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When Mental Health Becomes Health: Age and the Shifting Meaning of Self-evaluations of General Health

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Abstract
Self-evaluations of general health are among the most widely-used measures of health status in research on the need for and outcomes of medical care. Yet, researchers know little about the psychological processes behind them. This study looks at whether such evaluations, often referred to as self-rated health, shift in what they measure as individuals age. Although several perspectives point to age-related shifts, few researchers have explicitly tested these perspectives against each other. The study tests several competing hypotheses using a large, nationally representative, and longitudinal data set. The results suggest two countervailing trends. First, the correspondence between functional limitations and self-rated health declines, especially after the age of 50. Similarly, the correspondence between a variety of chronic conditions and self-rated health, while strong, declines precipitously. Both of these findings are consistent with the idea that individuals evaluate their health through a process of social comparison and, in so doing, are able to maintain an elevated sense of general health even as they age. Yet, the results also suggest that the correspondence between depressive symptoms and self-rated health increases steadily throughout the life course. Indeed, after the age of 74, the correspondence between self-rated health and some common symptoms of depression becomes stronger than the correspondence between self-rated health and several chronic, and often fatal, somatic conditions. The implications of this crossover for both theory and policy are discussed. Among other things, the crossover has important implications for the detection and treatment of depressive symptoms in later life.

Keywords
self-evaulations, health status, outcomes, self-rated health, perceptions

Comments
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WHEN MENTAL HEALTH BECOMES HEALTH: AGE AND THE SHIFTING MEANING OF SELF-EVALUATIONS OF GENERAL HEALTH ♦

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WHEN MENTAL HEALTH BECOMES HEALTH: AGE AND THE SHIFTING MEANING OF SELF-EVALUATIONS OF GENERAL HEALTH

ABSTRACT

Self-evaluations of general health are among the most widely-used measures of health status in research on the need for and outcomes of medical care. Yet, researchers know little about the psychological processes behind them. This study looks at whether such evaluations, often referred to as self-rated health, shift in what they measure as individuals age. Although several perspectives point to age-related shifts, few researchers have explicitly tested these perspectives against each other. The study tests several competing hypotheses using a large, nationally representative, and longitudinal data set. The results suggest two countervailing trends. First, the correspondence between functional limitations and self-rated health declines, especially after the age of 50. Similarly, the correspondence between a variety of chronic conditions and self-rated health, while strong, declines precipitously. Both of these findings are consistent with the idea that individuals evaluate their health through a process of social comparison and, in so doing, are able to maintain an elevated sense of general health even as they age. Yet, the results also suggest that the correspondence between depressive symptoms and self-rated health increases steadily throughout the life course. Indeed, after the age of 74, the correspondence between self-rated health and some common symptoms of depression becomes stronger than the correspondence between self-rated health and several chronic, and often fatal, somatic conditions. The implications of this crossover for both theory and policy are discussed. Among other things, the crossover has important implications for the detection and treatment of depressive symptoms in later life.

Self-evaluations of general health are among the most widely-used measures of health status in research on the need for and outcomes of medical care. The popularity of such evaluations—referred to as "self-rated health" hereafter—reflects two things. First, self-rated health is easy to include in surveys and item non-response is consistently low. Respondents are simply asked to rate their health from "excellent" to "poor" and have little obvious difficulty doing so. Self-rated health has been a cornerstone to such well-known and influential studies and surveys as the National Health Interview Survey, the Medical Outcomes Study, and the RAND Health Insurance Experiment. Second, self-rated health has a number of desirable empirical qualities. For one, it predicts mortality exceptionally well, usually better than and independent of a wide array of disease-specific indicators (Ferraro and Farmer 1999; Idler and Benyamini 1997; Kaplan and Camacho 1983). It also anticipates treatment behavior and is important for evaluating patient outcomes. Indeed, most models of health care utilization are premised on *perceptions* of general health (e.g., Rosenstock 1966). Furthermore, most researchers now recognize that general health perceptions integrate patient symptoms and values and, thus, are a cornerstone to patient reports of health-related quality of life (Cleary and Edgman-Levitan 1997; Patrick and Erickson 1993; Wilson and Cleary 1995).

Yet, despite self-rated health's popularity, validity, and conceptual appeal, researchers remain uncertain about its psychological underpinnings. Previous studies have explored the meaning of self-rated health by exploring its relationship to a variety of particular indicators (e.g., diagnoses) (Harlow and Linet 1989; Pijls, Feskens, and Kromhout 1993) or by asking a small group of study participations to elaborate what they think "health" is (Krause and Jay 1994). These studies reveal the great breadth of referents that individuals consider when ask to evaluate their health globally, from mental health, to physical health, to functional limitations.

Furthermore, they reveal that these evaluations reflect the individual's preferences, values, and experiences (Jylhä et al. 2001). Nevertheless, numerous gaps remain. Among the most important is that few studies have explicitly sought to understand when self-evaluations of general health begin to diverge from more particular indicators. Although researchers strongly distinguish self-evaluations of health from clinical outcome measures, they generally emphasize the strong relationship between the two. Indeed, the value of self-rated health to researchers would now seem to derive more from its convenient overlap with a variety of "objective" indicators than from what it reveals about a person's unique construal of his/her health—self-rated health is often equated with health itself.

The present study seeks to recapture the subjectivity of self-rated health by opening up the black box of what it measures. Moreover, in an extension of previous research, it seeks to explore how evaluations of health change with age. It focuses on age for several reasons. For one, a number of theoretical frameworks anticipate—explicitly or implicitly—that age affects how health is evaluated (for a review, see the special issue of *Research on Aging*, May 1999) (Harlow and Linet 1989; Pijls et al. 1993; Suls, Marco, and Tobin 1991). Indeed, research suggests that age may affect evaluations of health more than any other sociodemographic characteristics (Krause and Jay 1994). Furthermore, a focus on age may help to shed additional light on issues of special significance to contemporary clinical practice. Understanding the underpinnings of self-evaluations of general health among the aged is important for those interested in meeting the health care needs of older persons.

I explore these issues using a nationally representative longitudinal data set with an extensive battery of health-related questions (Americans Changing Lives, House 2003). Employing methods similar to those used in other contexts (see Case and Paxson 2005 regarding

gender), I examine associations between self-rated health and a variety of particular health indicators and explore how these associations change with age. The data provide two unique benefits.

The longitudinal design allows me to test age-based interpretations against equally viable cohort-based interpretations. Most of the theories outlined below emphasize how perceptions of health change with age. For example, social comparison theory argues that, as individuals age they are more likely to witness the poor health of age-peers and adjust their evaluations of their own health accordingly. Other perspectives emphasize cohort. Beliefs about health and illness may be formed—as are many beliefs—early in life. Recent cohorts may hold higher expectations for good health and these expectations may shape the perceived severity of assorted health-related limitations, elevating the severity of conditions that earlier cohorts consider minor.

The extensive battery of health questions, meanwhile, allows me to examine self-rated health's numerous and varied components. The results point to dramatic shifts in the psychological underpinnings of self-rated health, shifts that are at once consistent and inconsistent with previous speculation.

BACKGROUND

SOCIAL COMPARISON OR ILLNESS PREOCCUPATION

Virtually all accounts of self-rated health begin with the idea that health is evaluated relative to the health of comparable others and that individuals may be "biased" toward making favorable comparisons. In a series of now-classic studies, Shelley Taylor and colleagues demonstrated that, when asked to evaluate the severity of their condition, women with breast cancer were far more likely to compare themselves with women whose condition was worse than

their own than with women whose condition was better (i.e., they were more likely to make "downward" than "upward" comparisons) (Wood, Taylor, and Lichtman 1985). A similar result has been documented for other illnesses of similar or lesser severity (Afflect et al. 1988; DeVellis et al. 1990; Helgeson and Taylor 1993), leading researchers to the more general conclusion that individuals are often motivated to allay the perceived threat of illness more than they are to seek completely objective and accurate information.[1] This idea suggests that the elderly may be especially prone to inflating their self-evaluations of health given that they have more opportunities to make downward comparisons among their peers. To this point, research already suggests that individuals act as lay epidemiologists and evaluate the severity of a condition based on how unusual they believe that condition is for someone their age (Croyle 1992; Suls et al. 1991). Furthermore, a good deal of research finds that the elderly rate their health in a seemingly optimistic fashion. Using open-ended interviews, Idler (1993) finds that many elderly report good overall health, even if they are also quick to note that they have good health despite some limitations. Similarly, quantitative studies find that the correlation between functional limitations and self-rated health declines in later life, precisely when such limitations become more prevalent and severe (Hoeymans et al. 1997; Levkoff, Cleary, and Wetle 1987).

Although social comparison has received some generic support, there are reasons to expect that the salience of illness increases with age. The elderly might simply be more aware of illness and this awareness might, in turn, be sufficient to prompt perceptions of poor health. Leventhal (1984) elaborates a cognitive model of illness perception. In this model, physical limitations and diagnosed health problems cue other symptoms and limitations that might

[1] There are important exceptions to this finding. Among the most important is that individuals may compare themselves with those who are worse off, but continue to affiliate with those who are better off (Taylor and Lobel 1989).

otherwise have been overlooked, but once recognized through the lens of a diagnosis, bolster a more general sense of failing health. This model predicts that the correlation between any particular health indicator and self-evaluations of general health will increase with age. Although very much at odds with the predictions of social comparison, this model has received at least some empirical support. For example, Strain (1993) finds a steady increase in the salience of functional limitations with age; Krause and Jay (1994) find that older persons are more likely than younger persons to consider specific health problems when evaluating their health; and several researchers document health pessimism among the elderly (Borawski, Kinney, and Kahana 1996; Goldstein, Siegel, and Boyer 1984; Idler, Hudson, and Leventhal 1999; Levkoff et al. 1987). More generally, the model is consistent with the finding that the elderly seek health care quickly in response to any symptom that is regarded as even moderately threatening, a response premised on a growing sense of health-related vulnerability (Leventhal et al. 1993).

THE CASE OF DEPRESSION

It is important to distinguish mental health from physical health—the two may follow very different age trajectories. Indeed, it is unclear whether depressive symptoms are considered in self-assessments of general health at all: some studies find that very few people make explicit spontaneous reference to mental health when asked to discuss their health (Krause and Jay 1994). On the one hand, we might expect that the salience of depressive symptoms for self-evaluations of health declines with age. The undertreatment of depression among the elderly is a widely recognized problem and may be rooted in the elderly's belief that depression is an inevitable part of aging, loss, and grief (see, Unützer et al. 1999). These beliefs may be exacerbated by physician behavior insofar as physicians do not feel that depression warrants any

additional investigation or treatment beyond that provided for chronic illness (Glasser and Gravdal 1997).

Yet, on the other hand, there are good reasons to expect that the elderly are concerned with emotional experiences, even if they do not articulate such experiences in terms of depression. Along these lines, socioemotional selectivity theory argues that motives change considerably with age (Carstensen, Isaacowitz, and Charles 1999). The theory predicts that as individuals age their time horizons become shorter and they begin to devote more attention to realizing emotional satisfaction in the present than to making behavioral investments for the future. The theory has not been applied to self-evaluations of general health, although its insights can be generalized easily. Several studies speak to the growing salience of emotions. For example, the elderly appear to weigh the avoidance of negative emotions more strongly than the young when making decisions about social activities (Blanchard-Fields 1986; Blanchard-Fields, Jahnke, and Camp 1995). Indeed, recent studies concerned with health-related quality of life have found that are entirely consistent with the theory's predictions. In a study of adults with coronary artery disease, Ruo and colleagues (2003) found that depressive symptoms were strongly associated with patient-reported global health status, while two physiological measures of disease severity—left ventricular rejection fraction and ischemia—were not. Because of the restricted age-range of the study's participants (the average age of participants was over 60), the authors were unable address age-related differences in the relationship between depressive symptoms and global health. Nevertheless, socioemotional selectivity theory anticipates these results and further suggests that they may be particular to an older-age sample.

LIMITATIONS OF PREVIOUS RESEARCH

The complex results of these studies reflect many things, but they undoubtedly reflect, at least in part, the diverse methods the studies employ. For one, this is an area where qualitative research—with some notable exceptions—has far outweighed survey research. Although qualitative research is useful for uncovering the many components underlying self-rated health, it is less useful for evaluating the relative strengths of these assorted components. Furthermore, although interested in age, many of the above studies are cross-sectional and so are unable to disentangle age from cohort (Borawski et al. 1996; Borawski et al. 1996; Goldstein et al. 1984; Hoeymans et al. 1997; Idler 1993; Idler et al. 1999; Johnson and Wolinsky 1993; Levkoff et al. 1987; Levkoff et al. 1987; Maddox and Douglass 1973; Mechanic and Angel 1987; Rakowski and Cryan 1990; Tornstam 1975). This is an especially important limitation given that virtually all of the above findings could be interpreted in terms of cohort. Recent cohorts may have different conceptions of health given an extended life expectancy, improvements in medical treatment, and broad public enthusiasm for medical enhancement (Flykesnes and Forde 1991; Rosenberg 2002; Rosenberg 2002; Starr 1982). Along these lines, Spiers and colleagues (1996) find that recent cohorts in England and Wales are more likely to include mild conditions in their self-evaluations of health, findings they interpret in terms of these cohorts' especially strong expectations for a healthy lifespan.

DATA AND METHODS

Americans' Changing Lives (ACL) provides an excellent opportunity to redress many of these limitations (House 2003). The ACL is a nationally representative longitudinal study of adults aged 25 and older and is widely used in medical sociology and other disciplines. Respondents were identified using a four-stage sampling strategy, beginning with standard

metropolitan statistical areas and counties, followed by smaller geographic areas, followed by houses, followed by the random selection of eligible respondents therein. The ACL followed an initial sample for three waves (1986, 1989, and 1994). In the first wave, 3,617 respondents were interviewed, with an overall response rate of 68%. An attempt was made to recontact all these respondents in the second and third waves, although the sample size declined somewhat over time. With non-response and mortality (corresponding to a loss of 584 and 166 respondents respectively), 2,867 respondents were interviewed in the second wave and, following similar patterns of attrition, 2,562 respondents were interviewed in the third. The ACL oversampled African Americans and those over the age of 60.[2] The ACL contains numerous indicators of morbidity.

Morbidity Indicators

The dependent variable in the regression models presented below is self-rated health. Self-rated health was asked as follows: "how would you rate your health at the present time? Would you say it is excellent [coded as 1], very good, good, fair, or poor [coded as 5]?"[3] Although this direction of coding is the reverse of that used in most other studies, it provides a more straightforward way of evaluating a growing association between a particular condition and self-rated health: a growing association will be realized in a positive increase in an already positive coefficient. Age-groups were divided into one of six categories (see House et al. 1994):

[2] Because of the unequal probability of selection, all descriptive statistics (e.g., prevalence estimates) were weighted. The regression models, however, were not: because the models include or are stratified by the features of sample selection (i.e., age and race/ethnicity), the coefficients are unbiased and consistent even without the use of weights (Winship and Radbill 1994).

[3] There are several versions of self-rated health. Some include only four response categories and others are explicitly asked in relative terms. Yet, despite their differences, these versions correlate very highly with each other and their empirical properties (e.g., the ability to predict mortality) are nearly identical (Idler and Benyamini 1997).

25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 to 74, and 75 and older. The ACL contains three types of morbidity indicators.

Chronic Somatic Conditions. Respondents were asked whether they experienced each of the following conditions in the previous twelve months: arthritis or rheumatism, stroke, cancer or a malignant tumor, diabetes or high blood sugar, heart attack or other heart trouble, hypertension, and lung disease. Each condition was coded as a yes (1) or no (0) dummy variable.

Functional Limitations. Respondents were also asked a series of questions about functional limitations. Respondents were asked about five domains: the degree of difficulty they had in bathing themselves; whether they had difficulty climbing stairs, walking several blocks, and with heavy housework; and if they were in a bed or chair all or most of the day. Responses to these items were combined to create a four-level Guttman-style scale (ranging from 1 to 4) (Guttman 1950), with the first level indicating no functional limitations; the second indicating difficulty with heavy housework; the third indicating difficulty climbing stairs or walking; and the fourth indicating those who were in a bed or chair most of the day and/or had difficulty bathing. Because the distance between adjacent levels is unknown and may not be constant, the association between self-rated health and the functional limitations scale is estimated using a series of three dummy variables (with "no impairment" as the reference category).

The Center for Epidemiological Studies Depression Scale (CES-D). The CES-D is one of the most popular dimensional measure of depressive symptoms in the social sciences (Radloff 1977). The shortened version of the CES-D contained in the ACL consists of eleven items. Respondents were asked if they experienced the following symptoms "hardly ever" (coded 1),

"some of the time," or "most of the time" (coded 3) during the past week: "I felt depressed," "I felt that everything I did was an effort," "My sleep was restless," "I was happy" [reverse coded], "I felt lonely," "People were unfriendly," "I enjoyed life" [reverse coded], "I did not feel like eating. My appetite was poor," "I felt sad," "I felt that people disliked me," and "I could not get 'going.'" The analyses use these diverse items in two different ways. Models presented in Tables 3 and 4 use a standardized average, with a mean of zero and a variance of one—tests of coefficient reliability were sufficiently high for a summary measure (alpha = .83) (Cronbach 1951). Models presented in Table 6 explore each of the eleven items separately. This is done in order to examine the comparability of results between those items that are affective (e.g., "I felt sad") and those that are somatic (e.g., "I did not feel like eating").

Statistical Strategy

Recall that the ACL is a panel survey. Two types of models are used, each with a different goal in mind. First, simple linear regression models are used in order to examine the association between particular health indicators and self-rated health.[4] In these cross-sectional models, self-rated health is regressed on each of the particular indicators, using observations from the first panel only. Second, models that use data from all three panels (with person-panels

[4] All the analyses that follow use linear regression and assume that adjacent categories are equidistant. Supplementary analyses interrogated this assumption. Two general types of models were explored. First, ordered-logistic regression models were estimated (Long 1997). Such models relax the assumption of equal distance and estimate a series of "cut" points corresponding to the distance between categories. Second, self-rated health was recoded to allow, as suggested in previous research, the distance between categories of good health to be smaller than that between categories of poor health: I estimated models using self-rated health squared as an outcome, as well as models that recoded self-rated health as 5, 10, 20, 70, 85, rather than 1, 2, 3, 4, 5. In all these cases, the results were comparable to those presented below: all significant age × illness interactions that are reported as significant below were also significant using these alternative techniques. Although perhaps at odds with the intuition that excellent and very good health are distinct from the remaining categories, this result is consistent with methodological research suggesting that self-rated health behaves like a continuous variable (Manderback, Lahelma, and Martikainen 1998; Manor, Matthews, and Power 2000).

as the unit of observation) are used in order to test the sensitivity of the cross-sectional models to cohort-based processes. In this series of models, both random- and fixed-effects models are estimated. Random-effects regression models are similar to linear regression models, but correct for the within-person correlation resulting from using multiple observations from a single person (Baltagi 1995). Fixed-effects regression models, by contrast, consider these multiple observations by estimating (or by conditioning out of the estimation process) a constant (or "fixed") parameter for each individual (Allison 1990; England et al. 1988). Because fixed-effects models include an individual-specific constant, they are only able to estimate coefficients for variables that change between panels. Yet, by focusing on change, such models eliminate from consideration all observed and unobserved unchanging characteristics of the individual.[5] This property is attractive to social scientists because it provides a convenient solution to the common problem of unobserved heterogeneity. In the present study, it provides a simple way to test the sensitivity of age effects to cohort. Cohort effects are by definition fixed—they pertain to beliefs developed at particular historical periods, at particular times in the life course, which are then carried forward. As a result, they are estimated out of the effects of age when fixed-effects models are used. To be sure, fixed-effects models do not completely *resolve* the cohort problem: they do not eliminate *interactions* between age and cohort (see Ryder 1965) and, because the ACL covers only eight years, they are less sensitive to age-related change than data observed over a longer period. Nevertheless, fixed-effects models provide a convenient and useful sensitivity analysis: if age-group differences reflect cohort differences instead, the use of fixed-effects should eliminate (or substantially reduce) the effects of age.

[5] The language of "fixed" effects refers to "fixed" individual-specific parameters. It does not refer to "fixed" coefficients, as in multilevel modeling. In that context, a coefficient can either be "fixed" to be constant within higher-level units or "random" and allowed to vary.

The results begin with three tables. These tables examine the simple association between self-rated health and the three types of particular health-related evaluations as outlined above. Although the models may appear under-specified, it is important to reiterate that this study is concerned with the association between self-rated health and more particular indicators. It is not concerned with the *epidemiological causes* of health. Including variables antecedent to both self-rated health and the more particular indicators (e.g., education, income, occupation) would reduce the coefficients for the health indicators, but would not shed any additional light on the debates this study is concerned with.

RESULTS

Table 1 presents coefficients from thirty-nine regressions of self-rated health on each of seven chronic conditions, stratified by age group (because of the small sample size, models could not be estimated for stroke among those under the age of 55). For each condition, the first row presents the coefficient, followed in the second row by the standard error, followed in the third row by the condition's prevalence. Although not denoted using the conventional asterisks for statistical significance, each of the coefficients is statistically significant from zero at $p < .01$. The coefficients show the strength of the relationship between reports of a condition, such as arthritis or cancer, and self-assessments of general health—the larger the coefficient, the stronger the relationship. Thus, for example, reporting having cancer is more strongly associated with self-rated health for those ages 25 to 34 than for any other age group. By examining patterns between age groups, it is possible to test the hypotheses outlined above: social comparison predicts a decline in the size of these coefficients between age groups, while illness preoccupation predicts an increase. The tables also present information on the statistical

significance of age-trend in the coefficients: the superscript "a" denotes that age × illness dummy variables were statically significant in regression models estimated using all the age groups.

Table 1 suggests two related patterns, both of which point to social comparison, but not unambiguously so. For some conditions (e.g., diabetes and heart attack), the coefficients increase in size until approximately middle age (ages 45 to 54), but decrease steadily thereafter. For other conditions (e.g., stroke and hypertension), the coefficients decrease more consistently. These two patterns are distinct and do not provide absolutely clear support for social comparison. Nevertheless, for all but one of the conditions (cancer), the smallest coefficient is found for the 75 and older age group. Thus, even if illness preoccupation is occurring up until late middle age, it is more than negated by social comparison in later life. Indeed, the decline in the coefficients is often quite large. The coefficient for cancer, for example, decreases from 2.308 (for those 25 to 34) to .648 (for those age 75 and older), a decline of 72%. Similarly, the coefficient for heart attack decreases from 1.583 (for those 35 to 44) to .773, a decline of 51%. Regression models explored age × illness interactions, thereby exploring linear declines with age. All the declines presented above were statistically significant with the exception of arthritis and stroke.

—Insert Tables 1 and 2 About Here—

Table 2 turns to functional limitations. Recall that, as coded, functional limitations reflects four levels of consecutively more severe impairment. The results suggest that the associations between self-evaluations of general health and functional limitations increase from the age of 25 until sometime in middle age. Nevertheless, most of the coefficients decline after the age of 54. For each level of limitation, the smallest coefficient, as in Table 1, is always found for those 75 and older and the magnitude of the decline in the coefficients is remarkable.

For example, the coefficient for "most severe impairment" decreases from a high of 2.379 (for those 35 to 44) to a low of 1.281 (for those 75 and older), a reduction of 46%. The coefficient for "least severe impairment" decreases from 1.494 (for those 25 to 34) to .422, a reduction of 72%. Beyond the reduction, the absolute magnitude of the coefficients is noteworthy: the coefficients for the least severe impairment are as large or larger than the coefficients for many of the chronic conditions reported in Table 1. This suggests that individuals may judge their health more on the basis of successful role performance than on any other single factor, a result found in other studies as well (Flykesnes and Forde 1992; Liang 1986; Tessler and Mechanic 1978). Once again, tests of the significance of the declines by age were significant.

—Insert Table 3 About Here—

Table 3 turns to depressive symptoms. The standardized mean for the depression scale follows a U-shaped pattern, such that those over the age of 74 report the most depression (see Mirowsky and Ross 1992 for a similar pattern). Yet, in marked contrast to the above patterns, the association between self-rated health and depressive symptoms increases with age. Indeed, the coefficient doubles in size: for those aged 25 to 34, the coefficient for depression is .236, while, for those over the age of 75, the coefficient is .472. Although the largest consecutive increases are found between the youngest age groups, steady increases occur between most age groups and, in contrast to the results presented above, the *largest* coefficient is found for those ages 75 and over. In this case, a test of age-trends suggests a significant increase.

Although these findings are suggestive, the interpretation is ambiguous given that (*i*) age-related changes may, as noted above, reflect cohort-related changes instead; (*ii*) there is a clear correlation between chronic conditions, functional impairments, and depressive symptoms, such that when all three factors are considered in the model the relationship between depressive

symptoms and self-rated health might be very different; and (*iii*) the large association between depressive symptoms and self-rated health might reflect the unique perceptions of those nearing the end of life, rather than an aging effect *per se,* especially given that socioemotional selectivity focuses on how much time an individual perceives as having left to live. Tables 4 and 5 explore these possibilities in a series of multivariate sensitivity analyses. Table 4 explores multiplicative interactions between age and depressive symptoms and Table 5 explores multiplicative interactions between age and functional limitations. Given the results presented above, the interactions should be negative in the case of functional limitations and positive in the case of depression.[6] To test the sensitivity of the findings, these tables examine three things: they include independent variables that might account for the interactions, they estimate both fixed- and random-effects models, and they explore the interaction in analytically more stringent and revealing subsamples.

—Insert Tables 4 and 5 About Here—

Table 4 begins with depression. Four models are presented: the first is a simple random-effects regression model, the second is a random-effects model that includes controls for functional limitations and the number of chronic conditions, the third is a fixed-effects model, and the fourth is a random-effects model where the sample is limited to those who survived through all three panels. These tests do little to change the conclusions drawn earlier. Indeed, there is remarkable similarity between these assorted models. In Model 1, the interaction between age and depressive symptoms is positive and statistically significant, as we would expect. Model 2 suggests that this interaction remains significant even when controlling for

[6] Because the pattern is not entirely linear (as documented above), these interactions provide a conservative test of age-related change. A more robust test—if also more complex—would include interactions with age and age-squared.

functional limitations and the number of chronic conditions. Model 3 suggests that the interaction remains significant even when fixed-effects methods are used. And Model 4 provides little evidence that these changes reflect the idiosyncratic perceptions of those nearing mortality in subsequent panels—indeed, the interaction in Model 4 is nearly as large as that found in Model 1. Table 5 turns to functional limitations. The results parallel those for depressive symptoms. Model 1 confirms the declining association between functional limitations as self-rated health. Model 2 suggests that cohort effects do little to explain this decline. And Model 3 provides no evidence that the decline is driven only by those nearing death.

—Insert Table 6 About Here—

Given the declining association between self-rated health and chronic conditions and the rising association between self-rated health and depressive symptoms, it is possible that, in later life, self-assessments of general health reflect mental health as much as physical health. As presented in Tables 1, 3, and 4, the relative strength of the associations between self-rated health and chronic illness and self-rated health and depressive symptoms is difficult to evaluate. The independent variables are measured using different metrics: whereas the chronic conditions are dummy variables, the CES-D is a standardized mean. Furthermore, it is difficult to evaluate if the rising association between depressive symptoms and self-rated health exists for all of the symptoms of depression: the CES-D contains symptoms that are affective (e.g., I felt sad) and others that are clearly more somatic (e.g., I could not get going). Table 6 provides a straightforward basis for comparison and, at the same time, explores whether the rising association is limited to a particular class of symptoms. Table 6 presents coefficients from models regressing self-rated health on each of the eleven symptoms comprising the CES-D. The sample is limited to those 75 and older. Two coefficients are presented for each symptom,

corresponding to those who experienced the symptom "some of the time" (the first column of coefficients) and those who experienced the symptom "most of the time" (the second column of coefficients). Virtually all of coefficients are statistically significant and large. Indeed, the difference between those who experienced a symptom "hardly ever" and those who experienced a symptom "most of the time" is, in some cases, larger than the difference between those with and without chronic conditions. For example, the coefficients for "I felt that everything I did was an effort," "I could not get going," and "I felt depressed" are larger than the coefficients for *any* of the seven chronic conditions for those 75 and older presented in Table 1. Although the strongest associations are for symptoms involving functional limitations (i.e., "I felt that everything I did was an effort" "I could not get 'going'"), large associations are found for symptoms that are clearly affective. For example, the "most of the time" coefficient for "I felt depressed" is one of the largest coefficients, followed closely by the coefficient for "I felt lonely" and, when considering absolute magnitude, the coefficient for "I enjoyed life." All three of these coefficients are larger than the coefficient for cancer. Thus, strong associations are observed for affective and somatic symptoms alike.

CONCLUSION

In recent years, self-rated health has assumed such prominence that researchers have done little to assess what individuals consider when they are asked to evaluate their health. The present study sought to fill several gaps. The results indicate that the meaning of self-rated health changes with age, to the point that evaluations of general health are not strictly comparable between age groups. There are two patterns in this regard. The first indicates that the correspondence between functional limitations and self-rated health declines with age, as

does the correspondence between many chronic conditions and self-rated health. For all seven chronic conditions and all levels of functional limitation, the association with self-rated health is weakest among those 75 and older. Yet, the second pattern indicates that the correspondence between depressive symptoms and self-rated health increases precipitously with age. This second pattern is as striking as much for its strength as for its pattern. Indeed, after the age of 74, some depressive symptoms become more strongly associated with self-rated health than several of chronic—and generally severe—conditions. For example, agreement with the statement "I feel depressed most of the time" has a stronger association with self-rated health than does any of the seven chronic conditions with the exception of stroke. Similarly, agreement with the statement "I enjoy life most of the time" has a stronger association with self-rated health than does cancer. Although functional limitations maintain the strongest association, depressive symptoms eventually become a close rival.

In documenting the increasing salience of depressive symptoms, the results diverge from previous research in several respects and call for several reconsiderations. Most notably, the results call for a reconsideration of the overwhelming importance of maintaining a positive sense of health and, relatedly, the "biases" thought to motivate social comparison. To be sure, social comparison accurately anticipates the declining significance of both chronic illness and functional limitations and, in this regard, self-assessments of general health may appear more optimistic than assessments based on the presence or absence of disease or impairment. Yet, social comparison does not accurately anticipate the increasing significance of depressive symptoms given that its guiding principle is that individuals seek to inflate their sense of health beyond what their "objective" health might allow. If self-evaluations of general health reflect a defensive reaction to increasingly poor health, we would not expect the importance of depression

to increase, especially given that depressive symptoms are common among those over the age of 74. What these results suggest instead is that the elderly are changing their evaluations in ways that reflect their changing values. As socioemotional selectivity anticipates, the results suggest that emotions are an increasingly salient dimension of health, to the point of outweighing other, more conventional features of morbidity.

Although the results point to the growing salience of depressive symptoms, they should be read cautiously with respect to what they reveal about *beliefs* about depression. Indeed, there has been a good deal of discussion surrounding the reasons for the elderly's lack of treatment for depression, and much of this research has emphasized patient-level barriers, including but not limited to stigma (Unützer et al. 1999). While depressive symptoms may be increasingly salient to self-evaluations of general health, this does not mean that the elderly are any more supportive of psychiatric treatment. The results encourage more complex and fine-grained explorations of the elderly's beliefs and there are a number of intriguing possibilities in this regard. For example, in contrast to younger generations, the elderly may be more inclined to view depression as an important feature of health, but less inclined to articulate and present their symptoms in ways that lead to treatment. Age groups may differ just as much on their beliefs about the appropriate treatment for depression as how important avoiding depression is for maintaining one's quality-of-life.

The results also speak to the "validity" of self-rated health. Researchers continue to be drawn to self-rated health because of its remarkable ability to predict mortality. In this regard, the results do not suggest that self-rated health is any less valid because it is associated more with depression. For one, the association between chronic illness and self-rated health is not eliminated entirely: the age-based declines should be understood as declines *relative* to former

levels and not as declines to the point of statistical or substantive insignificance. Furthermore, depression itself is not entirely unrelated to mortality. Several studies have demonstrated a relationship between depressive symptoms and accelerated mortality (Anda et al. 1993; Cohen and Rodriguez 1995; Frasure-Smith, Lesperance, and Talajic 1995; Glassman and Shapiro 1998; Kiecolt-Glaser et al. 2002). Although the reasons for this relationship are not well understood and there is some skepticism regarding whether the relationship is causal, the relationship does suggests that self-rated health's ability to predict mortality may not be compromised simply because self-rated health is associated more with depressive symptoms and less with chronic conditions.

Perhaps more troubling are the results' implications for research concerned with age trajectories in health. Social epidemiology and demography have long been concerned with the shape of health disparities across the life course. A key debate has been whether the effects of socioeconomic status increase with age (consistent with a *cumulative advantage* approach) or whether they increase until late middle-age and decrease steadily thereafter (consistent with an *age-as-leveler* approach) (Ross and Wu 1996). Empirical tests of these alternative perspectives have yielded mixed results, with some finding evidence for age-as-leveler (House et al. 1994) and others for cumulative advantage (Lynch 2003). If the results presented here reflect broader patterns, those relying on self-rated health as their sole outcome should be cautious about inferring changes in the effects of socioeconomic status on morbidity when such changes might instead reflect changes in what self-rated health is capturing. More particular patterns are possible, including that the association between socioeconomic status and mental health increases while the association between socioeconomic status and physical health declines. Disentangling these possibilities will require considering multiple outcomes, including both

physical and mental health, and paying particular attention to the ways in which these different outcomes diverge.

This study has several important limitations. First, although the data are longitudinal and cover nearly a decade, there have undoubtedly been important changes since 1994. The availability of ever more pharmaceuticals, combined with the continued growth of direct-to-consumer marketing, may have significantly altered public perceptions of health and well-being (see Conrad 2005). Although changes between periods have no necessary relationship with changes between age groups, future research should be attentive to the rapid ways in which perceptions of health can progress and elevate the perceived severity of once minor conditions. Second, while the ACL is nationally representative and oversamples the elderly, it almost certainly under-represents the severely ill given that it samples households. Those coping with an illness severe enough to require institutionalization may have viewpoints that are very different from those who are well enough to live in a home. That said, there is little to suggest that a more thoroughly representative sample would yield radically different results—as shown above, the results are remarkably robust to several forms of selective sample-attrition. Third, the results may be very different between cultures. Indeed, the psychological processes underlying the salience of depressive symptoms may be uniquely Western, especially if they are rooted in the elderly's search for emotional satisfaction (Markus and Kitayama 1991). Third, while the ACL contains a wide variety of particular health indicators, other elements of health could not be explored. More objective clinical indicators—as uncovered, for example, in blood tests or a physical exam—may have very different relationships with self-rated health than the self-reported "clinical" indicators considered here.

This study encourages additional research on the disjuncture between particular illnesses and self-evaluations of general health. Researchers regularly speculate about group differences in beliefs about health and illness, but there is surprisingly little empirical research on such differences. This study's methods can easily be generalized to examine other sociodemographic factors, including education and race/ethnicity. More generally, the results encourage additional research on the subjectivity, construal, and social psychology of health. Although self-evaluations of general health overlap with clinical outcomes in important ways, the disjuncture between the two provides important clues regarding how different groups evaluate health, as well as insights about the particular health care needs of different populations.

Furthermore, the results encourage additional emphasis on depression as a feature of health. Depression is not conventionally considered an indicator of morbidity. Furthermore, it is especially likely to overlooked when treating the elderly (Unützer et al. 1999). Some suggest that the pursuit of happiness may only be a concern about recent cohorts, who are no longer concerned with basic survival (Felton 1987). However, depression's standing—at least in the health literature—appears be changing. For one, some have recently pushed for the recognition of depression as a disease equivalent to other somatic conditions (see, for example, Kramer 2005). Furthermore, researchers now recognize that depression contributes enormously to the total amount of disability experienced in a lifetime (see Murray and Lopez 1996). The results of the study are consistent with the spirit of this literature in suggesting that depression is an important feature of health and, indeed, that it might be the key feature of health in the mind of America's elderly population.

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TABLE 1. Coefficients from Thirty Nine Age-Group Stratified Regressions of Self-Rated Health on Chronic Illness: Americans' Changing Lives, 1986

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 +
Arthritis	0.648	0.463	0.667	0.668	0.679	0.423
	(0.132)	(0.108)	(0.120)	(0.081)	(0.081)	(0.115)
Prevalence	8.3	17.6	29.7	49.7	58.3	63.0
Stroke	NA	NA	NA	1.373	1.081	0.960
				(0.413)	(0.323)	(0.410)
Prevalence				.5	1.6	.9
Cancer	2.308	1.100	1.608	0.526	0.538	0.648 [a]
	(0.468)	(0.451)	(0.377)	(0.242)	(0.208)	(0.258)
Prevalence	.6	.7	2.5	2.9	4.7	6.1
Diabetes	0.752	0.946	1.307	0.723	0.601	0.441 [a]
	(0.262)	(0.216)	(0.212)	(0.125)	(0.113)	(0.148)
Prevalence	1.5	3.0	5.7	9.6	12.6	14.1
Heart Attack	1.259	1.583	1.262	1.001	1.096	0.773 [a]
	(0.331)	(0.240)	(0.215)	(0.124)	(0.109)	(0.143)
Prevalence	1	2.0	6.0	12.5	13.8	16.5
Hypertension	0.980	0.903	0.920	0.559	0.753	0.417 [a]
	(0.118)	(0.112)	(0.129)	(0.086)	(0.078)	(0.110)
Prevalence	7.4	10.4	19.7	34.5	44.0	43.3
Lung Disease	0.988	1.663	1.676	1.010	0.626	0.747 [a]
	(0.261)	(0.286)	(0.272)	(0.173)	(0.161)	(0.231)
Prevalence	1.6	1.8	4.3	5.8	7.4	7.4
N	740	591	390	685	765	446

Note: Coefficients are from models regressing self-rated health on each chronic illness separately. All models also include controls for race/ethnicity (coefficients not shown). Coefficients are unstandardized. Standard errors are in parentheses. All coefficients significantly different from zero at $p < .05$.

[a] Test of linear trend between age groups (i.e., age × illness interactions) significant at $p < .05$.

TABLE 2. Coefficients from Six Age-Stratified Regressions of Self-Rated Health on Functional Limitations: Americans' Changing Lives, 1986

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 +
Functional Limitations (vs. no impairment)						
Least Severe	1.494	1.197	1.202	1.004	0.744	0.422 [a]
Impairment	(0.247)	(0.195)	(0.215)	(0.120)	(0.099)	(0.126)
Moderately Severe	2.306	1.636	2.052	1.291	1.347	1.089 [a]
Impairment	(0.442)	(0.221)	(0.215)	(0.120)	(0.107)	(0.133)
Most Severe	2.038	2.379	1.848	1.606	1.610	1.281 [a]
Impairment	(0.314)	(0.273)	(0.275)	(0.151)	(0.140)	(0.151)
N	740	591	390	685	765	446
Functional Limitations Mean	1.06	1.11	1.19	1.45	1.54	2.02

Note: Coefficients are from models regressing self-rated health on dummy-variables for functional limitations and race/ethnicity (coefficients for race/ethnicity not shown). Coefficients are unstandardized. Standard errors are in parentheses. All coefficients significantly different from zero at $p < .05$.

[a] Test of linear trend between age groups (i.e., age × illness interactions) significant at $p < .05$.

TABLE 3. Coefficients from Six Age-Stratified Regressions of Self-Rated Health on Depressive Symptoms (CES-D): Americans' Changing Lives, 1986

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 +
Depressive Symptoms, CES-D	0.236 (0.032)	0.305 (0.034)	0.376 (0.052)	0.468 (0.038)	0.437 (0.038)	0.472 [a] (0.048)
N	740	591	390	685	765	446
CES-D Mean (Standardized)	.088	.019	-.066	-.089	-.141	.138

Note: All coefficients from models regressing self-rated health on CES-D and race/ethnicity (coefficients for race/ethnicity not shown). Standard errors are in parentheses. All coefficients significantly different from zero at $p < .05$.

[a] Test of linear trend between age groups (i.e., age × illness interactions) significant at $p < .05$.

TABLE 4. Random- and Fixed-Effects Regressions of Self-Rated Health on Depressive Symptoms (CES-D) × Age Interactions: Americans' Changing Lives, 1986, 1989, 1994

	Model 1	Model 2	Model 3	Model 4
	Random Effects	Random Effects	Fixed Effects	Random Effects, Survivor Sample
Depressive Symptoms, CES-D	0.094**	0.108**	0.058	0.114**
	(0.033)	(0.030)	(0.043)	(0.035)
Age	0.019**	0.003**	0.030**	0.018**
	(0.001)	(0.001)	(0.003)	(0.001)
Depressive Symptoms, CES-D×Age	0.004**	0.0014*	0.002*	0.003**
	(0.001)	(0.0005)	(0.001)	(0.001)
Functional Limitations (vs. no impairment)				
Least Severe Impairment		0.465**		
		(0.032)		
Moderately Severe Impairment		0.735**		
		(0.038)		
Most Severe Impairment		0.783**		
		(0.043)		
Number of Chronic Conditions		0.232**		
		(0.009)		
Constant	1.447**	1.898**	0.923**	1.491**
Total N	8,881	8,881	8,881	8,053
Individuals	3,617	3,617	3,617	3,071

Note: Random-effects models also include controls for race/ethnicity (coefficients not shown). Survivor sample consists of respondents who survived for all three panels of observation.
* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 5. Random- and Fixed-Effects Regressions of Self-Rated Health on Functional Limitations × Age Interactions: Americans' Changing Lives, 1986, 1989, 1994

	Model 1	Model 2	Model 3
	Random Effects	Fixed Effects	Random Effects, Survivor Sample
Functional Limitations (vs. no impairment)			
Least Severe Impairment	1.413**	0.959**	1.331**
	(0.153)	(0.181)	(0.160)
Moderately Severe Impairment	1.990**	1.172**	2.066**
	(0.181)	(0.216)	(0.192)
Most Severe Impairment	1.895**	1.242**	1.807**
	(0.181)	(0.221)	(0.194)
Age	0.012**	0.023**	0.011**
	(0.001)	(0.003)	(0.001)
Interactions			
Least Severe Impairment × Age	-0.012**	-0.009**	-0.011**
	(0.002)	(0.003)	(0.002)
Moderately Severe Impairment × Age	-0.014**	-0.009**	-0.017**
	(0.003)	(0.003)	(0.003)
Most Severe Impairment × Age	-0.011**	-0.009**	-0.011**
	(0.003)	(0.003)	(0.003)
Constant	1.640**	1.186**	1.670**
Total N	8,881	8,881	8,053
Individuals	3,617	3,617	3,071

Note: Random-effects models also include controls for race/ethnicity (coefficients not shown). Survivor sample consists of respondents who survived through all three panels of observation.
* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 6. Coefficients from Eleven Regressions of Self-Rated Health on Depressive Symptoms Among Respondents Ages 75 and Older: Americans' Changing Lives, 1986 ($N = 446$)

Model and Independent Variable	*Some of the Time (vs. Hardly Ever)*	*Most of the Time (vs. Hardly Ever)*
1. I felt depressed	.634**	.877**
	(.115)	(.236)
2. I felt that everything I did was an effort	.623**	1.180**
	(.110)	(.165)
3. My sleep was restless	.446**	.713**
	(.116)	(.156)
4. I was happy	.136	-.597**
	(.195)	(.178)
5. I felt lonely	.405**	.710**
	(.119)	(.190)
6. People were unfriendly	.530**	.667**
	(.177)	(.244)
7. I enjoyed life	.300	-.691**
	(.204)	(.178)
8. I did not feel like eating	.746**	.620**
	(.118)	(.198)
9. I felt sad	.573**	.409
	(.117)	(.213)
10. I felt that people disliked me	.340	.589
	(.190)	(.312)
11. I could not get "going"	.550**	1.013**
	(.111)	(.178)

Note: Coefficients are from eleven models regressing self-rated health on each symptom of depression and race/ethnicity (coefficients for race/ethnicity not shown).
* $p < .05$; ** $p < .01$ (standard errors in parentheses)