-0.061	-1.5
curateb	-0.529	-2.7 ***	-0.542	-2.8 ***
r_age			-0.010	-1.9 *
r_agesq			0.000	1.3
r_edyrs			-0.006	-0.5
r_edyrsq			0.000	0.1
r_male			-0.021	-0.6
r_empld			0.003	0.1
Province		yes		yes
LogL		-11117.50		-10984.71
Restr LogL		-12199.69		-12063.84
Pseudo R^2		0.0887		0.0895
N		8279		8190

Note: r_age and r_agesq are respondent's age and its square; r_edyrs and r_edyrsq are respondent's years of education and its square; r_male is gender and r_empld whether the respondent is employed or not.

Appendix Table 2
Means, standard deviations, and detailed marginal effects of variables,
using parsimonious specification of Table 2

	Descriptive		Marginal effects on probability of being			
	Mean	s.d.	Very dissatisfied	dissatisfied	satisfied	Very satisfied
<i>Control variables</i>						
age16-25	0.198	0.244	-0.094	-0.039	0.089	0.032
age26-35	0.186	0.282	-0.018	-0.008	0.017	0.006
age46-55	0.083	0.194	-0.010	-0.004	0.009	0.003
age56-65	0.059	0.166	-0.035	-0.015	0.034	0.012
Age>=66	0.051	0.158	-0.073	-0.031	0.069	0.025
hhsizem	4.562	2.984	0.005	0.002	-0.005	-0.002
hhnchild	1.849	1.963	-0.014	-0.006	0.014	0.005
migrate	0.117	0.310	-0.059	-0.025	0.056	0.020
<i>Basic needs variables</i>						
higher	0.075	0.218	-0.060	-0.025	0.057	0.021
hhdaysic	3.002	6.378	0.001	0.001	-0.001	0.000
ironroof	0.561	0.496	0.033	0.014	-0.031	-0.011
hhurate1	0.218	0.357	0.040	0.017	-0.038	-0.014
nolfpb	0.156	0.363	0.000	0.000	0.000	0.000
impass	0.387	0.487	0.016	0.007	-0.015	-0.005
pubtran	0.731	0.443	-0.030	-0.012	0.028	0.010
<i>Income/assets variables</i>						
lnhhcpi	5.578	1.412	-0.030	-0.013	0.029	0.010
assetval	9.558	13.216	-0.004	-0.002	0.004	0.001
<i>Social functioning variables</i>						
african	0.746	0.435	0.140	0.087	-0.145	-0.070
colored	0.076	0.266	0.068	0.019	-0.059	-0.018
indian	0.029	0.169	0.063	0.018	-0.054	-0.017
racialm	0.103	0.304	-0.063	-0.036	0.064	0.028
metropol	0.283	0.450	0.085	0.028	-0.075	-0.025
urban1	0.220	0.414	0.074	0.023	-0.065	-0.021
<i>Security variables</i>						
n_victim	0.115	0.356	0.025	0.010	-0.023	-0.008
ownship_	0.650	0.477	-0.027	-0.011	0.025	0.009
debt	0.447	0.497	0.017	0.007	-0.016	-0.006
curateb	0.324	0.237	0.146	0.061	-0.138	-0.050

Appendix Table 3
OLS regression of cluster fixed effects on cluster/district variables

	Coeff	t value		Coeff	t value
pub_tran	-0.021	-0.2		-0.002	0.0
distrans	-0.004	-1.2			
numfaci	0.001	0.3		0.001	0.2
disfaci	0.000	1.5			
impass	-0.085	-1.0		-0.080	-1.0
tarroad	0.021	0.2			
wcape	0.535	3.8 ***		0.640	4.9 ***
ncape	1.047	4.1 ***		1.076	4.4 ***
ecape	0.330	2.1 **		0.403	2.8 ***
natal	0.493	3.4 ***		0.595	4.4 ***
ofs	0.383	2.2 **		0.303	1.8 *
etvl	0.551	3.1 ***		0.524	3.1 ***
ntvl	0.425	2.5 ***		0.459	2.8 ***
nw	0.118	0.7		0.090	0.6
homeland	0.065	0.5		0.111	1.0
metropol	-0.349	-2.2 **		-0.268	-2.0 **
urban1	-0.251	-2.2 **		-0.171	-1.8 *
c_wdist	0.000	0.9			
c_ironroof	-0.135	-1.1			
c_electri	0.015	0.1			
c_personp	-0.126	-1.6		-0.158	-2.2 **
c_cedyrs	0.006	0.1			
ddedyrs	0.060	1.2			
curateb	0.218	0.6			
durateb	-0.472	-1.0			
lcchhpci	0.311	2.7 ***		0.293	3.9 ***
lddhpci	-0.162	-1.3		-0.013	-0.2
cons	-0.399	-0.7		-0.876	-1.7 *
N		327			332
Adjusted R-square		0.2614			0.2654
Mean of dependent var		0.8235			0.8235

Note: Dependent variable is the coefficient on cluster dummies in the ordered probit equation of subjective well-being, using parsimonious specification of Table 2, last column. The cluster variables cwdist, cironroof and celectri are jointly insignificant. Similarly, all the 10 variables excluded in the second column are jointly insignificant in the first [F(10,299)=0.90; p-value of F test=0.534]. All the variables are defined in Table1 except for the following: the prefix C stands for 'cluster'. Thus, c_wdist is the cluster average of distance to water, c_ironroof is cluster average of the 0/1 variable whether the family home has an iron roof, c_electri is cluster average of the 0/1 variable whether the household has electricity, and so on.