Volume Title: Research Findings in the Economics of Aging

Volume Author/Editor: David A. Wise, editor

Volume Publisher: The University of Chicago Press

Volume ISBN: 0-226-90306-0

Volume URL: http://www.nber.org/books/wise08-1

Conference Dates: May 10-13, 2007

Publication Date: February 2010

Chapter Title: Income, Aging, Health and Well-Being around the World: Evidence from the Gallup World Poll

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Chapter URL: http://www.nber.org/chapters/c8204

Chapter pages in book: (235 - 263)

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Income, Aging, Health, and Well-Being around the World
Evidence from the Gallup World Poll

Angus Deaton

9.1 Introduction

This chapter looks at the effects of income and age on self-reported well-being 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 age fifteen and older. Because the survey used the same questionnaire in all countries, it provides an 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.

The World Poll data are particularly rich in self-reported measures, including 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,

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I am grateful to the Gallup Organization for providing me access to the Gallup World Poll, and to Tim Besley, Anne Case, Ed Diener, Carol Graham, John Helliwell, Danny Kahneman, David Laibson, Richard Layard, Andrew Oswald, Glenn Phelps, Raksha Arora, and Jim Smith for comments and suggestions. I acknowledge financial support from the National Institute on Aging through grants No. R01 AG20275–01 to Princeton and P01 AG05842–14 to the NBER.

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.

I begin with a theoretical discussion of age-effects and income effects on life satisfaction, where life satisfaction is interpreted as period subutility 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 (such as 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. I follow this, in section 9.3, with a brief summary of what the happiness literature—including the literature in psychology—says about the relationship between happiness and age.

Section 9.4 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 most 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 11-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 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 9.5, 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 gross domestic product (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 United States ranks eighty-first among the 115 countries for which these data were collected.

All of the health measures, in levels and in 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 elsewhere 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 9.6 discusses the usefulness of the satisfaction measures for the purpose of assessing population health and well-being. 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 unacceptable position that dealing with HIV/AIDS in Africa need not be an urgent priority.

9.2 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

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

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 that 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 and the interest

rate—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 variation 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 minus the mortality rate, so that (3) can be rewritten

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

where m_t is the mortality rate at age t. Note that because we are talking about decision making regarding 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

$$\Delta u_t = \frac{\upsilon_1^2}{\upsilon_{11}} m_t + \left(\upsilon_2 - \frac{\upsilon_1 \upsilon_{12}}{\upsilon_{11}} \right) \Delta a_t. \tag{6}$$

The first term shows that mortality has a negative effect on the rate of change 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—in other words, 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, since they are generally purposively chosen might be supposed to enhance utility—although the empirical 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

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

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

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

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.

9.3 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 that 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" 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 about which—if any—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 well-being, 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 microlevel evidence from the German Socioeconomic Panel by Di Tella, Haisken-DeNew, and MacCulloch (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 previously 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 United States 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 United States or Japan. See, for example, Ingelhart and Klingemann (2000); Graham (2005); Layard (2005); Leigh and Wolfers (2006) 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 fully 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."

An important source of previous empirical evidence is the World Values Survey, which covers rich countries, together with a smaller number of poor countries, as well as a group of countries from Eastern Europe and the former Soviet Union. 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, 32], who writes that for "the Western industrial countries, the richer ones are no happier than the poorer.") 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.

9.4 Life Satisfaction, Income, and Age: Evidence from the World Poll

Figure 9.1 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 and Armenia. At the other end, there are two relatively poor places in the happiness top twenty, Costa Rica and Venezuela.

Figure 9.2 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 in the Penn World Table) measured in purchasing power parity (PPP) 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

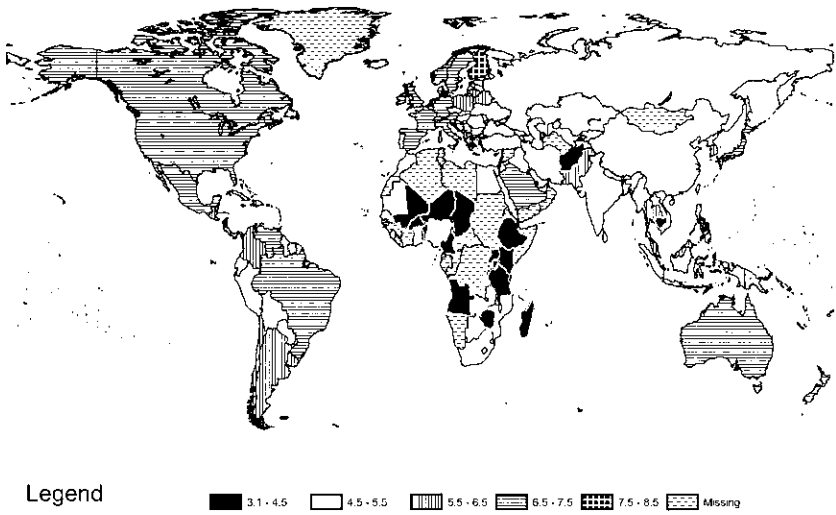

Fig. 9.1 Life satisfaction around the world: Population means of 0 to 10

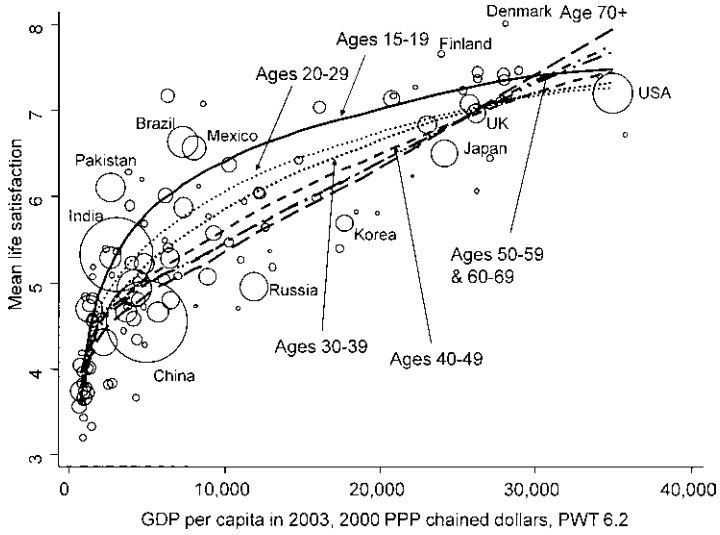

Fig. 9.2 Life satisfaction, per capita GDP, and age

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 United States is the large country on the top right. There are also seven plotted lines on the graph, only six of which are clearly visible. Each of these corresponds to an age group: fifteen to nineteen, twenty to twenty-nine, thirty to thirty-nine, forty to forty-nine, fifty to fifty-nine, sixty to sixty-nine, and seventy and over. For each of these seven groups, and for each country, I calculated the average life satisfaction. Each line is a nonparametric 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 9.1, 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 findings reviewed in the previous section, I investigate it further.

Figure 9.3 plots average happiness against the *logarithm* of income, and this simple transform is enough to make the relationship close to linear. Column (1) of table 9.1 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 0.850 with an estimated standard error

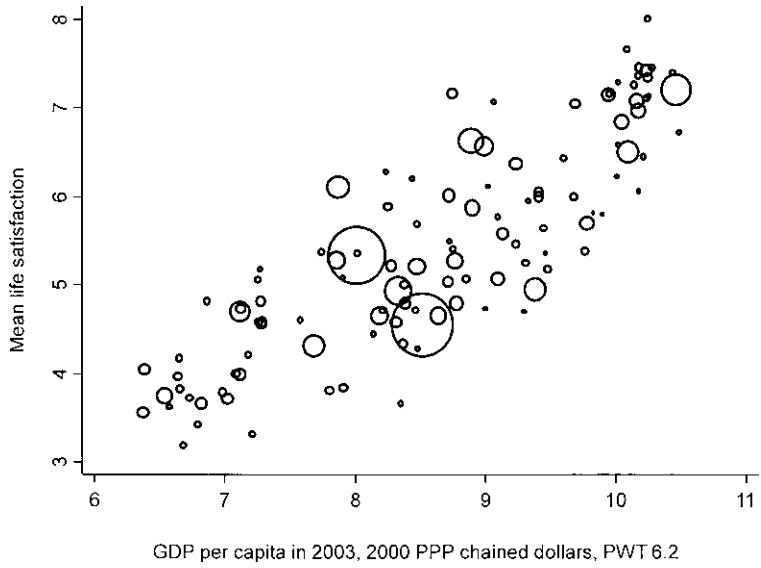

Fig. 9.3 Life satisfaction and the logarithm of GDP per capita

Table 9.1 Cross-country regressions of average life satisfaction on the logarithm of per capita GDP

Income cutoff	(1) None	(2) None	(3) y < 12,000	(4) y ≥ 12,000	(5) y ≥ 20.000	(6) None	(7) None
ln*y*	0.850	–0.859	0.708	1.743	0.617	0.751	0.677
s.e.	(0.051)	(0.778)	(0.085)	(0.287)	(0.649)	(0.081)	(0.064)
$(\ln y)^2$		0.101					
s.e.		(0.046)					
ln*y**I($y > 12{,}000$)						0.032	
s.e.						(0.021)	
ln*y**I($y > 20{,}000$)							0.073
s.e.							(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 12,000, similarly for I($y > 20{,}000$). Regressions are not weighted by population. s.e. = 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 9.2 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 twenty-four 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 9.3 shows that the latter is the 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), and 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.

These results support the visual impression in figure 9.3 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.

Why are these results so different from those studies that have concluded that, among the rich countries, national income has no effect on national life satisfaction? Figure 9.4 shows the data that supports these findings, taken from the 1981, 1990, and 1996 waves of the World Values Surveys, 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

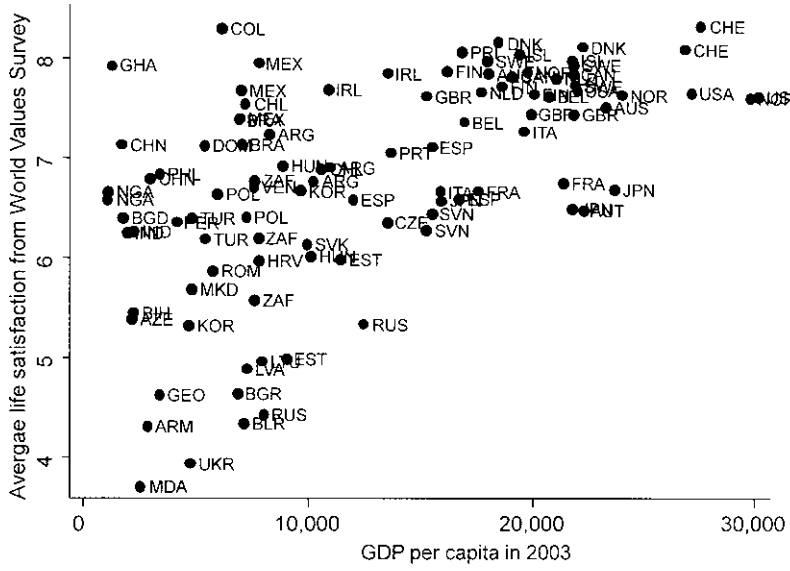

Fig. 9.4 Life satisfaction and national income from the World Values Surveys: 1981, 1990, and 1996

only countries that appear in both sources, and I have excluded regions or cities. Even so, figure 9.4 reproduces the main features of previous analyses. There is a 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 former Soviet countries, whose unhappiness is almost certainly not primarily due to their low incomes; (d) figure 9.4, unlike figure 9.3, shows income on an absolute, rather than a logarithmic scale. Once the transformation is made, the happiness to log income relationship is close to linear except, once again, for the countries of Eastern Europe (see also Leigh and Wolfers [2006]).

Figure 9.5 combines the World Poll and World Values Survey (WVS) data using a logarithmic scale for income; it is identical to figure 9.3 with the WVS data overlaid. The World Poll data are shown as heavy solid circles and correspond to the right-hand scale; the World Values Survey data in broken, lighter circles 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 World Poll 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 perhaps comes not from substance, but from the fact that the World Poll is a national sample whereas the WVS, particularly the earlier rounds, selected Indian and Chinese (and Nigerian) samples largely from literate people in urban areas. At the same time, some of the Eastern European and former Soviet 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 the World Values Surveys provide no evidence against the finding from the World Poll that, throughout the range of national incomes, higher average incomes are associated with higher levels of average life satisfaction.

It is of course possible that income is standing in for something else,

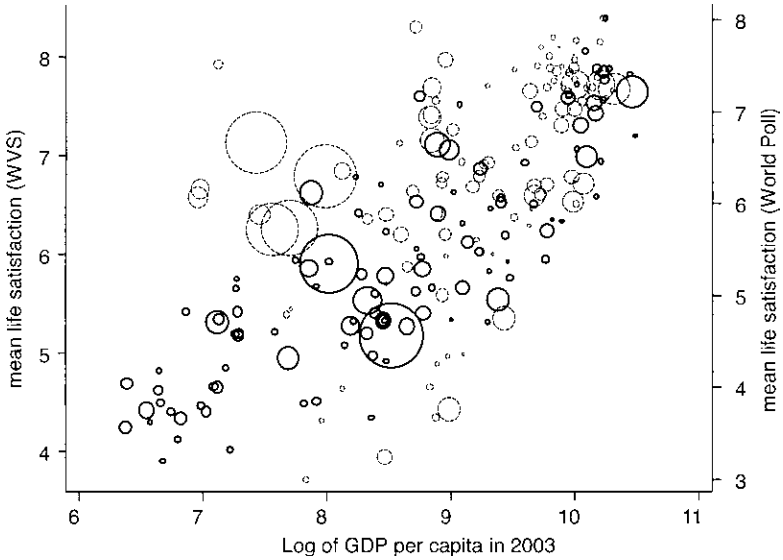

Fig. 9.5 Life satisfaction and log per capita income, World Poll and World Values Surveys compared

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 9.2 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 it is only the growth of income that matters, not its level. Secondly, 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, although see Diener, Diener, and Diener (1995), who also find a negative effect of growth on happiness in an international sample of college students, though not in their national samples. Indeed, this is one of the most puzzling and surprising results in this chapter.

Table 9.2 **Cross-country regressions of average life satisfaction on levels and lags of per capita GDP and on life expectancy**

Income cutoff	(1) None	(2) None	(3) None	(4) $y < 12{,}000$	(5) $y \geq 12{,}000$
ln y 2003	0.860	0.890	0.910	0.698	1.297
s.e.	(0.049)	(0.053)	(0.110)	(0.173)	(0.359)
Growth rate 2000–2003	–4.47	–3.65	–4.64	–3.50	–8.02
s.e.	(1.41)	(1.58)	(1.39)	(1.52)	(5.76)
Growth rate 1990–2000		–3.32			
s.e.		(2.51)			
Life expectancy 2000			–0.009	0.001	0.038
s.e.			(0.011)	(0.014)	(0.046)
LE 2000–LE 1990			0.047	0.036	–0.074
s.e.			(0.019)	(0.022)	(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 9.1. Among the countries that are dropped between columns (2) and (3) are Azerbaijan, Belarus, Georgia, Kazakhstan, Lithuania, Latvia, Moldova, Tajikistan, and Ukraine. s.e. = standard error.

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 twenty-eight 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 sizable negative effect on life 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 former Soviet Union (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, among 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.

I have also experimented with a measure of the HIV prevalence rate (taken from the World Development Indicators). Although this is certainly mea-

sured with error, it reliably identifies those countries most severely affected, and to ensure that is the case, I constructed a dummy variable that identifies the thirteen countries with an estimated 2003 prevalence of 5 percent or more, namely Botswana, Burundi, Cameroon, Haiti, Kenya, Mozambique, Malawi, Nigeria, Rwanda, South Africa, Tanzania, Zambia, and Zimbabwe. Whether added to the regressions in column (1) or column (3) of table 9.2, the dummy attracts a small and insignificant coefficient (not shown). This is surely an extraordinary finding, that reported life satisfaction is unaffected by a plague whose severity is unparalleled in modern times. And even if people do not know that they are HIV positive, it is hard to believe that their satisfaction with life is unaffected when more than a fifth of adults are infected, and when burials of the victims are a daily occurrence.

Figure 9.2 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 9.6 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. (These graphs show unconditional averages of life satisfaction with age with neither standardization

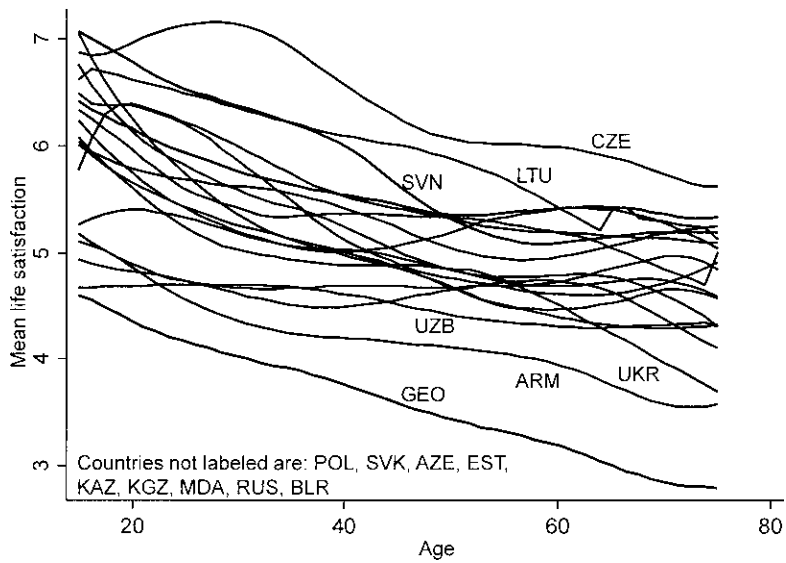

Fig. 9.6 Declining life-satisfaction with age in Eastern Europe and the FSU

nor controls.) 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 9.7 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 9.4, 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 to groups of countries. The age-related decline in life satisfaction in Eastern Europe and the Former Soviet Union (FSU) in figure 9.4 is unlikely to be a pure age effect, but is probably more

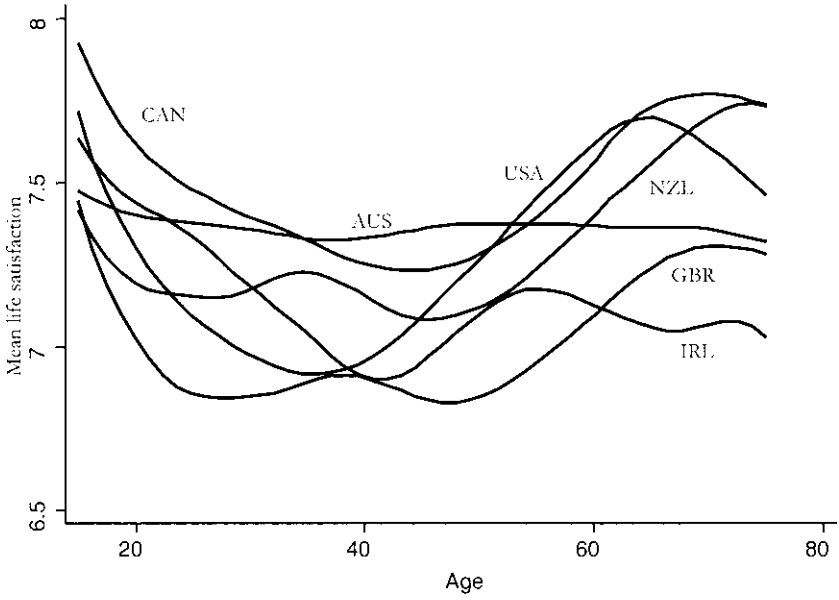

Fig. 9.7 U-shaped life satisfaction in rich English-speaking countries

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.

I have replicated the income results in tables 9.1 and 9.2 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.

9.5 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 9.8 (for health satisfaction) and 9.9 (for disability) are drawn in the same way as figure 9.2, 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 9.9, for disability, the circles are drawn separately for two of the age groups, ages thirty to thirty-nine (solid circles), and ages sixty to seventy (broken 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 9.8, the fifty to fifty-nine 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 fifty to fifty-nine and sixty to sixty-nine group in figure 9.9. It is most improbable that these reversals can be attributed to any objective health conditions or disabilities. Perhaps the fifty to fifty-nine group is particularly intolerant of the first signs of aging.

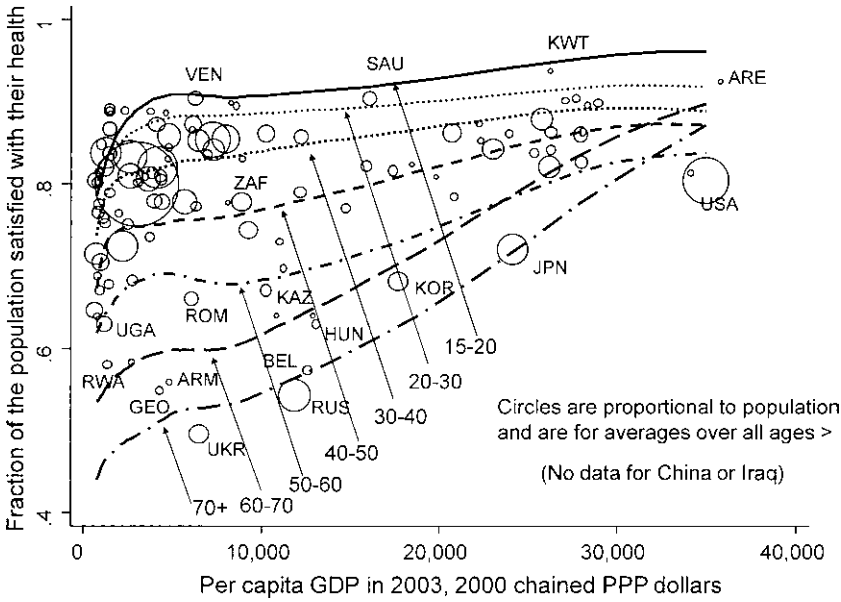

Fig. 9.8 Health satisfaction, age, and income

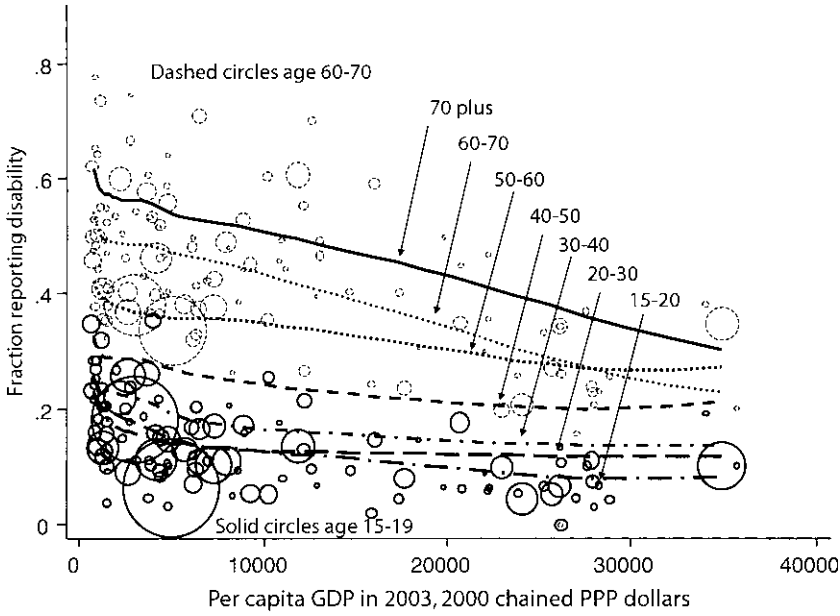

Fig. 9.9 Disability, age, and income

In health satisfaction, as in life satisfaction, the countries of Eastern Europe and the former Soviet Union 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 twentieth, 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 effect on health satisfaction, at least in changes if not in levels, so do other factors, and the declines in life expectancy in the countries of the former Soviet Union 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 9.10 and 9.11 the former shows five selected

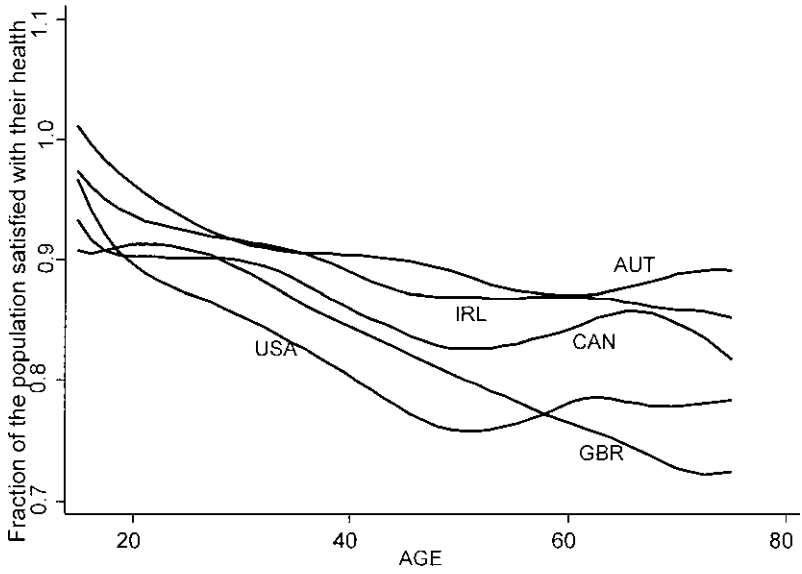

Fig. 9.10 Health satisfaction and age, selected rich countries

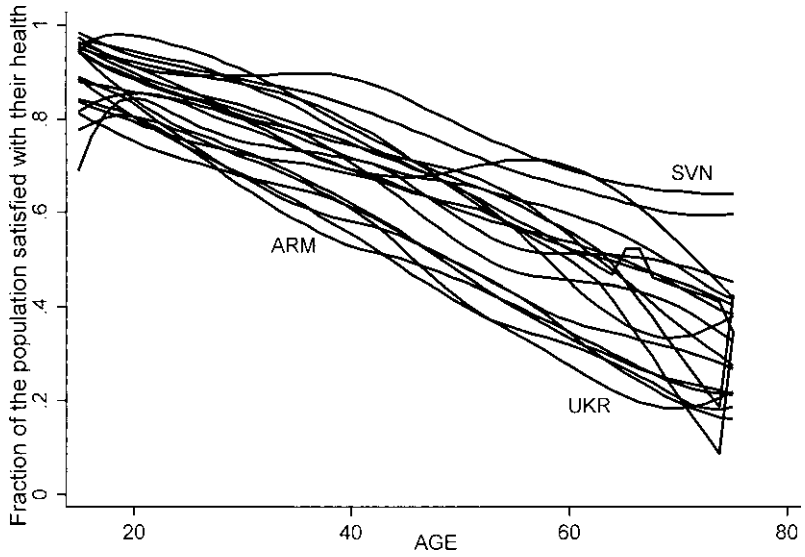

Fig. 9.11 Health satisfaction and age, Eastern Europe and FSU

rich countries, including the United States and Britain, while the latter shows the Eastern European and FSU countries. In the fifteen to nineteen age group, almost everyone is satisfied with their health. In the rich countries, satisfaction falls relatively slowly, and in the United States, actually *improves* with age after age fifty, (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 9.3 explores the correlates of health satisfaction, following the same general procedures as in tables 9.2 and 9.3. 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 HIV prevalence that has already been described. The first of these dummies ("east") attracts a negative and

Table 9.3 **Cross-country regressions of average health satisfaction**

	(1)	(2)	(3)	(4)
ln *y* 2003	0.0219	0.0472	0.0156	0.0127
s.e.	(0.006)	(0.014)	(0.014)	(0.014)
Growth rate 2000–2003	–1.346	–1.384	–0.722	–0.725
s.e.	(0.225)	(0.219)	(0.238)	(0.231)
Life expectancy 2000		–0.003	–0.000	–0.000
s.e.		(0.001)	(0.002)	(0.002)
LE 2000–LE 1990		0.007	0.001	0.000
s.e.		(0.002)	(0.003)	(0.003)
East			–0.137	–0.118
			(0.024)	(0.024)
SSA			–0.056	–0.041
			(0.034)	(0.034)
HIV			0.015	–0.001
			(0.036)	(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 fifteen to forty-nine-year-olds. s.e. = standard error.

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 9.6, 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 that 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 9.3, 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 9.12—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 United States is an exception in this regard is well-known, see Davis et al. (2007), who find also that the United States 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 United States, even if they deliver much worse health outcomes. The ranking of the United States in the World Poll (81 out of 115) is even worse than in the World Health Organization (WHO) (2000), though

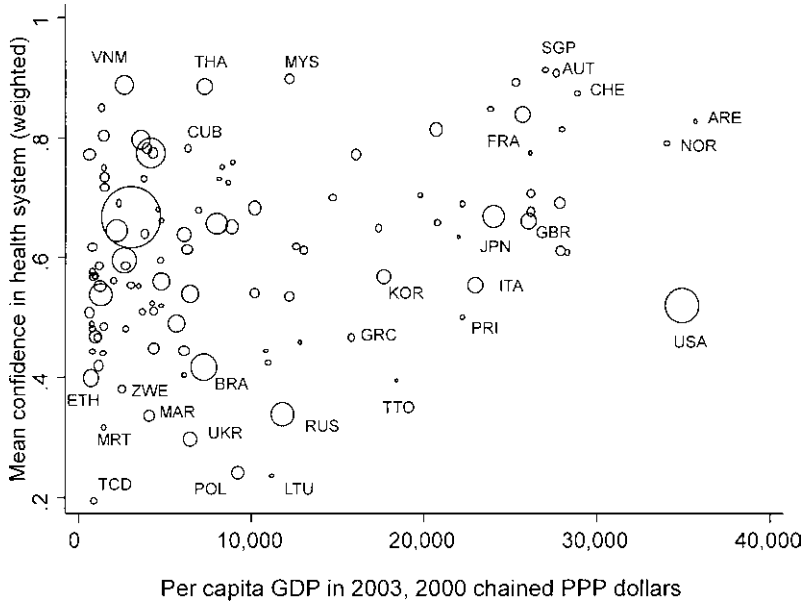

Fig. 9.12 Satisfaction with health care and income

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 9.2 with health satisfaction on the right-hand side, there is a large (close to 4) and statistically significant coefficient, and 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.

9.6 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 to lead a life worth living. 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 may adapt to misery and hardship, and cease to see it for what it is. They 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 as 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 chapter 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, 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, as does the special misery of the elderly in those countries. As a result, the map in figure 9.1 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 on 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 fifties, not in their sixties or seventies, 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, where the joint evolution of man and parasites has ensured that, for hundreds of thousands of years, morbidity has been a constant companion throughout life (Iliffe 1995), health satisfaction declines rapidly 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 well-being, 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 under-

stand what and why they are. In this respect, this 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 9.3, 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 almost all previous microbased 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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Comment

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Many questions in economics are motivated by the question of what circumstances or public policies make individuals better or worse off. Traditionally, economists have relied on revealed preference arguments to motivate the

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Chandra gratefully acknowledges support from the National Institute on Aging (NIA PO1-AG19783); Williams gratefully acknowledges support from the National Institute on Aging, Grant Number T32-AG0000186 to the NBER.