Income, aging, health and wellbeing around the world:
Evidence from the Gallup World Poll

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ABSTRACT

During 2006, the Gallup Organization collected World Poll data using an identical questionnaire from national samples of adults from 132 countries. This paper presents an analysis of the data on life-satisfaction (happiness) and health satisfaction and their relationships with national income, age, and life-expectancy. Average happiness is strongly related to per capita national income, with each doubling of income associated with a near one point increase in life satisfaction on a scale from 0 to 10. Unlike previous findings, the effect holds across the range of international incomes; if anything, it is slightly stronger among rich countries. Conditional on national income, recent economic growth makes people unhappier, improvements in life-expectancy make them happier, but life-expectancy itself has little effect. Age has an internationally inconsistent relationship with happiness. National income moderates the effects of aging on self-reported health, and the decline in health satisfaction and rise in disability with age are much stronger in poor countries than in rich countries. In line with earlier findings, people in much of Eastern Europe and in the countries of the former Soviet Union are particularly unhappy and particularly dissatisfied with their health, and older people in those countries are much less satisfied with their lives and their health than are younger people. HIV prevalence in Africa has little effect on Africans' life or health satisfaction; the fraction of Kenyans who are satisfied with their personal health is the same as the fraction of Britons and higher than the fraction of Americans. The US ranks 81st out of 115 countries in the fraction of people who have confidence in their healthcare system, and has a lower score than countries such as India, Iran, Malawi, or Sierra Leone. While the strong relationship between life-satisfaction and income gives some credence to the measures, the lack of such correlations for health shows that happiness (or self-reported health) measures cannot be regarded as useful summary indicators of human welfare in international comparisons.

Keywords: World Poll, Happiness, Life-satisfaction, Health, Income, Aging, HIV, Healthcare.

1. Introduction

This paper looks at the effects of age on self-reported wellbeing in more than a hundred countries. I am particularly concerned with self-reports of life satisfaction, of health, and of disability, with how these measures change with age, and with how the effects of age differ across countries according to their level of development and their region of the world. The analysis is based on the Gallup World Poll, which collected data from samples of people in each of 132 countries during 2006; with the exception of Angola, Cuba, and Myanmar, the samples are nationally representative of people aged 15 and older. Because the survey used the same questionnaire in all countries, it provides a unique opportunity to make cross-country comparisons while, at the same time, providing enough data to permit within-country disaggregation, for example, by age, sex, ethnicity or education. In time, these data will undoubtedly support much new analytical work, but my main concern here is descriptive, exploring a range of international and national comparisons that have previously not been possible.

The World Poll data are particularly rich in self-reported measures, such as a "ladder" question for life-satisfaction, questions on whether or not people are satisfied with their state of health, whether they have health problems that prevent them from doing things that people at their age can usually do, whether or not they have confidence in the healthcare or medical system, and whether or not they are satisfied with their standard of living. While these measures are far short of those that might appear in a comprehensive health and economics survey for a single country or a group of similar countries, they have the great advantage of having been asked in exactly the same way in all of the countries. The question is not, therefore, whether these self-reports are adequate measures

of individual health—they clearly are not—but whether they provide useful measures of *population* health. In particular, it is possible that individual self-reported satisfaction or health measures are more a function of individual personality, individual temperament, or individual expectations than of any objective circumstance, but the same might not be true for the population, or for age groups within it. In consequence, one of my main objectives is to investigate the usefulness of these simple, cheap, and comparable questions as supplemental measures of population or subpopulation health.

The paper and its main conclusions are as follows. Section 2 is a theoretical discussion of age-effects and income effects on life satisfaction, where life satisfaction is interpreted as period sub-utility in the economists' standard life-cycle model of consumption. Such a formulation essentially assumes that income and happiness are positively linked, but it offers more interesting predictions about the effects of age, for example that life satisfaction should fall more rapidly with age in countries with higher adult mortality rates, for example in places with high prevalence of HIV-AIDS. Under appropriate and plausible assumptions, the theory also predicts an inverse U-shaped age-profile of utility. Section 3 provides a brief summary of what the happiness literature—including the literature in psychology—says about the relationship between happiness and age.

Section 4 turns to the World Poll data. I look first at general life-satisfaction based on a ladder question, how it varies with national income, with age, and with age at different levels of national income. Like earlier studies using a smaller range of countries, I find that the citizens of richer countries are on average more satisfied with their lives than the citizens of poorer countries. Unlike the earlier studies, this effect of income is not

confined to poor, unhappy countries, but extends right across the range, from Cambodia, Sierra Leone, Togo, Niger, and Chad, which share the unenviable distinction of being in the bottom ten countries both by income and by life-satisfaction, to Norway, Switzerland, Denmark, Australia, and Canada, which rank in the top ten according to both income and life-satisfaction. Each doubling of national income is associated with a near one unit increase in average life-satisfaction measured on an eleven point scale from 0 ("the worst possible life") to 10 ("the best possible life"). If anything, the effect of national income on national happiness is somewhat *stronger* in the rich countries than in the poor countries.

Recent growth in national income, unlike income itself, *lowers* average life-satisfaction. This result appears to be new, and contradicts much earlier literature that argues that improvements in living standards make people better-off, but that the effect wears off over time.

The pattern of life satisfaction at different ages differs according to the level of economic development. In 2006, life satisfaction was much worse among the elderly than among the young in poor and middle-income countries. By contrast, in rich countries, especially the English speaking rich countries, the elderly were relatively satisfied with their lives, sometimes more satisfied than those in midlife. The elderly in the countries of Eastern Europe and the former Soviet Union are particularly dissatisfied with their lives. I find no evidence from the 2006 cross-sections that life-satisfaction declines with age more rapidly in countries where adult mortality is particularly high.

In Section 5, I show that in almost all countries and for all age groups, satisfaction with health declines with age, and is lowest among the elderly. More interesting is the

fact that the rate of deterioration is much faster in poor than in rich countries, and in some of the richest, satisfaction with health actually *rises* toward the end of life. Reports of limiting health conditions behave similarly, worsening much more rapidly with age in poor countries than in rich. It appears that one of the benefits of being rich, or at least of living in a rich country, is that wealth slows the ravages of age on health, or at least on satisfaction with health. While satisfaction with health is higher in places where more people have confidence in their health and medical systems (or *vice versa*), confidence in the healthcare system is only weakly correlated with GDP. Particularly remarkable is the position of the largest rich country, the United States, where only 52 percent of the population express themselves satisfied with the healthcare and medical system, a figure that is not only much lower than the comparable figure in any other rich country—for example, in Britain the fraction is 63 percent—but also lower than the fractions in (to take a few examples from many) India, Iran, Sierra Leone, or Malawi. The US ranks 81st among the 115 countries for which these data were collected.

For all of the health measures, whether the average levels, or their rates of decline with age, are particularly unfavorable in Eastern Europe and the countries of the former Soviet Union. Some of the dissatisfaction with health in these countries can certainly be linked to their recent decline in health and life-expectancy. But there have been much larger declines in life-expectancy associated with the HIV/AIDS epidemic, and people in countries with high prevalence do not express anything like the same levels of dissatisfaction with their health. Indeed, the fraction of Kenyans who are satisfied with their personal health is the same as the fraction of Britons, and is *higher* than the fraction of Americans.

Section 6 discusses the usefulness of the satisfaction measures for the purpose of assessing population health and wellbeing. The ladder question on life-satisfaction is strongly correlated with per capita GDP across countries, and increases linearly with the logarithm of income in rich countries as well as poor. However, the links between life-satisfaction and life expectancy or HIV prevalence, or even between health-satisfaction and these measures, show too many anomalies to make life-satisfaction a good indicator of health and income combined. The same would be true for some combination of life satisfaction and health satisfaction. Particularly troubling is the fact that HIV prevalence appears to have little or no effect on the fraction of the population reporting dissatisfaction with their health. Using such a measure to guide or evaluate policy would lead to the surely unacceptable position that HIV/AIDS in Africa is not much of a problem.

2. Life-satisfaction, income, and age: theoretical considerations

Economists have devoted a good deal of attention to life-cycle behavior. While these theories were designed to predict the life cycle pattern of consumption, saving, and labor supply, they can also be used to think about the life-cycle pattern of utility. While it would be a mistake to take these predictions too seriously, they provide a framework for consideration and interpretation.

The life-satisfaction question in the World Poll asks people to imagine an eleven-rung ladder where the bottom (0) represents "the worst possible life for you" and the top (10) represents "the best possible life for you." Respondents are then asked to report "on which step of the ladder do you feel you personally stand at the present time." Such a

question might elicit an evaluation of the respondent's complete life, as seen from "the present time," or perhaps more likely, an evaluation of today's contribution to the lifetime stream. From a standard life-cycle perspective, complete life utility is

$$U = \sum_{0}^{T} (1+\delta)^{-t} S_t \upsilon(c_t, a_t) \qquad (1)$$

where t represents age (or time), and runs from birth (0) to death (T), δ is the rate of time preference, S_t is the survival rate, the probability of surviving from time zero to time t, and $\upsilon(c_t, a_t)$ is the instantaneous utility—or "felicity," to separate it from U—function which depends on consumption at age t and other factors a sometimes referred to as "taste shifters". I follow the standard, but by no means innocuous, assumption that utility is intertemporally additive, which allows us to talk about instantaneous and lifetime utility in a simple way. For someone currently of age t, the part of (1) from the past will be known, with the remainder an expectation. Consumption is chosen so as to maximize (1) subject to a lifetime income and wealth constraint in which money can be moved from one period to another through lending and borrowing, for simplicity at a constant real interest rate r.

In this model, income—together with initial wealth—constrains how much utility is possible, so that, by assumption, higher incomes generate higher utility, within each period, and for life as a whole. Given this economic definition of happiness, there is no ambiguity about the proposition that income makes people happier. The effects of age, here represented by t, are somewhat more interesting.

Suppose first that life-satisfaction is taken to refer to lifetime utility U. In the absence of uncertainty, lifetime utility U does not change over time. With uncertainty, U will

change from period to period in response to new information and the changes in consumption induced by that information. For example, under the assumptions of the life-cycle permanent income model, consumption follows a random walk, which will induce random changes in U. But there will be no pattern to the changes in consumption, nor in U, so that there should be no systematic change in U with age. Happiness is what *lifetime* circumstances, both past and future, make it to be, and should not change systematically with age. Unless there is perfect risk-sharing across people, consumption inequality—and under some assumptions, utility inequality—will increase with age, see Deaton and Paxson (1994).

If, instead of life time utility U, we interpret the satisfaction questions as referring to instantaneous utility or felicity, there is more scope for changes with age. Given that consumption is optimally set over the life-cycle, and taking the certainty case for simplicity, we must have

$$\upsilon_1(c_t, a_t) = \lambda (1+\delta)^t (1+r)^{-t} S_t^{-1} \tag{2}$$

where the subscript 1 denotes the partial derivative of felicity with respect to its first argument—the marginal utility of consumption—and λ is the lifetime marginal utility of wealth, which is independent of age. If the changes over time in consumption, the interest rate and the discount rate are all relatively small, (2) gives the approximation

$$\frac{\upsilon_{11}}{\upsilon_1} \Delta c_t + \frac{\upsilon_{12}}{\upsilon_1} \Delta a_t = -r + \delta - \Delta \log S_t \tag{3}$$

where Δ indicates a change over time, and double partial derivatives are shown as double subscripts. Note that the proportional change in the survival rate is approximately equal to the mortality rate, so that (3) can be rewritten

$$\frac{\upsilon_{11}}{\upsilon_1}\Delta c_t + \frac{\upsilon_{12}}{\upsilon_1}\Delta a_t = -r + \delta + m_t \tag{4}$$

where m_t is the mortality rate at age t. Note that, because we are talking about decision making about life-cycle consumption, the relevant mortality rates are those in adulthood, not childhood or infancy, and the former vary a good deal less across poor and rich countries than do the latter.

Equation (4) has a number of useful implications. The marginal utility of consumption is positive and declining ($\upsilon_1 > 0$ and $\upsilon_{11} < 0$) so that, if a is constant, consumption will rise over time in response to r and fall in response to impatience or mortality (the survival rate S_t is falling with t). In thinking about the implications for this across countries, it is hard to see why there should be any systematic relationship between the level of national income and the difference between r and the rate of time preference, but there are certainly major differences in adult mortality rates. Provided the factor υ_{11}/υ_1 does not change too much with age, the optimal lifetime choice of consumption will have faster rates of consumption decline the higher is the mortality rate; the shorter future provides an incentive to consume and be happy now or to "eat, drink, and be merry, for tomorrow we die." Since the mortality rate rises rapidly with age, the rate of consumption decline should accelerate with age to match. Of course, consumption is not utility and the change in utility depends also on what is happening to a_t.

The change in utility is given by

$$\Delta u_t = \upsilon_1 \Delta c_t + \upsilon_2 \Delta a_t \tag{5}$$

and where Δc_t and Δa_t are linked by (4). Making the substitution, and assuming for simplicity that r and δ are equal, we have

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$$\Delta u_t = \frac{\upsilon_1}{\upsilon_{11}} m_t + \left(\upsilon_2 - \frac{\upsilon_1 \upsilon_{12}}{\upsilon_{11}} \right) \Delta a_t \qquad (6)$$

The first term shows that mortality has a negative effect on the rate of decline of utility, essentially because the rate of consumption decline rises as mortality rises. To think about the second term, suppose we normalize the taste factors a so that more a is associated with higher utility. The obvious interpretation is that a measures the capacity to enjoy consumption—or individual efficiency as a utility machine. Although the life-cycle pattern of a will be chosen by the individual, at least in part, it is plausible that it would have an inverse U-shape, rising at first as people accumulate human capital, self-knowledge, and the ability to enjoy themselves—learn to be happy--and then eventually falling as the capacity to enjoy fails with age. By this view, the marginal utility of consumption is higher when a is higher, so that $\upsilon_{12} > 0$. Consumers will adapt their consumption, not to compensate for changes in a, but to take advantage of them by consuming most when a is highest; consumption is higher in those periods of life where it does the most good, in this case, in midlife. Equation (4) shows that, discounting and mortality effects apart, consumption change tracks taste change, and equation (6) shows that the effects on utility are magnified by the addition of the direct utility effects of changes in a. A similar story could be told about children, whose average numbers follow an inverse U-shape, and who directly enhance utility—although the happiness literature often disputes this, see Argyle (1999), Clark and Oswald (2002), and Layard (2005)—as well as increasing the marginal utility of consumption by providing more opportunities for the parents to spend money to enjoy themselves. Once again, instantaneous utility would be predicted to have an inverse U-shape with age.

A simple explicit example illustrates further. Suppose that we continue to assume that $r = \delta$, and that the utility function takes the form

$$U = \frac{1}{1-\rho} \sum_{0}^{T} (1+\delta)^{-t} S_t (a_t c_t)^{1-\rho} \tag{7}$$

where ρ is a parameter with $0 < \rho < 1$. The quantity a_t in (7) simply acts to augment consumption. For this specification, the rate of change of consumption with age is given by

$$\Delta \ln c_t = \frac{1}{\rho} m_t + \frac{1-\rho}{\rho} \ln a_t \tag{8}$$

while happiness—defined here as $(1-\rho)^{-1}(a_t c_t)^{1-\rho}$—changes with age according to

$$\Delta \ln u_t = \frac{1-\rho}{\rho} m_t + \frac{1-\rho}{\rho} \ln a_t \tag{9}$$

so that the effect on mortality on the rate of change of happiness is constant, and as the mortality rate rises ever more rapidly with age, the rate of decline of happiness will accelerate. At the same time, if we look across countries with different adult mortality rates, the rate of decline of happiness with age should be higher in the higher mortality countries.

3. Insights from the psychology and happiness literatures

The psychology literature takes a different approach to questions of how happiness is affected by income and by age. In particular, there is no basic assumption that income promotes happiness; income is simply one of life's many circumstances which may or may not be associated with happiness.

One thread emphasizes the importance of personality and temperament as determinants of life-satisfaction. In the most extreme version, referred to as "set-point"

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theory, people cannot be *permanently* moved from their personal happiness set-point level, and while changing life circumstances—consumption, income, and even divorce or the death of a loved one—affect life satisfaction, they do so only temporarily. If this strict version is correct, and if the distribution of temperaments is the same in different countries, we should expect to see no difference in average life-satisfaction across populations, at least with the exception of populations that have recently experienced a large positive or negative change in their circumstances. More precisely, average life satisfaction across countries should depend *positively* on *changes* in national income, but should not depend on the *level* of national income. Within countries, happiness should be independent of age.

More generally individual life-satisfaction is taken to depend on some combination of temperament and circumstance, and there has been a lively debate about which circumstances are important, and on which have permanent as opposed to merely transitory effects. For example, it is often argued that income is relatively unimportant, and relatively transitory compared with family circumstances, unemployment, or health, see Easterlin (2003). Note that even if variations in temperament are more important than circumstances at the individual level, the same need not be true of the population because temperamental differences might average out over populations, though nothing rules out national differences in temperament. If temperament does average out, population measures of life-satisfaction could be useful indicators of population wellbeing, even when they are poor measures for individuals. The conflict between concepts of capabilities or functionings, which are the measures argued for by Sen (1999), and of which health and income are the most important, is *possibly* much more severe for

individuals than for nations. By contrast, if the strict form of set-point theory is true, it is impossible to make individuals or nations permanently happier, including through the improvements in national health and national income that would increase capabilities and that are normally seen as the main goals of economic development.

The role of one particular circumstance, income, is of particular interest. Many within-country studies have found only a small effect of income on happiness relative to other life-circumstances such as employment or marital status, see for example Helliwell (2003) or Blanchflower and Oswald (2004). Kahneman et al (2005) argue that even these measures *overstate* the effects of income. They suggest that more income may do nothing for happiness, and that the observed correlation between life satisfaction and income comes from a "focusing illusion," induced by the life-satisfaction question, which prompts respondents to compare their incomes with some standard, such as their own previous incomes or with the incomes of others. It is therefore possible that, over the long run, increases in income will generate no increase in life-satisfaction. This result is consistent with the micro-level evidence from the German Socioeconomic Panel by Di Tella et al (2005), who regress life satisfaction on income and on several lags of income, and find that life-satisfaction adapts completely to income within four years. It is only income *change* that matters, not income itself. At the country level, a long-run zero effect of income is also consistent with the famous findings of Easterlin (1974, 1995) that for those countries for which we have data, happiness does not increase over long time spans, in spite of large increases in per capita income. Such theories and findings are in sharp contrast to the standard economic model developed above in which more consumption— or more lifetime wealth, or lifetime income—makes people happier.

Whether or not set-point theory works for other circumstances—such as the death of a spouse, or the permanent loss of work—the results for income suggest that there is little or no long run relationship between national income and national happiness, so that one might reasonably infer that this would also be so across countries, given that most international income differences are long established. But the evidence does not support this inference. Although the US and Japan may have failed to become happier as they grew richer, poor countries, such as India or Nigeria, are less happy than rich countries, such as the US or Japan, see for example Ingelhart and Klingemann (2000), Graham (2005), Layard (2005), or the careful and balanced survey by Diener and Oishi (2000). As Diener and Oishi note, one argument, due to Veenhoven (1991), is that more income improves happiness only until basic needs are met; beyond the point where there is enough income so that people are no longer hungry, their children do not die from readily preventable diseases, and absolute poverty has been eliminated, income does not matter for happiness. While this story seems plausible, they also note that it might be only after these basic needs have been met that the possibilities for intellectual and cultural development can be effectively explored. This is akin to Robbins' (1938) account of the Brahmin who claimed to be "ten times as capable of happiness as that untouchable over there."

Previous empirical evidence, much of which comes from waves of the World Values Survey, which comprises a sample that is mostly rich countries, with a much smaller number of poor countries, together with a larger group of countries from Eastern Europe and the former Soviet Union. The authors who have worked with these data have tended to conclude that (a) richer countries are happier, (b) the cross-country effect of income on

happiness is larger than the within-country effect of income and happiness, and (c) that among the rich countries, there is no relationship between national income and national happiness, see again Ingelhart and Klingemann (2000, Figure 7.2) and Layard (2005, page 32). Findings (a) and (c) are consistent with the basic needs story together with a set-point or adaptive model in rich countries where basic needs are met, while (b) is a consequence of the comparison between poor countries as a group and rich countries as a group. As we shall see, the results from the World Poll are very different.

The literature on the relationship between happiness and age is essentially empirical; Helliwell (2003) and Easterlin (2006) review the literature, including work that finds essentially no effect of age, work that finds that older people are happier, and work that finds a U-shaped profile over the life course. As one might expect, these results are sensitive to which other variables are controlled—health in particular—and to what role is assigned to cohort and period effects when estimating age effects, see Blanchflower and Oswald's reply (2007) to Easterlin.

4. Life satisfaction, income and age: evidence from the World Poll

Figure 1 shows a world map of the life-satisfaction measure from the 2006 World Poll data. The numbers for each individual range from 0 to 10, and the shading corresponds to the (sample weighted) averages for the 121 countries used here. The map looks similar to an income plot of the world: North America, Europe, Japan, Australasia, and Saudi Arabia are happy as well as rich, and the really unhappy places on the planet are in sub-Saharan Africa, plus Haiti and Cambodia. The only countries in the bottom twenty according to life-satisfaction and that are relatively well-off in income terms are Georgia

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and Armenia. At the other end, there are two relatively poor places in the happiness top twenty, Costa Rica and Venezuela.

Figure 2 summarizes a great deal of information, about the relationship between life satisfaction and national income, and about how that relationship changes with age, or equivalently, how the age profile of average life satisfaction varies across countries. The horizontal axis, for all plots, is per capita GDP in 2003 (the nearest year for which there is complete data) measured in purchasing power parity dollars at 2000 prices. Each circle is a country, with diameter proportional to population, and marks average life satisfaction and GDP for that country. Important countries are labeled; most of the countries of sub-Saharan Africa are on the bottom left, India and China are the two large circles near the left, the western European countries appear near the upper right, and the USA is the large country on the top right. There are also seven plotted lines on graph, only six of which are clearly visible. Each of these corresponds to an age group, 15–19, 20–29, 30–39, 40–49, 50–59, 60–69, and 70 plus. For each of these seven groups, and for each country, I calculated the average life-satisfaction. Each line is a non-parametric regression plot for one age group of its average-life-satisfaction against national per capita GDP (taken to be the same for all age groups in the country.) These lines can be thought of as a disaggregation by age of the average plot represented by the circles.

As with the map in Figure 1, life-satisfaction increases with GDP per head. The slope is steepest among the poorest countries, where income gains are associated with the largest increases in happiness, but it remains positive and substantial even among the rich countries; it is *not true* that there is some critical level of GDP per capita above which income has no further effect on happiness. Since this result is different from the earlier

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findings reviewed in the previous section, I investigate it further; there is also a brief Appendix in which I compare the results from the World Poll with those from the World Values Surveys on which the earlier results were based.

Figure 3 plots average happiness against the *logarithm* of income, and this simple transform is enough to make the relationship close to linear. Table 1 shows the results of further experiments. Column 1 shows the basic regression for the 114 countries for which we have both life-satisfaction and per capita PPP GDP from the Penn World Table. The coefficient is 0.859 with an estimated standard error of 0.051. Using the same sample, the quadratic in column (2) improves the fit only slightly; the *t*-value on the squared term is only 2.2. Note too that the quadratic term has a *positive* sign, so that the effect of log income on life satisfaction is estimated to *increase* at higher levels of income per head. Columns 3 and 4 split the sample at $12,000; Figure 2 shows that this is a level that splits the poor and middle-income countries from the rich countries. Once again, the slope in the upper income countries is higher, although it has a large estimated standard error. If we restrict the sample to the 24 countries whose per capita GDP is above $20,000, the estimated slope is 0.617 with a standard error of 0.649, which is clearly consistent both with a zero slope, and with a slope that is the same as the slope in the poor countries; visual inspection of Figure 3 shows that the latter is the more obvious conclusion. The final two columns address the same question in a slightly different way, interacting the term in log income with, first, in column (6), an indicator that per capita income is above $12,000, and then second, in column (7), an indicator that per capita income is above $20,000. In both cases, the interaction term is estimated to be positive, and is significantly different from zero in the final column.

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These results support the visual impression in Figure 3, that the logarithmic fit with a constant slope is adequate for all countries, rich or poor, and if there is any evidence for deviation, it is small and in the direction of the slope being higher among the richer countries.

It is of course possible that income is standing in for something else, such as relative income, income relative to expectations or to past income (growth), or for other variables correlated with income, of which health is plausibly the most important. Indeed, the international pattern of life-satisfaction in relation to per capita GDP is very similar to the pattern between life-expectancy and income, first documented by Preston (1975).

Table 2 investigates the growth and health stories. Column 1 regresses average life-satisfaction on the logarithm of income in 2003 and the average growth rate of income from 2000 to 2003. Note that this is mechanically equivalent to regressing life satisfaction on the logarithms of income in both 2000 and 2003, or indeed to regressing life satisfaction on the logarithm of income in 2000 and its growth from 2000 to 2003. The addition of growth to the regression does not eliminate the effect of income in levels, so that there is no evidence that the effect of income is spurious, picking up only the correlation between income and its growth rate. It is not true that only growth matters, not the level of income. Second, and more surprisingly, at any given level of income, economic growth is associated with *lower* reported levels of life-satisfaction, a result that seems inconsistent with any of the accounts in the literature. Indeed, this is one of the most puzzling and surprising results in this paper.

Note that growth from 2000 to 2003 is the change in log income divided by three, so that the regression in column 1 can also be interpreted as a levels regression in which log

income in 2003 attracts a negative coefficient, and log income in 2000 a positive one, with their sum remaining at 0.860. Essentially these data cannot tell which year's income is the most important one, a finding that is confirmed by adding further lags of log income (not shown). Yet in all of these alternative specifications, the sum of the coefficients on the lags remains roughly constant, which is consistent with life-satisfaction responding to the long-term average income, as in a permanent-income model of life satisfaction. Column (2) also shows that the precise period of income growth is not important, and that the model does just as well assigning the negative effects of growth to the three years from 2000 to 2003, or the decade from 1990 to 2000, or some combination of the two. The addition of earlier growth rates does nothing to enhance or change these results.

It is also worth noting that the coefficients on growth, even when divided by three, are larger in absolute value than the coefficient on the current level of income. This implies that a regression of life-satisfaction on lagged income and current growth will still show a negative effect of growth; the coefficient on lagged income is the same as that on current income in the original regression. This finding rules out the possibility that the negative effect of growth comes from identifying those countries whose current income overstates their long-run income, and who should therefore be less happy than those who have been richer for longer. However we count it, income makes countries happy and income growth makes them unhappy.

The countries of Eastern Europe and of the former Soviet Union have some of the lowest levels of life-satisfaction in the world, much lower than warranted by their incomes. The upheavals associated with the fall of communism are likely factors, though

they do not show up in the regressions as working through the fall in incomes, if only because these countries were not among the countries with the worst growth record from 2000 to 2003. Consideration of earlier growth rates is not possible, because many of the countries did not exist in 1990, and are therefore excluded from the regression in column (2), see the footnote to the table. But given the robustness of the estimated negative effects of growth between columns (1) and (2) it seems most likely that it is features of the transition other than declines in income that are responsible for dissatisfaction with life.

Columns 3, 4, and 5 investigate the role of life expectancy and its rate of change. Because life expectancy is the standard period measure, formed from current survival rates, it is *not* a long-term measure that changes only slowly in response to changes in the epidemiological and social environment. There were 28 countries in the sample whose life expectancies fell from 1990 to 2000. Eighteen of these are in sub-Saharan Africa—as are all of the double-digit declines—one is Iraq (sanctions and Saddam Hussein), and the other nine are countries of the former Soviet Union, including Russia itself. (Note that estimates of life-expectancy are available for these countries in 1990, although income estimates are not.) Yet the table shows that life-expectancy plays a very limited role in explaining international variations in life satisfaction. The introduction of the life-expectancy variables has only a small effect on the estimated effects of income, so that it is not true that income is standing proxy for life-expectancy. Life-expectancy itself does not show up significantly in any of the regressions, though the increase in life-expectancy from 1990 to 2000 has a significant positive effect on average life-satisfaction. The estimated coefficient is 0.047, which would exert a sizeable negative effect on life-

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satisfaction in countries in sub-Saharan Africa with large declines in life expectancy,

such as Botswana (–20 years), Zimbabwe (–19 years) or South Africa (–16 years), but

cannot explain the low levels of life satisfaction in the FSU countries where the declines

were much smaller, such as Russia (–2 years).

I have repeated the life-satisfaction and health regressions using infant and child

mortality measures instead of, and in addition to, life expectancy. These generate no new

insights, largely because of the strong interrelations between the three measures in a

single cross-section. Indeed, in the poorest and highest mortality countries, amongst

whom the variation in life-expectancy is largest, life expectancy is often imputed using

measures of infant and child mortality, so it is not surprising that the data should be

unable to separate out their effects, if indeed they exist.

Figure 2 shows that the relationship between life-satisfaction and income differs

across the age-groups or, perhaps more obviously, that the relationship between life-

satisfaction and age depends on the level of development. Most notably, among the low

and middle-income countries, reported life-satisfaction declines as people age. However,

among the rich countries, the lines come together, and eventually cross so that, among the

world's richest countries, there is no monotone relationship between life-satisfaction and

age. Figure 4 explores these regularities in more detail for the transition countries among

which there is an almost uniform picture of life-satisfaction declining with age,

sometimes quite sharply. Whatever aspects of the transition it is that make people

unhappy, the effects appear to be much more pronounced among the elderly. Perhaps it is

they who have suffered the adverse consequences of disruption, who were most satisfied

with their old lives, and who cannot expect to live long enough to see any improvements that might occur in the future. For them, there is only transition, no promised land.

Figure 5 shows similar age-profiles of life-satisfaction for the rich English speaking countries of the world. Not only are these people generally much happier than people in the previous figure, but their life-satisfaction is in most cases U-shaped in age. Because of our inability to control for cohort or period effects, we cannot tell whether these U-shapes are age-effects for people in the English speaking countries, or some mixture of period and cohort effects. The results from other countries (not shown here) suggest that there is no general (unconditional) U-shape for life-satisfaction with age in the 2006 cross-section. Not only is life-satisfaction declining with age in the countries in Figure 4, but there is also somewhat milder (and less uniform) decrease with age in Latin America. There is no systematic pattern in the countries of Africa, Asia, or Western Europe other than Britain and Ireland. The obvious explanation is that there are period or cohort effects that are specific to countries or groups of countries. The age-related decline in life-satisfaction in Eastern Europe and the FSU in Figure 4 is unlikely to be a pure age effect, but is more probably an interaction of a period effect (the transition) that was particularly hard on the elderly. In the rich English-speaking countries, the relatively high satisfaction of the elderly might be linked to the substantial intergenerational transfers from young to old in those countries, though this explanation would also hold for much of the rich world. The lack of a decline in happiness with age in sub-Saharan Africa is also hard to reconcile with its generally high rates of adult mortality though, as always, the elderly may have been less affected by the HIV/AIDS epidemic than were younger adults.

I have replicated the income results in Tables 1 and 2 by age group, and the results

are qualitatively similar to those for all age groups combined. For each of the age groups,

the level of national income is an important positive determinant of life-satisfaction, and

the rate of growth of income a negative determinant. In further work, when the individual

income numbers from the World Poll are more developed, it may be possible to use the

data to look at income distribution across age groups, or indeed to compare the within

national effects of income on happiness with those estimated here from the international

comparisons.

5. Perceptions of health, disability, and health systems

I now turn from overall life-satisfaction to satisfaction with health. World Poll

respondents are asked whether they are satisfied or dissatisfied with the state of their

personal health. The next question is whether they "have any health problems that

prevent you from doing any of the things people of your age usually do," again with a

dichotomous answer, yes or no. I refer to this as the disability question. Figures 6 (for

health satisfaction) and 7 (for disability) are drawn in the same way as Figure 2, plotting

the fraction satisfied with their health or the fraction with a disability against average per

capita income, for everyone together—the circles with diameters proportional to

population—or separately by age—the fitted nonparametric curves. In Figure 7, for

disability, the circles are drawn separately for two of the age groups, ages 30–39 (black

circles), and ages 60–70 (blue circles).

These figures show that people are less often disabled and are more likely to be

satisfied with their health in richer countries, and that, less surprisingly, they become

more disabled and less healthy as they age. As was the case for life satisfaction, the rate at which things get worse with age is greater in poor and middle income countries than in rich countries, where income seems to provide some protection against the effects of aging. Indeed, at the top right of Figure 6, the 50–59 age group is *less* satisfied with its health than is either of the two older groups. There is even a similar reversal for reported disabilities between the 50–9 and 60–9 group in Figure 7. It is most improbable that these reversals can be attributed to any objective health conditions or disabilities. Perhaps the 50–9 group is particularly intolerant of the first signs of aging.

In health satisfaction, as in life satisfaction, the countries of Eastern Europe and the FSU report extraordinary low levels. Ukraine (rank 1), Russia (3), Georgia (4), Armenia (5), Belarus (6), Moldova (8), Hungary (9), Latvia (12), Estonia (14), Romania (15), and Kazakhstan (17) are eleven of the twenty worst countries in the world in health satisfaction, ranking alongside much higher mortality countries such as Haiti (2), Rwanda (7), Uganda (10), Burundi (11), Cambodia (14), Chad (16), Benin (18), and Cameroon (19). (South Korea is 20th, for no immediately obvious reason.) In all of these countries, the fraction of people reporting themselves satisfied with their health is between a half and two-thirds, which is worth contrasting with the situation in some of countries worst-hit by the HIV/AIDS epidemic, Tanzania (70 percent), Zimbabwe (75 percent), Botswana and South Africa (both 78 percent), and Kenya (82 percent). Indeed, the percentage of Kenyans satisfied with their health is the same as the proportion of Britons, and is a percentage point higher than the fraction of Americans. While objective mortality rates have an affect on health satisfaction, at least in changes if not in levels, so do other factors, and the declines in life expectancy in the FSU have clearly had a much larger

effect on reported life satisfaction than have the much larger declines in life expectancy in the African countries affected by HIV/AIDS.

The way in which health satisfaction declines with age is illustrated for two sets of countries in Figures 8 and 9; the former shows five selected rich countries, including the US and Britain, while the latter shows the Eastern European and FSU countries. In the 15–19 age group, almost everyone is satisfied with their health. In the rich countries, satisfaction falls relatively slowly, and in the US, actually *improves* with age after age 50, (probably coincidentally) overtaking the generally more stoical British at around the age at which the respective age-specific mortality curves cross. In the Eastern European and FSU group, health satisfaction falls very rapidly with age, and very large fractions of the elderly report themselves as dissatisfied with their health.

Table 3 explores the correlates of health satisfaction, following the same general procedures as in Tables 2 and 3. Column (1) shows, consistently with the figures, that the fraction of people satisfied with their health is higher in higher income countries, although even allowing for the fact that the scale is a tenth as large, the effect is a good deal smaller than for life-satisfaction. As was the case for life satisfaction, recent economic growth is *negatively* associated with health satisfaction conditional on the level of GDP per capita. In column (2), the level of life expectancy has no effect on health satisfaction, although increases in life expectancy between 1990 and 2000 are associated with higher health satisfaction. Because declines in life expectancy are associated either with HIV/AIDS (itself mostly in sub-Saharan Africa), or with the transition countries of Eastern Europe, I have constructed three dummy variables, one for the Eastern European countries, one for sub-Saharan Africa, and one for countries whose estimated HIV

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prevalence rate (age group 15 to 49) is estimated to be in excess of 5 percent using data from the 2006 version of the *World Development Indicators*. The first of these dummies ("east") attracts a negative and significant coefficient, the second (sub-Saharan Africa) an insignificantly negative one, and the third (HIV) a coefficient that is neither negative nor significant. With these dummies included, the change in life expectancy no longer has any effect, and the significance of the income variables is also reduced. This is perhaps not surprising given the evidence in Figure 6, where it is clear that the poor health satisfaction in the transition countries could not be attributed entirely to the objective decrease in life expectancy. These results also reinforce the fact that even high levels of HIV prevalence do not much affect the health satisfaction reports, certainly not in proportion to their dire effects on mortality. I have also interacted the dummies with the change in life expectancy (results not shown) to test the possibility that the changes in life expectancy have different effects in the different areas, or with different causes, but the estimated effects are neither significant nor informative.

One variable which does predict average health satisfaction is what people think of their healthcare system. The World Poll asks people to report whether or not they have confidence in their health care or medical system. The average of this for each country is entered in the last row of the last column of Table 3, where it has a large and statistically significant coefficient. Of course, because this is itself a subjective response, we do not know whether it is a better or worse indicator of the actual performance of the healthcare system than health satisfaction is itself a good indicator of objective health. Put differently, both health satisfaction and healthcare confidence may be functions of third factors which themselves vary by region, time, or age group. And it would certainly be

unwarranted to interpret the last column of the table as evidence that the healthcare system is effective in delivering health.

The degree of confidence in the healthcare system varies widely from country to country, and although it is correlated with income—see Figure 10—the correlation is weak. Note particularly the astonishingly low confidence that Americans in 2006 had in their healthcare and medical system. Almost all the inhabitants of rich countries are well-satisfied with their healthcare and medical systems; that the US is an exception in this regard is well-known, see Davis et al (2007), who find also that the US does not lag in the *effectiveness* of healthcare, but does in other dimensions such as equity, access, and safety. Experience is much more diverse among the poor countries of the world, but people in some poor countries (such as Vietnam, Thailand, Malaysia, and Cuba) have great confidence in the healthcare system, and the majority of poor countries do much better than does the US, even if they deliver much worse health outcomes. The ranking of the US in the World Poll (81 out of 115) is even worse than in WHO (2000), though it should be noted that the WHO's methodology has been robustly challenged by several commentators, see in particular Williams (2001).

Given the high correlation between the subjective evaluations in different domains, here between personal health and the healthcare system, it is worth returning to life satisfaction and asking whether we can "explain" life satisfaction in terms of health satisfaction. This follows Easterlin (2006) who relates overall life satisfaction to satisfactions in the various domains and thus aggregating satisfactions into an overall evaluation. Certainly, if we repeat the regressions in Table 2 with health satisfaction on the right hand side, there is a large (close to 4) and statistically significant coefficient, and

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with this variable added, life expectancy, the change in life expectancy, and the rate of economic growth lose their significance. While such regressions are useful for understanding the life satisfaction responses (though one might just as well argue for regressing health satisfaction on life satisfaction), they are less useful for deciphering the relationship between the satisfaction reports and the objective circumstances of life.

6. Discussion

The currently dominant approach for measuring population well-being is based on Sen's ideas of measuring people's abilities to function, or their capabilities. Without health, there is very little that people can do and, without income, health alone does little to enable people to lead a good life. Other factors, such as education, or the ability to participate in society, are important too, although income and health tend to get the primary attention in evaluations of development progress, for example in the Millennium Development Goals. For many reasons, elaborated by Sen and others, self-reports of satisfaction with life, with income, or health are given little weight. People do not necessarily perceive their lack of freedom as a problem; the child who is potentially a great musician, but never has a chance to find out, will not express her lack of satisfaction, and whole groups can be taught that their poor health, or their lack of political participation, are natural or even desirable aspects of a good world.

Some of these issues have an empirical as well philosophical component, and it is possible that reports of life satisfaction, at least on average, provide a clear-eyed aggregate of the different components of peoples' capabilities. Some of the results in this paper are quite supportive of that position, much more so than I had originally expected.

In particular, the very strong international relationship between per capita GDP and life satisfaction suggests that, on average, people have a good idea of how income, or the lack of it, affects their lives. It is simply not true that the people of India are as satisfied with their lives as the people of France, let alone Denmark, nor is it true that people in sub-Saharan Africa, or Afghanistan, or Iraq, or Cambodia, are as happy as people in India. Beyond that, the misery of many of the countries of Eastern Europe and the former Soviet Union seems plausible enough. In consequence, the map in Figure 1 clearly corresponds in broad detail to what an overall map of capabilities might look like, always supposing we could construct such a thing.

But when we turn to health and its effects on life-satisfaction, the poll results diverge from what would be required in the capabilities approach. Longer life expectancy surely enables people to do more with their lives yet, conditional in income, it has no apparent effect on life satisfaction. Instead, it is *changes* in the expectation of life that seem to have an effect, no matter whether life expectancy is high or low. Even satisfaction with health, a much more focused question, is not related to life expectancy, though in some specifications it is sensitive to changes in life expectancy, consistent with a focusing illusion for health. The extraordinary low health satisfaction ratings for Eastern Europe and the countries of the former Soviet Union are a testament, not to their poor population health, but to the effects of a decline in health among a population that was used to a better state of affairs. It is also the case that in the rich countries it is people in their 50s, not in their 60s or 70s, who report the least satisfaction with their health and the highest level of disability. Again, this is a group whose health is actually much better than that of their elders, but who are experiencing health problems for the first time; perhaps it is not

poor health that is hard to bear, but the first intimations of mortality. In the poor

countries, and particularly in Africa, morbidity is a constant companion throughout life,

as it has been for hundreds of thousands of years, Iliffe (1995), and for these countries

health satisfaction declines with age. But this does not mean that health satisfaction is a

good indicator of health capabilities in the poorest countries. That it is not so is

demonstrated by the fact that countries with high rates of HIV prevalence do not

systematically report poorer health status, a finding that is in line with earlier reports that

self-reported health measures are often better in places where people are sicker, and

presumably more adapted to being sick, Sen (2002), Chen and Murray (1992).

In spite of the positive relationship between life satisfaction and national income, and

in spite of the plausibility of unhappiness and health dissatisfaction in the countries of

Eastern Europe, neither life satisfaction nor health satisfaction can be taken as reliable

indicators of population wellbeing, if only because neither adequately reflects objective

conditions of health.

Even if this conclusion is accepted—and for a different view see Graham (2005)—the

satisfaction questions are clearly of interest in their own right, as is the analysis of their

correlates. These are among the best measures that we have of an important aspect of

human experience, and we need to understand what and why they are. In this respect, this

preliminary analysis of the World Poll data has confirmed a number of earlier findings,

but has yielded some new and different results. One surprising finding is Figure 3, the

close to linear relationship across countries between average life satisfaction and the

logarithm of income per head. There is no evidence that the cross-country effects of

income vanish among the richer countries. It is also true that life satisfaction responds to

changes in circumstances, though the effects of economic growth are *negative* and not positive, as would be predicted by previous discussion and previous micro-based empirical evidence. Health satisfaction, in contrast, responds very weakly to (perhaps unsatisfactory) objective measures of health, though there is a response of the correct sign to changes in life expectancy, at least in some specifications.

The 2006 within-country age profiles of life-satisfaction are quite different from country to country, sometimes declining, sometimes exhibiting a U-shape, and sometimes showing no particular pattern. But in the 2006 cross-sections, there is a systematic tendency for both life and health satisfaction to decline more rapidly with age in poorer countries. As with many other things, wealth helps buffer the effects of aging on at least the perception of good health and the good life.

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Appendix: Why are the results so different from previous findings?

Most of the previous international analyses of average life-satisfaction and average income have used data from the first three rounds of the World Values Surveys (WVS). These studies have in some cases concluded that the positive relationship between average national happiness and average income exists only among poor and middle-income countries, not among rich countries. Figure A1 shows data from the 1981, 1990, and 1996 waves of the WVS, with each country marked by its three letter "isocode" as used by the Penn World Table and World Bank. For comparability with the World Poll, I have included only countries that appear in both sources, and I have excluded regions or cities. Even so, Figure A1 reproduces the main features of previous analyses. There is a very steep relationship between happiness and income on the left of the graph, which becomes much flatter among the rich countries on the right. To see how this relates to the World Poll data, note four points: (a) apart from South Africa (ZAF) and Korea (KOR), *all* of the countries at the bottom left are in Eastern Europe or were once part of the Soviet Union, including Moldova, Ukraine, Armenia, Belarus, Russia, Bulgaria, Latvia, Estonia, Azerbaijan, Bosnia and Herzegovina, Macedonia, Romania, Estonia, and Slovakia; (b) if we look at the few long-term poor countries in the sample, Ghana, China, Philippines, Bangladesh, India, Peru, and the Dominican Republic, they all are much happier than the Eastern European countries; (c) as a consequence of (a) and (b), the sharply curved nature of the happiness to income relationship comes, not so much from the poor countries, but from the Eastern European and FSU countries, whose unhappiness is almost certainly not primarily due to their low incomes; (d) Figure A1, unlike Figure 3, shows income on an absolute, rather than a logarithmic scale. Once the transformation is

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made, the happiness to log income relationship is close to linear except, once again, for the countries of Eastern Europe.

Figure A2 combines the World Poll and World Values Survey data using a logarithmic scale for income; it is identical to Figure 3 with the WVS data overlaid. The World Poll data are shown in red and correspond to the right hand scale; the World Values Survey data in blue and correspond to the left-hand scale. The World Poll uses an 11 point scale (0 to 10) and the World Values Surveys a 10 point scale (1 to 10.) The most important difference between the two surveys is that all the points at the bottom left of the diagram are red points, mostly from Africa; the World Poll covers many more very poor countries than do the World Values Surveys and the happiness and income data for these countries lie close to the line for middle-income and rich countries alike. Otherwise, the two data sets are more notable for their similarities than their differences. India and China are richer and unhappier in the more recent World Poll (which suggests once again that time-series and cross-sectional changes are *not* the same thing), while some of the Eastern European and FSU countries, unhappy though they are in 2006, are less unhappy than in the earlier surveys. But there is no broad contradiction between the two surveys, and I do not believe that the World Values Surveys provide evidence against the finding from the World Poll that, throughout the range of national incomes, higher incomes are associated with higher levels of life satisfaction. The main task for the future is how to reconcile these international findings with the very modest effects of income on happiness within countries.

Table 1

Cross-country regressions of average life-satisfaction on the logarithm of per capita GDP

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Income cutoff	None	None	$y <$ 12,000	$y >=$ 12,000	$y >=$ 20.000	None	None
$\ln y$ s.e.	0.850 (0.051)	–0.859 (0.778)	0.708 (0.085)	1.743 (0.287)	0.617 (0.649)	0.751 (0.081)	0.677 (0.064)
$(\ln y)^2$ s.e.	--	0.101 (0.046)	--	--	--	--	--
$\ln y * I(y>12,000)$ s.e.						0.032 (0.021)	--
$\ln y * I(y>20,000)$ s.e.						--	0.073 (0.018)
R^2	0.716	0.728	0.480	0.521	0.040	0.722	0.752
Number of countries	114	114	78	36	24	114	114

Notes: y is real chained GDP per capita in 2003 in 2000 international \$ from the Penn World Table version 6.2. $I(y>12,000)$ is an indicator variable that is 1 if y is greater than 12000, similarly for $I(y>20,000)$. Regressions are not weighted by population.

Table 2

Cross-country regressions of average life-satisfaction on levels and lags of per capita GDP and on life-expectancy

	(1)	(2)	(3)	(5)	(6)
Income cutoff	None	None	None	*y* < 12,000	*y* >= 12,000
ln *y* 2003 s.e.	0.860 (0.049)	0.890 (0.053)	0.910 (0.110)	0.698 (0.173)	1.297 (0.359)
growth rate 00–03 s.e.	–4.47 (1.41)	–3.65 (1.58)	–4.64 (1.39)	–3.50 (1.52)	–8.02 (5.76)
growth rate 90–00 s.e.	--	–3.32 (2.51)	--	--	--
Life expectancy 2000 s.e.	--	--	–0.009 (0.011)	0.001 (0.014)	0.038 (0.046)
LE 2000 – LE 1990 s.e.	--	--	0.047 (0.019)	0.036 (0.022)	–0.074 (0.120)
R^2	0.740	0.763	0.757	0.556	0.582
Number of countries	114	103	114	78	36

Notes: See Table 1. Among the countries that are dropped between columns (2) and (3) are Azerbaijan, Belarus, Georgia, Kazakhstan, Lithuania, Latvia, Moldova, Tajikistan, and Ukraine.

Table 3

Cross-country regressions of average health-satisfaction

	(1)	(2)	(3)	(5)
ln *y* 2003 s.e.	0.0219 (0.006)	0.0472 (0.014)	0.0156 (0.014)	0.0127 (0.014)
growth rate 00–03 s.e.	–1.346 (0.225)	–1.384 (0.219)	–0.722 (0.238)	–0.725 (0.231)
Life expectancy 2000 s.e.	--	–0.003 (0.001)	–0.000 (0.002)	–0.000 (0.002)
LE 2000 – LE 1990 s.e.	--	0.007 (0.002)	0.001 (0.003)	0.000 (0.003)
east	--	--	–0.137 (0.024)	–0.118 (0.024)
ssa	--	--	–0.056 (0.034)	–0.041 (0.034)
hiv	--	--	0.015 (0.036)	–0.001 (0.035)
confidence in healthcare	--	--	--	0.121 (0.045)
R^2	0.303	0.357	0.529	0.559
Number of countries	112	112	112	112

Notes: East is a dummy that is one for Eastern Europe and the Former Soviet Union, SSA is a dummy that is one for sub-Saharan Africa, and HIV is a dummy that is one if the estimated prevalence of HIV/AIDS is greater than 5 percent among 15 to 49 year olds.
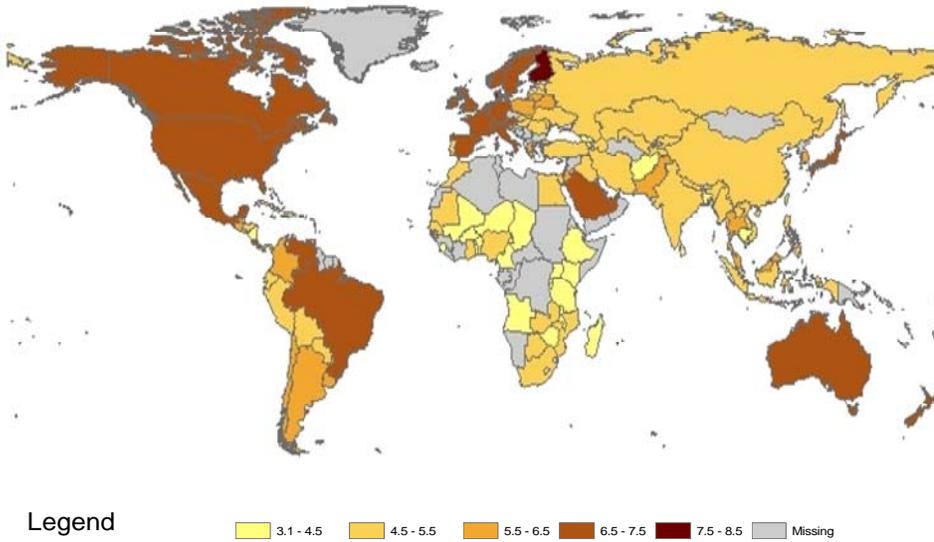
Figure 1: Life satisfaction around the world: population means of 0 to 10
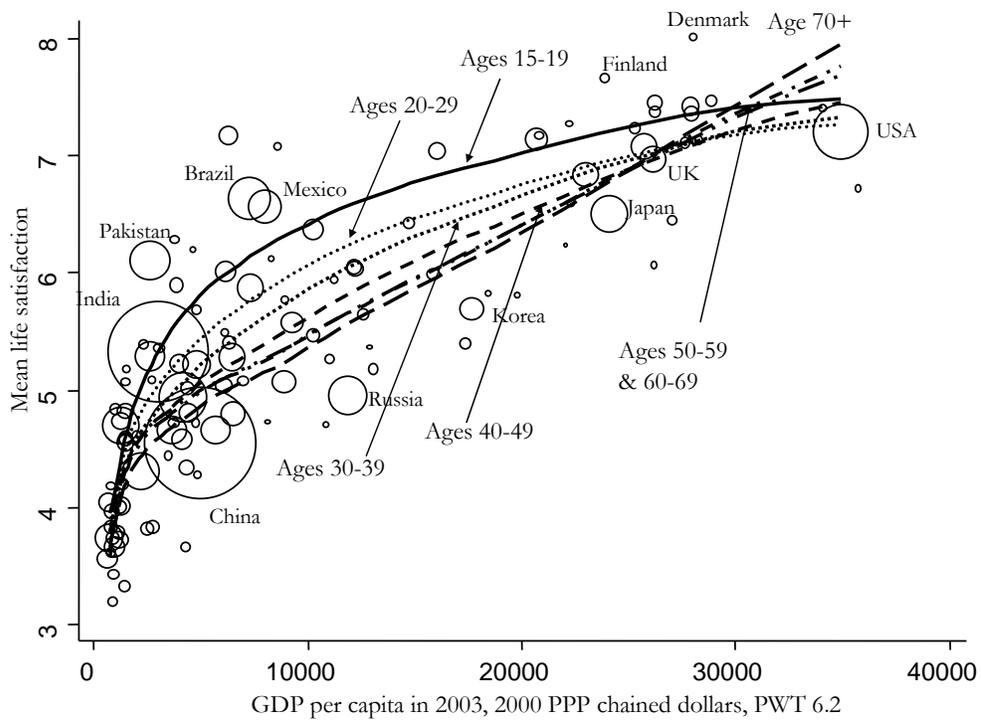
Figure 2: Life satisfaction, per capita GDP, and age
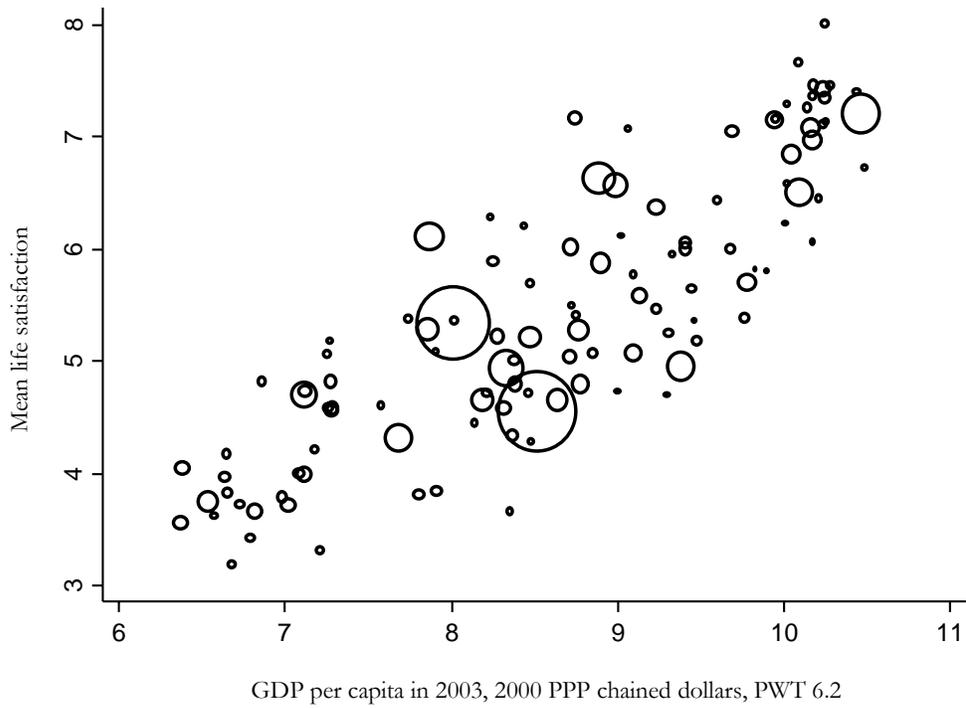
**Figure 3: Life satisfaction and the logarithm of GDP per capita**
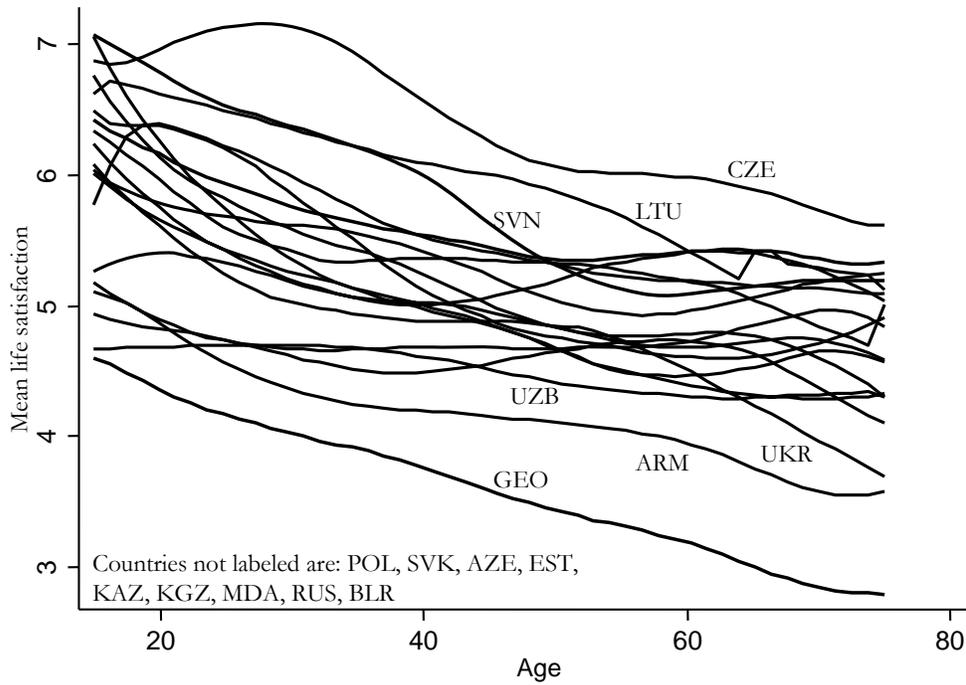
**Figure 4: Declining life-satisfaction with age in Eastern Europe and the FSU**

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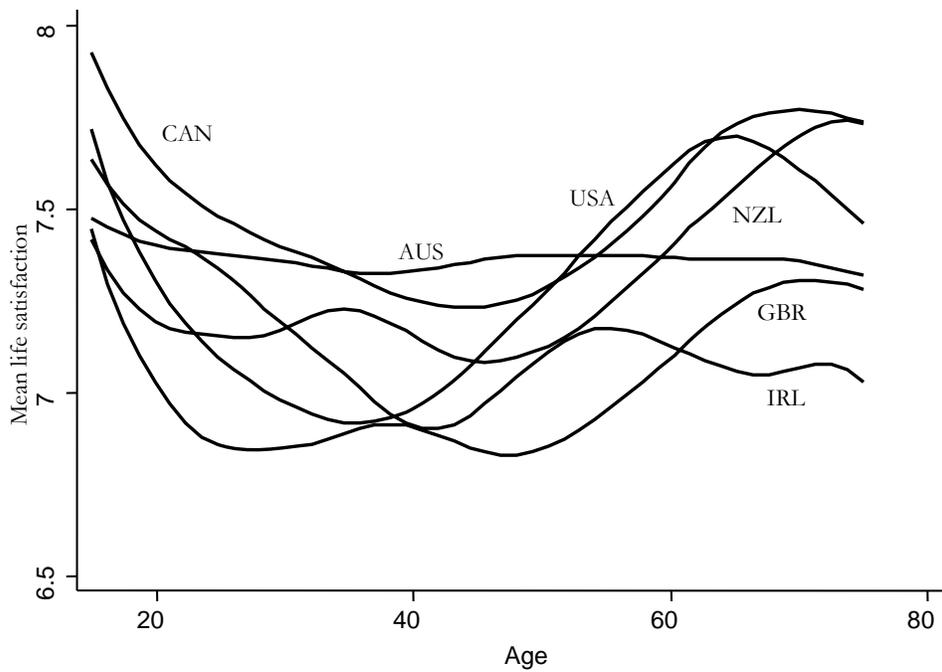
**Figure 5: U-shaped life satisfaction in rich English-speaking countries**
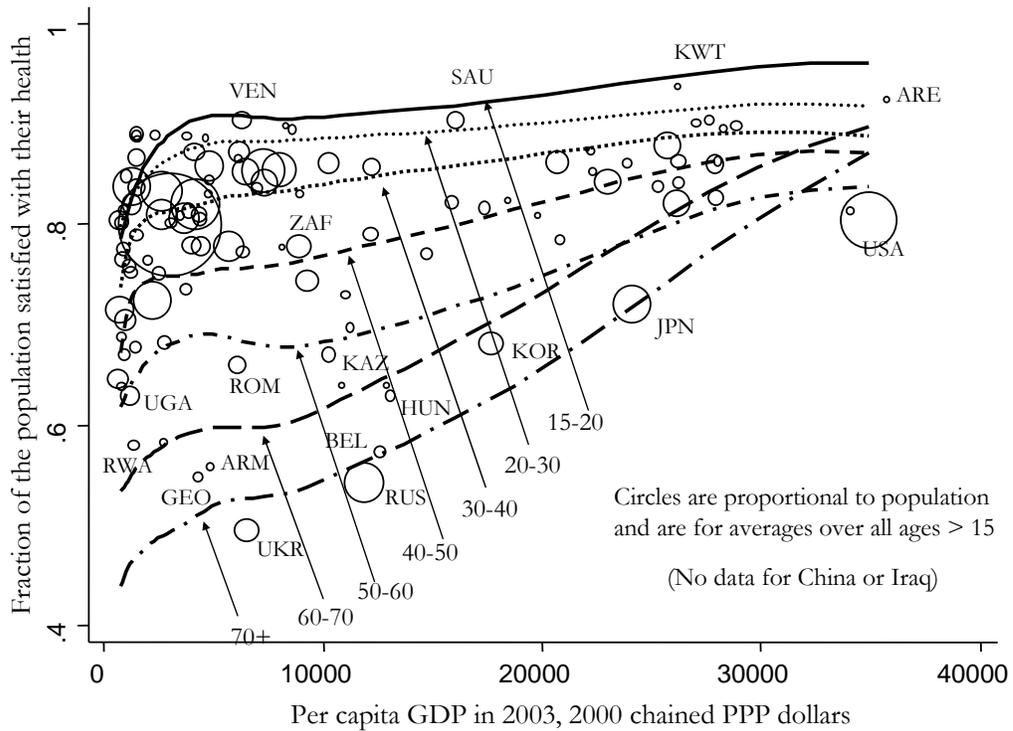

**Figure 6: Health satisfaction, age, and income**
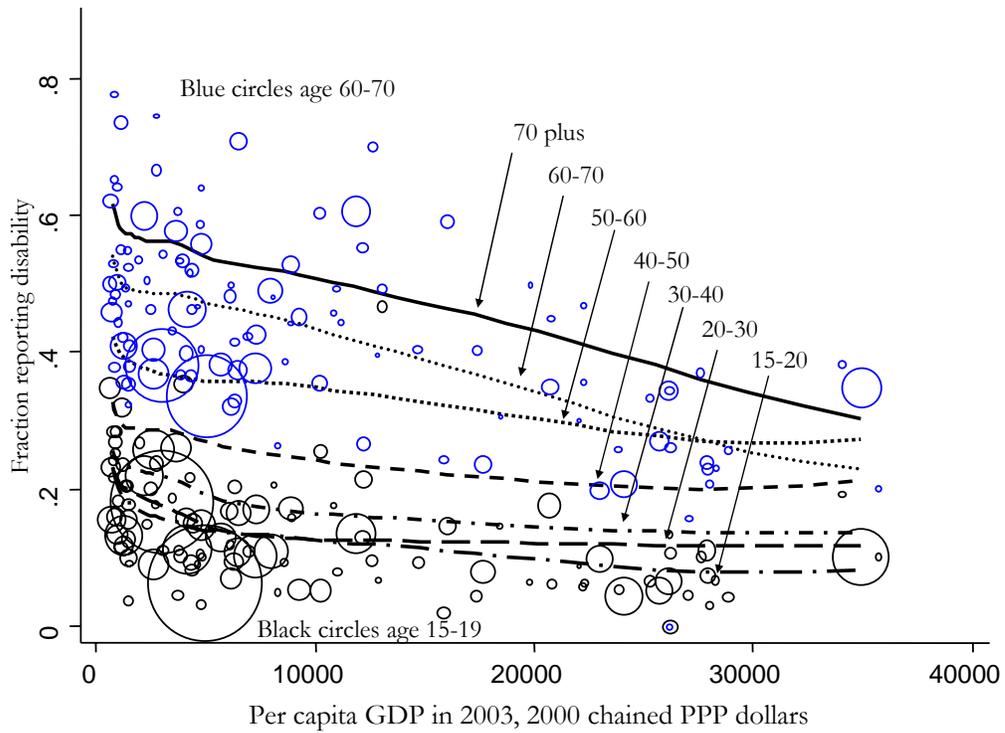
Figure 7: Disability, age, and income
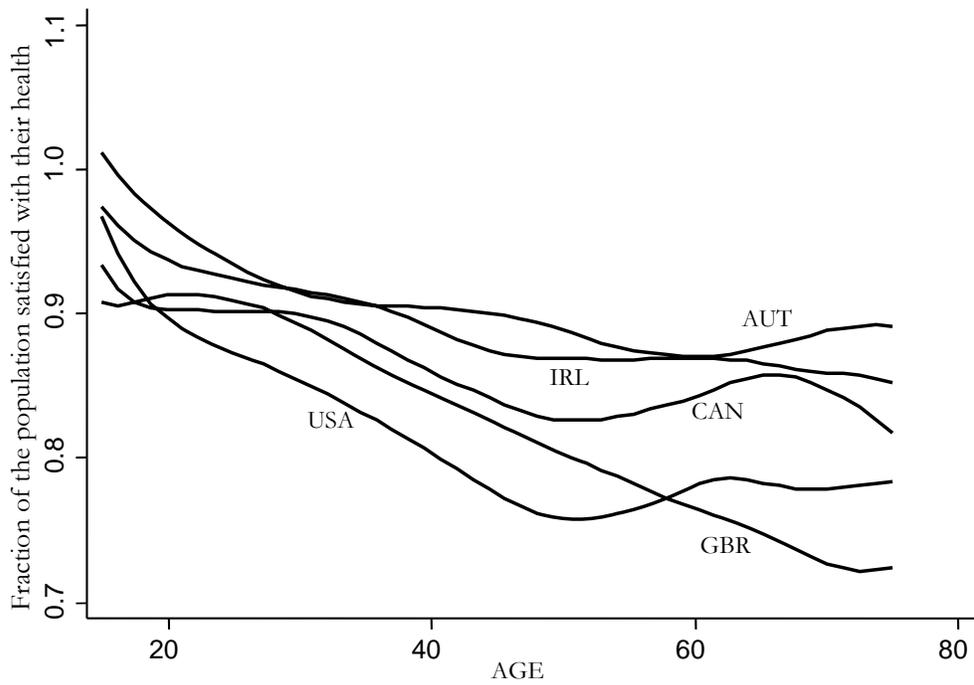
Figure 8: Health satisfaction and age, selected rich countries
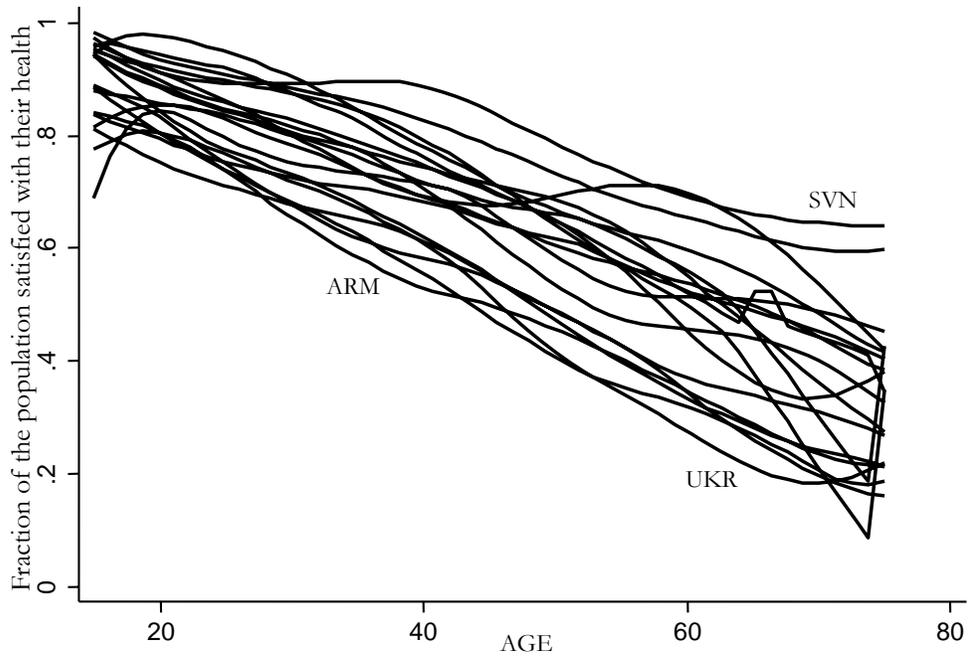
**Figure 9: Health satisfaction and age, Eastern Europe and FSU**
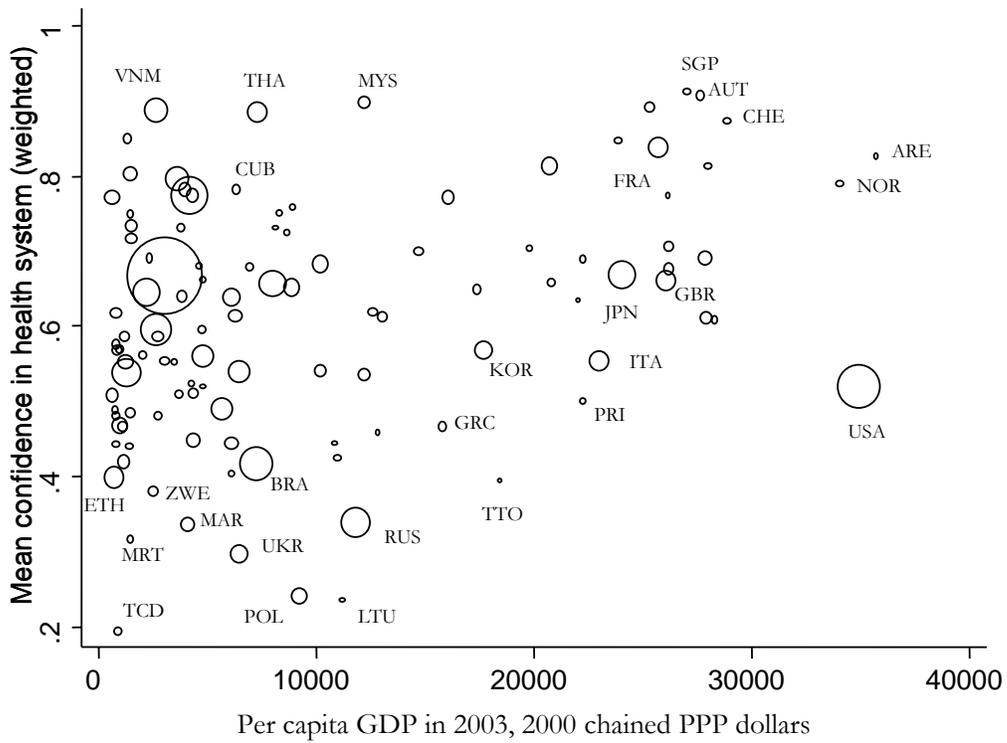
**Figure 10: Satisfaction with healthcare and income**

44
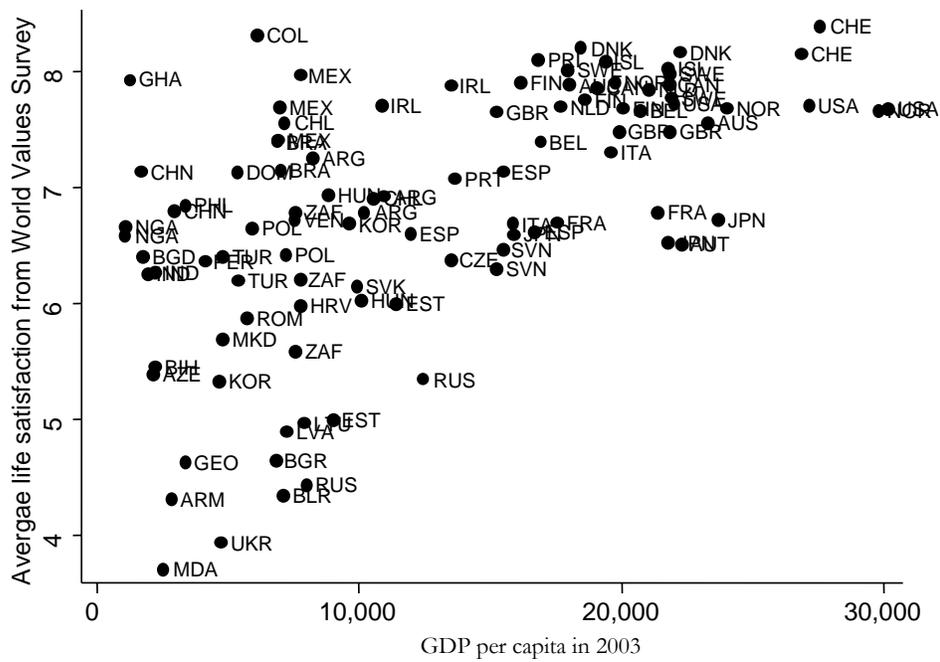
Figure A1: Life satisfaction and national income from the World Values Surveys, 1981, 1990, and 1996
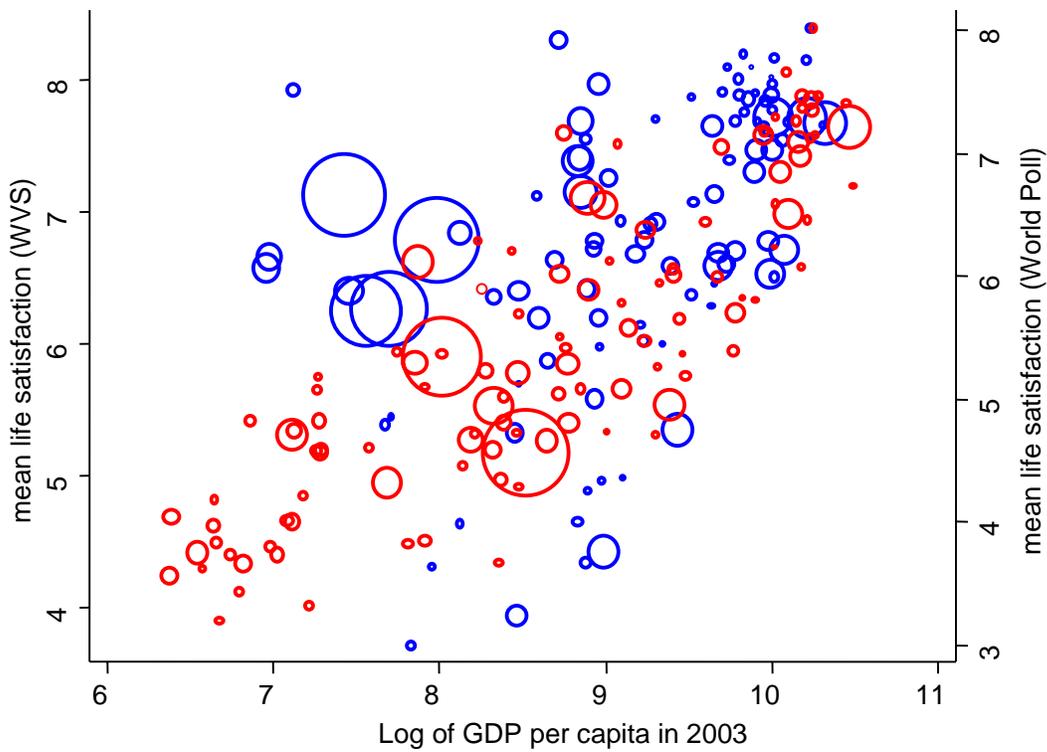

Figure A2: Life Satisfaction and log per capita income, World Poll and World Values Surveys compared