

CSAE WPS/2007-19

A Multidimensional Analysis of Adaptation in a Developing Country Context

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November, 2007

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Abstract: Econometric analyses of European datasets suggest that income aspirations increase with current income. This finding is consistent with the adaptation hypothesis – the notion that individual aspirations adjust to reflect personal circumstances and living conditions. We add to these existing studies in two ways: we investigate the relationship between aspirations and living conditions within a developing country rather than a developed country context, thereby extending the analysis to individuals with considerably poorer living conditions; and we expand the analysis to look not only at income but also at educational and health aspirations. Like earlier studies we find that income aspirations increase with both the individual's own actual income and the incomes of those around them. We also find a positive relationship between actual and aspired to education. However, with respect to health, we find that people aspire to more rather than less health when surrounded by others who are ill.

Key words: adaptation, aspirations, poverty, well-being, education, health

JEL classification: D60, I10, I20, I31

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1. Introduction

Following the work of Easterlin (1974; 1995; 2001), economists have become increasingly interested in the psychological phenomenon of adaptation. Using the language of economists, the hypotheses relating to adaptation state, first, that individuals' subjective well-being depends not only on their current circumstances but also on their aspirations and, second, that, in turn, these aspirations depend on their own past circumstances and the circumstances of those in their reference group, where the latter is usually defined as those living in the same neighbourhood.¹ Evidence supporting these hypotheses has been presented by Stutzer (2004) using Swiss survey data on individuals' subjective well-being, actual and aspired to income levels and personal characteristics and by Burchardt (2005) and Krause (2005) using similar data from the UK and Germany respectively. However, the literatures on welfare functions and income adequacy (e.g., van Praag, 1968, 1971, van Praag and Kapteyn, 1973, Chan, Ofstedal, and Hermalin, 2002), the income elasticity of poverty (e.g., Kilpatrick, 1973, Rainwater, 1974), and subjective poverty lines (e.g., Groedhart et al. 1977, Colastanto et al. 1984, Danziger et al. 1984, Kapteyn et al., 1985, 1988, Stanovnik, 1992, Kapteyn, 1994) can also be viewed as presenting evidence of adaptation as they focus on the relationship between individuals' actual incomes and their responses to questions eliciting the income level below which they could not make ends meet, a measure that could be viewed as a lower bound on their income aspirations. Indeed, in some of these papers the authors refer to 'an adaptation process' when describing how the income that an individual perceived as the minimum required to make ends meet adjusts downwards following a negative income shock (e.g., Groedhart et al., 1977, p. 514) and describe individual wants in the

¹ Early discussions about the economic implications of adaptation can be found in Mill (1861) and Karl Marx's analysis of what has later come to be known as 'false consciousness' (both discussed in Qizilbash, 2006a and Sen, 2006a). Well known conceptual and theoretical contributions have been made by Elster (1982; 1983) and Bowles (1998). For further references see Clark (2007) and Qizilbash (2006b).

same way that aspirations are described in the second hypothesis above (e.g., Kapteyn et al., 1988).

That the adaptation hypotheses are now finding survey-based empirical support, should be of particular interest to researchers in development, not least of all because of the role these hypotheses play in Sen's and Nussbaum's rejection of the utility metric in favour of the capability approach to assessing the well-being of the poor (for a concise overview of the argument and implications for theories of well-being, see Crocker, 1992 and Qizilbash, 2006b; important contributions include Sen, 1985, 1987, 1992, 2006b; Nussbaum and Glover, 1995; Nussbaum and Sen, 1993; Nussbaum, 2000; 2001). However, to many, the apparent salience of this evidence may be diminished by the exclusive focus on income, the most contended indicator of poverty status due to it being seen merely as a means to an end rather than as having intrinsic value in and of itself (e.g. Sen, 1999; Nussbaum, 2000). Further, with the exception of Stanovnik's (*op. cit.*) work on subjective poverty lines in Slovenia and Chan et al's (*op. cit.*) work on income adequacy among the elderly in Taiwan and Singapore, all of these empirical studies use representative survey data from the high income countries of northern Europe and the US.² Here, we address these issues, first, by investigating adaptation as it relates not only to income but to two other dimensions of well-being, namely education and health, and second, by using data from three low income, rural communities in South Africa.

As a result of extending the analysis to these two other dimensions of well-being, we identify an anomaly: while the relationships between individuals' income and educational aspirations (the latter being assumed to relate to their offspring as all of our respondents are adults) and their own and others' current incomes and education accord with the

² Biswas-Diener and Diener (2001, 2006) and Westaway (2006) surveyed members of Calcutta's poorest communities, homeless people in the US, and the inhabitants of an informal housing settlement in South Africa in order to assess the life satisfaction of individuals living in poverty. However, they do not test the adaptation hypotheses. Similarly, while Pradhan and Ravallion (2000) estimate subjective poverty lines using consumption adequacy data for Nepal and Jamaica, their data does not allow them to directly investigate the relationship between individuals' actual consumption and the consumption levels that they deem adequate. This notwithstanding, they do find that in Nepal any given level of consumption is less likely to be deemed adequate, the greater the average level of consumption in the respondent's cluster, i.e., geographical neighbourhood.

second hypothesis stated above; in the case of health, we identify a significant relationship bearing the opposite sign. To be precise, individuals who are surrounded by others in poor health, instead of having lower health aspirations as adaptation theory would predict, have significantly higher health aspirations. Due to a number of empirical problems that we cannot address given our data, we can only state that our findings relating to income and education are consistent with rather than providing strong support for adaptation. Further, because we have no information relating to the duration of the respondents' reported illnesses, we cannot rule out the possibility that those in ill health do adapt. However, we can with some conviction say that people do not adapt in response to the health status of those around them.

Following this introduction, Section 2 sets out our analytical framework, Section 3 introduces our data, Section 4 presents the results of our analysis, Section 5 discusses these results, and Section 6 concludes.

2. Analytical Framework

Our empirical objective is to test the hypotheses that individuals' income, educational, and health aspirations relate positively to their own circumstances and the circumstances of those around them. To the extent possible given our data, we apply the methodology developed by Stutzer (2004) for investigating income aspirations. Using two years of data relating to the same representative sample of Swiss individuals, Stutzer estimated a model of the form $Y_{i,t}^* = f(Y_{i,t-1}, \bar{Y}_{-i,t}, W_{i,t})$, where $Y_{i,t}^*$ is the income aspiration of individual i in period t , $Y_{i,t-1}$ is the income of individual i in period $t-1$, $\bar{Y}_{-i,t}$ is the average income of those in individual i 's reference group in period t , and $W_{i,t}$ is a vector of individual i 's personal characteristics, and tested two adaptation hypotheses: that income aspirations increase with past income, $\delta Y_{i,t}^* / \delta Y_{i,t-1} > 0$; and that income aspirations increase with the average income of the reference group, $\delta Y_{i,t}^* / \delta \bar{Y}_{-i,t} > 0$. We have just one year of data and so can only estimate a model of the form

$Y_{i,t}^* = f(Y_{i,t}, \bar{Y}_{-i,t}, W_{i,t})$, where $Y_{i,t}$ is the income of individual i in period t . For this reason, we are careful throughout our analysis not to infer causality from our empirical findings. Bearing this in mind, with respect to adaptation theory as it applies to income we test the following two hypotheses:-

1. people's income aspirations, $Y_{i,t}^*$, relate positively to their current individual income, $Y_{i,t}$, (controlling for the incomes of others in their reference group, $\bar{Y}_{-i,t}$, and their own individual characteristics, $W_{i,t}$), i.e.,

$$Y_{i,t}^* = f(Y_{i,t}, \bar{Y}_{-i,t}, W_{i,t}) \text{ and } \frac{\partial Y_{i,t}^*}{\partial Y_{i,t}} > 0;$$

2. people's income aspirations, $Y_{i,t}^*$, are also positively related to the average income of those in their reference group, i.e.,

$$\frac{\partial Y_{i,t}^*}{\partial \bar{Y}_{-i,t}} > 0.$$

Acceptance of hypotheses 1 and 2 would imply that our data is consistent with adaptation and that the conclusions of Stutzer and others generalize to low income countries.

Then, we apply the same approach in order to test whether our data is consistent with adaptation in educational aspirations. Here, we test the following two hypotheses:-

3. people's educational aspirations (for their children) $E_{i,t}^*$ are positively related to their actual educational attainment $E_{i,t}$ (controlling for the education of others in their reference group, $\bar{E}_{-i,t}$, and their own individual characteristics $W_{i,t}$), i.e.,

$$E_{i,t}^* = e(E_{i,t}, \bar{E}_{-i,t}, W_{i,t}) \text{ and } \frac{\partial E_{i,t}^*}{\partial E_{i,t}} > 0;$$

4. and people's educational aspirations $E_{i,t}^*$ are also positively related to the average educational attainment of those in their reference group, i.e.,

$$\frac{\delta E_{i,t}^*}{\delta \bar{E}_{-i,t}} > 0.$$

Finally, we apply the approach in order to test whether our data is consistent with adaptation in health aspirations. Here, our two hypotheses are as follows:-

5. people's health aspirations $H_{i,t}^*$ are positively related to their actual health $H_{i,t}$ (controlling for the health of others in their reference group, $\bar{H}_{-i,t}$, and their own individual characteristics $W_{i,t}$), i.e.,

$$H_{i,t}^* = h(H_{i,t}, \bar{H}_{-i,t}, W_{i,t}) \text{ and } \frac{\delta H_{i,t}^*}{\delta H_{i,t}} > 0;$$

6. and people's health aspirations $H_{i,t}^*$ are also positively related to the health of those around them, i.e.,

$$\frac{\delta H_{i,t}^*}{\delta \bar{H}_{-i,t}} > 0.$$

3. Data

Our data is taken from the Essentials of Life Survey (ELS), administered verbally in South Africa in 2001 by Clark and Qizilbash with the assistance and support of the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town (see SALDRU, 2001; Clark and Qizilbash, 2007). The primary aim of the ELS was to explore individuals' values, beliefs, and attitudes relating to a wide array of dimensions of poverty and well-being. Here, we restrict our attention to income, education and health, all of which featured prominently in ELS responses to questions

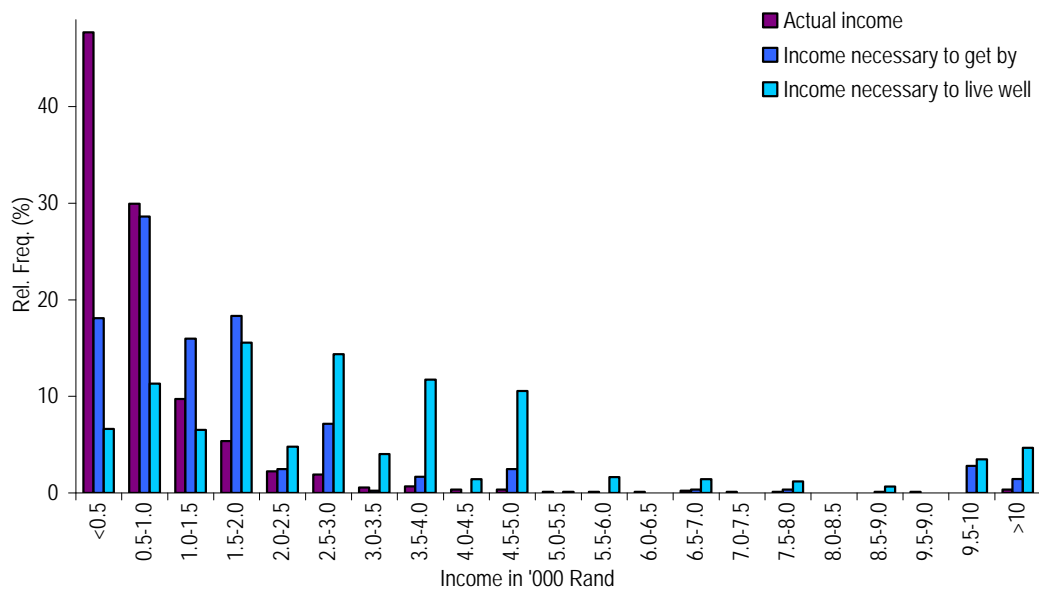
about the most subjectively important dimensions of well-being.³

The ELS involved just over 1,000 respondents distributed across three communities (see Clark and Qizilbash, 2007). The communities were purposively selected to be distinct from one another. Thus, one (Murraysburg) is a magisterial district in the Western Cape province, very close to the boarder with the Northern and Eastern Cape provinces, consisting of a small town and sparsely populated farmland, another (KwuNonqaba) is a township adjacent to Mossel Bay in the Southern Cape region of the Western Cape Province, and the third (Khubus) is an isolated village in the Northern Cape. The samples of respondents within each community were representative, although the sample intervals varied (1:2 in Murraysburg; 1:4 in KwaNonqaba; and 1:3 in Khubus). Importantly for our purposes, within both Murraysburg and KwuNonqaba the respondents were drawn from 9 and 17 census enumeration areas (EAs) respectively, while Khubus is treated as a single EA in the census.⁴ In our analysis we use EAs to define each respondent's reference group. While this is likely to be variably appropriate depending on whether a respondent lives in the centre or on the edge of an EA, travels out of his or her EA to work, and so on, the EAs have the merit of being exogenously defined.

Our measures of the surveyed individuals' income, education, and health aspirations are derived from their responses to the following questions: 'How much income per month do you think a person needs to (a) just get by and (b) live well?'; 'Which of the following is necessary for a person to (a) just get by and (b) live well – no schooling, one to three years of education, four to six years of education, seven to nine years of education, nine to twelve years of education, twelve to fifteen years of education, more than fifteen years of education?'; and 'Which of the following is necessary for a person to (a) just get by and (b) live well – complete use of senses and limbs, use of most senses and limbs, limited use of senses and limbs, very little use of senses and limbs (see SALDRU, 2001).

³ The first of these allows us to articulate our work with the empirical studies cited above. There is considerable consensus about the importance of the second and third in the philosophical literature on human well-being and development (see for example Saith 2001; Alkire, 2002; Clark, 2002, ch.3; Hulme and McKay, 2007). All three are dimensions of the human development index (see Jahan, 2003; Sen, 2006a).

None of these questions refer explicitly to the responding individuals' aspirations. However, we propose that their responses to the 'get by' and 'live well' questions can be interpreted as the lower and upper bounds on their aspirations respectively and assume that both will be correlated with their corresponding aspirations as a result.⁵ Thus, we have two continuous variables to use as proxies for income aspirations and two ordered categorical variables to use as proxies for both education and health aspirations. The survey also provides data on the surveyed individuals' actual incomes, educational attainments, and health status and a number of other variables that we use as controls.



Notes: All categories are exclusive of the lower limit and inclusive of the upper limit. The up-down pattern in the two aspiration variables is due to the respondents' tendency to choose round numbers.

Figure 1: Individual monthly income: Aspirations and actual amounts

⁴ In all three locations, EAs were defined in line with the 1996 Census boundaries. In Kwanonqaba one EA (1200106) consisting of a brand new and largely unpopulated housing development was excluded.

⁵ In as much as they refer to a third party rather than the responding individual, these questions have more in common with the Gallup poll question 'What is the smallest amount of money a family of four (husband, wife, and two children) needs each week to get along in this community?' analyzed by Kilpatrick (1973) and Rainwater (1974) than with the questions that generated data analyzed by Groedhart et al. (1977), Colastanto et al. (1984), Danziger et al. (1985), Kapteyn et al., (1985, 1988), Stanovnik (1992), Kapteyn (1994), all of which related to the income level that the respondent personally considered to be absolutely minimal, i.e., below which *they* could not make ends meet. Stutzer's (2004) income aspiration variable was derived from a request of the form 'Please try to state what income per month (before tax) for your entire household you consider to be sufficient' (p. 94). Note also that, while all of the questions described in this footnote relate to a household, the ELS question relates to an individual.

Table 1: Means and proportions of aspiration variables and corresponding actuals

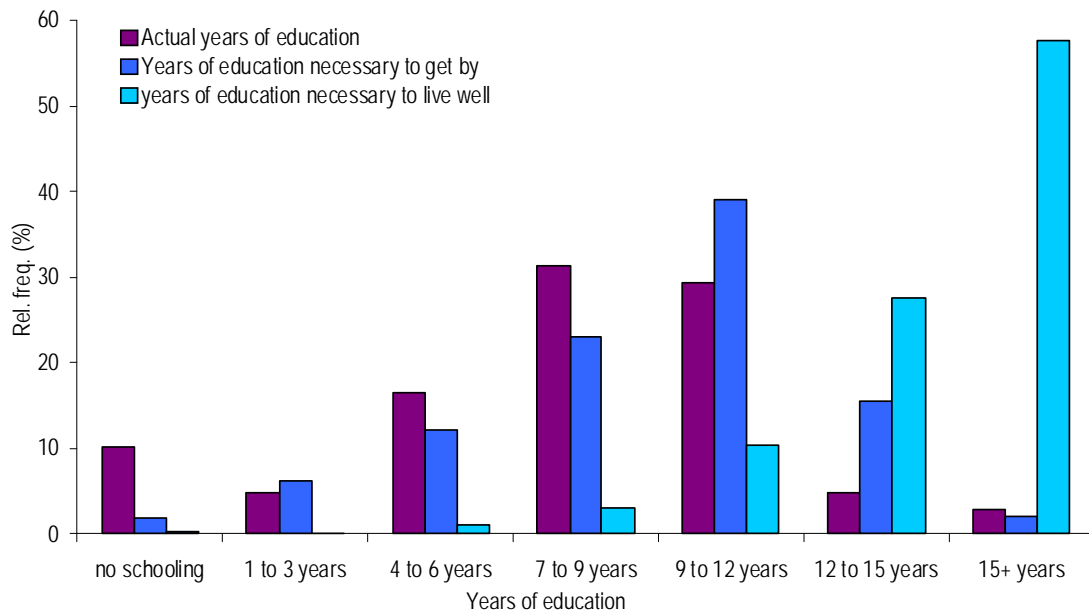
Variable	Obs.	Mean	s.d.
Actual individual income ('000 Rand per month)	895	0.74	1.42
Individual income necessary to get by ('000 Rand per month)	895	2.00	3.16
Individual income necessary to live well ('000 Rand per month)	895	3.95	5.75
With insufficient income to get by according to their own criterion	895	78%	
With insufficient income to live well according to their own criterion	895	93%	
Actual education (years of school attendance)	882	7.85	4.13
Years of schooling necessary to get by ¹	882	9.11	3.42
Years of schooling necessary to live well ¹	880	14.38	2.41
With insufficient education to get by according to their own criterion ²	882	46%	
With insufficient education to live well according to their own criterion ²	880	92%	
Actual health: Free from serious health problem and disability	809	0.70	
Actual health: days free from illness in the past fortnight	832	13%	2.78
Health necessary to get by: very little use of senses and limbs		3%	
limited use of senses and limbs		8%	
use of most senses and limbs		41%	
complete use of senses and limbs		49%	
Health necessary to get by: very little use of senses and limbs		3%	
limited use of senses and limbs		1%	
use of most senses and limbs		3%	
complete use of senses and limbs		93%	
complete use of senses and limbs		93%	

Notes: 1-means calculated by assigning mid point of chosen category to each respondent; 2-proportion of respondents whose actual years of education fall below the lower limit of the category they chose when stating their aspiration.

Aspirations and actual conditions compared

Before turning to our regression analyses and hypothesis tests, it is useful to compare the distributions of the aspiration variables with those of the corresponding actuals. Figure 1 presents a histogram of the respondents' actual individual monthly incomes (darkest, purple bars), the levels of monthly incomes they think necessary to get by (royal blue bars), and the levels of monthly income they think necessary to live well (lightest, blue bars). The distribution of actual individual incomes has one mode at zero to R500. In contrast, the distribution of individual incomes necessary to get by has a dominant mode

between R500 and R1,000 and the distribution of individual incomes necessary to live well has a dominant mode at R1,500 to R2,000. Further, as we move from actual, to necessary to get by, to necessary to live well, not only the modes but the distributions as a whole shift towards higher levels of income.



Note: The aspirational questions were, in some cases, ambiguous about the inclusiveness of the upper and lower limits of each category. For actual years of education, all categories are exclusive of the lower limit and inclusive of the upper limit.

Figure 2: Actual education and education necessary to get by and live well

This ranking is also reflected in the means reported in Table 1, which are R740, R2,000, and R3,950 for actual and necessary to get by and live well monthly individual income respectively. Finally, if we compare these three variables for each of the respondents, one at a time, we find that, according to their own criterion, 93 percent do not have enough to live well and 78 percent do not even have enough individual income to get by.

These descriptive statistics differ markedly from those reported by Stutzer in relation to the Swiss data. There, average actual income was greater than both average minimum and average sufficient income.⁶ While previous studies have, principally been studying

⁶ Our findings align more closely with those of Pradhan and Ravallion (2000) who found that, in Nepal and Jamaica respectively, 42 to 59 percent and 20 to 42 percent of respondents considered their consumption of at least one major category of goods or services inadequate.

adaptation among the relatively well off, we are studying adaptation among a group of individuals for whom reality, in terms of their incomes at least, does not reach even the lower bound of their aspirations.

Figure 2 presents a histogram of educational aspirations and attainments. The survey data indicates precisely how many years of education each respondent attained. The mode of actual years of education attained is at 7 to 9 years; the mode for years of education necessary to get by is at 9 to 12 years; and the mode for years of education necessary to live well is at 15 or more years, although considerable variation remains. In this case, the shift towards higher levels of educational attainment as we move from actual, to necessary to get by, to necessary to live well is marked. In Table 1 we take the midpoint of the educational categories chosen by each respondent as a point estimate and thereby construct the sample mean years of education necessary to get by and live well. These are 9.1 years and 14.4 years respectively, compared to the mean actual years attained (a continuous variable) of 7.9 years. Finally, according to their own criterion, 46 percent of the respondents believe they do not have sufficient education to get by and 92 percent believe that they do not have sufficient education to live well. So, here once again we see evidence of a large proportion of individuals living a reality that does not reach even the lower bound of their aspirations.

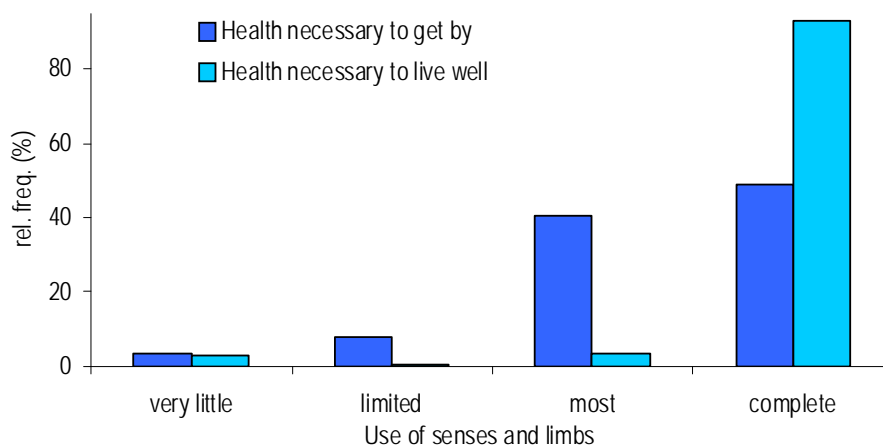


Figure 3: Freedom from disability necessary to get by and live well

Our data on actual and aspired to health are not matched in the same way as the data on

income and education and so they cannot be graphed together. Recall that our proxies for health aspirations are derived from the respondents' answers to questions about the degree of freedom from disability that they considered necessary to get by and live well. The frequencies with which the respondents chose each of the four levels of freedom from disability with reference to getting by and living well are reported in Table 1 and plotted in Figure 3. When considering the degree of health necessary to get by, the large majority of the sample was quite evenly divided between 'use of most' and 'complete use' of senses and limbs (41 and 49 percent respectively), while there was almost full agreement (93 percent) that, in order to live well, an individual needed complete use of their senses and limbs.

We have two measures of the respondents' actual health. The first relates to whether they reported a serious health problem or disability during the survey interview. Table 2 shows that 70 percent of the respondents reported no serious health problem or disability, while the remaining 30 percent reported a wide variety of problems that are likely to be variably disabling. When testing hypotheses we use a dummy variable indicating freedom from serious health problems or disabilities as an indicator of long run health.

Table 2: Major health problems and days free of illness

	frequencies	percentages	days of health in last 2 weeks
Free from serious health problem or disability	565	70%	13.41
With a serious health problem or disability	244	30%	11.29
heart problem	15		
blood pressure	68		
diabetes	12		
cancer	1		
tuberculosis	18		
eczema	1		
respiratory problem	39		
sight/hearing problem	17		
physical handicap	22		
mental health problem	2		
Other	49		

Our second measure of the respondents' actual health is the number of days free of illness that they experienced during the two weeks prior to the survey interview. This short run

measure is strongly related to the long run measure of health: Figure 4 shows the distributions of days free from illness for those who did and did not report a serious health problem. While 83 percent of those without serious health problems (lighter yellow bars) experienced 14 days free from illness, only 43 percent of those with serious health problems or disabilities (darker orange bars) were illness free. The relationship between the short and long run measures of health is also reflected in the means reported in the final column of Table 2, which are significantly different according to both a rank-sum and a t-test (0.01% level). Given the mismatch between our actual and aspiration measures for health, we cannot establish which and how many of the respondents have levels of health that, according to their own criterion, are sufficient to get by or live well.

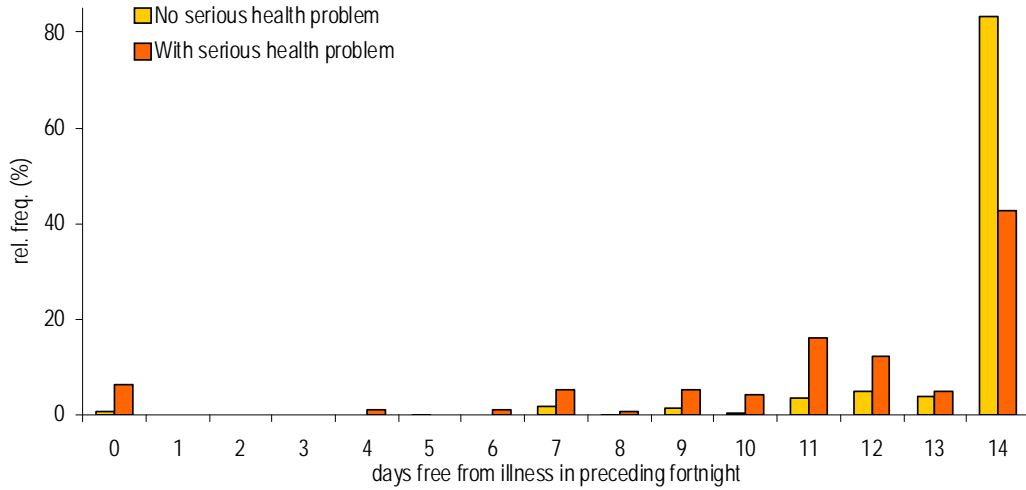


Figure 4: Days free from illness in the preceding fortnight for those with and without serious health problems or disabilities

Finally, before testing our hypotheses we also need to define the vector of control variables, $W_{i,t}$. In the regressions presented below we use a vector of 15 control variables, the names, definitions, means, and standard deviations of which are presented in Table 3. Seven of the variables relate to the individual. These include their age, sex, employment status, religiousness, whether they are the resident household head, how many different types of organization they belong to, and how many friends they have. Four relate to the households in which they live. These include the number of resident household members, the proportion of children (under 16 years) in the household, the proportion of elderly

(over 49 years) in the household, and an index of the apparent wealth of the household. Finally, we take account of the respondents' location, i.e., whether they live in Murraysburg, KwaNonqaba, or Khubus. In the regressions, Murraysburg is treated as the basis for comparison and dummy variables indicate location in one of the others. We do not control for race in the regressions because race and location are closely related in the ELS sample; all the KwaNonqaba respondents are black and all but 12 percent of the Murraysburg respondents and all the Khubus respondents are coloured according to official classifications, although the residents of Khubus are indigenous being related to the Nama, while the coloured respondents in Murraysburg are of mixed racial origins. Given this close link between location and race, we cannot distinguish race effects from location effects in our regressions and including both would lead to problems of multicollinearity. Readers may choose to view the coefficients on the location dummies as race effects.

Table 3: Names, definitions, means, and standard deviations of control variables

variable	definition	Obs.	Mean	s.d.
Age	age of respondent in years	940	40.18	15.08
Female	=1 if respondent female	944	0.52	0.50
Married	=1 if respondent married or cohabiting	940	0.44	0.50
Employed	=1 if respondent is employed	937	0.40	0.49
Religious	=1 if respondent gave a religious affiliation	935	0.92	0.27
Head	=1 if respondent is residential household head	929	0.59	0.49
Memberships	number of types of organization the respondent belongs to (0-4)	916	0.88	0.88
Friends	number of close friends	928	2.79	3.65
Household	number of people living in household including respondent	944	3.40	2.22
Children	proportion of other household members who are aged under 16	912	0.18	0.29
Elderly	proportion of other household members who are aged over 49	897	0.14	0.27
Wealth	normalized index of wealth based on housing characteristics and durables	874	0.00	1.00
Murraysburg	=1 if respondent lives in Murraysburg	929	0.32	0.47
KwaNonqaba	=1 if respondent lives in KwaNonqaba	929	0.61	0.49
Khubus	=1 if respondent lives in Khubus	929	0.06	0.25
Black	=1 if respondent is black	908	0.64	0.48
Coloured	=1 if respondent is coloured	908	0.36	0.48

4. Regression analyses

Income

Table 4 presents the regression analyses relating to our two proxies for income aspirations. Prior to conducting the analyses, we take the natural logs of the respondents'

income aspirations and own actual incomes. We use the mean of the log for each respondent's reference group. Taking logs has two beneficial effects; it normalizes the income distributions, thereby improving the power of our hypothesis tests, and makes it easier to interpret estimated coefficients. We then conduct two linear regressions, one for each of the income aspiration variables adjusting the reported standard errors to account for possible non-independence within EAs and heteroscedasticity relating to any of the right hand side variables. The log of actual individual income and the EA average log income are the right-hand side variables of interest, although the regressions also include all the control variables described above as well as the respondents' actual years of education and days free from illness during the preceding two weeks.

Table 4: Regression analysis of income aspirations

Dependent variable	Ln(Individual income necessary to get by)		Ln(Individual income necessary to live well)	
	Coeff.	s.e.	Coeff.	s.e.
<i>Log individual income</i>	0.125	0.048 **	0.098	0.053 *
<i>Ref. group average log income</i>	0.914	0.345 **	0.391	0.246
<i>Actual education</i>	0.015	0.006 **	0.026	0.009 ***
<i>Days free of illness</i>	0.002	0.008	-0.001	0.011
<i>Age</i>	0.000	0.001	0.000	0.002
<i>Female</i>	-0.051	0.054	-0.074	0.055
<i>Married</i>	0.028	0.039	0.000	0.049
<i>Employed</i>	-0.055	0.042	-0.025	0.044
<i>Religious</i>	-0.050	0.062	0.006	0.079
<i>Head</i>	0.019	0.043	0.014	0.057
<i>Memberships</i>	0.014	0.018	0.001	0.029
<i>Friends</i>	0.017	0.007 **	0.010	0.004 ***
<i>Household</i>	0.013	0.012	0.011	0.015
<i>Children</i>	0.042	0.057	0.132	0.088
<i>Elderly</i>	-0.029	0.078	-0.123	0.068 *
<i>Wealth</i>	0.041	0.023 *	0.049	0.028 *
<i>KwaNonqaba</i>	0.286	0.090 ***	0.385	0.091 ***
<i>Khubus</i>	0.329	0.045 ***	0.593	0.064 ***
<i>Constant (linear)</i>	0.087	0.192	0.650	0.197 ***
R-squared	0.258		0.207	
Obs.	646		646	

Notes: Robust standard errors reported. * sig. at 10% level; ** sig. at 5% level; *** sig. at 1% level.

Both of the regressions provide support for the hypothesis that individual income aspirations are positively related to individual current actual income, while only income

necessary to get by appears positively related to EA average income.⁷ Interestingly, in the income necessary to get by regression, while the coefficients on the two right-hand side variables of interest are similarly significant, the coefficient on the EA average is over seven times the size of the coefficient on own income: a ten percent increment in own income is associated with a 1.2 percent increase in the income an individual considers necessary to get by, whereas a ten percent increment in the average income of the reference group is associated with a 9.1 percent increase in the same aspiration proxy. A ten percent increment in own actual income is associated with a slightly lower increase of one percent in the income an individual considers necessary to live well.

Few of the control variables bear significant coefficients, although those that do are worthy of note. First, the *Wealth* variable bears a positive and significant coefficient in both regressions, possibly because it is capturing the individual's income earning potential over the longer run. Second, actual *Education* bears a positive and significant coefficient in both regressions, possibly because education generates income aspirations that individuals cannot always realize in the South African labour market.⁸ Third, the *Friends* variable bears a positive and significant sign in both regressions, possibly because individuals with larger circles of friends are more likely to include richer individuals among those friends and hence their reference group. Finally, income aspirations are higher in KwaNonquaba and Khubus, possibly because local labour market conditions and other aspects of the wider socio-economic environment impact on individual aspirations.⁹

⁷ The positive relationship between income aspirations and average EA income does not, at first glance, accord with the findings of Kingdon and Knight (2006). If income aspirations are positively related to incomes in an individual's reference group, in a regression taking subjective well-being as its dependent variable and own and mean reference group incomes as right hand side variables with other control for aspirations, we would expect mean reference group income to proxy for aspirations and, thus, bear a negative coefficient. In Kingdon and Knight's analysis EA average income bears a positive coefficient. However, Kingdon and Knight also include mean incomes for race groups in their models and these bear negative coefficients. The EAs in our sample are race-homogenous, while this is not the case for a significant proportion of the EAs in Kingdon and Knight's sample. So, the same effect may be being identified in different way in each of the analyses.

⁸ If it is indeed the case that education leads to higher income aspirations, psychologists would refer to this as 'feedforward' (for a discussion, see Frederick and Lowenstein, 1999).

⁹ That, after controlling for other factors, income aspirations in Khubus and KwaNonquaba are statistically indistinguishable, while those in Murraysburg are lower, suggests that we are not identifying a race effect.

Education

Table 5 presents the regression analyses relating to our two proxies for educational aspirations. Here, we took the mid point of range relating to each category and 16 years if the respondent indicated more than 15 years as the dependent variable in a linear regression.¹⁰ Once again, the reported standard errors are adjusted to account for possible non-independence within EAs and for heteroscedasticity relating to any of the right hand side variables. The respondents' own actual years of education and the EA average years of education are the right-hand side variables of interest, although the regressions also include all the control variables described above as well as the respondents' actual incomes (logged) and their days free from illness during the preceding two weeks.

Table 5: Regression analysis of educational aspirations

Dependent variable	Education necessary to get by		Education necessary to live well	
	Coeff.	s.e.	Coeff.	s.e.
<i>Actual education</i>	0.251	0.047 ***	0.161	0.031 ***
<i>Ref. group average years of educa.</i>	0.440	0.279	0.149	0.109
<i>Log individual income</i>	-0.086	0.416	0.074	0.199
<i>Days free of illness</i>	-0.103	0.030 ***	-0.073	0.022 ***
<i>Age</i>	-0.020	0.014	-0.003	0.009
<i>Female</i>	0.237	0.257	-0.097	0.218
<i>Married</i>	0.104	0.224	-0.163	0.194
<i>Employed</i>	-0.172	0.293	0.135	0.230
<i>Religious</i>	-0.441	0.514	-0.143	0.413
<i>Head</i>	0.383	0.314	-0.121	0.216
<i>Memberships</i>	-0.100	0.255	-0.380	0.067 ***
<i>Friends</i>	0.099	0.032 ***	-0.008	0.022
<i>Household</i>	0.077	0.085	0.020	0.060
<i>Children</i>	-0.148	0.582	0.468	0.306
<i>Elderly</i>	-0.440	0.669	-0.143	0.417
<i>Wealth</i>	-0.246	0.141 *	0.188	0.101 *
<i>KwaNonqaba</i>	-1.781	1.117	-1.106	0.537 **
<i>Khubus</i>	-0.158	0.669	-0.305	0.324
<i>Constant (tobit)</i>	6.543	1.700 ***	14.213	0.687 ***
Obs.	646		645	

Notes: Robust standard errors reported. * sig. at 10% level; ** sig. at 5% level; *** sig. at 1% level.

Both of the regressions provide support for the hypothesis that educational aspirations are

¹⁰ We also conducted interval tobit regressions and found that they returned qualitatively indistinguishable and quantitatively very similar results. However, the interval regression algorithms in Stata9 and Stata10 returned no standard error relating to the coefficient on Age, suggesting that the relative inefficiency of the interval regression was a problem given our data.

positively related to actual education. An increase of four years in actual education is associated with a one year increase in the amount of education an individual views as necessary to get by and an 8.5 month increase in the amount of education an individual views as necessary to live well. The coefficient on the EA average educational attainment is insignificant in both regressions.

Once again, a few of the control variables bearing significant coefficients are worthy of note. First, the health indicator, *Days free from illness*, bears a negative and highly significant coefficient in both regressions; those suffering ill health aspire to higher levels of education than those in good health. This is consistent with the notion of ‘compensating abilities’, discussed by Qizilbash (1997). Second, individuals from wealthier households believe that less education is necessary to get by and more is necessary to live well; it appears that they consider education to be more of a luxury and less of a necessity than their poorer compatriots. *Friends*, once again, bears a positive and significant coefficient in the ‘get by’ regression, while *Memberships* bears a significantly negative coefficient in the ‘live well’ regression. Finally, residents of KwaNonqaba indicated that significantly less education was necessary to live well.

Health

Table 6 presents the regression analyses relating to our two proxies for health aspirations. Here, we present two regressions for each proxy, one including *Days free from illness* for the respondents and the corresponding EA means and the other including the dummy variable indicating whether the respondents are *Free from chronic health problems* and the corresponding EA proportion as the right-hand side variables of interest. Including all four of these variables in a single regression leads to problems of multicollinearity. Because the aspiration variables are categorical and do not relate to numerically defined ranges in a continuous variable the appropriate regression models are ordered probits. Once again, the reported standard errors are adjusted to account for possible non-independence within EAs and for heteroscedasticity relating to any of the right hand side variables. As before, the regressions also include all the control variables described above as well as the respondents’ actual incomes (logged) and their years of education.

Table 6: Regression analysis of health aspirations

Dependent variable	Health necessary to get by				Health necessary to live well			
	Coeff.	s.e.	Coeff.	s.e.	Coeff.	s.e.	Coeff.	s.e.
<i>Day free of illness</i>	-0.027	0.020			-0.023	0.024		
<i>Ref. group average day free of illness</i>	-0.237	0.079 ***			0.127	0.107		
<i>Free from chronic health problem</i>			-0.157	0.134			0.169	0.194
<i>Proportion of ref. group free from chronic health problem</i>			-1.174	0.614 *			1.360	1.062
<i>Log individual income</i>	0.052	0.131	0.047	0.126	0.396	0.223 *	0.436	0.223 **
<i>Actual education</i>	-0.002	0.013	-0.003	0.014	0.002	0.019	-0.003	0.020
<i>Age</i>	0.002	0.005	0.001	0.005	0.002	0.005	0.004	0.005
<i>Female</i>	-0.102	0.090	-0.096	0.089	0.147	0.168	0.164	0.167
<i>Married</i>	0.014	0.099	0.040	0.099	0.218	0.144	0.198	0.144
<i>Employed</i>	0.122	0.106	0.129	0.110	0.018	0.168	-0.033	0.176
<i>Religious</i>	0.361	0.166 **	0.380	0.164 **	-0.135	0.294	-0.117	0.306
<i>Head</i>	-0.155	0.122	-0.152	0.128	0.291	0.180	0.317	0.182 *
<i>Memberships</i>	-0.017	0.073	-0.029	0.073	-0.019	0.111	-0.025	0.107
<i>Friends</i>	0.016	0.012	0.014	0.011	0.116	0.038 ***	0.123	0.038 ***
<i>Household</i>	-0.002	0.032	-0.011	0.031	0.056	0.063	0.066	0.062
<i>Children</i>	0.094	0.317	0.081	0.303	0.202	0.337	0.136	0.341
<i>Elderly</i>	-0.257	0.129 **	-0.260	0.137 *	-0.312	0.236	-0.235	0.237
<i>Wealth</i>	-0.171	0.045 ***	-0.166	0.047 ***	-0.063	0.077	-0.048	0.081
<i>KwaNongaba</i>	-0.148	0.224	-0.029	0.256	-0.182	0.229	-0.509	0.349
<i>Khubus</i>	0.632	0.152 ***	0.551	0.130 ***	0.354	0.183 *	0.216	0.190
<i>Cut 1 (ordered probit constants)</i>	-5.016	0.985	-2.596	0.411	0.177	1.564	-0.181	0.766
<i>Cut 2</i>	-4.307	0.966	-1.919	0.393	0.243	1.558	-0.115	0.757
<i>Cut 3</i>	-2.992	1.013	-0.599	0.376	0.583	1.572	0.228	0.774
R-squared	0.044		0.041		0.075		0.078	
Obs.	646		646		645		645	

Notes: Robust standard errors reported. * sig. at 10% level; ** sig. at 5% level; *** sig. at 1% level.

None of these regressions provide support for the hypotheses relating to health aspirations specified above. None of the right-hand side variables of interest bear significant coefficients in the ‘live well’ regressions, while in both of the ‘get by’ regressions the health of the respondents’ EA enters significantly but negatively. Respondents living in EAs in which people reported more chronic health problems and fewer days free from illness in the recent past considered greater freedom from disability necessary to get by. Because it is difficult to directly infer the magnitudes of effects from ordered probits, we have used the regression in the second column of Table 6 to predict the probabilities with which a fictitious, 40 year old male, who lives in Murraysburg, is employed, free from chronic illness, and average in all other respects would have chosen

each of the possible responses to the ‘health to get by’ question had he lived, first, in the healthiest and, second, in the least healthy EA in the survey and plotted the results in Figure 6. Thus we see that had he lived in the healthiest neighbourhood (pale teal columns) his most likely response would have been that one needs the use of most of ones senses and limbs to get by, whereas had he lived in the least healthy EA his most likely response by a significant margin would have been that one needs the complete use of ones senses and limbs to get by.

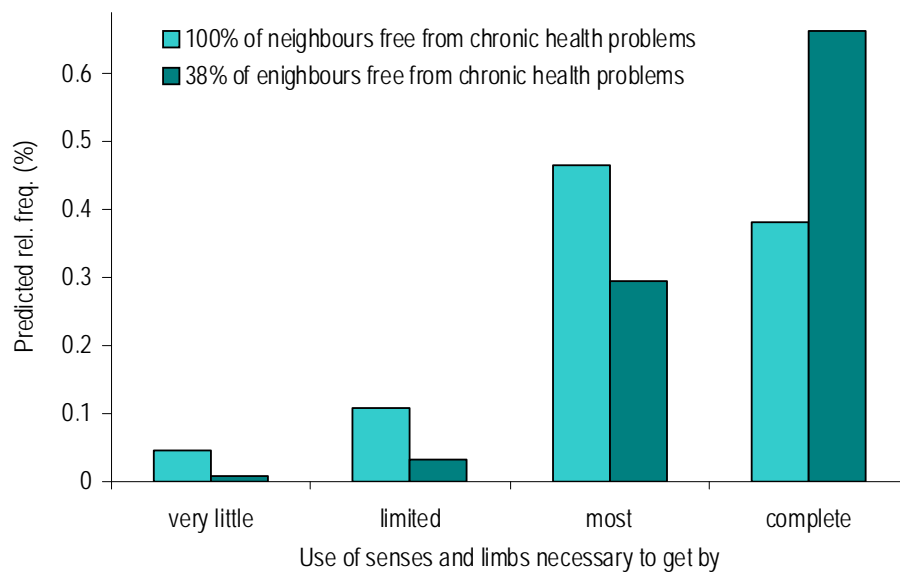


Figure 6: Fitted relationship between proportion of neighbours free from chronic illness and use of senses and limbs necessary to get by

As before, the coefficients on a few of the control variables are of interest. First, note the significant negative coefficient on *Elderly* in the ‘get by’ regressions. This could be indicative of a process of adaptation; those living with elderly people see them getting by despite the disabilities that inevitably accompany advancing years. Alternatively, it may indicate membership to a family that tends to take care of its elderly and infirm and a corresponding expectation that, if one is disabled, one will be taken care of. The significant negative coefficient on the *Wealth* variable suggests that wealthier individuals also expect to be taken care of or be able to get by in the event of disability. Strangely, this logic does not extend to the *Religious*. Here, the positive significant coefficient may be indicating that, contrary to believing that they will be taken care of, religious people

view more individual health as necessary to get by. Both higher incomes and more friends are associated with the view that greater freedom from disability is necessary to live well, although here it is important to remember the high degree of consensus in the aspiration variable and treat significant results with caution. And finally, we see that residents of Khubus aspire to significantly greater health.

5. Discussion

Our results relating to income and educational aspirations are consistent with adaptation, although, due to having only cross section data and a dearth of valid instrumental variables, we cannot rule out the possibility that, in both or either case, the respondents first aspired and then did what they could to achieve their aspirations.¹¹ In contrast, our results provide evidence that is inconsistent with the adaptation of health aspirations to the state of health of those in the respondents' reference groups. Before we accept this last finding as a basis for our conclusions, we need to ask whether it could be pure artifact, reflecting a relationship other than the one intended.

First, consider the fact that the data on actual health is self reported. What would be the implication for our analysis if these variables were poor proxies for actual health? Generally, such problems of measurement error bias estimated coefficients towards zero and insignificance. So, this could explain why the coefficient on individual health is insignificant but not why the coefficient on EA average health is significantly negative.

Second and potentially more interesting, is the possibility that the actual health status variables are, for some respondents, acting as proxies for recent declines in health, which could be leading to immediate increases in the degree of freedom from disability they consider necessary to get by, while for others it reflects a state of ill health to which they have indeed adapted.¹² This might explain why we do not see relationships between health aspirations and either of the individual actual health variables and the significant

¹¹ We are also not in a position to rule out any other explanation for our findings, although no such explanations readily spring to mind.

¹² In comparison, there is less reason to expect current income levels to be correlated with recent changes in income and educational achievements can only increase and are almost always set in early life.

negative coefficient on the proportion of elderly in the household concurs with this story. However, this argument does not reconcile our result relating to the EA averages with the aspirations hypotheses.

Third, could the mismatch in units between the actual and aspired to health variables cause the results? Had we found no evidence of a relationship, i.e., had the coefficients on all the actual health variables been insignificant in the regressions reported above, the mismatch may have been cited as a possible reason. However, it is not easy to see how the mismatch could be leading to the significant negative relationship that we identify.

And finally, could the direction of causality run from the aspiration to the actual? If it were the health status of the individual respondent that was significantly related to their aspiration, we would have had to examine this possibility carefully. Although we would expect an individual who aspires to good health and makes particular choices with respect to diet and exercise as a result, to positively rather than negatively affect their actual health status. However, it is not the individuals' actual health status that bears the significant sign, it is the actual average health status of the EA in which they live and this makes it difficult to conceive of a reverse causal link. Further, Manki's (1993) reflection problem is not a concern here as it is the individual's health aspiration and not his or her actual health that is taken as the dependent variable.

6. Conclusions

With respect to income and education we conclude that individuals in low income countries may adapt partially to low incomes and minimal educational attainments, although for many there remains a gap between their aspirations and their realities. And with respect to health, while we cannot rule out the possibility that individuals adapt to declines in their own health over time, we see evidence of a tendency for individuals to appreciate the importance of good health more when witnessing the effects of ill health on the lives of those around them.

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