Adapting to Heart Conditions: A Test of the Hedonic Treadmill

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Abstract: This paper tests the hypothesis of hedonic adaptation by analyzing the role that a history of heart problems has on the ability to deal with future heart conditions. The results show that those who have had a heart condition in the past are less likely to report worse self-assessed health and emotional health due to the onset of a new condition than those who have not previously had exposure to heart trouble. The results are fairly supportive of the notion of a hedonic treadmill.

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1 Introduction

The idea that happiness, or well-being, is relative to one's circumstances is centuries old and can be traced to the writings of early Greek philosophers. More recently, many researchers have proposed the question, "Is happiness relative?" and have found mixed results. Brickman, Coates and Bulman (1978) conclude that people adapt to their circumstances so that happiness is indeed relative, while Veenhoven (1991) finds evidence that is inconsistent with this hypothesis. In the recent literature on utility and decision theory, there has been an increasing emphasis on the importance of reference points of comparison in determining individual preferences. The effect of current consumption on the desirability of future consumption has been the subject of a large amount of research, including theories of habit formation (Constantinides 1990) and addiction (see, for example, Becker and Murphy 1996 and Becker, Grossman and Murphy 1994). A number of recent papers have shown preferences to be conditional on current endowments (Bateman, Munro, Rhodes, Starmer and Sugden 1997), implying that the willingness-to-pay for a good is not necessarily equivalent to the willingness-to-accept for a good. This notion of "reference-dependent preferences" has important implications to the study of externalities and the Coase Theorem (see Kahneman, Knetsch and Thaler 1990 and Knetsch 1989).

The earliest research that brings these ideas together in a general framework dates back to Helson's (1964) theory of adaptation level. The main hypothesis is that individuals' judgments and reactions to current stimuli, whether they are negative or positive, depend on how their previous history has given them a reference point for comparison. Subsequent work by Brickman and Campbell (1971) further develops this idea of a "hedonic treadmill", which implies that if people continue to adapt to their improving circumstances, the improvements yield no real benefits. Likewise, those who undergo changes for the worse will slowly adapt to these changes so that these "worsened" conditions will not necessarily translate into a lower assessment of well-being. Several empirical studies claim to show support for the hedonic treadmill idea, though many of them are rather unconvincing. The landmark study that is most cited in the literature is

by Brickman, Coates and Bulman (1978). They use 22 lottery winners and 29 paralyzed accident victims as case studies and find that as predicted, major lottery winners are not significantly happier than control subjects and actually derive much less satisfaction from a series of ordinary daily life activities. While paraplegics did rate their happiness lower than controls, the accident victims "did not appear as unhappy as might have been expected." Of course, it is difficult to distinguish whether this signifies a process of adaptation or it is simply the result of a lack of ex-ante information on the part of these individuals.

There is some evidence that people living in poorer cities or countries are not unhappier than those in more affluent places. Diener and Diener (1996) find that most people report relatively high levels of subjective well-being regardless of demographic characteristics. Diener and Suh (1997) show that across 40 different countries, men and women of all different ages hardly differ along the dimension of subjective well-being. Once again, however, this is merely cross-sectional evidence and there is no attempt to follow specific individuals over time to test for the presence of adaptation.

Though there have been several studies that have examined these hypotheses, most of the work has used case studies with extremely small samples and data with severe limitations. Due to these limitations, it is difficult to convincingly test for the presence of adaptation. In addition, the measurement of well-being has often been confined to a single subjective index. In this paper, I will use the recent Health and Retirement Study (HRS), which has an abundance of measures of health status and subjective happiness, to conduct a more in-depth empirical test of the hedonic treadmill and the adaptation level theory. The current analysis will focus on specific health conditions to test whether people adapt to these conditions over time and whether subjective measures of well-being improve over time, even when the condition continues to be present. Given the variety of health variables in the survey, I can test to see which specific aspects of well-being and health adapt to health shocks and which do not. The use of several

different measures of health and well-being is important given that there may be different results depending on the types of health measures used.

2 Well-Being and Health Status

The difficulties in measuring happiness or well-being are well-known. Some of the difficulty lies in the fact that different experiences may result in different types of happiness or pain that are not always comparable. Research by Melzack (1983) demonstrates that there are often qualitative differences between different experiences of pain, so that a single scale of intensity may not completely capture the information regarding one's underlying health. There are also problematic issues in comparing well-being across individuals and devising criteria for social welfare.[1]

Diener and Suh (1997) suggest three primary ways of assessing the quality of an individual's life. Characteristics of a good life may be determined by normative "ideals" that are based on certain philosophical, moral or religious viewpoints. Another method involves the satisfaction of people's preferences. The foundations of rational choice are based on the assumption that individuals will select the things that will maximize their utility subject to certain constraints. Finally, there are more subjective self-assessments of feelings regarding individuals' experiences. Often, survey questions such as, "How satisfied are you with your life?" or "How happy are you?" are used to gauge the self-reported well-being of respondents. Of course, the framing of these types of subjective questions can also have effects on the responses (Guyatt et. al 1999).

Determining who is healthy and who is not is a difficult issue and the choice of appropriate health measures is often crucial to answering research questions in a sensible manner (see, for example, Dwyer and Mitchell 1999 and Bound 1991). Though measures of self-reported health, functional limitations, emotional health and intensity of experienced pain are often correlated with one other (Idler and Kasl 1995), each variable adds useful information to the overall health

[1] See Sen (1999) or Arrow (1963) for a general exposition of social choice theory and the impossibility theorem. For discussions of problems with interpersonal comparisons of utility, refer to Robbins (1938).

status of an individual. For example, numerous studies have shown self-evaluations of health status to predict mortality, above and beyond the contribution to prediction made by functional indices and medical conditions (see for example, Idler and Kasl 1991 and Idler and Benyamini 1997).

In this paper, I will focus on how people adapt to heart conditions over time using a variety of measures for healthiness and well-being. By using multiple measures of health status, I can test to see whether those who are experiencing a heart condition for the first time have different levels of subjective health-status than those who have a prior history of conditions, even after controlling for observable differences in functional capacity.

3 The Data

The Health and Retirement Study is a nationally representative panel with first interviews conducted in 1992 and subsequent surveys being conducted in two-year intervals. One of the purposes of the survey is to follow individuals as they are entering retirement years and trace over time their health status, income and wealth accumulation and nature of their retirement decisions. The HRS has a host of variables related to health status, retirement plans and expectations, family structure, insurance and pension plans, asset holdings and income sources. The primary respondents of the study are between the ages of 51 and 61, though secondary respondents may be outside of the age-eligible range. For married couples, information has been collected for both spouses.

I will focus on data from the first two waves of the survey, completed in 1992 and 1994 and include only individuals with non-missing information for both the first and second waves of the survey.[2] The resulting subsample includes slightly over 11,000 men and women. The survey contains self-reported measures for both overall health and emotional health and also asks

[2] Though the third wave of the HRS is available, it does not give information on whether respondents who have had prior heart conditions experienced a new condition.

questions regarding the capacity to do specific activities of daily living (ADL's), the presence and severity of pain and the frequency of certain subjective feelings such as depression, loneliness, happiness and sadness. For the self-reported health measure, the actual survey question asks, "Would you say your health is excellent, very good, good, fair or poor?". For the emotional health measure, the question is phrased, "What about your emotional health - how good you feel or how stressed, anxious, or depressed you feel? Is it excellent, very good, good, fair or poor?" These variables are reported on a 1-5 scale, with 1 representing excellent health and 5 representing poor health, so higher values of self-reported health status signify worse conditions.

Summary statistics of the data are shown in table 1. The average age of respondents in the first wave is approximately 55.5 years, a little over half of the individuals are female and Blacks comprise 16% of the survey. The overall distribution of self-reported health status indicates that most individuals characterize themselves as being in "excellent", "very good" or "good" health, while only about 8% report being in "poor" health. Approximately 30% of respondents claim to have some history of a serious health event[3] prior to the first wave of the survey, and about 12% undergo a new health condition between the first and second wave. 13% of the individuals report having some history of a heart condition[4] prior to the first wave of the survey, while slightly less than 7% experience a new heart condition between periods. Severe health events are more common for men than for women, which is not surprising given the fact that the men are about three years older than the women in the study.

[3] Serious health conditions are defined here as a heart condition, stroke, onset of cancer, diabetes or chronic lung condition.
[4] Heart conditions include heart attacks, coronary heart disease, angina and congestive heart failure.

4 The Relationships Among Various Measures of Health Status

In this section, I analyze the correlation between the different health variables in the survey. Table 2 shows the relationship between self-reported health status and other health variables. While 59% of people who report their health as "poor" have some difficulty walking several blocks, only 2% of those in "excellent" health indicate having difficulty with this activity. Meanwhile, for those in excellent health, the average probability that an individual believes he or she will live until the age of 75 is 77%, whereas the analogous average is only 38% for those reporting poor overall health.[5] Nearly all of the measures of functional limitations show monotonic relationships according to the 5 self-reported health status categories. Table 3a also shows a similar story for the different variables representing emotional health. Those that report to be in poor emotional health are much more likely to feel depressed, lonely and sad and less likely to feel happy or energetic than those who report to be in excellent emotional health. At the very least, the cross-sectional correlation between the different health variables seems quite high.

Table 3b shows the relationship between mental health status and physical health status. The data in this sample suggest that those in better physical health are also in better mental health, though there are some exceptions. Of the 884 individuals reporting poor overall health, 554 (63%) say that their emotional health is fair or poor, but there are still 65 individuals (7%) who say that their emotional health is excellent. When comparing functional limitations with emotional health, the overall pattern persists, as those who report having more problems with activities of daily living also report being much more likely to be depressed or sad and less likely to have a positive outlook on life. That the different health measures in the survey are positively correlated with one another justifies the use of both subjective and more objective measures of overall health.

[5] The question in the survey asks, "What do you think the chances are that you will live until 75?" There is also an analogous question for the chance of living until 85.

5 Health History and Heart Conditions

5.1 Identification Strategy

In this section, I focus on how the effects of new heart conditions are dependent on a prior history of heart conditions. The intuition is that individuals who have undergone a heart condition in the past may be better able to deal with new conditions in the future, even after controlling for differences in current health status.[6] Consider the following model:

$$Health_2=\alpha_1 Health_1+\alpha_2 New+\alpha_3 Old+\alpha_4 New*Old+\beta'X+\varepsilon_2 \quad (1)$$

"New" is a dichotomous variable equal to one if there is a new heart condition between periods one and two and "Old" reflects the presence of a heart condition prior to the first period. It seems clear that new heart conditions would be correlated with worsened health in the second period after controlling for initial health status. Old heart conditions may also continue to have effects on health status in the next period so that even after conditioning on the initial health status, these conditions may affect the future trajectory of health. With worse health represented by higher values of the health variable, the empirical test for adaptation is $\alpha_2+\alpha_3+\alpha_4<\alpha_2$. Under the presence of hedonic adaptation, the total impact of a repeatedly occurring heart condition in wave 2 will be less severe than the impact of a first-time heart condition in wave 2. The test can be simplified to the expression, $\alpha_3+\alpha_4<0$. The sign of the sum of the coefficients α_3 and α_4 will be the focus of the subsequent empirical analysis.

One possible bias in the estimates is that those who have a history of heart conditions are different in their unobserved health status than those who have no history of heart problems. It seems reasonable to assume that those who have experienced a heart condition in the past would actually be less healthy than those without a history of conditions, even after controlling for initial

[6] An alternative methodology would be to determine the timing of the heart condition and test to see whether the decline in health status resulting from this condition fades over time. However, any evidence of adaptation would be confounded by the fact that the actual severity of the condition could have diminished over time.

self-reported health. Thus, the coefficient on the interaction term may be biased in the direction of downplaying the role of hedonic adaptation.

Another possibility is that new heart conditions differ in their severity, depending on whether a previous condition existed. This claim is difficult to test as there is little in the medical literature to either support or reject this claim. Repeat conditions may be more or less severe than new conditions. In some analysis not shown here, data taken from the first three waves of the survey suggests that the probability of dying by the third wave for those who have undergone a heart condition in *both* Wave 1 and Wave 2 of the survey is not statistically different from those who only experienced a heart condition in Wave 2.[7] Of course, there may still be differences in morbidity between these two groups of individuals. Indeed, it is difficult to directly determine the difference in severity of new and recurring heart conditions. To address this issue, I use objective measures of physical functioning as proxies for the severity of the conditions and include these as covariates in the empirical specifications.

5.2 Heart Conditions and Self-Reported Health Status

The underlying notion of hedonic adaptation suggests that for two individuals who have the same initial health status, one's prior experience with heart trouble may increase an individual's ability to cope with new conditions. Even if there is no adaptation in terms of physical functioning, there may be adaptation in an individual's overall view of his or her health. For example, a person who has had a previous heart condition may encounter just as much difficulty climbing stairs or getting in and out of bed as an individual experiencing a condition for the first time. However, the former individual may still be more inclined to report better self-assessed health due to a difference in attitude or perception of the health shock. To test this possibility, I use self-reported health status in the second period as the dependent variable in an ordered probit

[7]Given this evidence that there is no statistically significant difference in mortality patterns between those with repeat heart conditions and first-time conditions, sample selection bias is not an issue here.

model, where health is categorized as excellent, very good, good, fair or poor. The results are presented in table 4. Column 1 shows that after controlling for initial health status and other observed characteristics, the coefficients on new heart conditions and old heart conditions are both positive. In addition, the interaction between old conditions and new conditions is negative, implying that the marginal effect of a repeat heart condition is less than the effect of a prior heart condition. The relevant test for hedonic adaptation is that $\alpha_3+\alpha_4<0$. The statistical test yields a p-value of 0.02, showing strong support for adaptation. In order to control for possible differences in the actual severity of first-time and repeat conditions, the regression in column 2 now includes as regressors functional limitations during the second period for numerous ADL's listed in the survey. The relevant coefficients are fairly similar to those in column 1, and the test that $\alpha_3+\alpha_4<0$ gives a p-value of 0.01. Thus, even after controlling for physical limitations in the second period, new heart conditions do not affect self-reported health as strongly for those with prior heart conditions as for those who are experiencing their first heart condition. Thus, when analyzing self-reported health status as the relevant measure of well-being, there is fairly strong evidence of hedonic adaptation.[8,9]

5.3 Self-Reported Survival Probabilities

One reason for the difference between self-reported health of individuals experiencing first-time events and those experiencing "repeat" events may be that their perceived future health is not as bad for those with a prior history of heart conditions because these individuals believe that

[8] These results are not sensitive to the specification. A linear OLS model that uses values of 1-5 for the different health categories yields the same results. A framework that uses a dichotomous variable equal to one if health is reported as either "fair" or "poor" also yields the same conclusions.

[9] A potential problem with using self-reported health status is the categorical nature of these variables. Someone who reports that her health is poor (the worst category) in both periods may still have experienced a decline in health that will not show up when using this variable. However, the survey does have a variable that asks whether the respondent's health is better, worse, or the same as in the previous wave of the survey. Once again, use of this information does not change the main result that the decrement to self-assessed health status is smaller for repeat heart conditions than for first-time conditions.

they are more likely to survive these health shocks. To investigate this possibility, consider the following model:

$$Prob_2 = \gamma Prob_1 + \alpha_1 Health_1 + \alpha_2 New + \alpha_3 Old + \alpha_4 New*Old + \beta'X + \varepsilon_2 \qquad (2)$$

where $Prob_i$ represents the self-reported percentage chance that the individual will survive until 75 or 85 in period i. The results are reported in table 5. Column 1 controls only for age, education, race and sex and column 2 includes controls for physical limitations. New heart conditions, on their own, are associated with lower self-assessed survival probabilities, all else constant. After controlling for underlying characteristics, initial health status and perceived survival probability, the coefficient on new heart conditions is negative. The coefficient on old heart conditions is also negative, while the interaction term between old and new conditions is positive. In the case of self-reported survival probabilities, the relevant test for adaptation is $\alpha_3+\alpha_4>0$, since higher values of the dependent variable imply a higher perceived chance of surviving to 75 or 85 years of age. After controlling for specific physical limitations, the sum of the coefficients is positive for both regressions. However, the standard errors for the coefficients are quite large and the evidence for adaptation is fairly weak when using these measures.

5.4 Emotional Health Status

Finally, I examine the effects of heart conditions on mental health status. The survey asks specific questions: "During the past two weeks, how often did you feel…?" and then lists several different attitudes and feelings such as depression, loneliness, restless sleep and whether the individual felt that it was "hard to get going" in the beginning of the day. Table 6 shows the effects of heart conditions on these specific measures of emotional health. For these mental health indicators, new heart conditions are associated with a higher incidence of negative emotional feelings and a lower incidence of happiness or enjoyment of life. Those who experience a new condition between the first and second waves are more likely to feel lonely and

have restless sleep and are less likely to report that they enjoy life or are happy. However, the evidence for adaptation is fairly weak when using these measures. With one exception, the sum of the coefficients on old heart conditions and the interaction between old and new heart conditions is not statistically different than zero for these emotional health measures.

Table 7 uses a self-reported 1-5 scale of emotional health status as the dependent variable in an ordered probit model. The signs of the coefficients are similar to the regressions using self-reported health status as the dependent variable. After controlling for difficulties with specific ADL's, the statistical test that $\alpha_3+\alpha_4<0$ is significant at the 10% level. Once again, the effect of a new condition on self-reported emotional health status is not as strong for those with a prior history than for those with no prior exposure to heart problems, showing support for hedonic adaptation.[10]

When using measures of mental health status to test for hedonic adaptation, the results are a bit mixed. When specific emotional feelings are used in the analysis, most of the regressions show that there is no statistically significant difference between the effects of new heart conditions for those with a prior history and those who have not undergone a condition in the past. However, the case for adaptation is much stronger when the self-reported (1-5) scale for mental health is used.

6 Discussion

There seems to be fairly strong support for the presence of hedonic adaptation to heart conditions. The effect of a new condition is generally not as bad (in terms of lower assessment of well-being) for those who have had a prior history of heart problems than for those who are experiencing a heart problem for the first time. The effects of heart conditions on self-reported

[10] Again, the results are not sensitive to the chosen specification.

health status are less severe for those who have already experienced a condition in the past than for those who are experiencing one for the first time. That there is evidence of adaptation in terms of subjective well-being is consistent with the underlying idea behind Brickman and Campbell's (1971) notion of a hedonic treadmill. One's subjective assessment of health status may not be as affected when there is a prior experience that gives an individual a reference point of comparison. Given that self-reported health status has been shown to be a good predictor of mortality and morbidity even after controlling for physical ailments and limitations, these self-assessed measures may also give a picture of an individual's predicted future health trajectory.

The results with respect to emotional health depend on the particular measure used. When the dependent variables are specific feelings such as loneliness, depression or happiness, there is little evidence that the presence of an earlier condition affects adaptation to new heart conditions. However, when an overall self-reported 1-5 scale is used, one's overall mental health is not as adversely affected by new heart problems when there was a previous episode of heart trouble, showing support for adaptation. The self-reported measures likely represent a different aspect of emotional health status than the questions that ask about how often someone felt a certain way in the last two weeks. Although these different measures of emotional health are clearly correlated with one another, they may represent different aspects of one's overall mental health status.

The results of this study are quite supportive of the theory of hedonic adaptation. The data presented here suggest that the effects of heart conditions on subjective well-being are affected by one's prior health history. Individuals who have had a heart condition in the past are not as negatively affected by new conditions as those who have not experienced a prior condition. While the results here are modest, they offer a plausible test of the hedonic treadmill by following specific individuals over time and using multiple measures of health status in the analysis. There is still room for future research in this area as more data becomes available. In particular, future waves of the Health and Retirement Study will provide researchers the ability to track the trajectories of specific conditions to see whether there is long-term adaptation to health

conditions. It will also be beneficial to study in more detail the reasons why adaptation is present in certain aspects of well-being, but not others.

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Table 1: Means

Variable	All	Men	Women
Age	55.524	57.251	54.062
Education	12.074	12.120	12.036
Proportion Black	0.160	0.142	0.175
Existing Severe Health Condition	0.309	0.329	0.292
New Severe Health Condition	0.129	0.152	0.110
Existing Heart Condition	0.131	0.164	0.103
New Heart Condition	0.066	0.081	0.053
Initial Self-Reported Health			
Excellent	0.225	0.219	0.230
Very Good	0.280	0.274	0.284
Good	0.277	0.289	0.267
Fair	0.141	0.136	0.146
Poor	0.077	0.081	0.073
Mean of Self-Reported Health (1-5)	2.565	2.586	2.547
Initial Self-Reported Emotional Health			
Excellent	0.194	0.220	0.172
Very Good	0.296	0.297	0.295
Good	0.330	0.322	0.337
Fair	0.137	0.122	0.150
Poor	0.043	0.039	0.046
Mean of Self-Reported Emotional Health (1-5)	2.539	2.464	2.603
N	11,491	5,268	6,223

Note: Source - HRS Waves 1 and 2.

Table 2: Measures of Physical Health Status

Measure of Physical Health Status	Self-Reported Health Status				
	Excellent	Very Good	Good	Fair	Poor
ADL index (0-13)	0.883	1.307	1.738	3.047	5.342
Difficulty with at least one ADL	0.457	0.637	0.716	0.877	0.971
Proportion with:					
Heart Condition	0.033	0.070	0.131	0.256	0.411
Cancer	0.037	0.038	0.054	0.089	0.114
Chronic lung disease	0.024	0.040	0.073	0.154	0.281
Diabetes	0.023	0.054	0.112	0.238	0.318
Stroke	0.006	0.013	0.020	0.060	0.154
Arthritis	0.207	0.325	0.410	0.541	0.667
High blood pressure	0.179	0.322	0.441	0.575	0.631
Probability live until 75 (Self-Report)	0.768	0.697	0.631	0.515	0.383
Probability live until 85 (Self-Report)	0.556	0.474	0.417	0.309	0.217
Difficulty with the following activities:					
Running or jogging a mile	0.341	0.476	0.526	0.657	0.745
Walking several blocks	0.020	0.048	0.099	0.295	0.589
Walking several flights of stairs	0.068	0.140	0.242	0.504	0.761
Walking across a room	0.002	0.001	0.007	0.027	0.150
Sitting for a couple of hours	0.087	0.102	0.131	0.235	0.395
Getting in and out of bed without help	0.003	0.006	0.013	0.052	0.212
Carrying things over 10 pounds	0.025	0.054	0.103	0.284	0.574
Stooping, kneeling or crouching	0.056	0.120	0.206	0.408	0.669
Extending arms above shoulder level	0.007	0.016	0.032	0.107	0.298
Bathing without help	0.002	0.002	0.006	0.035	0.187
Eating without help	0.000	0.001	0.001	0.007	0.023
Pushing or pulling heavy objects	0.018	0.043	0.098	0.266	0.586
Dressing without help	0.001	0.002	0.003	0.017	0.067
N	2,588	3,214	3,184	1,622	884

Notes: Reported values are from Wave 1 of the HRS. The ADL (activities of daily living) index is a measure of the number of activities that an individual reports as having difficulty performing. The ADL (activities of daily living) index is a measure of the number of activities that an individual reports as having difficulty performing.

Table 3a: Measures of Emotional Health Status

Means	Self-Reported Emotional Health Status				
During the past week, I felt: (0=None of the time, 3=All of the time)	Excellent	Very Good	Good	Fair	Poor
Depressed	0.090	0.170	0.356	0.842	1.529
That it was hard to get going	0.264	0.382	0.519	0.898	1.343
Lonely	0.105	0.166	0.291	0.614	1.124
Sad	0.160	0.243	0.409	0.749	1.231
Restless	0.386	0.517	0.682	1.077	1.684
I had a poor appetite	0.114	0.157	0.243	0.486	0.905
Everything was an effort	0.238	0.343	0.555	1.010	1.625
I enjoyed life	2.751	2.529	2.310	1.969	1.564
Happy	2.535	2.261	2.037	1.599	1.057
I had lots of energy	2.233	1.904	1.675	1.209	0.751
N	2,588	3,214	3,184	1,622	884

Table 3b: Physical Health Status and Emotional Health Status

Physical SRHS (1-5 Scale)	Self-Reported Emotional Health Status				
	Excellent	Very Good	Good	Fair	Poor
Excellent	1168	793	494	114	19
Very Good	528	1528	912	218	28
Good	344	756	1630	387	67
Fair	124	250	569	559	120
Poor	65	73	192	295	259
Mean SRHS (Physical)	1.829	2.201	2.751	3.447	4.160
N	2,588	3,214	3,184	1,622	884

Note: Reported values are from Wave 1 of the HRS.

Table 4: Heart Conditions and Self-Reported Health Status
Ordered Probit Models

Explanatory Variable	(1)	(2)
New Heart Condition	0.846	0.681
	(0.059)	(0.061)
Old Heart Condition	0.151	0.094
	(0.036)	(0.036)
New Heart*Old Heart	-0.341	-0.313
	(0.089)	(0.092)
p-value for joint significance of Old+New*Old	0.023	0.010
Problems doing the following activities:		
Running, jogging	…	0.094
		(0.014)
Climbing stairs	…	0.275
		(0.019)
Lifting heavy objects	…	0.091
		(0.024)
Pushing or pulling large objects	…	0.106
		(0.024)
Dressing without help	…	0.174
		(0.066)
Eating without help	…	0.366
		(0.101)
Walking across a room	…	-0.040
		(0.055)
Reaching or extending arms	…	0.124
		(0.027)
Bathing or showering without help	…	0.263
		(0.057)
Sitting for about two hours	…	0.083
		(0.020)
Walking several blocks	…	0.099
		(0.024)
Getting out of bed without help	…	0.005
		(0.049)
Stooping, kneeling or crouching	…	0.023
		(0.018)
N	11,487	11,487

Notes: Dependent variable is self-reported health status category: Excellent, Very Good, Good, Fair or Poor (with higher values indicating worse health). All regressions include controls for age, education, sex, race, the presence of other pre-existing conditions (diabetes, strokes, lung conditions and cancer) and initial self-reported health and emotional health status. Standard errors in parentheses.

Table 5: Heart Conditions and Self-Reported Survival Probabilities

Explanatory Variable	Perceived probability of living until 75 (0-100%)		Perceived probability of living until 85 (0-100%)	
New Heart Condition	-6.753	-5.412	-6.182	-5.346
	(1.527)	(1.535)	(1.645)	(1.657)
Old Heart Condition	-1.926	-1.475	-0.878	-0.577
	(0.884)	(0.885)	(0.951)	(0.954)
New Heart*Old Heart	2.308	2.211	2.400	2.295
	(2.257)	(2.255)	(2.469)	(2.470)
p-value for joint significance of Old+New*Old	0.856	0.727	0.511	0.458
Problems doing the following activities:				
Running, jogging	…	-0.457	…	-1.493
		(0.341)		(0.365)
Climbing stairs	…	-1.301	…	-1.433
		(0.477)		(0.521)
Lifting heavy objects	…	-0.206	…	-0.357
		(0.580)		(0.639)
Pushing or pulling large objects	…	-0.897	…	-0.262
		(0.571)		(0.630)
Dressing without help	…	-2.054	…	-5.523
		(1.627)		(1.946)
Eating without help	…	-3.720	…	4.224
		(3.426)		(4.488)
Walking across a room	…	1.012	…	-0.196
		(1.264)		(1.471)
Reaching or extending arms	…	-1.665	…	0.297
		(0.638)		(0.716)
Bathing or showering without help	…	0.699	…	1.635
		(1.380)		(1.635)
Sitting for about two hours	…	-0.101	…	1.185
		(0.486)		(0.541)
Walking several blocks	…	-0.648	…	0.500
		(0.576)		(0.640)
Getting out of bed without help	…	-0.166	…	0.619
		(1.148)		(1.338)
Stooping, kneeling or crouching	…	-0.002	…	-0.179
		(0.443)		(0.477)
N	9,484	9,484	9,330	9,330

Notes: All regressions include controls for age, education, sex, race, the presence of other pre-existing conditions (diabetes, strokes, lung conditions and cancer) and initial self-reported health and emotional health status. Standard errors in parentheses

Table 6: Heart Conditions and Measures of Emotional Health

Explanatory Variable	During the past two weeks, did you feel … much of the time?		
	Depressed	Lonely	Hard to Get Going
New Heart Condition	0.037	0.010	0.028
	(0.019)	(0.017)	(0.020)
Old Heart Condition	-0.009	-0.012	-0.007
	(0.011)	(0.010)	(0.011)
New Heart*Old Heart	-0.024	0.029	0.062
	(0.028)	(0.025)	(0.029)
p-value for joint significance of Old+New*Old	0.232	0.462	0.042
N	10,614	10,618	10,610
	Restless Sleep	Enjoyed Life	Happy
New Heart Condition	0.069	-0.037	-0.032
	(0.024)	(0.015)	(0.018)
Old Heart Condition	-0.004	0.003	0.007
	(0.014)	(0.009)	(0.010)
New Heart*Old Heart	-0.033	0.007	0.010
	(0.035)	(0.021)	(0.025)
p-value for joint significance of Old+New*Old	0.248	0.594	0.461
N	10,616	10,608	10,600

Notes: All regressions include controls for age, education, sex, race, the presence of functional limitations, the presence of other pre-existing conditions (diabetes, strokes, lung conditions and cancer) and initial self-reported health and emotional health status. Standard errors in parentheses.

Table 7: Heart Conditions and Self-Reported Emotional Health Status
Ordered Probit Models

Explanatory Variable	(1)	(2)
New Heart Condition	0.279	0.179
	(0.059)	(0.060)
Old Heart Condition	0.021	-0.004
	(0.035)	(0.036)
New Heart*Old Heart	-0.142	-0.145
	(0.088)	(0.089)
p-value for joint significance of Old+New*Old	0.140	0.070
<u>Problems doing the following activities:</u>		
Running, jogging	…	0.028
		(0.014)
Climbing stairs	…	0.080
		(0.019)
Lifting heavy objects	…	0.015
		(0.023)
Pushing or pulling large objects	…	0.048
		(0.023)
Dressing without help	…	0.107
		(0.062)
Eating without help	…	-0.016
		(0.105)
Walking across a room	…	0.041
		(0.049)
Reaching or extending arms	…	0.094
		(0.026)
Bathing or showering without help	…	0.038
		(0.054)
Sitting for about two hours	…	0.095
		(0.020)
Walking several blocks	…	0.061
		(0.023)
Getting out of bed without help	…	0.162
		(0.046)
Stooping, kneeling or crouching	…	0.017
		(0.018)
N	11,306	11,306

Notes: Dependent variable is self-reported emotional health status category: Excellent, Very Good, Good, Fair or Poor (with higher values indicating worse health). All regressions include controls for age, education, sex, race, the presence of other pre-existing conditions (diabetes, strokes, lung conditions and cancer) and initial self-reported health and emotional health status. Standard errors in parentheses.