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Subjective life expectancy in the US: correspondence to actuarial estimates by age, sex and race

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Abstract

This study maps the relationship between subjective and actuarial life expectancy in a 1995 national sample of 2037 Americans of ages 18–95. Subjective estimates parallel age-specific actuarial ones based on current age-specific mortality rates. However males expect to live about 3 years longer than the actuarial estimate and blacks expect to live about 6 years longer. The apparent optimism remains after adjusting for socioeconomic status and the signs and symptoms of good health. Contrary to economists' rational-expectations hypothesis, young adults do not adjust their life expectancies upward to account for the favorable trends in mortality rates. © 1999 Elsevier Science Ltd. All rights reserved.

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Introduction

The broad issue addressed in this paper is whether people make reasonably accurate judgments of the remaining number of years of life they can expect. The issue began as a somewhat academic debate among economists over the empirical validity of presumed rational expectations (Lovell, 1986). Economic theories often assume that people have expectations that accurately account for the information available. Any one individual making a particular decision might misjudge, but the errors are essentially random and unbiased with respect to the available information. Subjective life expectancy estimates seem to provide an empirical test of the assumption, because governments regularly disseminate actuarial estimates for public consumption (Hamermesh and Hamermesh, 1983; Hamermesh, 1985; Lovell, 1986).

The issue became political when the state of Hawaii wanted to allow public employees to opt for personally managed retirement accounts (Polluck and Suyderhoud, 1992). Until recently, governments and large corporations in the United States provided large, centrally managed pension programs with defined benefits. In recent decades they began shifting away from that toward individually managed retirement savings accounts with defined contributions. The question arose whether individuals generally will make sensible, rational, informed decisions about saving for retirement. Government and corporate pension plans hire demographers, economists, and investment analysts to plan for the future needs of members. Can government and industry reasonably expect individuals to make decisions for themselves that are, on average, as informed and unbiased as those made by the experts? Again the correspondence between subjective and actuarial life expectancy provides one handle on the issue. It

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measures the correspondence between public expectations and expert forecasts about one critical element of planning for retirement, as well as related judgments about things such as the need for medical or long-term care insurance, or the wisdom of enrolling in a comprehensive life care community.

The small number of prior studies consistently find a high correlation between subjective and actuarial estimates of the number of years of life likely remaining, because both depend heavily on current age (Hamermesh and Hamermesh, 1983; Hamermesh, 1985; Polluck and Suyderhoud, 1992). However the difference rather than the correlation is the issue. If everyone guessed the actuarial estimate minus five years the correlation would be perfect but the difference considerable. The United States Bureau of the Census (1995) disseminates actuarial estimates of life expectancy by age, sex and race. Age-specific differences between subjective and actuarial estimates are at the heart of an ongoing debate over whether young adults account for the favorable trends in mortality when making estimates (Hamermesh and Hamermesh, 1983; Hamermesh, 1985; Polluck and Suyderhoud, 1992). Sex and race specific differences may exist, too (Hurd and McGarry, 1995), perhaps owing to beliefs about sex and race specific mortality trends.

The remainder of this introduction reviews the relevant demographic concepts and terms, the prior findings, and the unresolved issues. It also specifies a model that allows tests of several hypotheses, previewed here and explained below. The *age congruity hypothesis* states that age-specific mean subjective life expectancy conforms closely to age-specific actuarial life expectancy, because age has a big effect on both types of estimates. The *cohort-improvement hypothesis* states that younger adults expect longer lives than implied by current age-specific mortality rates, because they expect the mortality rates to be lower when they reach a given age than the rates for people that age now. The *sex-anomaly hypothesis* states that males expect to live longer relative to females than actuarial estimates suggest. The anomaly may exist because men expect larger declines in age-specific mortality than women, because men feel healthier than women despite higher mortality rates, or because men's greater socioeconomic status makes them more confident about survival. The *race-anomaly hypothesis* states that black Americans expect to live longer relative to whites than actuarial estimates suggest. The anomaly may exist because black Americans expect larger declines in age-specific mortality than white Americans, or because the subgroups that account for higher mortality rates among black Americans tend not to participate in surveys.

Congruity of actuarial and subjective estimates

Subjective life expectancy measures well-being in terms parallel to core demographic concepts and measures. Demographers define life expectancy as "the average number of years of life remaining to a group of persons reaching a certain age" (Nam, 1994). They do not have a standard term for the sum of current age and remaining life expectancy, but 'longevity' (the length of life) will serve. Whether subjective or actuarial, life expectancy can be defined as follows:

$$\text{life expectancy} \mid \text{age} = \text{longevity} \mid \text{age} - \text{age}. \quad (1)$$

Longevity is the age to which one probably will survive, and life expectancy is the number of years remaining until that age. Actuarial estimates project life expectancy from the age-specific annual survival rates of persons a given age or older (e.g. Nam, 1994; Weeks, 1996). Subjective estimates project from observation, information and intuition. The present survey asks "To what age do you expect to live?" The subjective life expectancy is that imagined longevity minus current age.

Actuarial life expectancy has certain properties that subjective life expectancy inherits. The most obvious is that, for adults, life expectancy goes down as age goes up. This is logically implied in the actuarial estimates for adults because the population has a constrained life span and some of its members die at each age. It is not necessarily true in subjective estimates, but individuals seem to imagine a length of life that appears reasonable for people like themselves (Nelson and Honnold, 1980; Hamermesh and Hamermesh, 1983; Robbins, 1988a). Their beliefs may form by observing the ages at death of people like themselves – particularly relatives (Nelson and Honnold, 1980; Robbins, 1988a; Hurd and McGarry, 1995), or by learning the actuarial estimates or cultural standards (Nam and Harrington, 1986), and then adjusting up or down to account for personal circumstances (Hurd and McGarry, 1995). Knowledge, whether personal, cultural, or scientific, tends to cap the longevity estimate. Subjective life expectancy reflects the understanding that life is limited and gets shorter as one ages.

Actuarial life expectancy has another property that is less obvious but also likely to find reflection in subjective estimates. Actuarial life expectancy goes down by less than one year for each additional year of life lived (Polluck and Suyderhoud, 1992). Another way of saying this is that the longevity expected increases with age. There are two reasons. First, by definition life expectancy must be positive for all persons still alive. One's longevity must be greater than one's current age. Second, the people who survive longer into old age may have been healthier throughout life than average