The Shifting Signification of Self-Rated Health ♦

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ABSTRACT

Self-rated health is one of the most pervasive measures of health in the social sciences. Yet, scholars know little about the psychological processes behind it. The present study explores how the association between "objective" health and self-rated health changes with age. Many argue that individuals become overly health optimistic with age. Thus, while objective health declines, self-rated health does not decline in tandem. The results of the present study, however, reveal two distinct and opposing patterns. On the one hand, the correspondence between functional limitations and self-rate health decreases precipitously after middle-age. Similarly, the correspondence between a variety of chronic conditions and self-rated health, while strong, declines steadily. The correspondence between depressive symptoms and self-rated health, however, increases strongly and monotonically. Indeed, in a striking cross-over effect, the correspondence between self-rated health and some common symptoms of depression is stronger after the age of 74 than is the correspondence between self-rated health and several chronic conditions. The empirical, theoretical, and policy implications of this cross-over are discussed.

Self-rated health is among the most pervasive measures of health in the social sciences. Its popularity reflects two things. First, it is easy to include in surveys and item-response is consistently low. Respondents appear to have little difficulty in rating their health from "excellent" to "poor." Second, self-rated has a number of desirable empirical qualities. Critics have questioned the usefulness of self-rated health when disease-specific indicators (e.g., "has a doctor diagnosed you with heart disease") have more straightforward interpretations and are not presumably subject to the same biases (Lawton, Ward, and Yaffe 1967). Yet, self-rated health has exceptional predictive validity in at least two respects. For one, it predicts mortality very well. Indeed, it usually performs better than an array of disease-specific indicators (Ferraro and Farmer 1999; Idler and Benyamini 1997; Kaplan and Camacho 1983). Furthermore, it anticipates treatment behavior accurately. Models of health care utilization, for example, are often premised on *perceptions* of health, rather than objective health as might be defined by a physician (Rosenstock 1966).

But despite self-rated health's popularity, scholars remain uncertain about its psychological underpinnings. To be sure, previous studies have explored the meaning of self-rated health. Several studies, for example, suggest that the correspondence between self-rated health's correspondence and "objective" health indicators (e.g., disease diagnoses, functional limitations) is strong, but far from perfect (Harlow and Linet 1989; Pijls, Feskens, and Kromhout 1993). Furthermore, many allude to age-differences in conceptions of health (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).

Yet, numerous gaps remain. Indeed, the idea that conceptions of health change with age remains highly controversial and broadly debated. Existing frameworks for understanding the

link between objective health and self-rated health make very different predictions and focus on different mechanisms. Some frameworks, for example, emphasize a growing "transcendence" of health problems with age and, so, predict a declining correspondence between objective health and self-rated health. Other frameworks emphasize a growing preoccupation with disease and, so, predict an increasing correspondence (Mechanic and Angel 1987; VanderZee and Buunk 1995). Quite apart from these differences, some frameworks emphasize cohort patterns, whereas others emphasize age. There are good reasons to expect cohort plays an important role. For example, in light of declining mortality and broad improvements in medical treatment, recent cohorts may be more likely to factor mild conditions into self-rated health (Flykesnes and Forde 1991; Rosenberg 2002; Starr 1982). Similarly, modernization may have led to an increasing focus on psychological well-being more readily than they have in the past (Inglehart and Baker 2000). Medical sociology regularly points to generational differences in perceptions of health and medicine (Conrad 2000).

In this article, I explore the link between objective and self-rated health. I do so in two parts. First, I explore the association between a variety of objective measures of health and self-rated health. I explore how this association differs between age groups (see Case and Paxson 2004). Second, I explore the sensitivity of these differences to cohort effects. In examining these issues, I use a nationally representative, longitudinal data set with an extensive battery of health-related questions (Americans Changing Lives, House 2003). The data provide several benefits over those used in previous analyses. The longitudinal design permits an exploration of intra-individual change. The extensive battery of health questions, meanwhile, permits an exploration of a variety of aspects of health simultaneously. The empirical, theoretical, and policy implications of the results are discussed in the conclusion.

BACKGROUND

The seeming simplicity of self-rated health belies the difficulty that anyone will have in assessing health generically. Approaches to understanding how conceptions of health change have focused on either historical change or human development.

Social Comparison and Health Transcendence

Both social comparison and health transcendence predict that the association between objective indicators and self-rated health is stronger among younger persons than among older (Suls et al. 1991). This tendency toward optimism appears motivated in much the same way as are the "biases" that elevate self-perceptions generally (Taylor and Brown 1988): just as most individuals rate themselves favorably relative to others in terms of personality, the elderly think their health compares favorably with others their own age (Suls et al. 1991). Health transcendence, likewise, predicts a declining association with age. Rather than casting this decline as the denial, suppression, or rationalization of illness, however, health transcendence emphasizes the psychological resources that can be lent to overcoming illness. In support of this idea, Idler (1993)finds that the elderly regularly report good health, but qualify that they have good health despite having a variety of physical limitations.

Both of the above frameworks emphasize age-effects, but cohort effect may lead to very similar patterns. Steady increases in life-expectancy may have inflated health expectations to the point that frustrating these expectations increases the association between self-rated health and many conditions. Similarly, recent cohorts may be more likely to view a wider variety of physical and functional difficulties in terms of "health" given the rapid expansion of medical treatments in the and the increasing medicalization of once mundane problems (Clarke et al. 2003; Conrad 2000; Flykesnes and Forde 1991; Starr 1982). Indeed, debates over diagnosis and

treatment have become increasingly public over the 20th century, perhaps suggesting even stronger generational patterns than found in earlier eras (Rosenberg 2002). Although this idea, as applied to self-rated health, has not been explored in the United States, research conducted elsewhere is consistent with the idea. Spiers and colleagues (1996) find that recent cohorts in England and Wales are more likely than older cohorts to include mild conditions in their self-evaluations of health.

Illness Preoccupation and Health-Related Values

The above frameworks focus on different mechanisms and characterize the process of aging in different ways, but they all predict a decline in the association between objective health and self-rated health. An entirely different side of the debate predicts an increase in the association. Elaborating a general model of illness perception, Leventhal (1984) discusses feedback loops from extant health problems to nascent problems and symptoms. Existing illnesses may amplify the perception of "sickness" by cuing other symptoms and limitations (Fenigstein and Carver 1978; Flykesnes and Forde 1992; Mayne 1999; Mechanic and Angel 1987; Wegner and Giuliana 1980). Although at odds with the most popular thinking regarding self-rated health, this idea has received some empirical support. Strain (1993), for example, documents an increase in the salience of functional limitations as individuals age. Others, meanwhile, have found broad evidence for health pessimism among the elderly (Borawski, Kinney, and Kahana 1996; Goldstein, Siegel, and Boyer 1984; Idler, Hudson, and Leventhal 1999; Levkoff, Cleary, and Wetle 1987).

This notion is also at least partially consistent with some research on changing perceptions and values among the aging. Along these lines, socioemotional selectivity theory argues that motivation changes with age, leading to differences in behavior and attribution

(Carstensen, Isaacowitz, and Charles 1999). These changes are rooted in perceptions of time. Motives can generally be classified as related either to the acquisition of skills for the future or the regulation of emotions. Because the former involves long-term payoffs, whereas the latter involves immediate ones, which of the two dominates behavior and perception is structured by the amount of time one perceives as having left. Because their time horizons are shortening, the elderly may devote more to emotional satisfaction in the present than they do to investments in the future. Although the theory has not been applied to self-rated health, its implications are readily generalizable. The elderly appear, for example, to weigh negative emotions more heavily in interpersonal decisions than do those who are younger (Blanchard-Fields 1986; Blanchard-Fields, Jahnke, and Camp 1995). Similarly, if the elderly are increasingly focusing on satisfaction in the present, negative emotions may become more salient to evaluations of health.

DATA AND METHODS

Previous studies of the link between objective health and self-rated health have been limited in several respects. Some studies only explore the elderly (Borawski et al. 1996); others explore a limited set of objective health problems (Hoeymans et al. 1997; Manderbacka et al. 2003); and virtually all studies are cross-sectional and so are unable to disentangle age and cohort (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).

Americans' Changing Lives (ACL) provides a unique opportunity to redress these limitations (House 2003). The ACL is a nationally representative panel study of adults aged 25 and older. It follows respondents for three panels (in 1986, 1989, and 1994). The ACL

oversamples those over the age of 60 and blacks at twice their usual rate in the population. Because of this unequal probability of selection, all the descriptive statistics (e.g., prevalence estimates) were weighted. The regression models were not weighted, but since the models include or are stratified by the features of sample selection (i.e., age and race/ethnicity) they provide unbiased and consistent estimates without the use of weights (Winship and Radbill 1994).

Health Measures

The models presented below examine the association between self-rated health and a variety of objective indicators of health. Self-rated health was asked in the conventional manner. Respondents were asked "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]?"[1] Although the reverse of the coding used in most studies (where positive increases in self-rated health indicate positive improvements in health), this coding provides a more straightforward interpretation of an "increasing" association between a particular health problem and self-rated health. An increasing association will be indicated by a positive increase of an already positive coefficient. Age-groups were coded into one of six groups (see House et al. 1994): 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 objective health measures.

Chronic Conditions. Respondents were asked whether they experienced the following conditions in the preceding twelve months: arthritis or rheumatism, stroke, cancer or a malignant

[1] Self-rated health is not always asked in precisely the same way in other studies. Some versions include only four response categories, while others explicitly ask respondents to compare their health with that of their age-peers. Nevertheless, most versions of self-rated health correlate highly with each other and the empirical properties of self-rated health outlined above (e.g., the ability to predict mortality) are similar (Idler and Benyamini 1997).

tumor, diabetes or high blood sugar, heart attack or other heart trouble, hypertension, and lung disease. Each condition is coded as a yes (1) or no (0) dummy variable.

Functional Impairments. Respondents were also asked questions about the extent of physical limitations in several specific domains: the degree of difficulty they had in bathing themselves, climbing stairs, walking several blocks, and with heavy housework, and if they were in a bed or chair most of the day. Responses to these items were combined to create a four-point Guttman-style scale (Guttman 1950): the first indicates no functional impairments; the second indicates difficulty with heavy housework; the third indicates difficulty climbing stairs or walking; and the fourth indicates those who are in bed or a chair most of the day and/or those who have difficulty bathing. Since in a Guttman scale the distance between adjacent categories 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). Although not always considered on par with the presence of chronic conditions, functional limitations are important to self-rated health. Indeed, individuals may judge their health more on the basis of successful role functioning than on any other single factor (Flykesnes and Forde 1992; Liang 1986; Tessler and Mechanic 1978).

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," "I felt that there were people who really understood me," "My sleep was restless," "I was happy" [reverse coded for scale construction], "I felt lonely,"

"People were unfriendly, "I felt that no one really knows me well, "I enjoyed life" [reverse coded], "I did not feel like eating. My appetite was poor," "I felt sad," "I felt that people dislike me," and "I could not get 'going.'" The analyses presented below use these items in two ways. Models presented in Tables 3 and 4 explore a standardized summary measure. Tests of coefficient reliability were acceptably high (Cronbach's alpha = .83) (Cronbach 1951). Models presented in Table 6, meanwhile, explore each of the eleven items separately.

Statistical Strategy

Recall that the ACL is a panel survey. For this study, a person-panel data set was constructed and two types of models were estimated, each with a different goal in mind. First, in order to examine the association between objective health indicators and self-rated health, random-effects regression models were estimated (Baltagi 1995). Random-effects regression models are similar to ordinary-least squares regression, but correct for the within-person correlation that results from using data containing multiple observations of a single person. Second, in order to examine the sensitivity of age-based effects to cohort effects, fixed-effects models were estimated (Allison 1990; England et al. 1988). Because they use differences within individuals, fixed-effects models hold constant all observed and unobserved fixed characteristics. This property has become increasingly attractive to social scientists since it provides a convenient solution to the common problem of unobserved heterogeneity. In the present study, it provides a simple way to eliminate the effects of cohort.

RESULTS

The results begin with three tables that examine the association between the three types of objective conditions and self-rated health. Tables 1 through 3 present coefficients from

random-effects regression models. In these models, self-rated health is regressed on each objective health condition. Although the models may appear under-specified, it is important to reiterate that the theories outlined above are concerned with the association between objective measures and self-rated health and not the causes of health *per se*. Including other variables the might be antecedent both to self-rated health (e.g., education, income, occupation) and objective health would reduce the coefficients for the objective indicators (since both are affected by the same epidemiological factors), but would not shed any additional light the debates this paper is concerned with (see Case and Paxson 2004 for a strategy that is similar to that used here).

—Insert Table 1 About Here—

Table 1 presents results from the random-effects regression of self-rated health on each of the chronic conditions, stratified by age group. For each condition, coefficients are presented in the first row, followed in the second row by standard errors (in parentheses), followed in the third row by the condition's prevalence (in brackets). Recall that social comparison/health transcendence predicts a decline in the coefficients for consecutive age-groups. Illness preoccupation, meanwhile, predicts an increase in the coefficients with age. Table 1 suggests two patterns. For some conditions, the coefficients increase until middle age (ages 45 to 54) and decrease thereafter. This pattern is found for cancer, diabetes, and lung problems (arthritis shows this pattern as well, although it is far less pronounced than for the other conditions). For other conditions, the coefficients decrease more consistently. This pattern is found for stroke, heart attack, and hypertension. These patterns are distinct, but the overall pattern is a declining correspondence between objective and self-rated health. The smallest coefficient for each of the seven conditions is always found for the 75 to 98 age-group. Even if illness preoccupation is occurring up until late middle-age (and so resulting in an increase in the association between

objective measures and self-rated health), illness preoccupation in middle-age appears to be more than negated by other processes in later life. Indeed, the overall decline in the coefficients is quite large. The coefficient for cancer, for example, decreases from a high of .978 (for those 35 to 44) to .154. Similarly, the coefficient for heart attack decreases from 1.356 (for those 25 to 34) to .573.

—Insert Table 2 About Here—

Table 2 turns to functional health. Recall that functional health is indicated through four levels of functional limitations. In the regression models, three dummy variables are presented, with the "no impairment" category as the reference category. Like some of the results presented in Table 1, the results in Table 2 indicate that the importance of functional limitations increases somewhat from the age of 25 to middle age (age 45 to 54). Yet, in general, the clearest pattern is the precipitous decline in the coefficients occurring sometime after the age of 54. Once again, for each level of functional impairment, the smallest coefficient is always for those 75 to 98. Furthermore, like the coefficients for the chronic conditions, the extent of the between age-groups variation is remarkable. The coefficient for "most severe impairment," for example, reduces from a high of 1.492 (for those 35 to 44) to 1.170, a reduction of 22%. The coefficient for "least severe impairment," meanwhile, decreases from .908 (for those 55 to 64) to .474, a reduction of nearly 50%. Beyond variation in the coefficients, the sizes of the coefficients are noteworthy: the coefficients for the least severe impairment are as large or larger than the coefficients for many of the chronic conditions explored in Table 1.

—Insert Table 3 About Here—

Table 3 turns to depression. Consistent with previous research, the mean for depression follows a u-shaped pattern (the point of inflection, however, is slightly more advanced than is

that found in some multivariate studies (Mirowsky and Ross 1992)). The association between depression and self-rated health, however, increases monotonically. For those aged 25 to 34, the coefficient for depression is .184. For those aged 75 to 103, the coefficient is .404. Although the largest consecutive increases are observed between younger age-groups, steady increases are found between each of the consecutively older groups. Indeed, the coefficient more than doubles in size.

—Insert Table 4 About Here—

Although the results of Table 3 are suggestive, the interpretation of the results presented in Table 3 is no entirely unambiguous since (*i*) age-related changes may reflect cohort instead, (*ii*) there is a correlation between chronic conditions and functional impairments and depression, and (*iii*) the increasing association between depression and self-rated health may reflect the perceptions of those nearing the end of their life, rather than an aging effect *per se*.

—Insert Tables 4 and 5 About Here—

Tables 4 and 5 explore these possibilities. These tables, in contrast to those presented above, use a somewhat different modeling strategy. Table 4 explores depression; Table 5 explores functional limitations. As before, self-rated health is the outcome. The independent variables include depression (in Table 4), functional limitations (in Table 5), a term for age, and multiplicative interactions between age and depression and age and functional limitations. Since, as demonstrated earlier, the coefficients for functional health limitations and depression change with age, we expect significant interactions. The interaction should be negative in the case of functional limitations and positive in the case of depression.

Table 4 begins with depression. Four models are presented: the first is a random-effects model; the second is a random-effects model with 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 only to those who survived for all three panels of observation (from 1986 to 1994). The results reinforce an aging interpretation. In Model 1, all the interactions with age are statistically significant. This interaction remains significant when controlling for functional limitations and chronic conditions (Model 2). Furthermore, this significant interaction remains significant when fixed-effects are used (Model 3), suggesting that considering cohort (or any other fixed characteristic) does little to explain age-related effects. Similarly, Model 4 provides little evidence that these patterns are driven only by those facing mortality in subsequent panels.

Table 5 turns to functional limitations. The results parallel those for depression. Model 1 confirms the declining importance of functional limitations; Model 2 suggests that cohort effects do little to explain these changes; and Model 3 provides little evidence that the finding is limited only to those who are nearing mortality.

—Insert Table 6 About Here—

Given the declining association between self-rated health and chronic conditions and functional limitations, and the rising association between self-rated health and depression, it is possible that conceptions of health in later life reflect mental health as much as physical health. As presented in the tables, the "strength" of the association between self-rated health and the assorted chronic conditions, relative to that between self-rated health and depression is difficult to evaluate. The variables are measured on different metrics: whereas the chronic condition dummy variables are zero/one, the CES-D scale is standardized. Table 6 provides some grounds for comparison by exploring each symptom separately. Table 6 presents coefficients from eleven random-effects regression models that regress self-rated health on each of the eleven

symptoms of depression among respondents age 75 to 98. Each symptom coded as a series of two dummy variables: those who experience the symptom "some of the time" (the first column of coefficients) and those who experience the symptom "most of the time" (the second column of coefficients), with those who experience the symptom "hardly ever" as the reference category. The coefficients are quite large. Indeed, the difference between those who experienced some symptoms hardly ever and those who experienced it "most of the time" was, in some cases, larger than the difference between those with and without a chronic condition. For example, the coefficients for "I felt depressed," "I felt that everything I did was an effort," "I felt lonely," and "I could not get 'going'" (.827, .871, .584, and .795 respectively) were larger than the coefficients for any of the seven chronic conditions presented in Table 2 for those aged 75 to 98.

CONCLUSION

In recent years, self-rated health has assumed such prominence that scholars have done little to assess what factors into it. The present study sought to fill several gaps. The results indicate, first and foremost, that the meaning of self-rated health changes with age. There are two patterns in this regard. The first indicates that correspondence between functional limitations and self-rated health declines with age, as does the correspondence between many chronic conditions and self-rated health. The second, however, indicates that the correspondence between depression and self-rated health increases with age. This second pattern is as striking as much for its strength, as for its pattern. Indeed, after the age of 75, some depressive symptoms are more strongly associated with self-rated health than are some chronic conditions. Additional analyses indicate that these changes reflect age, rather than cohort. Furthermore, these analyses

indicate that the rising correspondence between self-rated health and depression is not especially sensitive to the correlation between chronic conditions and depression.

In documenting an increase in the salience of depression, the results diverge from previous research in several respects. Most notably, they call for a reconsideration of the ubiquity of optimism assessments of health. On the one hand, social comparison and health transcendence accurately anticipate the declining significance of chronic illness and functional limitations. In this regard, generic self assessments of health may, indeed, appear more optimistic than an assessment based on the presence or absence of chronic conditions. Yet, on the other hand, social comparison and health transcendence do not accurately anticipate the increasing significance of depression. Clearly, the elderly are not increasing the importance of depression simply because they become less depressed with age. Nor are the elderly denying the problems they have or substituting dimensions they assess well on for dimensions they assess poorly on.

What do these results suggest for studies that use self-rated health? Is self-rated health biased? The results speak both to the predictive validity of self-rated health across age groups and to age-related trajectories of health. The results are perhaps less troubling for the former than for the latter. Even if the weights associated with a variety of health conditions shift with age, such a shift may not undermine self-rated health's ability to predict mortality. For one, the association between chronic illness and self-rated health is not eliminated entirely: the declines observed should be understood as declines relative to former levels and not as declines to the point of substantive insignificance. Furthermore, depression itself is not entirely unrelated to mortality. Prospective studies have demonstrated an effect of depressive symptoms (often in a graded monotonic pattern) on 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 the relationship between depression and mortality (e.g., health behaviors, physiological changes) are not precisely understood, the fact that older adults consider depression more in their self-ratings of health, together with depression's apparent abilities to predict mortality, suggests that the ability of self-rated health to predict mortality is not necessarily compromised simply because self-rated health is associated more with depression and less with chronic conditions.

Perhaps more troubling are the studies' implications for research on age trajectories in health. As noted, the results indicate that self-rated health is not entirely age-comparable. A central debate in social epidemiology is whether the effects of socioeconomic status increase (consistent with a *cumulative advantage* approach) or decrease (consistent with an *age-as-leveler* approach) with age (Ross and Wu 1996). To date, these investigations have yielded mixed results. Consider two key studies: Using prospective data from a relatively short time frame (no more than three years) and two health outcomes (i.e., number of chronic conditions, functional status), House and colleagues (1994) find that the association between education (and income) and health increases until mid-life, but decreases steadily thereafter, consistent with an age-as-leveler approach. Other studies support cumulative advantage. Using longitudinal data observed over a longer period of time and sophisticated methods for evaluating change, Lynch (2003) eliminates the role of cohort and finds that the association between education and health *increases* well into later life. Lynch's only outcome, however, is self-rated health. It is possible that the association between education and depression increases with age (and so, then, does the association between education and self-rated health), while the association between education and physical health declines. If the results presented here do reflect broader patterns, research

that uses self-rated health should be cautious about inferring changes in the effects of socioeconomic status when such changes might reflect changes in the meaning of self-rated health instead. More generally, research might benefit from considering physical and mental health outcomes simultaneously so as to be sensitive to their different trajectories.

The results also speak to research on help-seeking. Among other things, they may help scholars to understand why those nearing the end of life often seek medical care less regularly than do those who are younger. Some research suggests that the demand for health care increases until the age of approximately 80, but declines thereafter (Wolinsky, Mosely, and Coe 1986). Insofar as aging individuals are defining health less in terms of chronic conditions, they might also be less motivated to seek care than they were when such conditions were more salient. The elderly might be defining their health more in terms of depression, but Americans have long been more reluctant to seek treatment for depression than for other health problems (Kessler et al. 2003). At the same time, even though the elderly may be placing more emphasis on psychological well-being, they may also be less likely to think of depression as a treatable condition than those who are younger. The age *vs*. cohort dynamics discussed above may look very different depending on whether one is talking about changes in the salience of depression or changes in beliefs about how and if depression should be treated. Future research might explore further some possible disjunctures between age, cohort, beliefs about depression, and the perceived importance of depression in health and well-being.

Finally, the results help to expand research on the psychology of aging. Most research suggests that maturing individuals are better able to confront declines in health with hard-won resilience, perspective, and transcendence. The results presented here are consistent with this notion insofar as chronic conditions become less salient to global evaluations of health. But the

results also suggest that the salience of depression increases, even as depressive symptoms become more prevalent. Future research should consider further just how the elderly come to cope with their depression in light of the increasing emphasis they appear to place on it.

REFERENCES

Allison, Paul D. 1990. "Change Scores As Dependent Variables in Regression Analysis." Pp. 93-114 in *Sociological Methodology*, Edited by Clifford C. Clogg. Oxford, England: Basil Blackwell.

Anda, R., D. Williamson, D. Jones, C. Macera, E. Eaker, A. Glassman, and J. Marks. 1993. "Depressed Affect, Hopelessness, and the Risk of Ischemic Heart Disease in a Cohort of U.S. Adults." *Epidemiology* 4:285-94.

Baltagi, B. H. 1995. *Econometric Analysis of Panel Data*. New York: John Wiley & Sons.

Blanchard-Fields, Fredda. 1986. "Reasoning on Social Dilemmas Varying in Emotional Saliency: An Adult Developmental Perspective." *Psychology and Aging* 1:325-33.

Blanchard-Fields, Fredda, Heather C. Jahnke, and Cameron Camp. 1995. "Age Differences in Problem-Solving Style: The Role of Emotional Salience." *Psychology and Aging* 10:173-80.

Borawski, Elaine A., Jennifer M. Kinney, and Eva Kahana. 1996. "The Meaning of Older Adults' Health Appraisals: Congruence With Health Status and Determinant of Mortality." *Journal of Gerontology: Social Science* 51B:S157-S170.

Carstensen, Laura L., Derek M. Isaacowitz, and Susan T. Charles. 1999. "Taking Time Seriously: A Theory of Socioemotional Selectivity." *American Psychologist* 54:165-81.

Case, Anne and Christina Paxson. 2004. "Sex Differences in Morbidity and Mortality." Unpublished manuscript. Center for Health and Wellbeing. Princeton University.

Clarke, Adele E., Janet K. Shim, Laura Mamo, Jennifer R. Fosket, and Jennifer R. Fishman. 2003. "Biomedicalization: Technoscientific Transformations of Health, Illness, and U.S. Biomedicine." *American Sociological Review* 68:161-94.

Cohen, Sheldon and Mario S. Rodriguez. 1995. "Pathways Linking Affective Disturbances and Physical Disorders." *Health Psychology* 14:374-80.

Conrad, Peter. 2000. "Medicalization, Genetics, and Human Problems." Pp. 322-33 in *Handbook of Medical Sociology*, Fifth ed. Edited by Chloe E. Bird, Peter Conrad, and Allen M. Fremont. Upper Saddle River, NJ: Prentice Hall.

Cronbach, L. J. 1951. "Coefficient Alpha and the Internal Structure of Tests." *Psychometrika* 16:297-334.

England, Paula, George Farkas, Barbara S. Kilbourne, and Thomas Dou. 1988. "Explaining Occupational Sex Segregation and Wages: Findings From a Model With Fixed Effects." *American Sociological Review* 53:544-58.

Fenigstein, A. and C. S. Carver. 1978. "Self-Focusing Effects of False Heart-Beat Feedback."

Journal of Personality and Social Psychology 36:1241-50.

Ferraro, Kenneth F. and Melissa M. Farmer. 1999. "Utility of Health Data From Social Surveys: Is There a Gold Standard for Measuring Morbidity?" *American Sociological Review* 64:303-15.

Flykesnes, Knut and Olav H. Forde. 1991. "The Tromso Study: Predictors of Self-Evaluated Health--Has Society Adopted the Expanded Health Concept?" *Social Science and Medicine* 32:141-46.

———. 1992. "Determinants and Dimensions Involved in Self-Evaluations of Health." *Social Science and Medicine* 35:271-79.

Frasure-Smith, Nancy, Francois Lesperance, and Mario Talajic. 1995. "The Impact of Negative Emotions on Prognosis Following Myocardial Infarction: Is It More Than Depression?" *Health Psychology* 14:388-98.

Glassman, A. H. and P. A. Shapiro. 1998. "Depression and the Course of Coronary Artery Disease." *American Journal of Psychiatry* 155:4-11.

Goldstein, M. S., J. M. Siegel, and R. Boyer . 1984. "Predicting Changes in Perceived Health Status." *American Journal of Public Health* 74:611-14.

Guttman, Louis. 1950. "The Basis for Scalogram Analysis." Pp. 60-90 in *Measurement and Prediction: Studies in Social Psychology in World War II*, vol. 4, Edited by S. A. Stouffer. Princeton, NJ: Princeton University Press.

Harlow, Sioban D. and Martha S. Linet. 1989. "Agreement Between Questionnaire Data and Medical Records: The Evidence for Accuracy of Recall." *American Journal of Epidemiology* 129:233-48.

Hoeymans, N., E. J. Feskens, D. Kromhout, and G. A. van den Bos. 1997. "Ageing and the Relationship Between Functional Status and Self-Rated Health in Elderly Men." *Social Science and Medicine* 45:1527-36.

House, James S. 2003. *Americans' Changing Lives: I, II, AND III, 1968, 1989, and 1994* [Computer file]. ICPSR version. Ann Arbor, MI: University of Michigan, Institute for Social Research, Survey Research Center [producer], 2002. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2003.

House, James S., James M. Lepkowski, Ann M. Kinney, Richard P. Mero, Ronald C. Kessler, and A. R. Herzog. 1994. "The Social Stratification of Aging and Health." *Journal of Health and Social Behavior* 35:213-34.

Idler, Ellen and Yael Benyamini. 1997. "Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies." *Journal of Health and Social Behavior* 38:21-37.

Idler, Ellen L. 1993. "Age Differences in Self-Assessments of Health: Age Changes, Cohort

Differences, or Survivorship?" *Journal of Gerontology: Social Sciences* 48:S289-S300.

Idler, Ellen L., Shawna V. Hudson, and Howard Leventhal. 1999. "The Meanings of Self-Ratings of Health: A Qualitative and Quantitative Approach." *Research on Aging* 21:458-76.

Inglehart, Ronald and Wayne E. Baker. 2000. "Modernization, Cultural Change, and the Persistence of Traditional Values." *American Sociological Review* 65:19-51.

Johnson, Robert J. and Fredric D. Wolinsky. 1993. "The Structure of Health Status Among Older Adults: Disease, Disability, Functional Limitation, and Perceived Health." *Journal of Health and Social Behavior* 34:105-21.

Kaplan, George A. and Terry Camacho. 1983. "Perceived Health and Mortality: A Nine-Year Follow-Up of the Human Population Laboratory Cohort." *American Journal of Epidemiology* 117:292-304.

Kessler, Ronald C., Patricia Berglund, Olga Demler, Robert Jin, Doreen Koretz, Kathleen R. Merikangas, A. J. Rush, Ellen E. Walters, and Philip Wang. 2003. "The Epidemiology of Major Depressive Disorder: Results From the National Comorbidity Survey Replication (NCS-R)." *Journal of the American Medical Association* 289:3095-105.

Kiecolt-Glaser, Janice K., Lyanne McGuire, Theodore F. Robles, and Ronald Glaser. 2002. "Emotions, Morbidity, and Mortality: New Perspectives From Psychoneuroimmunology." *Annual Review of Psychology* 53:83-107.

Lawton, M. P., M. Ward, and S. Yaffe. 1967. "Indices of Health in an Aging Population." *Journal of Gerontology* 22:334-42.

Leventhal, E. A. 1984. "Aging and the Perception of Illness." *Research on Aging* 6:119-25.

Levkoff, S. E., Paul D. Cleary, and T. Wetle. 1987. "Differences in the Appraisal of Health Between Aged and Middle-Aged Adults." *Journal of Gerontology* 42:114-20.

Liang, Jersey. 1986. "Self-Reported Physical Health Among Aged Adults." *Journal of Gerontology* 41:248-60.

Lynch, Scott M. 2003. "Cohort and Life-Course Patterns in the Relationship Between Education and Health: A Hierarchical Approach." *Demography* 40:309-31.

Maddox, George L. and Elizabeth B. Douglass. 1973. "Self-Assessment of Health: A Longitudinal Study of Elderly Subjects." *Journal of Health and Social Behavior* 14:87-93.

Manderbacka, K., I. Kareholt, P. Martikainen, and O. Lundberg. 2003. "The Effect of Point of Reference on the Association Between Self-Rated Health and Mortality." *Social Science and Medicine* 56:1447-52.

Mayne, Tracy J. 1999. "Negative Affect and Health: The Importance of Being Earnest." *Cognition and Emotion* 13:601-35.

Mechanic, David and Ronald J. Angel. 1987. "Some Factors Associated With the Report and Evaluation of Back Pain." *Journal of Health and Social Behavior* 28:131-9.

Mirowsky, John and Catherine E. Ross. 1992. "Age and Depression." *Journal of Health and Social Behavior* 33:187-205.

Pijls, Loek T., Edith J. M. Feskens, and Daan Kromhout. 1993. "Self-Rated Health, Mortality, and Chronic Disease in Elderly Men: The Zutphen Study, 1985-1990." *American Journal of Epidemiology* 138:840-848.

Radloff, Lenore. 1977. "The CES-D Scale: A Self Report Depression Scale for Research in the General Population." *Applied Psychological Measurement* 1:385-401.

Rakowski, William and Cynthia D. Cryan. 1990. "Associations Among Health Perceptions and Health Status Within Three Age Groups." *Journal of Aging and Health* 2:58-80.

Rosenberg, Charles E. 2002. "The Tyranny of Diagnosis: Specific Entities and Individual Experience." *The Milbank Quarterly* 80:237-60.

Rosenstock, I. M. 1966. "Why People Use Health Services." *Milbank Quarterly* 44:94-106.

Ross, Catherine E. and Chia-Ling Wu. 1996. "Education, Age, and the Cumulative Advantage in Health." *Journal of Health and Social Behavior* 37:104-20.

Spiers, Nicola, Carol Jagger, and Michael Clarke. 1996. "Physical Function and Perceived Health: Cohort Differences and Interrelationships in Older People." *Journal of Gerontology: Social Sciences* 51B:S226-S233.

Starr, Paul. 1982. *The Social Transformation of American Medicine*. New York: Basic Books.

Strain, Laurel A. 1993. "Good Health: What Does It Mean in Later Life?" *Journal of Aging and Health* 5:338-64.

Suls, Jerry, Christine A. Marco, and Sheldon Tobin. 1991. "The Role of Temporal Comparison, Social Comparison, and Direct Appraisal in the Elderly's Self-Evaluations of Health." *Journal of Applied Social Psychology* 21:1125-44.

Taylor, Shelley E. and Jonathon D. Brown. 1988. "Illusion and Well-Being: A Social Psychological Perspective on Mental Health." *Psychological Bulletin* 103:193-210.

Tessler, Richard C. and David Mechanic. 1978. "Psychological Distress and Perceived Health Status." *Journal of Health and Social Behavior* 19:254-62.

Tornstam, Lars. 1975. "Health and Self-Perception: A Systems Theoretical Approach." *The Gerontologist* 27:264-70.

VanderZee, Karen I. and Bram P. Buunk. 1995. "Social Comparison As a Mediator Between Health Problems and Subjective Health Evaluations." *British Journal of Social Psychology* 34:53-65.

Wegner, D. M. and T. Giuliana. 1980. "Arousal-Induced Attention to Self." *Journal of Personality and Social Psychology* 38:719-26.

Winship, Christopher and Larry Radbill. 1994. "Sampling Weights and Regression Analysis." *Sociological Methods and Research* 23:230-57.

Wolinsky, Fredric D., Ray R. Mosely, and Rodney M. Coe. 1986. "A Cohort Analysis of the Use of Health Services by Elderly Americans." *Journal of Health and Social Behavior* 27:209-19.

TABLE 1. Coefficients from Random-Effects Regression of Self-Rated Health on Chronic Illness Indicators, Stratified by Age Group: Americans' Changing Lives, 1986 – 1994

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 – 98
Arthritis	0.467**	0.452**	0.516**	0.459**	0.485**	0.371**
	(0.100)	(0.063)	(0.065)	(0.056)	(0.049)	(0.065)
	[7.3 %]	[15.8 %]	[26.5 %]	[48.8 %]	[56.5 %]	[62.8 %]
Stroke		0.903**	0.723	0.728**	0.720**	0.508**
	NA	(0.348)	(0.386)	(0.190)	(0.134)	(0.150)
		[.3 %]	[.3 %]	[1.4 %]	[2.4 %]	[3.3 %]
Cancer	0.632*	0.978**	1.141**	0.323*	0.498**	0.154
	(0.293)	(0.239)	(0.198)	(0.146)	(0.104)	(0.127)
	[.7 %]	[.7 %]	[1.9 %]	[4.4 %]	[5.6 %]	[7.0 %]
Diabetes	0.548*	0.816**	1.025**	0.534**	0.515**	0.467**
	(0.217)	(0.128)	(0.123)	(0.093)	(0.072)	(0.088)
	[1.3 %]	[3.2 %]	[4.8 %]	[10.2 %]	[13.1 %]	[13.7 %]
Heart Attack	1.356**	1.239**	0.912**	0.800**	0.763**	0.573**
	(0.211)	(0.126)	(0.121)	(0.084)	(0.065)	(0.082)
	[1.3 %]	[2.8 %]	[4.8 %]	[12.0 %]	[13.0 %]	[15.7 %]
Hypertension	0.828**	0.759**	0.665**	0.478**	0.493**	0.407**
	(0.087)	(0.069)	(0.071)	(0.063)	(0.049)	(0.064)
	[7.8 %]	[11.1 %]	[20.0 %]	[32.6 %]	[43.4 %]	[42.8 %]
Lung Disease	0.735**	0.887**	1.177**	0.777**	0.621**	0.467**
	(0.178)	(0.136)	(0.129)	(0.107)	(0.089)	(0.118)
	[1.8 %]	[2.8 %]	[4.7 %]	[7.5 %]	[8.6 %]	[7.1 %]
Total N	1,298	1,686	1,176	1,440	1,969	1,312
Individuals	742	1,040	762	922	1,220	808

Note: All coefficients from random-effects models regressing self-rated health on each chronic illness separately. All models include controls for race/ethnicity (coefficients not shown).

* $p < .05$; ** $p < .01$ (standard errors in parentheses; prevalence estimates in brackets)

TABLE 2. Coefficients from Random-Effects Regression of Self-Rated Health on Functional Health Status Dummy Variables by Age Group: Americans' Changing Lives (1986 – 1994)

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 – 98
Functional Impairment (vs. no impairment)						
Least Severe Impairment	0.899** (0.176)	0.809** (0.119)	0.863** (0.113)	0.908** (0.081)	0.664** (0.060)	0.474** (0.070)
Moderately Severe Impairment	1.277** (0.269)	1.521** (0.131)	1.515** (0.131)	1.251** (0.089)	1.112** (0.068)	0.944** (0.081)
Most Severe Impairment	1.354** (0.216)	1.492** (0.135)	1.468** (0.150)	1.429** (0.106)	1.276** (0.082)	1.170** (0.084)
Mean for Age Group	1.058	1.122	1.178	1.397	1.517	1.926
Total N	1,298	1,686	1,176	1,440	1,969	1,312
Individuals	742	1,040	762	922	1,220	808

Note: All coefficients from random-effects models regressing self-rated health on dummy-variables for functional health status and race/ethnicity (coefficients for race/ethnicity not shown). All models are stratified by age group.
* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 3. Coefficients from Bivariate Random-Effects Regressions of Self-Rated Health on CES-D by Age Group: Americans' Changing Lives (1986 – 1994)

	Age Group					
	25 – 34	35 – 44	45 – 54	55 – 64	65 – 74	75 – 98
CES-D	0.184**	0.267**	0.326**	0.381**	0.391**	0.404**
	(0.024)	(0.022)	(0.028)	(0.027)	(0.024)	(0.029)
CES-D Mean	.017	-.128	-.148	-.139	-.211	.024
Total N	1,298	1,686	1,176	1,440	1,969	1,312
Individuals	742	1,040	762	922	1,220	808

Note: All coefficients from random-effects models regressing self-rated health (by age group) on CES-D and race/ethnicity (coefficients for race/ethnicity not shown). All models stratified by age group.

* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 4. Regression of Self-Rated Health: Americans' Changing Lives (1986 – 1994)

	Model 1 Random Effects	Model 2 Random Effects With Health Controls	Model 3 Fixed Effects	Model 4 Random Effects, Survivor Sample,
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)
CES-D × Age	0.004**	0.001*	0.002*	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Functional Impairment (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 (1, 2, and 4) also include controls for race/ethnicity (coefficients not shown). Survivor sample represents those who survived for all three panels of observation (1986, 1989, 1994).

* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 5. Functional Health and Self-Rated Health Sensitivity Analyses: Americans' Changing Lives (1986 – 1994)

	Model 1 Random-Effects	Model 2 Fixed-Effects	Model 3 Random-Effects, Survivor Sample
Functional Impairment (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 race/ethnicity (coefficients not shown). Survivor sample represents those who survived all three panels of observation (1986, 1989, 1994).
* $p < .05$; ** $p < .01$ (standard errors in parentheses)

TABLE 6. Coefficients from Eleven Random-Effects Regressions of Self-Rated Health on Each CES-D Item Among Respondents 75 to 98: Americans' Changing Lives (1986 – 1994)

	Some of the Time (vs. Hardly Ever)	*Most of the Time (vs. Hardly Ever)*
I felt depressed	.422**	.827**
	(.065)	(.127)
I felt that everything I did was an effort	.444**	.871**
	(.060)	(.089)
My sleep was restless	.348**	.624**
	(.062)	(.091)
I was happy	.062	-.560**
	(.106)	(.095)
I felt lonely	.364**	.584**
	(.065)	(.103)
People were unfriendly	.315**	.480**
	(.096)	(.141)
I enjoyed life	.169	-.529**
	(.117)	(.099)
I did not feel like eating	.383**	.358**
	(.068)	(.099)
I felt sad	.472**	.551**
	(.063)	(.114)
I felt that people disliked me	.123	.230
	(.095)	(.177)
I could not get "going"	.308**	.795**
	(.059)	(.103)
Total N	1,312	
Individuals	808	

Note: All coefficients from separate random-effects models regressing self-rated health on each chronic illness and race/ethnicity (coefficients for race/ethnicity not shown). All models are stratified by age-group.

* $p < .05$; ** $p < .01$ (standard errors in parentheses; prevalence estimates in brackets)