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Documentation of Affective Functioning Measures in the Health and Retirement Study

Documentation Report

Prepared by Diane E. Steffick

Product of the HRS Health Working Group:
Robert B. Wallace
A. Regula Herzog
Mary Beth Ofstedal
Diane Steffick
Stephanie Fonda
Ken Langa

Survey Research Center
Institute for Social Research
University of Michigan
Ann Arbor, Michigan

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Documentation of Affective Functioning in the Health and Retirement Study (HRS/AHEAD)

This paper is one in a series of working papers that provides background information and documentation of several substantive areas of the Health and Retirement Study (HRS/AHEAD). The Health Working Group of the HRS project is in the process of providing similar papers on the assessment of cognitive functioning, physical functioning (including ADLs, IADLs, Nagi items), clinical conditions and their severity, and alcohol use.

This paper documents the HRS measures of mental health status, also called affective functioning. It is intended for a wide range of users, particularly those who would like to include mental health in their research but are not familiar with the measures available in the HRS. It also addresses topics of interest to mental health specialists who are concerned with how the abbreviated scales in the HRS correspond to the full scales used in the existing literature. This paper provides users with an overview of the measures included in the study, including their origins and pedigree. It details the specific steps used to create standard summary variables for the scales measuring depressive symptoms and major depressive episodes, and includes SAS code for this variable creation in a Technical Appendix[1].

Also included in this working paper is an examination of data quality. We provide univariate distributions of the HRS measures and compare these to other published studies, and also perform standard psychometric evaluations for reliability (the coefficient alpha) and exploratory factor analysis. The paper shows key bivariate relationships that support construct validity **C** showing that the HRS measures relate to several other respondent characteristics in the manner one would expect; for example, individuals with higher depressive symptoms are also less satisfied with their jobs and marriages than those with fewer symptoms of depression. It also addresses methodological issues specific to the mental health measures such as the change in the question wording of the depression symptoms scale between Wave 1 and Wave 2 of the HRS.

The paper is structured as follows. Section I provides a discussion of affective functioning in general and describes the decisions which led to the selection of specific measures for the HRS. Section II provides an inventory of the measures for the first three waves of HRS (the cohort aged 51 to 61 in 1992) and first two waves of AHEAD (the Asset and Health Dynamics Among the Oldest Old study, a cohort representative of those age 70 and older in 1993) and describes summary variable creation. Section III details the origins of the measures. Section IV outlines special methodological issues with the depression measures with subsections on age-eligibility, proxy respondents, HRS Wave 1 imputation, and determining caseness.

[1]SAS is a statistical software package licensed by the SAS Institute.

Section V assesses the comparability of the measures across the HRS waves (1992, 1994, and 1996) and AHEAD waves (1993 and 1995). Section VI provides the results of investigations into the quality of the measures, using data from the first few waves of each survey (HRS/AHEAD). This section included subsections on univariate distributions, benchmarking against other surveys and prevalence measures, internal consistency and measurement properties, constructed variables, item nonresponse and missing data, and construct validity. The Appendix contains additional tables, which may be of interest to the reader, while the Technical Appendix contains the SAS code for constructed summary variables.

1. Rationale for Measuring Affective Functioning and Depression

Affective functioning, a person's mood and emotional health, is an important component of an individual's overall health and wellbeing. Research has shown that symptoms of depression and anxiety have a significant impact on a person's performance in the labor market. Individuals with poor affective functioning are less attached to the labor force, work fewer hours, have more work loss days, and earn lower wages (for example, see Ettner et al. (1997), Broadhead et al. (1990), and Steffick (1998)). Consequently, a person's emotional health is likely to affect his or her decision to retire.

Affective functioning is also related to physical health in many ways. A high level of psychological distress (symptoms of depression) is associated with poorer physical health. Research has shown that the direction of causation goes both ways. On the one hand, depression increases the risk of physical disease. For example, Barefoot and Schroll (1996) found that individuals with high levels of depression during their baseline observation were significantly more likely to experience a myocardial infarction (heart attack) than those with low levels of depression, even after controlling for baseline cardiovascular function. On the other hand, many physical illnesses and functional impairments have the effect of increasing depression and anxiety. For example, a study by Palomäki et al. (as cited in Hachinski, 1999) found that the prevalence of depression in a sample of ischemic stroke survivors increased with time from 6 percent at the initial stage, to 11 percent at one year, and 18 percent at eighteen months.

For these reasons, the Health and Retirement Study (HRS/AHEAD) includes affective functioning as one of its health domains. The remainder of this section describes the definition of affective functioning, introduces the measures, and provides the reasons behind their selection.

Affective functioning is not a well-defined concept that is easily quantified. It has many dimensions and not all of them can be measured well in a survey. A comprehensive inventory of psychological traits and disorders was prohibited by the nature of the survey and its time constraints. Therefore, one task facing the designers of the HRS/AHEAD was the selection of mental health concepts to comprise the affective functioning inventory from the wide range of alternatives **C** aspects of personality or self-esteem; general levels of stress or psychological distress; or recognized disorders such as major depression, schizophrenia, or generalized anxiety disorder (to name just a few).

The most direct method of characterizing affective functioning included in HRS/AHEAD is a set of questions asking the respondent to report about their own emotional health directly. This includes a global rating of emotional health as excellent, very good, good, fair, and poor. Respondents are also asked directly about receipt of a diagnosis from a doctor of an emotional or nervous problem and, whether he/she has sought treatment for this problem such as therapy or medication. This allows the respondent to acknowledge any mental health problem for which they have sought care from a health-care professional. However, the fact that these diagnosis-based questions are influenced by the decision to seek care, which is in turn influenced by economic considerations (insurance coverage, ability to pay) makes them undesirable for many research studies. To avoid this problem, the HRS/AHEAD sought to include more comprehensive measures of affective functioning, which are asked of all self-respondents.

It was decided that these measures would include one inventory of psychological distress and one measure of major depressive episodes. The measure of psychological distress, or symptoms of depression, consists of a subset of items from the Center for Epidemiologic Studies Depression Scale (CES-D)[2]. The CES-D scale measures a continuum of psychological distress (symptoms of depression and anxiety), rather than determining the presence or absence of recognized psychiatric disorders. Fechner-Bates, Coyne, and Schwenk (1994) provide results of research on the relationship of the CES-D to both depressive disorders and anxiety disorders, as well as other psychiatric diagnoses.

In the third wave of interviews for the HRS and the second wave for AHEAD, a short form of the World Health Organization's Composite International Diagnostic Interview (CIDI-SF) was administered. This scale determines a probable diagnosis of the psychiatric condition known as a major depressive episode, as defined by the *Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association*, third edition revised (DSM-III-R)[3]. The CIDI-SF elicits information relating to symptoms and duration as spelled out in the DSM-III-R and can be used to identify individuals whose depressive symptoms would be recognized as an illness by mental health practitioners.

The HRS/AHEAD focused on depression since it is the most prevalent psychiatric disorder among the elderly (Reiger et al., 1988) and may be quite disabling (see Wells et al., 1989, for example)[4]. The choice of these specific measures of affective functioning was subject to the constraints of the survey format. Structured interviews by mental health providers were not feasible, so the instruments had to be designed for administration by interviewers with no

[2]Wave 1 of the HRS included 11 items from the 20-item CES-D while all subsequent waves of the HRS and all waves of the AHEAD study contain 8 items.

[3]The HRS/AHEAD study uses a version of the CIDI-SF that implements DSM-III-R criteria. Later versions of the CIDI-SF have operationalized the DSM-IV criteria (Nelson et al., 1998).

[4]Reiger et al. (1988) found phobia and cognitive impairment to have the highest one-month prevalence rates among individuals age 65 or older, followed by the combination of depression and dysthymia. However, phobias tend to be very specific and do not often limit daily activities, so HRS/AHEAD chose not to ask about phobia. Cognitive impairment is evaluated in a separate section of the survey. See Ofstedal (1999) for details on HRS/AHEAD coverage of cognitive functioning.

advanced training in psychology or psychiatry. The instruments also had to be reliable when administered over the telephone, as well as in person. Both the CES-D and the CIDI-SF have been shown to be reliable in interviewing environments similar to the HRS/AHEAD (Ross and Mirowsky, 1984; Mroczek and Kessler, 1994).

An additional goal was to ensure comparability between the HRS/AHEAD and other national surveys. In addition to the CES-D, there are dozens of inventories of depressive symptoms used in psychiatric and psychological research. Many of these contain questions that are very similar to the CES-D. Ultimately, the CES-D was chosen because of its widespread use, which both attests to its reliability and validity for a variety of subpopulations, and allows for greater comparability of the HRS/AHEAD with existing research. The CES-D has been used in the National Health and Nutrition Examination Survey (NHANES), the Established Populations for Epidemiologic Study of the Elderly (EPESE), the National Longitudinal Surveys (NLS-Mature Women, NLS-Older Men, NLSY), and the Americans' Changing Lives study (ACL). The long form of the CIDI was used in the National Comorbidity Survey (NCS) and the Short Form was developed for use in the National Health Interview Survey (NHIS).

II. Inventory of Measures Including Variable Construction

This section of the working paper details the individual items that make up the mental health measures in the HRS and shows the user how the items were operationalized as questions in the respondent's interview. It notes changes between waves of the survey and includes tables listing the individual items for quick reference. It also details the most commonly used methods of combining the individual items into a summary score.

The HRS Depression Symptoms Measure: The Shortened CES-D

As mentioned previously, the HRS/AHEAD depression symptoms measure is a subset of the Center for Epidemiologic Studies Depression scale (CES-D). The original CES-D contains 20 items designed to assess the level of depressive symptomatology in epidemiologic studies of various populations. Due to interview time constraints, the first wave of the HRS included a shortened version of the CES-D which was developed for use in the Established Populations for Epidemiologic Study of the Elderly (EPESE) survey rather than including the full twenty-item scale.

In HRS Wave 1, respondents were asked to rate the frequency of eleven symptoms of psychological distress along the following categories: rarely/none of the time, some of the time, most of the time, or all of the time. (This four-level rating of frequency of symptoms will be referred to as "frequency response" throughout this document.) This retains the original response format of the CES-D but selects the subset of items used in the Iowa cohort of the EPESE. According to Kohout et al. (1993), these items were chosen based on the factor-analytic results presented by Radloff (1977).

The number of items and response format for the CES-D questions changed between the first and second waves of the HRS, in order to simplify telephone administration. In HRS Wave 2, three items were dropped from the subset, leaving 8 symptoms for respondents to evaluate. Additionally, the response format was changed from the frequency response to a question stem worded as "would you say yes or no?" (a Yes/No response). This eight-item scale was administered to the full sample. Table 1 below illustrates the question wording of the HRS/ AHEAD depressive symptoms measure in HRS Wave 1 and all other waves.

Table 1
Question Wording for CES-D

Wave 1 of HRS (Frequency Response)	Wave 2 and subsequent waves of HRS and all waves of AHEAD
Please tell me how often you have experienced the following feelings during the past week **C** all or almost all of the time, most of the time, some of the time, or none or almost none of the time. I felt depressed.	Now think about the past week and the feelings you have experienced. Please tell me if each of the following was true for you much of the time this past week. Much of the time during the past week, you felt depressed. Would you say yes or no?

In an experimental module (Module 1 of HRS Wave 2), the exact measure from HRS Wave 1 was administered to a random subset of 808 respondents, in addition to the new Yes/No response scale. This allows for comparison across the two response formats for a given individual. Analysis presented in Section V of this paper has shown that there is some disagreement between the two forms of the scale, leading to the conclusion that there is no simple way to accurately compare HRS Wave 1 and HRS Wave 2 depression symptomatology. Such comparisons are likely to be biased by measurement issues unless the analyst adjusts for this wording change with statistical models (refer to Section V of this paper for more information).

Subsequent waves of the HRS, and all of the AHEAD interviews, include the eight-item scale with the same Yes/No response format used in HRS Wave 2. Table 2 contains an inventory listing the CES-D items contained in the HRS and AHEAD studies.

[Table 2 about here]

Summary Scores. The traditional method of summarizing (also referred to as scoring) the CES-D is to assign each item a value from zero to three, with a response of "none of the time" counting as zero, "some of the time" counting as 1, "most of the time" counting as 2, and "all of the time" counting as 3. The items worded in the positive direction are "reverse-scored"; for

example, "I am happy" is valued at zero if answered "most of the time". The items are then summed to yield a total score ranging from zero to thirty-three, in the case of the 11-item subset in HRS Wave 1. All other waves of the HRS and all waves of the AHEAD use a summary score ranging from zero to eight, created by summing the number of "yes" answers across the eight items (with the positive items reverse-scored).

In addition to the standard method of scoring, researchers have used the items that make up the CES-D scale in several alternate forms of summary scores. Many researchers have further transformed the CES-D summary score into a dichotomous variable indicating a high likelihood of clinical depression, following the example of Comstock and Helsing (1976). The subsection on determining caseness in Section IV contains more information on this. Pimley (1990) suggests using differential weights on symptoms (instead of the equal weight given when the items are simply summed), giving a higher weight to the rarer symptoms, which presumably discriminate between clinical and non-clinical depression better than the more common symptoms. Gottlib, Lewinsohn, and Seeley (1995) create two different summary scores, one measuring the number of symptoms endorsed and one representing the frequency. This strategy could be employed when analyzing the HRS Wave 1 data, however, only the number of symptoms is available in the other waves of the study. Obviously, the researcher is free to use the individual items in any manner he or she deems acceptable, but the summary score described in the previous paragraph is most commonly used in the psychology and epidemiology literatures.

The Short Form Composite International Diagnostic Interview (CIDI-SF) Used In HRS/AHEAD

The short form of the CIDI for major depressive episodes (MDE) is only administered once to each respondent in the surveys. The HRS cohort answered the CIDI-SF for MDE in Wave 3 (1996) and the AHEAD cohort in Wave 2 (1995). New cohorts added to the combined survey (starting with HRS-1998) will be administered the CIDI-SF for MDE during their baseline interview. As of this writing, there are no plans for a follow-up administration of the CIDI-SF for any respondents.

The short form for major depressive episodes in its entirety consists of thirty-three questions. However, respondents do not answer all thirty-three questions. Respondents are first asked a screen question regarding depressed mood (dysphoria): whether they ever felt sad, blue or depressed for more than two weeks in a row in the past 12 months (E1006 in HRS), as shown in Figure 1. If they answer "no" to this question, they are then skipped past the detailed questions (E1007-E1024 in the HRS) and are asked the second screen question about anhedonia (the inability to experience pleasure from normally pleasurable activities): "during the past 12 months was there ever a time lasting two weeks or more when you lost interest in most things like hobbies, work, or activities that usually give you pleasure?" (E1028 in the HRS). If they also answer "no" to this question, they are finished with the CIDI-SF (this is called being screened out of the CIDI-SF) and continue with the remainder of the HRS/AHEAD interview.

[Figure 1 about here]

Similarly, if a respondent volunteers that they did not experience a dysphoric period of 2 weeks or more because they were taking antidepressant medications, they are coded as such and skipped to the second screen question. If they answer "no" to that question also, and indicate that this was due to the medication, they are coded as such and are screened out of the CIDI-SF (skipped to the next section of the HRS interview).

If a respondent answers "yes" to one of the screen questions, they are then asked about the intensity and duration of the depressed mood or anhedonia (E1007 and E1008 for the first screen question, E1029 and E1030 for the second in the HRS interview). If the intensity was less than "all" or "most" of the day or it occurred less often than "every day" or "almost every day", the respondent is screened out of the CIDI-SF. If the respondent indicates that the depressed mood or anhedonia was for most/all of the day *and* for almost every/every day, he or she is then probed for specific symptoms. The symptom questions asked after the depressed screen question (E1009 through E1017 in HRS) and the symptom questions asked after the anhedonia screen question (E1031 through E1038 in HRS) parallel each other.

Respondents that endorse the first screen question (depressed mood) for the necessary duration and intensity are then asked about seven symptoms. The first symptom is anhedonia, probed by E1009 in the HRS. Anhedonia is only counted as a separate symptom for those respondents who endorse the depressed mood screen question. Respondents endorsing the second screen question (E1028-anhedonia) are asked about the same six remaining symptoms that the depressed-mood respondents are asked.

Both groups are asked about feeling tired or having low energy (E1010, E1031). The third symptom is appetite change, either decreased appetite (E1011, E1032) or increased appetite (E1012, E1033)[5]. The fourth symptom is trouble sleeping (E1012, E1034) and a "yes" response is probed about frequency **C** every night, nearly every night, or less often (E1013, E1035). To qualify as a depressive symptom for the CIDI-SF diagnosis, the respondent must have trouble sleeping nearly every night or every night. The fifth symptom is trouble concentrating (E1015, E1036), the sixth is feeling worthless (E1016, E1037), and the seventh symptom is thinking about death (E1017, E1038). Note that the respondent is asked whether they think about death in general, their own or someone else's, rather than asking about suicidal thoughts directly. The remaining questions in the CIDI-SF consist of review questions, asking about the length of the spell (from 2 to 52 weeks) and the month of onset of the most recent spell. Table 3 lists the items included in the CIDI-SF for major depressive episodes.

[Table 3 about here]

Summary scores. The summary variable for the CIDI-SF ranges from zero to seven. It is zero for those who answered "no" to the depressed and anhedonia screen questions, those who

[5]Note that this is a change from the original CIDI and the CIDI-SF v1.0 questions, which ask about weight gain and loss rather than appetite.

did not meet the frequency and duration criteria for those questions, and those that did not endorse any MDE symptoms beyond one of the screen questions. For those who *did* endorse one of these screen questions with the appropriate frequency/duration, the summary variable is the count of the number of symptoms endorsed out of the seven. Note that the possible score for respondents endorsing the second screen question only ranges from zero to six, because anhedonia is counted as an additional symptom for those with depressed mood.

According to Nelson et al. (1998), a score of three or more is indicative of a diagnosis of depression. Researchers may implement a more stringent cutoff of five or more symptoms to correspond to the DSM III-R requirements for major depression, if desired. Also, Nelson et al. (1998) detail a strategy for using the CIDI-SF as a continuous measure, by associating each symptom level (zero to seven) with a probability of "caseness" derived from the National Comorbidity Survey. This probability of caseness estimate is actually the probability that the *full* CIDI (rather than the short form) would designate the individual as having the disorder, and not the probability that a clinician would diagnose the individual with a disorder. Researchers should be wary of the applicability of this approach to the HRS/AHEAD data, since the NCS has a different age range, 15 to 54 years. One must believe that the presentation of major depressive episodes is the same for those over age 50 as those under age 50 to use the probabilities of caseness from the NCS with the HRS/AHEAD.

Self-Rated Emotional Health and Self-Reported Psychological Diagnosis

A final set of measures that addresses psychological health in general is the self-report questions. In each wave, respondents are asked to rate their own emotional health on a scale ranging from excellent, very good, good, fair, to poor. They are also asked about a doctor's diagnosis of psychological problems, the receipt of psychological treatment, and the use of psychotropic medications. In the baseline interview (Wave 1 for the HRS and AHEAD cohorts), respondents are asked if a doctor ever told them that they had psychiatric, emotional, or nervous problems. If they answered affirmatively, they are asked about treatment and medication. In subsequent waves, respondents that answered "no" in previous waves are asked if they have received such a diagnosis since the last interview. All respondents who reported a diagnosis in the current wave or any previous wave are then asked about treatment and medication at each interview. Table 4 shows these questions across waves of the HRS and AHEAD.

[Table 4 about here]

Reliance on physician diagnoses of psychological problems is believed to underestimate the true prevalence of psychiatric disorder. A majority of individuals with mental disorders do not receive treatment from a general care doctor or a mental health professional (Kessler et al., 1994). The use of medical services for treatment of mental disorders is influenced by a person's economic situation, as well as other factors. As a result, the use of self-reported physician diagnosis as an indication of psychiatric illness when studying the relationship between mental health and economic behaviors is problematic.

III. Origin of the CES-D and CIDI-SF

This section of the paper gives background information on the development of the original scales from which the HRS/AHEAD derives its affective functioning measures. These are the Center for Epidemiologic Studies Depression Scale (CES-D) and CIDI-SF for major depressive episodes.

The CES-D Scale

The CES-D was developed to measure the frequency of depressive symptoms in the general population and was designed for inclusion in surveys (Radloff, 1977). The twenty items that comprise the full scale were taken from existing measures of depression including Zung (1965); Beck, Ward, and Mendelson (1961); Raskin, Schulterbrandt, and Reating (1967); and the depression subscale of the Minnesota Multiphasic Personality Inventory (Dahlstrom and Welsh, 1960). Individuals evaluate how frequently they experienced each of the twenty items during the past week, from none or almost none of the time, some of the time, most of the time, to all/almost all of the time. With exploratory factor analytic techniques, Radloff (1977) found that the full (20-item) CES-D has four factors **C** depressed affect, positive affect, somatic complaints, and interpersonal problems. National norms for the CES-D came from its inclusion in the 1974-1975 National Health and Nutrition Examination Survey.

Hundreds of studies have used the CES-D scale to measure depressive symptoms in a wide range of both clinical and non-clinical populations. It has been used with many ethnic minority groups and has been translated for use in many non-English speaking countries **C** examples include Korean immigrants, Chinese-Americans, American Indians, Guatemalans, African-Americans, Hispanics, and Japanese. It has also been used with specific subpopulations suffering from physical health complaints: chronic pain patients, hospitalized physically-ill patients, persons with rheumatoid arthritis, and stroke survivors (Geisser et al., 1997).

The CIDI-SF for Major Depressive Episodes

The CIDI-SF is the most recent version of the highly-structured research interview which implements the diagnostic criteria of the DSM, can be administered by lay interviewers, and is scored by computer[6]. The initial instrument of this type was the Diagnostic Interview Schedule (DIS) developed at the National Institute of Mental Health and used in the Epidemiologic Catchment Area studies during the early 1980's (see Robins et al. (1981) for the history of the DIS). The World Health Organization (WHO) and the National Institutes of Health then modified the DIS to form the Composite International Diagnostic Interview (WHO-CIDI) by adding questions to generate ICD-10 (International Classification of Diseases, version 10) diagnoses in addition to DSM-III-R. The ICD-10 diagnoses allow cross-cultural and cross-national comparisons.

[6]See Kessler et al. (1998a), Wittchen and Kessler (1994), and Wittchen (1994).

Additional modifications to the WHO-CIDI led to the UM-CIDI, which was used in the National Comorbidity Survey (NCS). To form the UM-CIDI, the NCS researchers dropped diagnoses from the WHO-CIDI that were not of interest to their study, retaining only the questions needed to ascertain DSM-III-R diagnoses. They re-organized questions to minimize the "no" response set **C** when respondents realize that a "yes" answer to a stem question results in several more questions being asked, they have an incentive to answer "no" in order to minimize interview burden, even if their true answer is "yes". The UM-CIDI moves all stem questions to the beginning of the interview, then begins the detailed questions once all of the general probes have been answered.

Researchers from the NCS and WHO developed "short forms" of the CIDI for use in the National Health Interview Survey[7]. One difference between the full CIDI and the CIDI-SF has to do with the time frame; the short form asks about the past twelve months while the full CIDI asks about lifetime experience. Respondents are asked about fewer symptoms than are in the full CIDI for major depression. In the short form, respondents are asked to identify their worst episode during the past twelve months and then are probed about symptoms. Questions were added to assess the DSM-III-R criteria regarding the persistence of symptoms[8]. The CIDI-SF does not ask questions regarding the organic nature of the symptoms; that is, whether the symptoms are a result of physical illness, medication, substance usage, or alcohol usage. Additionally, as a requirement for inclusion in the National Health Interview Survey, the short form scales were tested in a cognitive research laboratory. The wording of some questions was changed to clarify meaning, based on the results of this laboratory research.

IV. Special Methodological Issues

This section documents two general methodological issues of the HRS/AHEAD study and two special methodological issues relating to the depression measures. The first general issue concerns the determination of age-eligibility and why that impacts analyses. The second general issue concerns the imputed data that was released as part of the standard HRS Wave 1 data.

The last two issues are of special concern for the affective functioning measures. The first of these issues concerns the presence of proxy respondents, which appear as "don't know" answers to the CES-D and CIDI-SF measures. The last issue discussed in this section concerns the use of these survey measures for detecting mental illness, which is often called determining "caseness."

[7] As of this writing, these measures were planned as part the 1999 NHIS as indicated in the draft questionnaire.

[8] The CIDI-SF implements criterion A through C of the DSM-III-R but not criterion D that the depression is "not superimposed on schizophrenia, schizophreniform disorder, delusional disorder, or psychotic disorder not otherwise specified." It also does not impose the hierarchy of diagnoses in the DSM (Kessler et al., 1998).

Age-Eligibility

The desire of the HRS surveys to collect information on both spouses of a married couple has lead to two mutually exclusive groups **C** those age-eligible for their survey and those who are spouses of an age-eligible respondent but are not age-eligible themselves. The HRS sampled households with at least one individual born between 1931 and 1941 and also interviewed the spouse when that individual was married, regardless of the spouse's birth year[9]. Therefore, some households contain two respondents who are age-eligible while some contain only one age-eligible respondent.

It is important to note that these not-age-eligible respondents are not a random sample representative of their age cohort. Rather than being chosen at random, they were sampled because they were married to an age-eligible person. In the HRS, not-age-eligible respondents born before 1931 (therefore older than the HRS cohort) tend to be the male husbands of age-eligible female respondents. Those not-age-eligible respondents born in 1942 or later (therefore younger than the HRS cohort) tend to be female **C** the wives of HRS-age-eligible men. Including these not-age-eligible respondents in an analysis can lead to biases. Therefore, the individual-level sampling weights on the HRS and AHEAD files are zero for not-age-eligible respondents. However, in unweighted analyses, the researcher must be careful to account for this conditionally selected group. Excluding these individuals is recommended. Hence, not-age-eligible respondents are excluded from the tabulations that appear in all of the tables in this paper.

Table 5 shows the number of age-eligible and not-age-eligible respondents in the HRS and AHEAD samples.

Table 5
Age-Eligibility for HRS and AHEAD

Age-Eligibility	HRS Sample	AHEAD Sample
Total Respondents	12,652	8,222
Age-Eligible	9,772	7,447
Not Age-Eligible	2,880	775

[9]Likewise, the AHEAD study sampled households with at least one individual born in 1923 or earlier and also interviewed their spouse, if married, who would not be age-eligible if born in 1924 or later.

HRS Wave 1 Imputations

This subsection describes the imputation procedures that are unique to Wave 1 of the HRS survey. Wave 1 of the HRS was released to the public with all missing items replaced with imputations. This is to allow analysts to quickly use the data without having to dwell on the issue of missing data. Imputation flags are provided for users who wish to "unimpute" these missing data and analyze the pattern of missing responses.

Of all the tabulations and analyses presented in this working paper for HRS Wave 1 use data that have had imputed responses replaced with missing values. For most of the tables in this paper, respondents with missing CES-D or CIDI-SF items are excluded from the sample that is presented in the table. All tables are clearly marked when they exclude respondents with missing data. For analysts trying to replicate tables in this paper, it is important to use the imputation flags to derive the appropriate sample.

Proxy Respondents

The methodology of the HRS/AHEAD study includes the use of "proxy" respondents when the original (i.e., sampled) respondent could not or would not complete the interview. In the introduction to the Special Issue (regarding the AHEAD study) of the Journals of Gerontology Series B (Vol. 52B), Myers, Juster, and Suzman (1997) explain proxy interviews as follows:

> "Finally, a substantial number of the AHEAD interviews were completed by a proxy respondent rather than by the designated respondent. This typically occurred because the designated respondent was ill, cognitively impaired, or unable to participate in a relatively lengthy interview. The incidence of proxy responses varied with the age of the designated respondent, with almost a third of the interviews in the oldest old age group being conducted with proxy respondents rather than with the designated respondent." (Myers et al., 1997: p. vii)

The following table (Table 6) shows the number of proxy respondents in each wave of the surveys to date.

Table 6
Proxy Respondents in HRS/AHEAD

	HRS			AHEAD	
Proxy Respondents	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Total Age-Eligible Respondents	9,772	8,933	8,364	7,447	6,299
Proxy Used	475	651	483	791	856
Not a Proxy	9,297	8,282	7,881	6,656	5,443

Since the need for a proxy respondent increases with the likelihood of illness and/or cognitive impairment and these conditions increase with age, the use of a proxy respondent is not independent of age. The use of proxy respondents interacts with the age-eligibility question discussed earlier in this section, particularly for the HRS cohort. In the HRS, most of the respondents older than 61 in the base year (1993) were male, the husbands of age-eligible women. These older men were much more likely to need a proxy respondent than the members of the HRS cohort or the female respondents who were not-age-eligible, since most of these wives were younger than the HRS cohort. Therefore, including not-age-eligible respondents will show a gender bias in the use of proxy respondents for the HRS. Respondents who are not age-eligible in AHEAD are, by definition, younger than the AHEAD cohort and therefore are less likely to need a proxy than the age-eligible respondents.

The CES-D and the CIDI-SF are self-report instruments calling on the respondent to evaluate his or her state of mind. For that reason, neither the CES-D nor the CIDI-SF is asked of proxy respondents. The items for the CES-D and CIDI-SF measures will have the code "8" meaning "don't know" for individuals with proxy respondents.

In HRS Wave 1, however, the CES-D items *were* mistakenly asked of proxy respondents. Since this was not intentional, we can not document whether the proxies reported on their own state of mind or gave their opinion of the designated respondent's state of mind. We suggest that the researcher use the variable AAPROXY@ (from the tracker file, which is available on the HRS web site: http:\\www.umich.edu\~hrswww) to remove proxy respondents from any analysis of the CES-D in Wave 1 of the HRS. Proxy respondents were not asked the depression questions in any other wave of HRS or AHEAD.

Determining Caseness

This subsection discusses the use of the HRS/AHEAD affective functioning measures to diagnose mental disorders; which is referred to as determining caseness.

The CES-D Measures

Originally, the CES-D scale was not designed to measure the prevalence or incidence of depressive disorders in the general population, although it has been used this way in the literature. There are many ways in which the CES-D questions do not match the DSM (Diagnostic and Statistical Manual) criteria for depressive disorders. They do not address duration and intensity, which are important components for a diagnosis of disorder, nor do they probe respondents as to whether the depressive symptoms were the result of bereavement, medication side effects, drugs and alcohol, or physical illness. They also ignore the possibility of other psychological disorders that have symptoms similar to depression, most notably anxiety disorders. This information is important in making a diagnosis of depressive disorder that would be comparable to a clinician's diagnosis.

However, even with these drawbacks, the CES-D has been used to indicate the prevalence of depression in the literature. Consequently, a number of studies have assessed the ability of the CES-D to identify clinical depression by comparing CES-D scores to the results of structured interviews by mental health practitioners. To explore this question, researchers have evaluated several dimensions of the scale as listed below:

- Specificity: the ability to accurately identify noncases or "true negatives."
- Sensitivity: the ability to accurately identify cases, the "true positives."
- Positive Predictive Value: the proportion of true cases among those *exceeding* the cutoff.
- Negative Predictive Value: the proportion of true noncases among those *below* the cutoff.

In each of the measures described above, the "truth" refers to the diagnosis made by a clinician; these measures compare the CES-D above and below a cutoff level with a psychological diagnosis for the same individual. Estimates of sensitivity for the full CES-D scale range from 70 percent to 99 percent, and estimates of specificity range from 56 percent to 94 percent (Gotlib et al., 1995). Positive predictive value is generally low, between 20 and 30 percent, while the negative predictive value is high, above 90 percent (Roberts et al., 1991). This is because the cutoff is generally chosen to be conservative.

Although the HRS and AHEAD samples have not been evaluated by mental health professionals, the surveys do include the CIDI-SF for major depressive episodes, which can be used for comparison, as a substitute for clinician diagnosis. Turvey et al. (1997) do this comparison using the AHEAD Wave 2 data. At a cutoff point of 3 or more on the 8 item CES-D, they found a sensitivity of 71 percent and a specificity of 79 percent using the CIDI-SF diagnosis as the "true caseness." This means that the abbreviated CES-D in AHEAD classified 71 percent of individuals as "not depressed" that the CIDI-SF also determined were "not depressed." Conversely, the CES-D identified 79 percent of individuals as depressed that the CIDI-SF also classified as depressed.

Although the sensitivity and specificity of the eight-item CES-D measure were similar in the AHEAD sample when compared against the CIDI-SF, the published evaluations of the full CES-D scale (compared with clinician diagnosis) imply that the CES-D is able to identify individuals who are currently depressed pretty well; that is, it does not miss many cases of true depression. However, it tends to have many false positives; its ability to discriminate between those who have many symptoms of depression but do not qualify as clinically depressed, and those who qualify for a diagnosis of depression, is poor. Of course, these evaluations vary depending on what level of CES-D score is used as the cutoff to indicate depression.

Comstock and Helsing (1976) originated the traditional cutoff point of 16 or higher on the full CES-D scale (which ranges from zero to sixty) to indicate the likelihood of clinical depression. This point corresponded to the 80th percentile of the CES-D score distribution of

their epidemiologic survey. Although a score of 16 or higher is often used as a cutoff, many researchers have found different optimal cutoff points for various subpopulations. Of course, a score of 16 on the full scale (with range 0-60) does not correspond to a score of 16 on the shortened scale used in the HRS and AHEAD. For more discussion of cutoff points for the HRS/AHEAD measures, see Section VI, Evaluation of Measures and Data Quality.

More recent research using receiver operating curve (ROC) analysis has identified different optimal cutoff points. Additionally, these optimal cutoff points vary by subpopulation under study. For example, a cutoff of 28 or higher maximized sensitivity and specificity among a Native American village population; 24 or higher was optimal for American high school students; 17 or higher for Cuban Americans; 26 or higher for Puerto Ricans; 27 or higher for patients at primary care clinics; and 13 or higher for nursing home residents (Furukawa et al., 1997).

The CIDI-SF Measure

The full WHO-CIDI measure is currently the most widely accepted method for determining the prevalence of psychiatric disorders in the United States (and elsewhere) through large surveys with lay interviewers (Kessler et al., 1994). The CIDI-SF included in the HRS and AHEAD surveys approximates the diagnosis given by the full CIDI. The authors of the short form recommend a cutoff point of 3 or more symptoms to indicate a diagnosis of clinical depression, based on their analysis comparing the CIDI-SF to the full CIDI. Other researchers have advocated the use of 5 or more symptoms as the cutoff for clinical relevance, to better correspond with the guidelines in the DSM-III-R (Turvey et al., 1997).

The use of this measure will provide the researcher with an estimate of the 12-month prevalence of major depressive episodes among the HRS and AHEAD cohorts. It should be noted that the CIDI-SF does not distinguish between major depressive episodes that occur with major depressive disorder, bipolar disorder (manic-depression), or psychotic disorders. Because major depressive episodes occur within several different psychiatric disorders, the prevalence estimates of major depressive episodes from the CIDI-SF will not necessarily correspond to the prevalence of actual major depressive disorder. Additionally, since it is not used as a longitudinal measure in HRS/AHEAD, the CIDI-SF will not be able to estimate the incidence, or onset, of depression.

V. Comparability of the Shortened CES-D Measures Across HRS and AHEAD Waves

This section provides information about using the measures of affective functioning for longitudinal analysis. Only the CES-D measure of depressive symptoms is repeated in each wave, so any longitudinal analysis must make use of the shortened CES-D scale.

This section documents the changes in the shortened CES-D scale between waves of the surveys. There was a significant change in the wording of the CES-D response options between Wave 1 and Wave 2 of the HRS (AHEAD has consistent wording throughout all waves of the

survey). Since Wave 2 of the HRS, the CES-D scale format and items have not changed. Only Wave 1 of the HRS differs from the rest of the survey.

Making use of an experimental module included in Wave 2 of the HRS, the effect of wording changes in the CES-D between Wave 1 and Wave 2 of the HRS is evaluated. This section also provides basic statistics on between-wave changes in the level of depression for both the HRS (Wave 2 and Wave 3) and the AHEAD (Wave 1 and Wave 2) surveys.

Wording Changes Between Waves 1 and 2 of the HRS

To evaluate the effect of changing the CES-D response categories from the frequency response (4 choices **C** rarely/none of the time, some of the time, most of the time, all/almost all of the time) to the Yes/No response, a subset of the Wave 2 HRS respondents was given the CES-D scale with the frequency response format (i.e., the exact wording from Wave 1) in an experimental module. This subset also had answered the new CES-D format (Yes/No) in the main HRS interview. The frequency response CES-D questions are contained in Module 1 of the HRS Wave 2 data set. They are labeled "Module 1" in the tables that follow.

The dilemma of CES-D scales with different response formats was also encountered in the Established Populations for Epidemiologic Studies of the Elderly (EPESE). Kohout et al. (1993) details their experiences. The Yale/New Haven site administered the full, twenty-item CES-D with the traditional four-level frequency response format. The East Boston and Iowa sites only asked a subset of the 20 items (10 in East Boston, 11 in Iowa) and changed the response format[10]. East Boston offered the Yes/No format, while the Iowa site offered three choices **C** hardly ever or never; some of the time; and much or most of the time. To compare the measurement properties of these shortened CES-D scales the authors used the full scale in the Yale data to simulate the Iowa and East Boston scales. To replicate the Yes/No response format of the East Boston scale, they considered "rarely/none of the time" and "some of the time" to be "No" answers and "much of the time" and "most or all of the time" to be "Yes" answers.

To resolve the problem of different response formats for the HRS Wave 1 and HRS Wave 2 shortened CES-D scale, the survey staff intended to follow this same strategy used to compare the difference response formats between EPESE sites. We assumed collapsing "most" and "all" of the time into "yes" and "none" and "some" of the time into "no" would be equivalent to the format where respondents answered with yes or no.

The results from following this strategy with the HRS data are presented in Table 7. Note that for all of the tables presented in this paper, only age-eligible respondents who did not use a proxy response (called self-respondents) with no missing or imputed CES-D items were included in the sample. Counts and frequencies are unweighted. In Table 7, the sample consists of only age-eligible respondents who answered all of the CES-D items in the experimental module (the frequency response) *and* the main HRS interview (the Yes/No response) in both Waves 1 and 2. This leaves 594 respondents out of the 808 originally administered Module 1.

[10]The Duke/Piedmont site of the EPESE administered the full, twenty-item CES-D scale, but used the Yes/No response format (Blazer et al., 1991). The Duke site is not discussed in Kohout et al. (1993).

[Table 7 about here]

The first column of Table 7 contains the tabulations of Yes and No responses to the 8 CES-D items given in the main section of the HRS interview, for the sample of 594 Module Respondents. The second column reports tabulations of the frequency response CES-D items (the Module questions) which have been converted to Yes/No responses by coding "most of the time" and "all of the time" as "Yes" and "some of the time" and "none of the time" as "No" **C** as was done in the EPESE study.

Comparing these two columns highlights the problem with this conversion strategy. For example, take the "Felt Depressed" symptom. When given a choice between "Yes" and "No", 14.8 percent of the Module respondents said, "Yes, I felt depressed." However, when the four choices of the frequency response format are collapsed into two categories (Yes and No), only 4.7 percent are coded as "Yes." This pattern is repeated for all of the symptoms, with the converted frequency response yielding much lower estimates of the prevalence of each symptom then the actual Yes/No response. This problem was not apparent in the EPESE because they did not have a group of the *same* individuals answering both forms of the CES-D during the same interview. With the inclusion of the experimental module in HRS Wave 2, this problem was discovered. Table A1 in the Appendix contains additional tabulations.

Further exploration with the Module respondents uncovered the reason why the proposed conversion strategy did not work. Table 8 cross-classifies the Module respondents on the two formats **C** the frequency response (from the Module questions) and the Yes/No response (from the main HRS interview). Each of the 8 symptoms is listed in bold type. In the rows beneath each symptom title are the four frequency-response options (all of the time, most of the time, some of the time, and rarely/none of the time). For each frequency response level group (as reported in the Module questions), the columns show the percentage of that group that responded "yes" or "no" to the corresponding question from the main HRS interview.

[Table 8 about here]

For example, 90.9 percent of the respondents who answered "I felt depressed almost all of the time" in the Module also answered "yes" when asked if they felt depressed in the main HRS interview. However, 9.1 percent (one respondent) that answered "I felt depressed all of the time" in the Module said "no" they did not feel depressed in the main HRS interview. This is an obvious contradiction, since one would expect feeling depressed all of the time to translate to "yes, I felt depressed." Contradictions like these, which do not correspond to our conversion plan (most and all of the time **ÿ** yes; some and none of the time **ÿ** no), are outlined in the table.

Examining these contradictions reveals the major source of discrepancy from collapsing the four-level response categories into yes/no responses. It is the respondents that report "some of the time" on the frequency response. For example, on the "I felt depressed" question, 45.1 percent (55 respondents) responding "some of the time" to the frequency response choice

answered "yes", while 54.9 percent (67 respondents) answered "no"[11]. This pattern is repeated for the rest of the questions with 40 to 69 percent of the "some of the time" respondents endorsing "yes" in the main questionnaire. There is no clear strategy to resolve this issue; designating "some of the time" respondents as "yes" will overstate the endorsement of the item, while designating them as "no" understates the prevalence.

There are many possible statistical methods to get around this problem. One could randomly assign the "some of the time" respondents to Yes and No based on the proportions derived from the Module respondents. Or, one might want to fully impute Yes and No answers from the Module for all combinations of frequency response and Yes/No response, rather than just the "some of the time" group. Depending on the purpose of the analysis, the researcher may want to include covariates in the imputations. Additionally, one circumvents this problem by modeling depression as an underlying latent variable with each CES-D question being a separate indicator of the latent variable.

Since there is no easily agreed upon method to handle these problems with the wording change, the HRS staff recommend starting any longitudinal analysis of depression with Wave 2 for the HRS. Table 9 presents a comparison of Wave 2 and Wave 3 CES-D scores for the HRS respondents, and the same statistics for AHEAD respondents between Wave 1 and Wave 2. Each survey (HRS and AHEAD) compares the same sample of individuals in both waves; those with no missing values for any CES-D item in either wave (also age-eligible and not proxy, as in all of the tables).

[Table 9 about here]

The left-hand side of Table 9 shows the prevalence of the individual CES-D items. The first two columns are for the HRS cohort (Wave 2 and Wave 3), while the second two columns are for the AHEAD cohort (Wave 1 and Wave 2). For each cohort as a whole, the distribution of CES-D scores and endorsement of individual items does not change much between waves. For example, in Wave 2 of the HRS, 15.9 percent of respondents said "yes, I felt depressed" while 14.0 percent did in Wave 3. Similarly, in AHEAD Wave 1, 18.7 percent of respondents endorsed the depressed mood symptom while 18.0 percent did in Wave 2.

The right-hand side of Table 9 shows the summary scores for each cohort. The summary score creation is described in Section II of this working paper. In Wave 2, 52.1 percent of HRS respondents had zero symptoms while 51.6 percent had zero in Wave 3. In AHEAD, there was slightly more movement in the lowest end of the scale, with 40.8 percent having zero symptoms in Wave 1 and 44.2 percent scoring zero in Wave 2. However, for scores above two, the distribution is very similar in Wave 1 and Wave 2.

This aggregate analysis, however, masks significant individual change, as shown in Table 10. As the left-hand side of Table 10 shows, more than half of the HRS respondents experienced a change in their total CES-D score between Wave 2 and Wave 3. Nearly the same fraction increased their score as decreased their score, accounting for the aggregate stability. Most of

[11]Table A2 in the Appendix contains the sample counts corresponding to Table 8.

those whose score did change between waves only changed by a small amount **C** one or two points (85.7 percent had a change of two points or less). Very few respondents went from highly symptomatic to asymptomatic and vice versa. The right-hand side of Table 10 shows a similar pattern for the AHEAD respondents. A somewhat higher fraction experienced a change in score, roughly 60 percent, with more having a decrease in their score (32.4 percent) than an increase (28.0 percent). As seen with the HRS cohort, the size of the change was small — 85.6 percent with a change of 2 points or less. Tables A3 and A4 in the Appendix show more detail on these between wave changes.

[Table 10 about here]

VI. Evaluation of the Measures and Data Quality

This section of the working paper examines the HRS and AHEAD data on affective functioning in great detail. These tabulations and analyses are to allow the user to evaluate the quality of the HRS and AHEAD measures and to use as background to their own research.

The first subsection (Section A) contains the univariate distributions of the CES-D-based measure and the CIDI-SF for major depressive episodes within each wave of HRS and AHEAD, through 1997.

The next subsection, entitled "Benchmarking Against Other Surveys" (Section B), describes the use of the National Longitudinal Survey of Mature Women (NLS-MW) dataset to calibrate the shortened form of the CES-D scale used in HRS Wave 1 with the full CES-D. The full 20-item CES-D scale with the four-level frequency response (rarely/none, some, most, all/almost all of the time) was administered to the NLS-MW cohort in 1989. This section also compares the estimated prevalence of depression in the HRS and AHEAD with previously-published figures.

The section on "Internal Consistency and Measurement Properties" (Section C) evaluates the scales' reliability and validity using basic psychometric techniques. Coefficient alpha scores are presented, as well as the results of exploratory factor analysis; both of which replicate the previously reported reliability and factor structure of the CES-D.

Constructed variables are discussed in the following subsection, Section D. At the time of this writing, only the first wave of the AHEAD study (AHEAD Wave 1) has been released with the inclusion of constructed variables for affective functioning. The method of constructing these variables is documented and the reader is referred to SAS coding in the technical appendix for all other waves of HRS/AHEAD.

Section E describes the amount of missing data, or item-nonresponse, associated with the depression measures, the CES-D and the CIDI-SF. Section F concludes this investigation with a look at the construct validity of the CES-D-based measure. That is, it describes bivariate and multivariate relationships between the CES-D summary score and many relevant items.

A. Univariate Distributions

This section presents the univariate distributions of the depression measures in the HRS and AHEAD for the use of the reader. The univariate distributions show all of the characteristics of the distribution of CES-D scores from sources outside of the HRS. For each wave, the distribution of scores is highly skewed towards the low end of the scale with significant fractions of the sample receiving a total score of zero. To date, there is no outside data to contrast the CIDI-SF against so the distribution is presented for the user's information.

The CES-D Measure

Tables 11 and 12 show the univariate distributions of the CES-D. Table 11 shows the distribution of the 11-item CES-D summary score in Wave 1 of the HRS, while Table 12 shows the distributions of the eight-item CES-D for Waves 2 and 3 of the HRS and Waves 1 and 2 of AHEAD.

[Table 11 about here]

The summary score shown in Table 11 was created following the traditional method of construction **C** adding up the eleven items with each frequency level receiving a different score from 0 to 3. The sample included all age-eligible respondents in Wave 1 of the HRS, and excluded those who were proxy respondents (see Section IV for rationale) and those with an imputed value for any of the CES-D items, leaving a sample size of 9,137. The mean CES-D score is a low 4.97 and the median is 4. As is the case with other samples that use the CES-D, the distribution is highly skewed towards the low end, with 23.1 percent of respondents scoring zero or one.

The right-hand side of Table 11 contains several cutoffs for indicating clinically-relevant symptoms of depression, or Acaseness@. Three different Aback of the envelope@ strategies were employed to translate the 16 or higher cutoff point of the full CES-D (which ranges from zero to 60) to a cutoff point on the shortened CES-D scale included in Wave 1 of the HRS. A fourth method is described in Subsection B. First, a proportional strategy was employed. We set up the following equation: 16/60=x/33. The solution for "x" is 8.8 which is rounded this up to 9. A cutoff of 9 and above yields a prevalence of 18.2 percent.

The second strategy uses the fact that 16 can be interpreted as reporting slightly more than 5 symptoms out of 20 with the frequency of "all or almost all of the time." Five symptoms out of 20 is equivalent to 2.75 symptoms out of 11. When valued at the "all or almost all of the time" frequency, 2.75 symptoms yields a total CES-D score of 8.25, which rounds to 8. This cutoff results in a prevalence of 22.6 percent.

The third strategy for finding a cutoff point, uses the interpretation of a "16 plus" score as 8 symptoms at "most of the time". Using the same approach described for the second method

gives a cutoff on the HRS scale of 8.8 which rounds to 9, a prevalence of 18.2 percent. The fourth method listed on Table 11 is described in detail in the subsection on Benchmarking below.

[Table 12 about here]

Table 12 shows the distribution of the eight-item CES-D with yes/no responses for Waves 2 and 3 of HRS and Waves 1 and 2 of AHEAD. In both waves of the HRS, more than half of the respondents had zero symptoms of depression, while in AHEAD, 38.4 percent scored zero in Wave 1 and 44 percent had zero in Wave 2.

In HRS Wave 2, 14.3 percent of the HRS sample scored 4 or higher, while 12.8 percent scored 4 or higher in Wave 3. In the AHEAD cohort, 17.3 scored 4 or higher in Wave 1 and 15.1 percent scored 4 or higher in Wave 2. Tables A5 and A6 in the Appendix provide additional tabulations. Table A5 shows the distributions for the Module respondents, and Table A6 shows the individual CES-D items for Wave 1 of the HRS. See Table 9 in Section V for the individual items for HRS Waves 2 and 3 and AHEAD Waves 1 and 2.

The CIDI-SF for Major Depressive Episodes

Tables 13 and 14 present the results of the CIDI-SF administration for the HRS (in Wave 3) and AHEAD (in Wave 2) cohorts. Throughout the CIDI-SF, the AHEAD cohort appears to exhibit fewer indications of depression than the HRS cohort. As shown in the top panel of Table 13, while 16.2 percent of the HRS cohort said "yes" to the first screen question regarding depression (i.e., has there been a two week period when you felt depressed, blue, etc.), only 10.9 percent of the AHEAD cohort did. The persistence questions (i.e., were the depressed feelings most or all of the day during the two-week period; and, did they occur every day or almost every day during the spell) screened out more than half of those initially endorsing the depression screen question for both HRS and AHEAD. A smaller fraction of both samples endorsed the anhedonia stem question (losing interest in things), 6.7 percent in both cohorts. Over three-quarters of these respondents did not meet the persistence requirements. As a result, 9.4 percent of the HRS cohort and 5.6 percent of the AHEAD cohort "screened in" to the CIDI-SF and were asked the symptom questions.

[Table 13 about here]

The bottom panel of Table 13, labeled Individual Symptoms, shows the prevalence of each symptom asked in the CIDI-SF for major depression. Note that respondents who did not pass the initial screening questions were not asked the symptom questions and were automatically assigned a "no" response. Feeling tired and/or having low energy was the most frequent symptom for the HRS cohort (7.9 percent), followed by trouble concentrating (7.5 percent). For the AHEAD cohort, feeling tired and/or having low energy was the most frequent

symptom (4.6 percent) followed by change in appetite (3.7 percent), thoughts of death (3.7 percent), and trouble concentrating (3.6 percent).

The top panel of Table 14, labeled Total Score on CIDI-SF for MDE Scale, shows the range of the total number of symptoms for the full HRS and AHEAD samples. The majority of the sample for both cohorts had zero symptoms on the CIDI-SF scale. For those with at least one symptom, scores of 5 or 6 were the most common in the HRS cohort, and scores of 4, 5, or 6 were most common in the AHEAD cohort. The next panel, CIDI-SF Diagnosis of Depression (MDE), shows the fraction of the samples scoring above the recommended three or more cutoff and the more stringent five or more cutoff **C** 8.2 percent of the HRS cohort and 5.2 percent of the AHEAD cohort are depressed by the three-or-more cutoff; while only 5.6 percent of HRS and 3.7 percent of AHEAD pass the five-or-more cutoff.

[Table 14 about here]

The final panel of Table 14 shows the percentage endorsing each individual symptom, out of the group that was asked the symptom questions (those meeting the persistence criteria of either the first or second screen questions). These frequencies show the types of symptoms experienced by the subgroups of HRS and AHEAD that passed the initial screen and potentially have a major depressive episode. Again, we see that feeling tired and/or having low energy and having trouble concentrating were the most frequently endorsed symptoms among the HRS subgroup. Feeling tired and/or having low energy was also the most frequent symptom among the AHEAD subgroup, followed by thoughts of death and change in appetite.

B. Benchmarking Against Other Surveys and Prevalence Estimates

One method of evaluating the quality of the depression measures is to compare them against results found in other surveys using the same or similar measures. Because of the shortened versions of the CES-D scale used in the HRS/AHEAD, it is impossible to compare directly to data collected with an identical measure. Using the microdata from the National Longitudinal Survey of Mature Women (NLS-MW), we were able to approximate the full CES-D score for Wave 1 of the HRS. Going one step further and using data from the individuals in HRS that answered the questions from Module 1 in HRS Wave 2, we were able to approximate the traditional cutoff point of 16 or higher for the eight-item Yes/No response scale. This section describes the process of estimating these cutoff points and compares the resulting prevalence rates to other published figures.

Finding an Equivalent to A16+@ for the HRS Wave 1 Measure: A More Rigorous Approach

The NLS-MW survey administered the full twenty-item CES-D to its respondents in 1989. In 1989, the NLS-MW respondents were age 52 to 66, which corresponds well to the HRS Wave 1 age range of 51 to 61. We created a sample of women from the NLS-MW who were age

52 to 61 and a sample of women from HRS Wave 1 who were age 52 to 61. Because the CES-D measure in Wave 1 of HRS uses the same response categories as the original CES-D, it was possible to create identical CES-D measures for the NLS-MW and HRS Women by selecting from the NLS-MW the items common to both studies.

Figure 2 shows a graph of the distributions of the identical 11-item CES-D measure for both the NLS-MW (the solid line) and the HRS Women (the dashed line). Both distributions are weighted. All possible CES-D scores are listed along the X-axis (from 0 to 33) and the fraction of the weighted sample that scored zero is plotted on the Y-axis, then the fraction that scored one, etc. These points are then joined with a line. The figure shows that the HRS Women and NLS-MW distributions track each other rather well, with some deviation around the lowest end of the scale. The NLS-MW sample has a much larger fraction scoring zero than the HRS Women. Consequently, the sample of HRS Women has a larger fraction scoring one through 10, with the distributions coming together at the score of 11.

[Figure 2 about here]

Figure 3 shows the distribution of the 11-item CES-D in the NLS-MW by whether the respondent scored above or below the traditional 16+ cutoff on the full CES-D. The dashed line shows the scores on the 11-item CES-D (the measure used in Wave 1 of the HRS) for the group scoring less than 16 on the full CES-D. The solid line shows the distribution of scores on the 11-item CES-D for those scoring 16 or higher. No one scoring less than 16 on the full CES-D scored higher than 13 on the 11-item measure. No one scoring above the 16 or higher cutoff had a score lower than 6 on the 11-item CES-D. However, scores on the 11-item CES-D between 6 and 13 represent a mix of those meeting the traditional cutoff for depression and those who do not.

[Figure 3 about here]

Table 15 below shows the sensitivity and specificity of cutoffs on the 11-item CES-D measure where the "truth standard" is scoring above or below 16 on the full CES-D scale.

Table 15
NLS Mature Women, Ages 52-61, 1989

Proposed Cut-off for the 11-Item CES-D	Specificity (identify true non-cases)	Sensitivity (identify true cases)
A Score of:		
6 and above	85.6	99.7
7 and above	94.4	96.8
8 and above	95.4	94.6
9 and above	97.4	90.2
10 and above	98.6	84.1
11 and above	99.3	74.5
12 and above	99.4	64.1
13 and above	99.9	55.6

The ideal cutoff for the 11-item CES-D to mimic the full CES-D depends on the relative weight placed on sensitivity versus specificity. A cutoff of 9 and above does pretty well on both. This table is provided for the use of readers who are interested in choosing their own cutoff point.

Following the somewhat different strategy adopted by several of the EPESE studies (Established Populations for the Epidemiologic Study of the Elderly, see Blazer et al. (1991) and O'Hara, Kohout, and Wallace (1985)), we used the NLS-MW sample to estimate a regression model predicting the full CES-D score from the 11-item CES-D measure used in Wave 1 of the HRS. Our NLS-MW sample contained 1,890 observations and the regression was weighted by the 1989 NLS-MW sampling weight, using White's heteroskedasticity-consistent (robust) estimator of the standard errors. The results were:

(Eq. 1) [Full, standard CES-D] = 1.6212 *[modified, 11-item CES-D] + 0.7415
(Standard errors) (0.0162) (0.0696)

The correlation between the modified 11-item CES-D and the full CES-D was 0.93. Using these estimated parameters, we predicted a full 20-item CES-D score for everyone in Wave 1 of the HRS (male and female, age-eligible, non-proxy) with no missing CES-D items. We then applied the A16+@ cutoff to the predicted full, standard CES-D score.

One can also use the regression equation above to convert the "16 or higher" cutoff point into a cutoff point for the 11-item scale. Setting the "Full, standard CES-D" score to 16 in Equation 1 and solving for the modified, 11-item CES-D yields 9.41, which rounds to a cutoff point of 9 or higher. As we saw in Table 11, 14.5 percent of the HRS cohort (unweighted) scored 9 or higher in Wave 1. According the NLS-MW sensitivity and specificity analysis (see Table 15), a cutoff point of 9 or higher has a sensitivity of 90.2 percent and specificity of 97.4 percent when compared to the full, twenty-item CES-D with a cutoff of 16 or higher.

Table 16 compares the prevalence of clinically-relevant depression, defined as a score of 16 or higher on the full CES-D, in the HRS Wave 1 data (using the predicted score from Eq. 1) with other studies covering a similar age range. Note that the age ranges for the NHANES and EPESE do not correspond exactly to the HRS cohort age range. However, these estimates were the most relevant that were found in the literature. As one can see, the shortened scale included in the HRS does a pretty good job of estimating prevalence as reported in previous studies. The HRS data yielded 12.5 percent of blacks and whites with scores above the cutoff, while the NHANES I and EPESE-New Haven reported 14.8 and 16.4 percent, respectively.

Table 16
Comparison of HRS Wave 1 CES-D With Other Surveys

Measure	HRS Wave 1 1992 Age 51-61		NLS-MW 1989 Age 52-61	NHANES I 1974-75 Age 65-74	EPESE 1982 Age 65+ New Haven
	Blacks & Whites	All Races	Blacks & Whites	Blacks & Whites	All Races
Total Percent Above Cutoff	12.5%	13.3%	---	14.8%	16.4%
Men	10.5%	11.1%	---	---	11.3%
Women	14.3%	15.1%	15.9%	---	19.2%

Source: Author's calculations for HRS Wave 1 and NLS-MW; NHANES I from Eaton and Kessler (1981); New Haven EPESE from Berkman et al. (1986).

Determining a A16+@ Equivalent for the 8-Item CES-D Scale

Taking the estimation strategy one step further allows us to estimate an equivalent to the A16+@ cutoff for the 8-item scale. Using data from the module respondents (N=594), we estimated the following equation, weighted by the Wave 1 HRS sampling weights, using White's heteroskedasticity-consistent (robust) estimator of the standard errors:

(Eq. 2) [Module 11-item CES-D] = 1.9784 * [Main HRS 8-item CES-D]+ 1.5633
(Standard errors) (0.0851) (0.1140)

Setting AModule 11-item CES-D@ equal to 9.41 and solving for the AMain HRS 8-item CES-D@ yields 3.96, which rounds to a cutoff point of 4 or more symptoms.

Table 17 below shows the percentage of each sample scoring 4 or above for each of the HRS and AHEAD waves using the 8-item CES-D measure. The prevalence of 14.3 percent in HRS Wave 2 is slightly higher than the 13.3 percent estimated with the 11-item CES-D in Wave 1. In HRS Wave 3, the prevalence rate is slightly lower, at 12.8 percent. The AHEAD surveys, the cohort age 70 and above in 1993, show higher prevalence rates which also decrease over time, with the Wave 1 rate being 17.3 percent which drops to 15.1 in Wave 2.

Table 17 Prevalence Estimates for HRS Waves 2 & 3 and AHEAD Waves 1 & 2				
	HRS Wave 2	HRS Wave 3	AHEAD Wave 1	AHEAD Wave 2
Sample Size	8,377	7,861	6,566	5,396
Percent scoring 4 or higher:	14.3%	12.8%	17.3%	15.1%
Notes: Uses 8-item CES-D with Yes/No response format. Age-eligible, self-respondents with no missing responses to any CES-D item.				

The CIDI-SF for Major Depressive Episodes

As of this writing, the CIDI-SF for Major Depressive Episodes (MDE) has not been used in any surveys of older Americans. There is no appropriate data to benchmark the CIDI-SF against. Reiger et al. (1998) present 12-month prevalence rates for MDE for a sample of ages 18 to 54 from three samples: the first wave of the Epidemiologic Catchment Area (ECA), which used the DIS, had a prevalence of 4.2 percent; the two-wave ECA had a prevalence of 6.4 percent; and the National Comorbidity Survey, which used the full CIDI, had a prevalence of 10.1 percent. The prevalence of MD in the HRS cohort was 8.2 percent and in the AHEAD cohort was 5.2 percent.

C. Internal Consistency and Measurement Properties

This section explores the reliability and factor structure of the shortened CES-D included in the HRS and AHEAD. Being a well-established scale, the full, twenty-item CES-D scale has been shown to have high internal consistency and to exhibit a four-factor structure when analyzed using exploratory factor analysis techniques (Radloff, 1977). Below, we analyze the reliability and factor structure of the 11-item and 8-item version used in the HRS/AHEAD.

[Table 18 about here]

Table 18 shows a psychometric analysis of the eleven-item CES-D scale in Wave 1 of the HRS. This includes the standard statistic on scale reliability, Cronbach's alpha, in the top panel of Table 17. In HRS Wave 1, the alpha coefficient was 0.843 using the standardized version of the CES-D items and 0.838 using the raw items. These values are quite high and indicate that the eleven-item CES-D is reliable in the Wave 1 HRS data.

Focusing on the bottom of Table 18 (the last two lines) shows that a principal components analysis yielded three components (estimated linear approximations of the factors; hereafter, they will be referred to as factors) with eigenvalues greater than one, which are identifiable as depressed mood, somatic complaints, and interpersonal relationship problems. The depressed mood factor explained 40.2 percent of the variance, the somatic factor explained an additional 10.4 percent, and the interpersonal factor explained an additional 9.5 percent.

The center of Table 18 shows two types of rotation. Rotating the factors identified by the principal components analysis results in a more interpretable factor loading matrix. Varimax rotation (which was used by Radloff (1977)) maintains the orthogonality of the factors after the rotation (that is, the factors remain uncorrelated), while promax oblique rotation allows the rotated factors to be correlated with each other. In both cases, five symptoms loaded most strongly on the depressed mood factor **C** depressed, happy, lonely, enjoyed life, and felt sad. "Everything was an effort", "restless sleep", "could not get going", and "poor appetite" loaded most strongly on the somatic complaints factor. "People were unfriendly" and "people dislike me" loaded on the interpersonal relationships factor, while "feeling lonely" cross-loaded on both the depressed mood and the interpersonal factor.

Table 19 presents the psychometric evaluation of the eight-item CES-D scale used in Waves 2 and 3 of HRS, and all of AHEAD. The top panel shows the Cronbach alphas, measuring reliability, which are lower for the two waves of AHEAD (0.77 to 0.79) than the HRS (0.81 to 0.83); however, they still show good reliability for the shortened scale with the Yes/No format.

[Table 19 about here]

The principal components analysis with subsequent rotation showed a similar factor structure for all four waves considered. The "eigenvalue greater than one" criterion led to the identification of two factors **C** depressed mood and somatic complaints[12]. This is reasonable since the items loading most strongly on the interpersonal factor for the 11-item scale are not included in the 8-item scale. The same five symptoms loaded on the depressed mood factor as did in the 11-item scale: felt depressed, was happy, felt lonely, enjoyed life, and felt sad. The remaining three symptoms loaded on the somatic complaints factor: everything was an effort, restless sleep, and could not get going. Overall, the abbreviated CES-D scales used in the HRS and AHEAD show good internal consistency.

[12]In Wave 2 of the HRS, the somatic factor had an eigenvalue of 0.99, technically not meeting the traditional criterion of being larger than one. Since the value of one as a cutoff for a salient fact is somewhat arbitrary, the second factor was retained in the factor analysis of the HRS Wave 2 data.

D. Constructed Variables

This subsection explains the constructed variables included in Wave 1 of AHEAD. Code for the summary variables used throughout this paper is included in the Technical Appendix. Currently constructed variables exist for the depression measures on the Wave 1 data file of AHEAD only. The main constructed variable included with the AHEAD Wave 1 data is CESD8. This is a sum of the eight CES-D items, with yes counting as "one" and no counting as "zero" except for the two positively worded items. For "I felt happy" and "I enjoyed life", an answer of yes counted as "zero" and an answer of "no" counted as "one."

This variable was created for everyone with at least one non-missing CES-D item. This is a difference from all of the results presented in this working paper which exclude observations with any missing CES-D items. For the CESD8 variable, if a respondent refused to answer one of the CES-D items, the variable CESD8 contains the sum of the other seven items, and so on, for those missing up to five items (see Appendix Table A7 for details). The researcher should be careful to understand this variable before using it in analysis.

There are two additional constructed variables regarding affective functioning on AHEAD Wave 1. They are AFF9 and AFF10. The variable AFF9 adds the response to "much of the time last week I felt interested in things" to the CESD8 score, with an answer of "No" receiving one point and "Yes" receiving zero. The AFF10 adds the response to "much of the time last week I had a lot of energy" to the AFF9 score, with an answer of "No" receiving one point and "Yes" receiving zero. As was done with CESD8, these variables contain values for all respondents with at least one non-missing item.

Constructed variables for inclusion on the other data files (HRS Waves 1, 2, and 3; AHEAD Wave 2) have not yet been released. The Technical Appendix to this working paper contains the SAS programs used to construct the summary measures presented in this document for both the CES-D scale and the CIDI-SF scale for use by researchers[13].

E. Item Non-Response / Missing Data

This subsection documents the amount of item non-response missing data in the affective functioning measures in the HRS and AHEAD. Missing data refers to respondent answers of "don't know" and "refused." Table 20 shows counts of missing data for the shortened CES-D scale in the first three waves of the HRS and the first two waves of AHEAD. As noted in Section IV, CES-D items on the HRS Wave 1 data file will not contain missing data; this is because all items with missing data in Wave 1 of HRS were replaced by imputed responses. Therefore, for Wave 1 of the HRS, missing data also refers to responses that have been imputed. These responses are identified by the imputation flags that are also contained in the HRS Wave 1 file.

[Table 20 about here]

[13]SAS is a statistical software package produced by the SAS Institute in Cary, North Carolina.

As Table 20 shows, there were 161 age-eligible, self-respondents who were missing at least one CES-D item in HRS Wave 1. The majority of this group missed only one item (139 respondents, which is 85.8 percent of the total with missing items). Ten respondents refused or could not answer the entire set of eleven CES-D questions in HRS Wave 1.

The amount of missing data was much lower in the remaining waves of the HRS and in the AHEAD. This reduction in missing data is most likely due to the simpler response categories (the yes or no choice) implemented in these waves. In HRS Wave 2, there were only 44 respondents with any missing data, with only seven missing more than one item. Three of these seven respondents refused to answer all eight of the CES-D items. In Wave 3 of the HRS, there were even fewer respondents with missing data; 19 had at least one missing item, five of whom were missing more than one item, and two of those five were missing the entire set of CES-D questions.

The initial wave of AHEAD, similar to the initial wave of the HRS, had more missing data than the second wave **C** 90 respondents had at least one missing item with 15 respondents missing more than one item, two of whom were missing the entire CES-D scale. In Wave 2 of AHEAD the number of missing responses went down, with only 47 respondents missing any CES-D items and only four missing more than one item. One person in AHEAD Wave 2 refused to answer every item in the CES-D scale.

The bottom of Table 20 shows the individual CES-D items and their non-response frequencies. Four items stand out as the most frequently missing: the two positively-worded items **C** I was happy and I enjoyed life; and two of the somatic complaints items **C** everything was an effort and could not get going. This pattern was evident in all waves of both surveys.

Table 21 shows the item non-response for the CIDI-SF for Major Depressive Episodes, which was administered in HRS Wave 3 and AHEAD Wave 2. Overall, there was very little missing data for the CIDI-SF. In the HRS only 5 respondents had missing data for both screener questions, which is equivalent to having missing data for the whole CIDI-SF instrument. Only one respondent in AHEAD was missing both screener questions.

[Table 21 about here]

Since only those who answer "yes" to one of the screener questions are asked the subsequent questions, respondents that answered "no" to both screens are appropriately coded as missing for the remaining questions. Of those asked the subsequent questions in the HRS, thirteen were missing the portion of the day duration question and two were missing the frequency during the spell question. For each of the individual symptom questions, the number of missing responses ranged from zero to three. Similar response patterns are evident in AHEAD.

These tabulations lead us to conclude that item non-response is not a large problem with the affective functioning measures in HRS and AHEAD. The researcher should use whatever

method they choose to deal with item non-response — excluding those respondents from the sample or imputing a response using the questions that were answered or other variables from the file.

F. Construct Validity

This subsection of the paper evaluates the construct validity of the shortened CES-D scale used in HRS/AHEAD. Construct validity refers to how well a scale reflects the underlying concept it is trying to measure. It asks the question: Is the relationship between the scale score and other characteristics of the respondent what theory would predict for the relationship between depression and the other characteristics?

Multivariate and bivariate relationships between the abbreviated CES-D scale used in Wave 1 of the HRS and many other respondent characteristics are presented to allow the reader to evaluate construct validity. In our opinion, these results provide strong evidence that the HRS depression measure does tap the underlying level of psychological distress and depression.

Table 22 shows bivariate relationships between the HRS Wave 1 CES-D measure and various demographic, health, and attitudinal characteristics of the respondents. Using the coefficients from the NLS-MW, a full CES-D scale score (ranging from 0 to 60) was predicted for all HRS Wave 1 respondents who were age-eligible, not a proxy interview, and did not have missing values for any HRS CES-D items. Sample sizes for each characteristic are shown in the column labeled AN@, while the remaining three columns show the percentage of Wave 1 respondents with the given characteristic who scored under 10, 10 to 15, or 16 and over using the predicted full CES-D score[14]. Summing across these three columns yields 100 percent.

[Table 22 about here]

As mentioned in the subsection on prevalence estimates, the fraction of HRS Wave 1 respondents scoring 16 or higher on the imputed full CES-D scale is 13.3 percent. As the literature on depression predicts, there is a higher fraction of women scoring 16 and above than men; 15.1 percent of female respondents versus 11.1 percent of male respondents. The bivariate relationship between race and depression is also as expected from prior literature; more non-whites score above 15 than whites. While 11.4 percent of whites score 16 or higher, 21.6 percent of blacks and 24.2 percent of Hispanics do.

The relationship between depression and marital status is similar to that seen in other studies (see Steffick (1998) for example). Currently married people have the lowest prevalence of depression symptoms with only 9.5 percent scoring 16 and above. Separated individuals show the highest prevalence of depression with 30.2 percent scoring 16 or higher. The next highest

[14]For more details regarding this imputation procedure, refer to subsection B of this section, Benchmarking Against Other Surveys and Prevalence Estimates.

prevalence of depression is seen in widowed respondents (27 percent), followed by divorced respondents (20.9 percent), never-married individuals (19.8 percent), and those living with a partner (16.8 percent).

We see the expected relationship between physical health and depression, using the HRS Wave 1 abbreviated CES-D scale. Very few respondents reporting excellent physical health experienced high levels of depression, only 3.7 percent scored 16 or higher. Also, the majority of respondents reporting poor physical health experienced high levels of depression with 53.7 percent scoring 16 or more.

Self-rated emotional health also shows a strong negative relationship with depressive symptoms, as expected. Over 90 percent of those claiming excellent emotional health scored below 10 on the full (imputed) CES-D scale. Seventy-three percent of those reporting poor emotional health scored above 15 on the CES-D. Likewise, self-reported diagnosis of emotional or psychological illness correlates positively with depressive symptoms, 42.6 of those saying they had ever been diagnosed scored 16 or above.

The final set of variables presented in Table 22 are the respondents rating of their overall satisfaction with various aspects of their life: house or apartment, neighborhood, physical health, financial situation, friendships, marriage (if married), job (if employed), family life, the way he or she handles problems in life, life as a whole, and rating of time spent with their spouse (if married). In each case, those reporting that they are satisfied or very satisfied with a specific aspect of their life show the lowest prevalence of scores of 16 and higher. Those saying they are unsatisfied or very unsatisfied with various aspects of their life score much higher, with a substantial fraction scoring 16 or higher. Table A8 in the Appendix shows additional bivariate relationships between the CES-D and respondent characteristics such as economic situation, job characteristics, and social support.

To further support the construct validity of the HRS Wave 1 CES-D, we examined the multivariate relationships between the shortened CES-D measure and several known predictors of depression. Table 23 shows the results of ordinary least squares regression analysis with the eleven-item, frequency response CES-D from Wave 1 of the HRS as the dependent variable. This multivariate regression model confirms various relationships found in the literature (Blazer et al., 1991; Hays et al., 1998; Roberts et al., 1997; for example). Being female and also being non-white increase the level of depressive symptoms; depressive symptoms increase as physical and cognitive functioning decrease. Respondents rating their satisfaction with various aspects of their lives as poor or fair is strongly predictive of depressive symptoms, as one would expect. Being unemployed or disabled is also associated with higher depressive symptoms. The results of both of these explorations indicate that the abbreviated CES-D shows good construct validity.

[Table 23 about here]

VII. Conclusion

This working paper has described the affective functioning measures used in the HRS and AHEAD surveys. Detailed analysis has shown that the quality of these measures in HRS/AHEAD is very good. There are no structural changes planned for the affective functioning measures in future waves of the surveys at this date. This means that the information in this working paper is applicable to HRS-1998 and HRS-2000, as well as future waves. Any proposed changes to the measures will be publicized on the HRS web site, and updated versions of this working paper will be provided.

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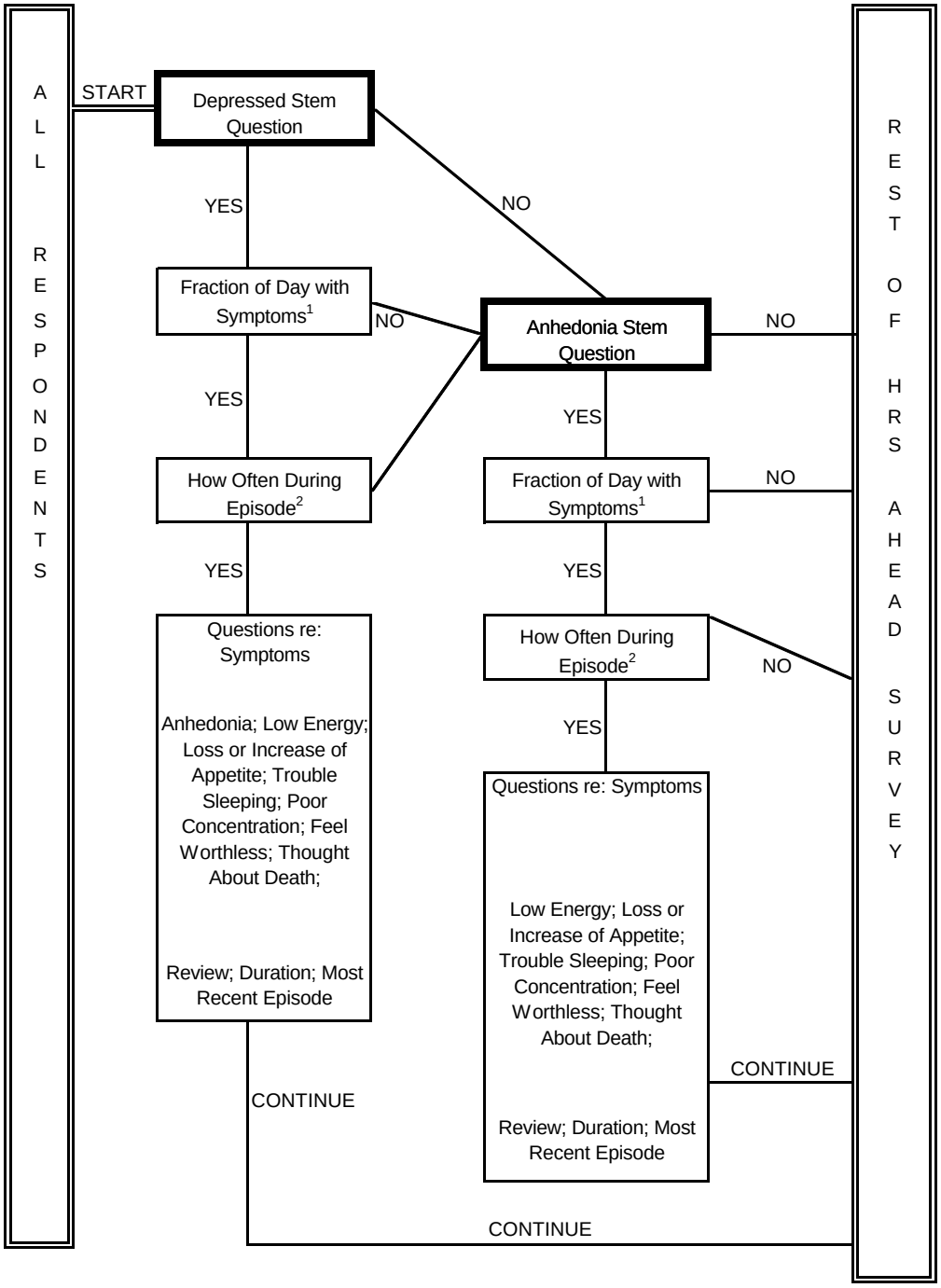
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Figure 1 **[Back to text]**

The CIDI-SF for Major Depressive Episodes In The HRS And AHEAD



NOTES:

[1] For "Fraction of Day with Symptoms", a "YES" answer is "all day long" or "most of the day". "NO" is "less often".

[2] For "How Often During Episode", a "YES" answer is "every day" or "almost every day". "NO" is "less often".

Figure 2 **[Back to text]**

Comparison of HRS Wave 1 Women and NLS Mature Women Using Common CES-D Score From HRS Wave 1: Both Weighted, Ages 52-61 Only

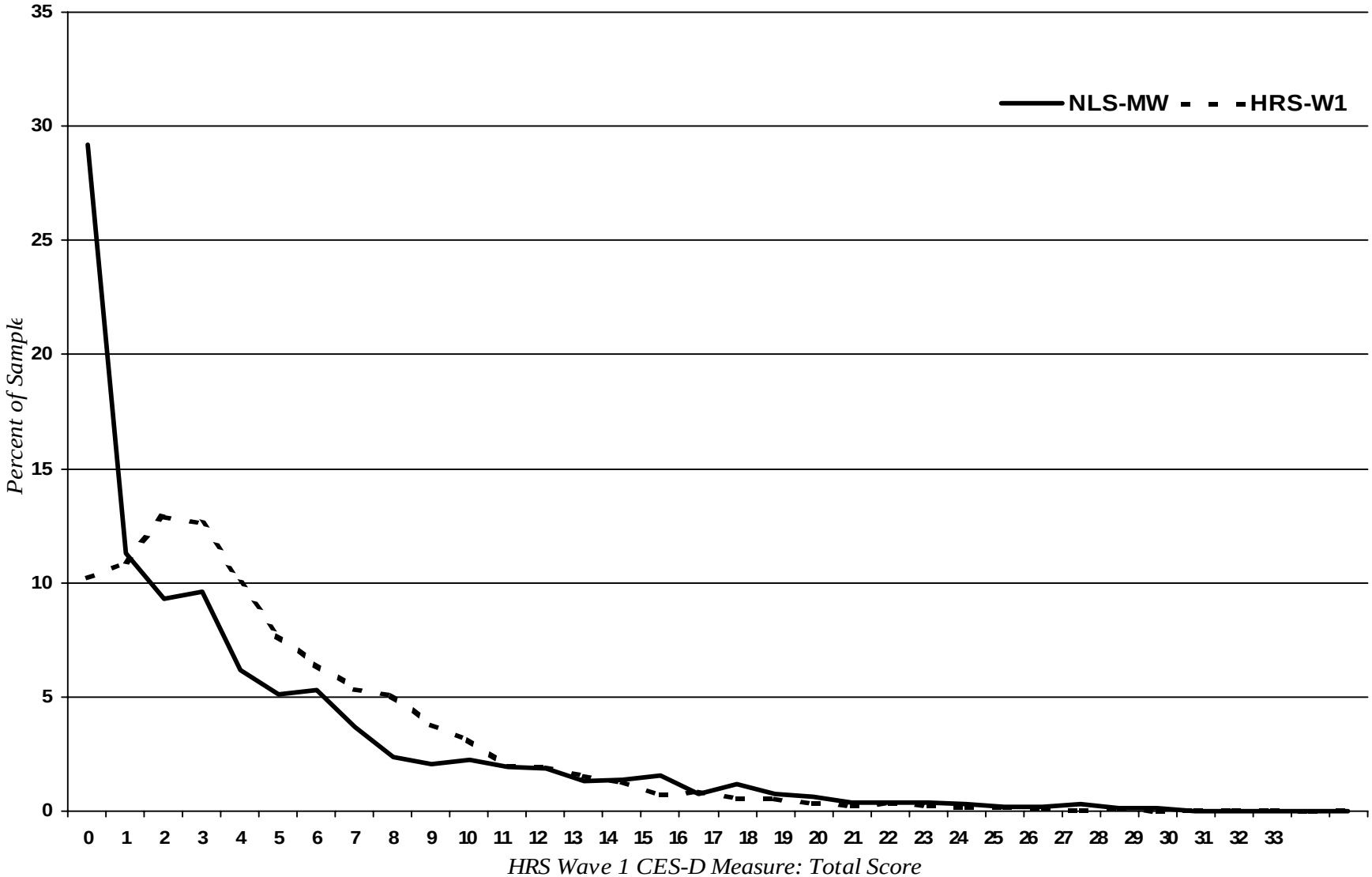


Figure 3 **[Back to text]**

NLS Mature Women Distribution of HRS Wave 1 CES-D Measure By Whether Full Score Is Above or Below 16+ Cutoff: Weighted, Age 52-61 Only

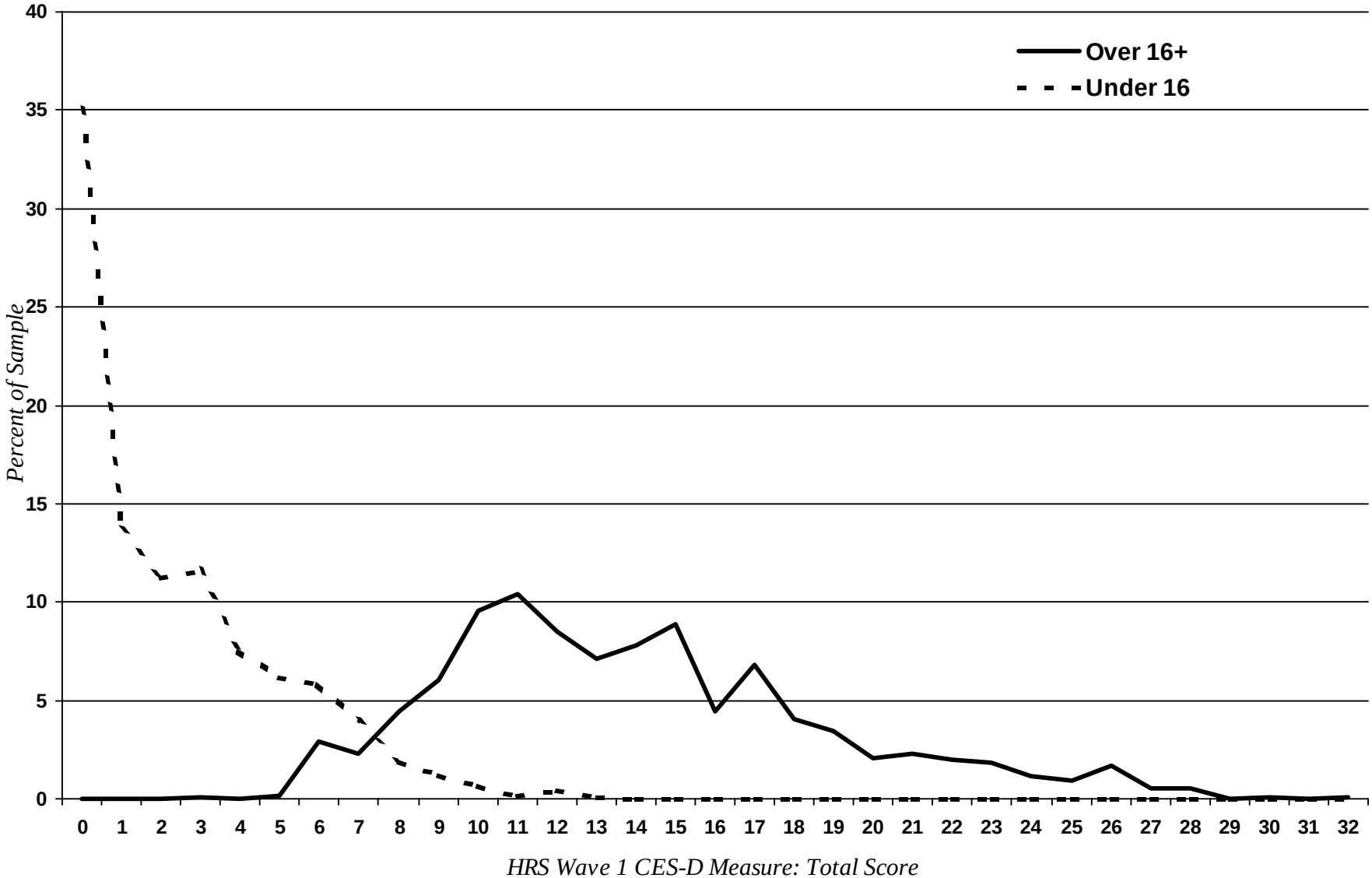


Table 2 **[Back to text]**

Affective Functioning Questions Asked in HRS & AHEAD: The CES-D

Question	HRS1 (1992)	HRS2 (1994)		HRS3 (1996)	AHEAD1 (1993)	AHEAD2 (1995)
		Section B	Module 1			
Items from original CES-D scale (Radloff, 1977):						
	(freq)	(yes/no)	(freq)	(yes/no)	(yes/no)	(yes/no)
Depressed	B44a	B46a	B44a	B24	B24	B24
Everything was effort	B44b	B46b	B44b	B24a	B24a	B24a
Sleep was restless	B44c	B46c	B44c	B24b	B24b	B24b
Happy	B44d	B46h	B44d	B24c	B24c	B24c
Lonely	B44e	B46e	B44e	B24d	B24d	B24d
Enjoyed life	B44g	B46f	B44g	B24e	B24f	B24e
Felt sad	B44h	B46g	B44h	B24g	B24g	B24g
Couldn=t get going	B44k	B46d	B44k	B24h	B24h	B24h
Felt people unfriendly	B44f	--	B44f	--	--	--
Felt people disliked me	B44j	--	B44j	--	--	--
Poor appetite	B44m	--	B44m	--	--	--

Notes:

(freq) = four-level frequency response (rarely/none of the time, some of the time, most of the time, all/almost all of the time)
(yes/no) = Yes/No response format (Much of the time during the past week, you felt ....<symptom>...? Yes or No)

Table 3 **[Back to text]**

Affective Functioning Questions Asked in HRS & AHEAD: The Composite International Diagnostic Interview - Short Form (CIDI-SF) for Major Depressive Episodes

Question	HRS1 (1992)	HRS2 (1994)	HRS3 (1996)	AHEAD1 (1993)	AHEAD2 (1995)
Items from CIDI-SF for Major Depression:					
2-week depression (screen question)		B46r	B26		B26
- what fraction of day			B27		B27
- how many days			B27a		B27a
- lose interest in things			B28		B28
- tired out			B29		B29
- lose appetite			B30		B30
- increase appetite			B30a		B30a
- trouble falling asleep			B31		B31
- how often			B31a		B31a
- trouble concentrating			B32		B32
- down on self/worthless			B33		B33
- think about death			B34		B34
- # weeks in past year			B36		B36
- most recent month			B37		B37
2-week period of loss of interest (screen)		B46r	B38		B38
- what fraction of day			B39		B39
- how many days			B39a		B39a
- tired out			B40		B40
- lose appetite			B41		B41
- increase appetite			B42		B42
- trouble falling asleep			B43		B43
- how often			B43a		B43a
- trouble concentrating			B44		B44
- feel down on self/worthless			B45		B45
- think about death			B46		B46
- # weeks in past year			B48		B48
- month of most recent period			B49		B49

Notes:

Respondents are only asked the symptom questions upon passing a screen consisting of the first 3 questions. If respondents endorse the depression 2-wk period screen, they are not asked the 2-wk loss of interest questions.

New cohorts entering the survey in 1998 or later are asked the CIDI-SF in their baseline interview.

Table 4 **[Back to text]**

Affective Functioning Questions Asked in HRS & AHEAD: Self-Reported Measures

Question	HRS1 (1992)	HRS2 (1994)	HRS3 (1996)	AHEAD1 (1993)	AHEAD2 (1995)
Self-Rated Emotional Health	B3	B3	---	---	---
Has a Doctor Ever Told You That You Had Emotional, Nervous, or Psychiatric Problems?	B23	B23	B10	B9	B10
During the Last 12 Months Have You Had Any Emotional, Nervous, or Psychiatric Problems?	B24	---	---	B9a	---
Have These Problems Gotten Better or Worse Since the Previous Wave?	---	---	B10a	---	B10a
Do You Now Get Psychiatric/Psychological Treatment For Your Problems?	B24a	B23a	B10b	---	B10b
Do You Now Use Tranquilizers, Anti-depressants, or Pills For Your Nerves?	B24b	B23b	B10c	---	B10c

TABLE 7 **[Back to text]**

HRS WAVE 2: COMPARING CES-D ITEMS ACROSS RESPONSE FORMATS

	Module Respondents	
	Main HRS in Wave 2 (1994)	**Module 1 in Wave 2 (1994)**
	Responded as Yes/No	**Converted to Yes/No ***
Number of Respondents	594	594
Felt Depressed		
Yes	14.8%	4.7%
No	85.2%	95.3%
Everything Was an Effort		
Yes	19.2%	10.6%
No	80.8%	89.4%
Sleep Was Restless		
Yes	30.8%	11.8%
No	69.2%	88.2%
I Was Happy		
Yes	90.6%	82.5%
No	9.4%	17.5%
Felt Lonely		
Yes	9.9%	2.7%
No	90.1%	97.3%
I Enjoyed Life		
Yes	94.6%	89.6%
No	5.4%	10.4%
Felt Sad		
Yes	14.0%	3.9%
No	86.0%	96.1%
Could Not Get Going		
Yes	17.5%	4.9%
No	82.5%	95.1%

***** Converted to Yes/No: For this column, respondents reported one of four frequencies for each CES-D item. These responses were converted to Yes/No by setting "all" and "most" of the time equal to "Yes" and "some" and "none" of the time equal to "No".

Notes: All tabulations are unweighted. The sample includes only self-respondents (not proxy) who are age-eligible for the HRS. The 594 Module respondents exclude those missing any CES-D items in Wave 1 (1992), Wave 2 (1994), or Module 1 of Wave 2 (1994).

TABLE 8 **[Back to text}**

COMPARISON OF FREQUENCY RESPONSE AND YES/NO RESPONSE : MODULE RESPONDENTS BOTH FORMATS ASKED DURING SAME INTERVIEW (1994)

FREQUENCY RESPONSE: MODULE 1 IN WAVE 2	YES/NO RESPONSE: MAIN HRS IN WAVE 2 — Percent of Row Answering Yes or No	
	Yes	**No**
Felt Depressed		
All of the time	90.9%	9.1%
Most of the time	88.2%	11.8%
Some of the time	45.1%	54.9%
None of the time	1.8%	98.2%
Everything Was an Effort		
All of the time	85.7%	14.3%
Most of the time	78.6%	21.4%
Some of the time	44.7%	55.3%
None of the time	2.6%	97.4%
Sleep Was Restless		
All of the time	96.8%	3.2%
Most of the time	94.9%	5.1%
Some of the time	65.4%	34.6%
None of the time	4.3%	95.7%
I Was Happy		
All of the time	98.9%	1.1%
Most of the time	94.5%	5.5%
Some of the time	68.6%	31.4%
None of the time	22.2%	77.8%

FREQUENCY RESPONSE: MODULE 1 IN WAVE 2	YES/NO RESPONSE: MAIN HRS IN WAVE 2 — Percent of Row Answering Yes or No	
	Yes	**No**
Felt Lonely		
All of the time	87.5%	12.5%
Most of the time	87.5%	12.5%
Some of the time	45.9%	54.1%
None of the time	1.2%	98.8%
I Enjoyed Life		
All of the time	98.3%	1.7%
Most of the time	97.8%	2.2%
Some of the time	68.0%	32.0%
None of the time	50.0%	50.0%
Felt Sad		
All of the time	66.7%	33.3%
Most of the time	94.1%	5.9%
Some of the time	39.8%	60.2%
None of the time	2.3%	97.7%
Could Not Get Going		
All of the time	93.3%	6.7%
Most of the time	92.9%	7.1%
Some of the time	42.2%	57.8%
None of the time	2.9%	97.1%

The outlined cells indicate inconsistent responses between the Main HRS scale and Module 1 when considering "all" and "most" of the time equal to "yes" and "some" and "none" of the time equal to "no".

Notes: All tabulations are unweighted. The sample includes the 594 self-respondents (not proxy) who are age-eligible for the HRS and are not missing any CES-D items from Wave 1 (1992), Wave 2 (1994), or Module 1 of Wave 2 (1994).

TABLE 9 [Back to text]

HRS AND AHEAD: BETWEEN-WAVE CHANGES USING THE CES-D MEASURE

Individual Items	Main HRS		Main AHEAD	
	Wave 2 (1994)	Wave 3 (1996)	Wave 1 (1993)	Wave 2 (1995)
Number of Respondents	7,414	7,414	5,204	5,204
Felt Depressed				
Yes	15.9%	14.0%	18.7%	18.0%
No	84.1%	86.0%	81.3%	82.0%
Everything Was an Effort				
Yes	21.4%	20.7%	24.6%	24.1%
No	78.6%	79.3%	75.4%	75.9%
Sleep Was Restless				
Yes	29.2%	26.6%	32.2%	28.6%
No	70.8%	73.4%	67.8%	71.4%
I Was Happy				
Yes	88.9%	88.6%	89.1%	90.0%
No	11.1%	11.4%	10.9%	10.0%
Felt Lonely				
Yes	12.8%	14.1%	18.8%	19.9%
No	87.2%	85.9%	81.2%	80.1%
I Enjoyed Life				
Yes	92.6%	93.3%	93.8%	93.3%
No	7.4%	6.7%	6.2%	6.7%
Felt Sad				
Yes	15.5%	15.6%	18.2%	16.7%
No	84.5%	84.4%	81.8%	83.3%
Could Not Get Going				
Yes	18.3%	17.3%	23.4%	22.7%
No	81.7%	82.7%	76.6%	77.3%

Summary Score	Main HRS			
	Wave 2 (1994)		Wave 3 (1996)	
Number of Respondents	7,414	100.0%	7,414	100.0%
CES-D Summary Score				
0	3,861	52.1%	3,829	51.6%
1	1,514	20.4%	1,495	20.2%
2	607	8.2%	712	9.6%
3	405	5.5%	452	6.1%
4	280	3.8%	287	3.9%
5	227	3.1%	209	2.8%
6	212	2.9%	195	2.6%
7	175	2.4%	146	2.0%
8	133	1.8%	89	1.2%

Summary Score	Main AHEAD			
	Wave 1 (1993)		Wave 2 (1995)	
Number of Respondents	5,204	100.0%	5,204	100.0%
CES-D Summary Score				
0	2,125	40.8%	2,301	44.2%
1	1,181	22.7%	1,145	22.0%
2	698	13.4%	569	10.9%
3	422	8.1%	412	7.9%
4	289	5.6%	274	5.3%
5	181	3.5%	198	3.8%
6	151	2.9%	161	3.1%
7	103	2.0%	90	1.7%
8	54	1.0%	54	1.0%

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS or AHEAD). The HRS sample excludes those respondents missing any CES-D items for Wave 2 (1994) or Wave 3 (1996). The AHEAD sample excludes those resondents missing any CES-D items for Wave 1 (1993) or Wave 2 (1995).

TABLE 10 **[Back to text]**

HRS AND AHEAD CES-D SUMMARY SCORES: TWO-YEAR CHANGE DIRECTION AND MAGNITUDE

HRS COHORT CHANGE BETWEEN WAVE 2 (1994) AND WAVE 3 (1996):			AHEAD COHORT CHANGE BETWEEN WAVE 1 (1993) AND WAVE 2 (1995):		
Direction:	# Obs.	Percent	**Direction:**	# Obs.	Percent
No change in scores	3,425	46.2%	No change in scores	2,060	39.6%
Depression decreased	2,010	27.1%	Depression decreased	1,687	32.4%
Depression increased	1,979	26.7%	Depression increased	1,457	28.0%
Magnitude:			**Magnitude:**		
No change in scores	3,425	46.2%	No change in scores	2,060	39.6%
One CES-D point	2,085	28.1%	One CES-D point	1,671	32.1%
Two CES-D points	848	11.4%	Two CES-D points	722	13.9%
Three CES-D points	462	6.2%	Three CES-D points	355	6.8%
Four CES-D points	248	3.3%	Four CES-D points	197	3.8%
Five CES-D points	160	2.2%	Five CES-D points	104	2.0%
Six CES-D points	111	1.5%	Six CES-D points	59	1.1%
Seven CES-D points	62	0.8%	Seven CES-D points	28	0.5%
Eight CES-D points	13	0.2%	Eight CES-D points	8	0.2%

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS). The HRS sample excludes those respondents missing any CES-D items for Wave 2 (1994) or Wave 3 (1996).

TABLE 11 **[Back to text]**

SUMMARY CES-D SCORES IN THE HRS: FREQUENCY RESPONSE
HRS WAVE 1 (1992) RESPONDENTS

FREQUENCY RESPONSE: 11 items, 4-choice - this table shows the distribution of the CES-D summary score for all respondents in Wave 1 (1992).

WAVE 1 (1992): All age-eligible respondents
Asked in the main HRS survey in Wave 1
Range: potential 0-33
actual 0-33
N: 9,136
Mean: 4.97
Median: 4

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*9,136*	*100*	--	--
0	1,095	12.0	1095	12.0
1	1,020	11.2	2115	23.1
2	1,204	13.2	3319	36.3
3	1,124	12.3	4443	48.6
4	904	9.9	5347	58.5
5	699	7.7	6046	66.2
6	554	6.1	6600	72.2
7	471	5.2	7071	77.4
8	401	4.4	7472	81.8
9	336	3.7	7808	85.5
10	278	3.0	8086	88.5
11	186	2.0	8272	90.5
12	166	1.8	8438	92.3
13	144	1.6	8582	93.9
14	118	1.3	8700	95.2
15	80	0.9	8780	96.1
16	71	0.8	8851	96.9
17	47	0.5	8898	97.4
18	56	0.6	8954	98.0
19	34	0.4	8988	98.4
20	32	0.4	9020	98.7
21	27	0.3	9047	99.0
22	16	0.2	9063	99.2
23	15	0.2	9078	99.4
24	10	0.1	9088	99.5
25	10	0.1	9098	99.6
26	8	0.1	9106	99.7
27	10	0.1	9116	99.8
28	3	0.0	9119	99.8
29	4	0.0	9123	99.8
30	5	0.1	9128	99.9
31	1	0.0	9129	99.9
32	2	0.0	9131	99.9
33	5	0.1	9136	100.0

CES-D Indication of Depression based on the 16+ cut-off of the full 20-item scale:

Score of 8 or higher: 22.6%
Score of 9 or higher: 18.2%

Calculating the Above Cut-off Points:

Original Scale Cut-Off: 16+ out of 60 possible points.

(1) 16 out of 60 is equal to 8.8 out of 33
(16/60=x/33 --> x=8.8)
This implies 9+ as a cutoff for Wave 1

(2) 16 out of 60 is equal to 5 symptoms at "all of the time" frequency on the original scale, out of 20 symptoms.

5 out of 20 is equal to 2.75 out of 11
2.75 symptoms weighted by 3 is 8.25
This implies 8+ as a cutoff for Wave 1

(3) 16 out of 60 is equal to 8 symptoms at "most of the time" frequency on the original scale, out of 20 symptoms.

8 out of 20 is equal to 4.4 out of 11
4.4 symptoms weighted by 2 is 8.8.
This implies 9+ as a cutoff for Wave 1

(4) Using the regression approach described in Section VI, 16 out of 60 corresponds to 9.4 out of 33. This implies 9+ as a cutoff for Wave 1

Notes: All tabulations are unweighted. Sample includes only self-respondents (not proxy) who are age-eligible for HRS and have no missing responses to any CES-D item from Wave1 (1992).

TABLE 12 **[Back to text]**

SUMMARY CES-D SCORES IN THE HRS AND AHEAD: YES/NO RESPONSE

YES/NO RESPONSE: CES-D 8 : 8 items, Yes/No - this table shows the distribution of the CES-D summary score as measured in Waves 2 and 3 of HRS and Waves 1 and 2 of AHEAD. The upper two tables show the distribution for all respondents in Wave 2 (1994) and Wave 3 (1996) for HRS, and the lower two tables are for Wave 1 (1993) and Wave 2 (1995) of AHEAD.

HRS WAVE 2 (1994):

Asked in the main HRS survey in Wave 2
Range: potential 0-8
actual 0-8
N: 8,260
Mean: 1.34
Median: 0

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*8,260*	*100*	--	--
0	4,248	51.4	4,248	51.4
1	1,686	20.4	5,934	71.8
2	685	8.3	6,619	80.1
3	456	5.5	7,075	85.7
4	324	3.9	7,399	89.6
5	262	3.2	7,661	92.7
6	249	3.0	7,910	95.8
7	202	2.4	8,112	98.2
8	148	1.8	8,260	100.0

HRS WAVE 3 (1996):

Asked in the main HRS survey in Wave 3
Range: potential 0-8
actual 0-8
N: 7,861
Mean: 1.28
Median: 0

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*7,861*	*100*	--	--
0	4,020	51.1	4,020	51.1
1	1,590	20.2	5,610	71.4
2	759	9.7	6,369	81.0
3	484	6.2	6,853	87.2
4	319	4.1	7,172	91.2
5	230	2.9	7,402	94.2
6	214	2.7	7,616	96.9
7	153	1.9	7,769	98.8
8	92	1.2	7,861	100.0

AHEAD WAVE 1 (1993)

Asked in the main AHEAD survey in Wave 1
Range: potential 0-8
actual 0-8
N: 6,566
Mean: 1.67
Median: 1

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*6,566*	*100*	--	--
0	2,520	38.4	2,520	38.4
1	1,471	22.4	3,991	60.8
2	880	13.4	4,871	74.2
3	562	8.6	5,433	82.7
4	393	6.0	5,826	88.7
5	259	3.9	6,085	92.7
6	242	3.7	6,327	96.4
7	162	2.5	6,489	98.8
8	77	1.2	6,566	100.0

AHEAD WAVE 2 (1995)

Asked in the main AHEAD survey in Wave 2
Range: potential 0-8
actual 0-8
N: 5,396
Mean: 1.48
Median: 1

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*5,396*	*100*	--	--
0	2,375	44.0	2,375	44.0
1	1,185	22.0	3,560	66.0
2	595	11.0	4,155	77.0
3	428	7.9	4,583	84.9
4	290	5.4	4,873	90.3
5	200	3.7	5,073	94.0
6	169	3.1	5,242	97.1
7	99	1.8	5,341	99.0
8	55	1.0	5,396	100.0

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS or AHEAD). The top left-hand table excludes those missing any CES-D items from Wave 2 (1994) of HRS; the top right-hand table excludes those missing any CES-D items from Wave 3 (1996) of HRS. The bottom left table excludes those missing any CES-D items from Wave 1 (1993) of AHEAD; the bottom right-hand table excludes those missing any CES-D items from Wave 2 (1995) of AHEAD.

TABLE 13 **[Back to text]**

CIDI-SF SCALE FOR MAJOR DEPRESSIVE EPISODES: HRS WAVE3 (1996) AND AHEAD WAVE 2 (1995) -- I

Number of respondents missing both stem questions: HRS (1996): 5 AHEAD (1995): 1

Respondents are asked further questions based on the answers to 2 screen questions:
During the past 12 months, was there a two-week time period where you:
Screen Question 1: Felt depressed? Screen Question 2: Lost interest in things?

FULL SAMPLE	HRS WAVE 3 (1996)			AHEAD WAVE 2 (1995)		
	Total	Count Yes	Percent Yes	Total	Count Yes	Percent Yes
Total Number of Respondents	7,875			5,442		
Screen Question 1: Depressed						
Initial Endorsement of:	7,875	1,277	16.2%	5,442	591	10.9%
Also Meeting Persistence Conditions:	7,875	594	7.5%	5,442	231	4.2%
Screen Question 2: Anhedonia						
Initial Endorsement of:	7,875	531	6.7%	5,442	367	6.7%
Also Meeting Persistence Conditions:	7,875	144	1.8%	5,442	72	1.3%
Meets Persistence Conditions for Either SQ1:Depressed or SQ2:Anhedonia:	7,875	738	9.4%	5,442	303	5.6%
Individual Symptoms						
Anhedonia (Loss of Interest)	7,875	413	5.2%	5,442	164	3.0%
Tired/Low Energy	7,875	622	7.9%	5,442	251	4.6%
Change in Appetite	7,875	525	6.7%	5,442	200	3.7%
Trouble Sleeping	7,875	482	6.1%	5,442	156	2.9%
Trouble Concentrating	7,875	593	7.5%	5,442	197	3.6%
Feeling Down on Self	7,875	395	5.0%	5,442	138	2.5%
Thoughts of Death	7,875	465	5.9%	5,442	202	3.7%

Notes: All tabulations are unweighted. Sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS or AHEAD) and are not missing both CIDI screen questions.

TABLE 14 [Back to text]

CIDI-SF SCALE FOR MAJOR DEPRESSIVE EPISODES: HRS WAVE3 (1996) AND AHEAD WAVE 2 (1995) -- II

FULL SAMPLE	HRS WAVE 3 (1996)			AHEAD WAVE 2 (1995)		
	Total	Count Yes	Percent Yes	Total	Count Yes	Percent Yes
Total Score on CIDI-SF for MDE Scale						
Total		7,875	100.0%		5,442	100.0%
0		7,144	90.7%		5,145	94.5%
1		36	0.5%		16	0.3%
2		46	0.6%		31	0.6%
3		78	1.0%		46	0.8%
4		129	1.6%		56	1.0%
5		159	2.0%		53	1.0%
6		159	2.0%		62	1.1%
7		124	1.6%		33	0.6%
1 or more		731	9.3%		297	5.5%
CIDI-SF Diagnosis of Depression (MDE)						
Three or more symptoms	7,875	649	8.2%	5,442	281	5.2%
Five or more symptoms	7,875	442	5.6%	5,442	204	3.7%
Frequency of Individual Symptoms of Those Saying Yes to Screen Question 1 or 2:						
Anhedonia (Loss of Interest)	738	413	56.0%	303	164	54.1%
Tired/Low Energy	738	622	84.3%	303	251	82.8%
Change in Appetite	738	525	71.1%	303	200	66.0%
Trouble Sleeping	738	482	65.3%	303	156	51.5%
Trouble Concentrating	738	593	80.4%	303	197	65.0%
Feeling Down on Self	738	395	53.5%	303	138	45.5%
Thoughts of Death	738	465	63.0%	303	202	66.7%

Notes: All tabulations are unweighted. Sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS or AHEAD) and are not missing both CIDI screen questions.

TABLE 18 **[Back to text]**

RELIABILITY AND FACTOR ANALYSIS FOR THE 11 CES-D ITEMS IN WAVE 1 OF THE HRS

	HRS: Wave 1		
Number of obs w/ no missing	9,136		
RELIABILITY[1]			
Cronbach's alpha - raw variables	0.838		
Cronbach's alpha - standardized	0.843		
FACTOR ANALYSIS[1]	Factor 1 Depressed Mood	Factor 2 Somatic	Factor 3 Interpersonal Relationships
Varimax (Orthogonal) Rotation[2]			
Felt depressed	0.58	0.48	0.24
Everything was an effort	0.17	0.70	0.17
Sleep was restless	0.21	0.68	0.01
I was happy (reverse scored)	0.81	0.19	0.07
Felt lonely	0.48	0.31	0.41
People were unfriendly	0.13	0.15	0.83
Enjoyed life (reverse scored)	0.83	0.08	0.06
Felt sad	0.59	0.35	0.32
People dislike me	0.13	0.13	0.83
Could not get going	0.22	0.69	0.13
Poor appetite	0.08	0.66	0.19
Promax (Oblique) Rotation[3]			
Felt depressed	0.42	0.29	0.08
Everything was an effort	-0.01	0.60	0.02
Sleep was restless	0.05	0.60	-0.13
I was happy (reverse scored)	0.73	-0.01	-0.07
Felt lonely	0.34	0.12	0.29
People were unfriendly	-0.02	-0.02	0.77
Enjoyed life (reverse scored)	0.78	-0.12	-0.07
Felt sad	0.45	0.14	0.18
People dislike me	-0.01	-0.04	0.77
Could not get going	0.04	0.59	-0.02
Poor appetite	-0.10	0.59	0.06
Correlation Between Factors 1 & 2		0.505	
Correlation Between Factors 1 & 3		0.371	
Correlation Between Factors 2 & 3		0.400	
Eigenvalue	4.42	1.14	1.04
Percent of variance explained	40.2%	10.4%	9.5%

NOTES:

[1] Uses principal components analysis that is weighted by the sampling weight.

[2] Rotated factor pattern shown. Rotated factors are uncorrelated.

[3] The reference structure (semipartial correlations) is shown for the rotated factors.

TABLE 19 **[Back to text]**

PSYCHOMETRIC PROPERTIES OF THE CES-D IN THE HRS AND AHEAD: RESULTS FROM FACTOR ANALYSIS AND INTERNAL CONSISTENCY INVESTIGATIONS

	HRS: Wave 2		HRS: Wave 3		AHEAD: Wave 1		AHEAD: Wave 2	
Number of obs w/ no missing	8,260		7,861		6,566		5,396	
RELIABILITY[1]								
Cronbach's alpha - raw variables	0.834		0.805		0.771		0.776	
Cronbach's alpha - standardized	0.830		0.812		0.781		0.787	
FACTOR ANALYSIS[1]	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
	Depressed Mood	Somatic	Depressed Mood	Somatic	Depressed Mood	Somatic	Depressed Mood	Somatic
Varimax (Orthogonal) Rotation[2]								
Felt depressed	0.68	0.45	0.61	0.48	0.59	0.45	0.60	0.45
Everything was an effort	0.29	0.70	0.20	0.73	0.23	0.72	0.20	0.72
Sleep was restless	0.12	0.72	0.14	0.69	0.09	0.62	0.04	0.67
I was happy (reverse scored)	0.80	0.15	0.79	0.13	0.78	0.06	0.80	0.03
Felt lonely	0.63	0.33	0.61	0.31	0.55	0.34	0.57	0.33
Enjoyed life (reverse scored)	0.78	0.07	0.77	0.04	0.74	0.03	0.75	0.04
Felt sad	0.71	0.35	0.67	0.34	0.68	0.33	0.67	0.35
Could not get going	0.20	0.77	0.18	0.72	0.13	0.74	0.21	0.70
Promax (Oblique) Rotation[3]								
Felt depressed	0.54	0.26	0.47	0.32	0.47	0.31	0.49	0.30
Everything was an effort	0.10	0.60	0.01	0.66	0.06	0.65	0.04	0.66
Sleep was restless	-0.07	0.66	-0.03	0.64	-0.05	0.59	-0.10	0.64
I was happy (reverse scored)	0.73	-0.07	0.73	-0.06	0.75	-0.12	0.77	-0.14
Felt lonely	0.52	0.16	0.52	0.16	0.46	0.21	0.48	0.20
Enjoyed life (reverse scored)	0.74	-0.14	0.73	-0.15	0.72	-0.14	0.72	-0.12
Felt sad	0.60	0.15	0.57	0.17	0.59	0.17	0.57	0.20
Could not get going	0.00	0.69	0.00	0.66	-0.04	0.70	0.05	0.64
Correlation between factors	0.505		0.475		0.434		0.426	
Eigenvalue	3.85	0.99	3.49	1.01	3.20	1.03	3.26	1.06
Percent of variance explained	48.1%	12.4%	43.6%	12.6%	40.0%	12.9%	40.7%	13.3%

NOTES:

[1] Principal components analysis is weighted. Weights from HRS 2 are also used for HRS 3; weights from AHEAD 1 are used for AHEAD 2.

[2] Rotated factor pattern shown. Rotated factors are uncorrelated.

[3] The reference structure (semipartial correlations) is shown for the rotated factors.

TABLE 20 [Back to text]

HRS AND AHEAD ITEM NON-RESPONSE: CES-D BASED MEASURE

CES-D SCALE	Main HRS in WAVE 1 (1992)	Main HRS in WAVE 2 (1994)	Main HRS in WAVE 3 (1996)	Main AHEAD in WAVE 1 (1993)	Main AHEAD in WAVE 2 (1995)
Number of Observations with at least one CES-D item missing	161	44	19	90	47
Observations missing:					
1 item	139	37	14	75	43
2 items	5	4	2	9	2
3 items	5	0	0	2	1
4 items	1	0	1	1	0
5 items	0	0	0	1	0
6 items	1	0	0	0	0
7 items	0	0	0	0	0
8 items	0	3	2	2	1
9 items	0	--	--	--	--
10 items	1	--	--	--	--
11 items	9	--	--	--	--
Individual Items:					
Felt depressed	19	6	4	9	4
Everything was an effort	37	8	8	24	6
Sleep was restless	22	6	2	8	1
I was happy (reverse scored)	18	18	7	20	16
Felt lonely	17	4	3	6	6
Enjoyed life (reverse scored)	31	12	6	26	14
Felt sad	18	6	2	12	5
Could not get going	41	9	6	19	6
People were unfriendly	27	--	--	--	--
Felt people dislike me	27	--	--	--	--
Poor appetite	26	--	--	--	--

Notes: All counts are unweighted. Missing items were counted from the sample of all self-respondents (not proxy) who were age-eligible for their survey (HRS or AHEAD). Missing items refers to responses of "don't know" or "refused." For HRS Wave 1, missing items means items whose responses were imputed.

TABLE 21 **[Back to text]**

HRS AND AHEAD ITEM NON-RESPONSE:
CIDI-SF FOR MAJOR DEPRESSIVE EPISODES

SHORT-FORM UM-CIDI	Main HRS in WAVE 3 (1996)	Main AHEAD in WAVE 2 (1995)
Missing both SQ1:Depressed and SQ2:Anhedonia (stem questions)	5	1

Of those respondents who said "Yes" to one of the Stem Questions:
(By design, those answering "No" to both Stem Questions have missing values for all below)

	Main HRS in WAVE 3 (1996)	Main AHEAD in WAVE 2 (1995)
Missing "portion of day" duration	13	12
Missing "frequency during 2-wk spell"	2	1
Missing "losing interest"	1	0
Missing "feeling tired"	0	1
Missing "appetite"	2	0
Missing "sleep trouble"	2	3
Missing "concentration trouble"	3	2
Missing "feeling down about self"	3	1
Missing "thoughts about death"	2	0

Notes: All counts are unweighted. Missing items were counted from the sample of all self-respondents (not proxy) who were age-eligible for their survey (HRS or AHEAD). Missing items refers to responses of "don't know" and "refused".

TABLE 22 [Back to text]

CES-D CONSTRUCT VALIDITY: BIVARIATE RELATIONSHIPS

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60) Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
DEMOGRAPHIC CHARACTERISTICS				
Age				
51-55	4,317	66.4	19.9	13.7
56-61	4,698	68.8	18.3	12.9
Sex				
Male	4,144	72.2	16.7	11.1
Female	4,992	63.9	20.9	15.1
Race				
White	6,564	70.4	18.2	11.4
Black	1,553	54.9	23.6	21.6
American Indian	78	*53.0*	*20.3*	*26.7*
Asian/Pacific Isd.	98	58.5	*32.0*	*9.5*
Hispanic	826	57.1	18.8	24.2
Other	*4*	*19.5*	*63.7*	*16.9*
Consider Self Hispanic				
Yes	826	57.1	18.8	24.2
No	8,296	68.5	19.0	12.5
Marital Status				
Married	6,611	72.5	17.9	9.5
Live with Partner	220	61.6	*21.6*	*16.8*
Separated	293	49.6	20.2	30.2
Divorced	1,037	56.9	22.2	20.9
Widowed	595	52.0	21.1	27.0
Never Married	337	57.2	23.0	19.8
HEALTH CHARACTERISTICS				
Self-Rated Physical Health				
Excellent	2,009	84.1	12.2	3.7
Very Good	2,572	76.1	17.2	6.7
Good	2,521	66.8	21.5	11.7
Fair	1,294	45.8	27.2	27.0
Poor	735	20.8	25.5	53.7
Self-Rated Emotional Health				
Excellent	1,785	91.6	6.5	*2.0*
Very Good	2,675	81.9	14.6	3.6
Good	2,994	62.8	26.1	11.1
Fair	1,277	29.0	31.6	39.5
Poor	394	*8.5*	18.6	73.0
Psychological Diagnosis: Lifetime				
Yes	1,015	35.0	22.4	42.6
No	8,104	71.9	18.6	9.6
Psychological Problems Past Year				
Yes	934	29.3	24.2	46.6
No	8,167	72.2	18.4	9.3
Received Psych Treatement Last Year				
(If "yes" to psychological problems)				
Yes	195	*23.0*	*20.5*	56.5
No	737	31.0	24.9	44.0

See Notes on last page.

TABLE 22 [Back to text]

CES-D CONSTRUCT VALIDITY: BIVARIATE RELATIONSHIPS

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60) Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Take Psychoactive Medication (If "yes" to psychological problems)				
Yes	382	22.2	20.3	57.6
No	549	34.2	26.5	39.3
RATING SATISFACTION				
How Satified Are You With:				
House or Apartment				
Very satisfied	5,209	75.2	15.8	9.0
Somewhat satisfied	2,395	61.6	23.1	15.3
Even	625	57.0	24.0	19.0
Somewhat unsatisfied	516	45.3	26.4	28.3
Very unsatisfied	218	33.0	*20.2*	46.9
Neighborhood				
Very satisfied	5,475	72.8	16.8	10.4
Somewhat satisfied	2,306	62.8	22.2	15.0
Even	532	60.2	21.4	*18.5*
Somewhat unsatisfied	580	51.2	25.7	23.1
Very unsatisfied	214	41.9	19.9	38.1
Own Health / Physical Condition				
Very satisfied	4,261	81.8	13.0	5.2
Somewhat satisfied	2,963	67.5	22.0	10.5
Even	572	52.3	29.5	18.2
Somewhat unsatisfied	776	34.3	31.2	34.5
Very unsatisfied	529	17.5	22.1	60.5
Financial Situation				
Very satisfied	2,419	83.3	12.1	4.6
Somewhat satisfied	3,543	72.3	19.1	8.6
Even	973	62.0	23.6	14.3
Somewhat unsatisfied	1,290	50.2	25.4	24.4
Very unsatisfied	877	33.0	24.5	42.6
Friendships				
Very satisfied	5,887	75.4	16.0	8.6
Somewhat satisfied	2,504	58.0	24.3	17.8
Even	416	43.5	25.0	31.5
Somewhat unsatisfied	204	36.4	26.7	37.0
Very unsatisfied	84	*15.4*	*23.3*	61.3
Marriage				
Very satisfied	5,583	76.4	16.5	7.2
Somewhat satisfied	839	56.6	24.7	18.7
Even	146	40.9	*22.8*	36.3
Somewhat unsatisfied	97	*36.3*	*33.6*	*30.1*
Very unsatisfied	70	*27.9*	*31.8*	*40.3*
Not Married	2,215	55.1	21.9	23.1

See Notes on last page.

TABLE 22 **[Back to text]**
CES-D CONSTRUCT VALIDITY: BIVARIATE RELATIONSHIPS

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60) Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Job				
Very satisfied	3,053	82.9	12.5	4.6
Somewhat satisfied	1,949	70.0	20.1	9.9
Even	436	59.6	27.5	*12.9*
Somewhat unsatisfied	340	49.3	34.0	*16.7*
Very unsatisfied	127	*33.8*	*28.4*	*37.8*
Not Working	3,207	56.2	21.1	22.7
Family Life				
Very satisfied	6,350	75.7	16.3	8.1
Somewhat satisfied	2,038	55.5	25.7	18.8
Even	338	39.8	25.5	34.7
Somewhat unsatisfied	259	31.8	24.6	43.7
Very unsatisfied	92	*21.7*	*13.6*	64.7
Way You Handle Problems in Life				
Very satisfied	4,120	81.5	12.9	5.6
Somewhat satisfied	3,823	63.2	22.4	14.4
Even	719	45.9	29.6	24.4
Somewhat unsatisfied	367	21.1	29.6	49.2
Very unsatisfied	75	*8.9*	*13.8*	77.3
Life As A Whole				
Very satisfied	5,344	82.0	13.3	4.7
Somewhat satisfied	2,848	56.7	26.4	16.9
Even	504	27.5	32.5	40.0
Somewhat unsatisfied	291	*14.1*	27.3	58.6
Very unsatisfied	119	*8.5*	*14.1*	77.4
Rating of Time Spent With Spouse				
Extremely enjoyable	1,891	82.0	13.4	4.5
Very enjoyable	3,710	74.0	17.6	8.4
Somewhat enjoyable	1,078	51.4	27.4	21.2
Not too enjoyable	138	*30.4*	*28.1*	41.5

Notes: Data are from Wave 1 of the HRS, 1992. Sample consists of age-eligible self-respondents (not proxy) with no missing items for the CES-D.

Using estimated coefficients from the NLS-Mature Women survey, the full 20-item CES-D score (range 0-60) was predicted from the 11 items reported in the HRS. The first column contains respondents with low symptoms of depression, while the middle column contains respondents with relatively higher reports of symptoms but still lower than the standard cutoff for clinical depression. The far-right column contains respondents scoring above the traditional cutoff of 16 or higher.

See Notes on last page.

TABLE 23 **[Back to text]**

OLS REGRESSION MODEL OF DEPRESSION USING HRS WAVE 1 CES-D SCORE (11 ITEMS, FREQUENCY RESPONSE)

	Standard Beta	Parameter Estimate	Standard Error	
AGE				
50-54		(Reference Group)		
55-59	-0.01481	-0.1373	0.0888	
60 and older	-0.01782	-0.2159	0.1185	*
GENDER				
Female	0.04884	0.4536	0.0946	***
Male		(Reference Group)		
RACE/ETHNICITY				
White		(Reference Group)		
Black	0.02379	0.2972	0.1254	**
Other Race	0.02126	0.7157	0.2932	**
Hispanic	0.01563	0.2680	0.1714	
RURAL RESIDENCE				
Does not live in a MSA	0.01138	0.1182	0.0935	
EDUCATION				
Less than 9 years of school	0.02942	0.4352	0.1530	***
9 to 12 years of school	-0.00725	-0.0956	0.1269	
High School grad / GED		(Reference Group)		
Some College, no degree	-0.02189	-0.2775	0.1198	**
College degree or higher	-0.01663	-0.1887	0.1156	
RELIGION - DENOMINATION				
Protestants (all)		(Reference Group)		
Catholic - Roman/Eastern Orth.	0.02524	0.2632	0.1010	**
Jewish	0.01478	0.5443	0.3227	*
Other religion (Islam, Buddist, Hindu)	0.01101	0.2890	0.2295	
No religion	0.01077	0.2335	0.2025	
RELIGION - ATTENDANCE				
At least once per week	0.00620	0.0588	0.1151	
Once per month or year	0.02031	0.1943	0.1103	*
Not at all		(Reference Group)		
NUMBER OF CHILDREN	-0.00581	-0.0128	0.0204	
MARITAL STATUS				
Never-married		(Reference Group)		
Married	-0.04786	-0.4976	0.2290	**
Living with partner	-0.00159	-0.0497	0.3475	
Divorced	0.00793	0.1041	0.2375	
Widowed	0.01841	0.3421	0.2658	
SELF-RATED HEALTH				
Rated physical health fair or poor	0.02124	0.2416	0.1335	*
Rated mental health fair or poor	0.26741	3.2736	0.1251	***
FUNCTIONING				
Number of physical functioning items (out of 14) reported as Very Difficult	0.03609	0.1382	0.0430	***
Number of cognitive functioning items (out of 4) reported as Very Difficult	0.03452	0.2929	0.0777	***
DISEASES/HEALTH CONDITIONS				
High Blood Pressure	0.03443	0.3243	0.0851	***
Diabetes	-0.02456	-0.3681	0.1349	***
Cancer	0.00146	0.0297	0.1766	
Chronic Lung Disease	0.01126	0.1916	0.1580	
Heart Problems	0.00358	0.0494	0.1265	

Continued on following page.

* = 0.10 level ** = 0.05 level *** = 0.01 level

OLS REGRESSION MODEL OF DEPRESSION USING HRS WAVE 1 CES-D SCORE (11 ITEMS, FREQUENCY RESPONSE)

	Standard Beta	Parameter Estimate	Standard Error	
DISEASES/HEALTH CONDITIONS - cont.				
Stroke	-0.00603	-0.1785	0.2592	
Psychological/nervous disorders	0.12682	1.8760	0.1378	***
Arthritis	0.02246	0.2121	0.0887	**
Asthma	0.03628	0.7024	0.1730	***
Bone fracture after age 45	0.00441	0.0583	0.1143	
Often troubled with pain	0.09232	0.9941	0.1108	***
SENSORY LIMITATIONS				
Rate vision with glasses fair or poor	0.03550	0.5029	0.1343	***
Rate hearing (w/aid) fair or poor	0.00331	0.0454	0.1246	
HEALTH BEHAVIORS				
SMOKING				
Non-smoker		(Reference Group)		
Smoker	0.00129	0.0134	0.0948	
ALCOHOL				
Do Not Drink	-0.00545	-0.0515	0.0894	
Have 1 or 2 drinks per day		(Reference Group)		
Have 3 or 4 drinks per day	0.01586	0.3921	0.2171	*
Have 5 or more drinks per day	0.01648	0.6961	0.3672	*
EXERCISE				
Any exercise or heavy housework	-0.03711	-0.4408	0.1046	***
SOCIAL SATISFACTION				
Report very unsatisfied with:				
House or apartment	0.03816	1.1776	0.2738	***
Own health	0.08193	1.6858	0.2141	***
Finances	0.06459	1.0306	0.1592	***
Friends	0.06482	3.2853	0.4552	***
Marriage	0.04591	2.3449	0.4482	***
Job	0.03800	1.4782	0.3403	***
Family	0.06717	3.1717	0.4225	***
Odds of living to age 75 (1 to 10)	-0.05825	-0.0912	0.0207	***
Odds of living to age 85 (1 to 10)	-0.02763	-0.0397	0.0188	**
ECONOMIC ACTIVITY				
Unemployed	0.02447	0.6125	0.2188	***
Disabled	0.03575	0.5808	0.1816	***
Retired (self-defined)	-0.00579	-0.0913	0.1402	
Homemaker	0.01192	0.1513	0.1226	
ECONOMIC RESOURCES				
Wealth - lowest quartile	0.04920	0.5109	0.1391	***
Wealth - 25th to 50th percentile	0.01689	0.1760	0.1189	
Wealth - 50th to 75th percentile	0.01527	0.1732	0.1189	
Wealth - top quartile		(Reference Group)		
Household income - lowest quartile	-0.01746	-0.1827	0.1454	
Household income - 25th to 50th	-0.02549	-0.2710	0.1270	**
Household income - 50th to 75th	-0.01651	-0.1749	0.1182	
Household income - top quartile		(Reference Group)		
INTERCEPT	0.00000	3.9898	0.3114	***

R-SQ: 0.4383 **N: 7,818**

Notes:

Sample includes only age-eligible self-respondents without missing values.

* = 0.10 level ** = 0.05 level *** = 0.01 level

APPENDIX TABLES

TABLE A1
HRS: COMPARING CES-D ITEMS ACROSS RESPONSE FORMATS

	Module Respondents		All Respondents	
	Main HRS in Wave 2 (1994)	Module 1 in Wave 2 (1994)	Main HRS in Wave 1 (1992)	Main HRS in Wave 2 (1994)
	Responded as Yes/No	Converted to Yes/No *	Converted to Yes/No *	Responded as Yes/No
Number of Respondents	594	594	9,136	8,260
Felt Depressed				
Yes	14.8%	4.7%	5.3%	16.4%
No	85.2%	95.3%	94.7%	83.6%
Everything Was an Effort				
Yes	19.2%	10.6%	12.9%	22.0%
No	80.8%	89.4%	87.1%	78.0%
Sleep Was Restless				
Yes	30.8%	11.8%	13.7%	29.3%
No	69.2%	88.2%	86.3%	70.7%
I Was Happy				
Yes	90.6%	82.5%	79.1%	11.4%
No	9.4%	17.5%	20.9%	88.6%
Felt Lonely				
Yes	9.9%	2.7%	4.9%	13.3%
No	90.1%	97.3%	95.1%	86.7%
People Were Unfriendly				
Yes	--	1.9%	2.9%	--
No	--	98.1%	97.1%	--
I Enjoyed Life				
Yes	94.6%	89.6%	87.6%	92.4%
No	5.4%	10.4%	12.4%	7.6%
Felt Sad				
Yes	14.0%	3.9%	4.3%	15.9%
No	86.0%	96.1%	95.7%	84.1%
People Dislike Me				
Yes	--	1.2%	1.8%	--
No	--	98.8%	98.2%	--
Could Not Get Going				
Yes	17.5%	4.9%	8.2%	18.6%
No	82.5%	95.1%	91.8%	81.4%
Poor Appetite				
Yes	--	4.7%	4.7%	--
No	--	95.3%	95.3%	--

***** Converted to Yes/No: For these columns, respondents reported one of four frequencies for each CES-D item. These responses were converted to the Yes/No Format by setting "All" and "Most" of the time equal to "Yes" and "Some" and "None" of the time equal to "No".

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for the HRS. The 9,136 Wave 1 (1992) respondents exclude those missing any CES-D items in Wave 1. The 8,260 Wave 2 (1994) respondents exclude those missing any CES-D items in Wave 2. The 594 Module respondents exclude those missing any CES-D items in Wave 1 (1992), Wave 2 (1994), or Module 1 of Wave 2 (1994).

TABLE A2

COMPARISON OF FREQUENCY RESPONSE AND YES/NO RESPONSE : MODULE RESPONDENTS BOTH FORMATS ASKED DURING SAME INTERVIEW (1994)

FREQUENCY RESPONSE: MODULE 1 IN WAVE 2	YES/NO RESPONSE: MAIN HRS IN WAVE 2 Yes	No
Felt Depressed		
All of the time	10	1
Most of the time	15	2
Some of the time	55	67
None of the time	8	436
Everything Was an Effort		
All of the time	30	5
Most of the time	22	6
Some of the time	51	63
None of the time	11	406
Sleep Was Restless		
All of the time	30	1
Most of the time	37	2
Some of the time	100	53
None of the time	16	355
I Was Happy		
All of the time	267	3
Most of the time	208	12
Some of the time	59	27
None of the time	4	14

FREQUENCY RESPONSE: MODULE 1 IN WAVE 2	YES/NO RESPONSE: MAIN HRS IN WAVE 2 Yes	No
Felt Lonely		
All of the time	7	1
Most of the time	7	1
Some of the time	39	46
None of the time	6	487
I Enjoyed Life		
All of the time	347	6
Most of the time	175	4
Some of the time	34	16
None of the time	6	6
Felt Sad		
All of the time	4	2
Most of the time	16	1
Some of the time	53	80
None of the time	10	428
Could Not Get Going		
All of the time	14	1
Most of the time	13	1
Some of the time	65	89
None of the time	12	399

The outlined cells indicate inconsistent responses between the Main HRS scale and Module 1 when considering "all" and "most" of the time equal to "yes" and "some" and "none" of the time equal to "no".

Notes: All tabulations are unweighted. The sample includes the 594 self-respondents (not proxy) who are age-eligible for the HRS and are not missing any CES-D items from Wave 1 (1992), Wave 2 (1994), or Module 1 of Wave 2 (1994).

TABLE A3
CES-D SUMMARY SCORES:
COMPARISON OF HRS WAVE 2 (1994) AND HRS WAVE 3 (1996) SCORES

Each cell below contains the count of observations with that specific combination of HRS Wave 2 and HRS Wave 3 CES-D scores:

HRS WAVE 2 SCORE (1994)	HRS WAVE 3 SCORE (1996)								
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0	2,708	682	232	101	53	40	21	19	5
1	661	434	195	95	52	30	19	18	10
2	190	155	111	75	27	15	15	14	5
3	103	90	53	54	48	20	24	8	5
4	74	50	37	32	26	23	23	9	6
5	36	27	38	46	21	19	24	9	7
6	31	19	18	27	33	24	28	22	10
7	18	23	15	10	20	22	27	22	18
8	8	15	13	12	7	16	14	25	23

CHANGE BETWEEN WAVE 2 (1994) AND WAVE 3 (1996):	# Obs.	Percent
Direction:		
No change in scores	3,425	46.2%
Depression decreased	2,010	27.1%
Depression increased	1,979	26.7%
Magnitude:		
No change in scores	3,425	46.2%
One CES-D point	2,085	28.1%
Two CES-D points	848	11.4%
Three CES-D points	462	6.2%
Four CES-D points	248	3.3%
Five CES-D points	160	2.2%
Six CES-D points	111	1.5%
Seven CES-D points	62	0.8%
Eight CES-D points	13	0.2%

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for their survey (HRS). The HRS sample excludes those respondents missing any CES-D items for Wave 2 (1994) or Wave 3 (1996).

TABLE A4
CES-D SUMMARY SCORES:
COMPARISON OF AHEAD WAVE 1 (1993) AND AHEAD WAVE 2 (1995) SCORES

Each cell below contains the count of observations with that specific combination of AHEAD Wave 1 and AHEAD Wave 2 CES-D scores:

AHEAD WAVE 1 SCORE (1993)	AHEAD WAVE 2 SCORE (1995)								
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0	1,420	438	121	61	41	19	12	6	7
1	502	338	154	88	33	25	23	12	6
2	199	195	114	80	45	35	20	6	4
3	88	82	76	68	50	19	23	9	7
4	42	44	51	45	43	28	22	10	4
5	14	23	18	37	28	34	10	9	8
6	20	19	19	17	20	17	21	11	7
7	15	5	10	10	10	13	21	15	4
8	1	1	6	6	4	8	9	12	7

CHANGE BETWEEN WAVE 1 (1993) AND WAVE 2 (1995):

Direction:	# Obs.	Percent
No change in scores	2,060	39.6%
Depression decreased	1,687	32.4%
Depression increased	1,457	28.0%
Magnitude:		
No change in scores	2,060	39.6%
One CES-D point	1,671	32.1%
Two CES-D points	722	13.9%
Three CES-D points	355	6.8%
Four CES-D points	197	3.8%
Five CES-D points	104	2.0%
Six CES-D points	59	1.1%
Seven CES-D points	28	0.5%
Eight CES-D points	8	0.2%

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for their survey (AHEAD). The AHEAD sample excludes those respondents missing any CES-D items for Wave 1 (1993) or Wave 2 (1995).

TABLE A5
SUMMARY CES-D SCORES IN THE HRS: FREQUENCY RESPONSE
FOR MODULE RESPONDENTS ONLY

FREQUENCY RESPONSE: 11 items, 4-choice - this table shows the distribution of the CES-D summary score in Wave 1 (1992) and Wave 2 (1994) for the 594 respondents to Module 1 in HRS Wave 2.

WAVE 1 (1992): Module 1 respondents
Asked in the main HRS survey in Wave 1
Range: potential: 0-33
actual: 0-33
N: 594
Mean: 4.62
Median: 3

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*594*	*100*	--	--
0	71	12.0	71	12.0
1	71	12.0	142	23.9
2	92	15.5	234	39.4
3	82	13.8	316	53.2
4	53	8.9	369	62.1
5	44	7.4	413	69.5
6	30	5.1	443	74.6
7	26	4.4	469	79.0
8	27	4.5	496	83.5
9	20	3.4	516	86.9
10	20	3.4	536	90.2
11	13	2.2	549	92.4
12	8	1.3	557	93.8
13	8	1.3	565	95.1
14	8	1.3	573	96.5
15	6	1.0	579	97.5
16	1	0.2	580	97.6
17	3	0.5	583	98.1
18	6	1.0	589	99.2
19	1	0.2	590	99.3
20	0	0.0	590	99.3
21	0	0.0	590	99.3
22	0	0.0	590	99.3
23	0	0.0	590	99.3
24	0	0.0	590	99.3
25	1	0.2	591	99.5
26	0	0.0	591	99.5
27	0	0.0	591	99.5
28	1	0.2	592	99.7
29	1	0.2	593	99.8
30	0	0.0	593	99.8
31	0	0.0	593	99.8
32	0	0.0	593	99.8
33	1	0.2	594	100.0

WAVE 2 (1994): Module 1 respondents
Asked in experimental module in Wave 2 of HRS
Range: potential: 0-33
actual: 0-29
N: 594
Mean: 4.03
Median: 2

			Cumulative	
Score	# Obs.	% of Total	# Obs.	% of Total
Total	*594*	*100*	--	--
0	120	20.2	120	20.2
1	87	14.6	207	34.8
2	93	15.7	300	50.5
3	60	10.1	360	60.6
4	52	8.8	412	69.4
5	35	5.9	447	75.3
6	20	3.4	467	78.7
7	15	2.5	482	81.2
8	22	3.7	504	84.9
9	13	2.2	517	87.1
10	21	3.5	538	90.6
11	12	2.0	550	92.6
12	9	1.5	559	94.1
13	6	1.0	565	95.1
14	6	1.0	571	96.1
15	5	0.8	576	96.9
16	3	0.5	579	97.4
17	5	0.8	584	98.2
18	1	0.2	585	98.4
19	1	0.2	586	98.6
20	2	0.3	588	98.9
21	2	0.3	590	99.2
22	0	0.0	590	99.2
23	1	0.2	591	99.4
24	1	0.2	592	99.6
25	1	0.2	593	99.8
26	0	0.0	593	99.8
27	0	0.0	593	99.8
28	0	0.0	593	99.8
29	1	0.2	594	100.0
30	0	0.0	594	100.0
31	0	0.0	594	100.0
32	0	0.0	594	100.0
33	0	0.0	594	100.0

Notes: All tabulations are unweighted. Sample includes only self-respondents (not proxy) who are age-eligible for HRS and have no missing responses to any CES-D item from Wave1 (1992), Wave 2 (1994), or Module 1 (Wave 2/1994).

TABLE A6
FREQUENCIES OF INDIVIDUAL CES-D ITEMS IN THE HRS: FREQUENCY RESPONSES

		Module Respondents	
	All Wave 1 Respondents (1992)	Main HRS in Wave 1 (1992)	Module ?s in Wave 2 (1994)
Number of Respondents	9,136	594	594
Felt Depressed			
None of the time	70.2%	73.1%	74.7%
Some of the time	24.6%	21.9%	20.5%
Most of the time	3.0%	2.5%	2.9%
All of the time	2.3%	2.5%	1.9%
Everything Was an Effort			
None of the time	62.9%	67.2%	70.2%
Some of the time	24.2%	21.4%	19.2%
Most of the time	8.0%	6.9%	4.7%
All of the time	4.9%	4.5%	5.9%
Sleep Was Restless			
None of the time	51.4%	49.5%	62.5%
Some of the time	34.9%	37.7%	25.8%
Most of the time	8.1%	8.4%	6.6%
All of the time	5.6%	4.4%	5.2%
I Was Happy			
None of the time	3.3%	2.4%	3.0%
Some of the time	17.5%	17.2%	14.5%
Most of the time	45.7%	47.5%	37.0%
All of the time	33.5%	33.0%	45.5%
Felt Lonely			
None of the time	75.7%	80.6%	83.0%
Some of the time	19.4%	16.3%	14.3%
Most of the time	2.9%	1.7%	1.3%
All of the time	2.0%	1.3%	1.3%
People Were Unfriendly			
None of the time	83.1%	84.0%	85.0%
Some of the time	14.0%	12.6%	13.1%
Most of the time	1.9%	1.9%	1.0%
All of the time	1.1%	1.5%	0.8%

		Module Respondents	
	All Wave 1 Respondents (1992)	Main HRS in Wave 1 (1992)	Module ?s in Wave 2 (1994)
Number of Respondents	9,136	594	594
I Enjoyed Life			
None of the time	2.3%	2.2%	2.0%
Some of the time	10.1%	7.1%	8.4%
Most of the time	34.5%	36.0%	30.1%
All of the time	53.2%	54.7%	59.4%
Felt Sad			
None of the time	65.5%	68.7%	73.7%
Some of the time	30.2%	28.5%	22.4%
Most of the time	2.7%	1.7%	2.9%
All of the time	1.6%	1.2%	1.0%
People Dislike Me			
None of the time	88.0%	88.7%	90.4%
Some of the time	10.3%	8.6%	8.4%
Most of the time	1.0%	1.3%	0.7%
All of the time	0.8%	1.3%	0.5%
Could Not Get Going			
None of the time	59.9%	58.9%	69.2%
Some of the time	31.8%	35.4%	25.9%
Most of the time	5.2%	3.7%	2.4%
All of the time	3.1%	2.0%	2.5%
Poor Appetite			
None of the time	81.4%	84.0%	84.0%
Some of the time	13.9%	12.1%	11.3%
Most of the time	2.3%	2.4%	2.5%
All of the time	2.3%	1.5%	2.2%

Notes: All tabulations are unweighted. Each sample includes only self-respondents (not proxy) who are age-eligible for the HRS. The 9,137 Wave 1 (1992) respondents exclude anyone missing any Wave 1 CES-D item. The 594 Module respondents exclude anyone missing any CES-D items from Wave 1 (1992), Wave 2 (1994), or Module 1 of Wave 2 (1994).

TABLE A7
CONSTRUCTED VARIABLES ON AHEAD WAVE 1: CESD8

Number of CESD items missing:	Total Num. of R w/ CESD missing	Constructed Variable Also Missing	SCORE ON CONSTRUCTED VARIABLE "CESD8"								
			0	1	2	3	4	5	6	7	8
None	7286	0	2,853	1624	950	612	424	288	265	181	89
One	80	0	17	17	8	15	8	6	4	5	0
Two	10	0	3	4	1	0	1	1	0	0	0
Three	2	0	0	0	0	0	0	2	0	0	0
Four	1	0	0	0	0	0	1	0	0	0	0
Five	1	0	0	0	1	0	0	0	0	0	0
Eight	842	842	0	0	0	0	0	0	0	0	0

Notes:
Sample includes all respondents in AHEAD1 regardless of age-eligibility or proxy status. Counts are unweighted.
There were no respondents with Six or Seven missing CES-D items and those rows are excluded from the table.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
DEMOGRAPHIC CHARACTERISTICS				
Age				
51-55	4,317	66.4	19.9	13.7
56-61	4,698	68.8	18.3	12.9
Sex				
Male	4,144	72.2	16.7	11.1
Female	4,992	63.9	20.9	15.1
Race				
White	6,564	70.4	18.2	11.4
Black	1,553	54.9	23.6	21.6
American Indian	78	*53.0*	*20.3*	*26.7*
Asian/Pacific Isd.	98	58.5	*32.0*	*9.5*
Hispanic	826	57.1	18.8	24.2
Other	*4*	*19.5*	*63.7*	*16.9*
Consider Self Hispanic				
Yes	826	57.1	18.8	24.2
No	8,296	68.5	19.0	12.5
Marital Status				
Married	6,611	72.5	17.9	9.5
Live with Partner	220	61.6	*21.6*	*16.8*
Separated	293	49.6	20.2	30.2
Divorced	1,037	56.9	22.2	20.9
Widowed	595	52.0	21.1	27.0
Never Married	337	57.2	23.0	19.8
HEALTH CHARACTERISTICS				
Self-Rated Physical Health				
Excellent	2,009	84.1	12.2	3.7
Very Good	2,572	76.1	17.2	6.7
Good	2,521	66.8	21.5	11.7
Fair	1,294	45.8	27.2	27.0
Poor	735	20.8	25.5	53.7
Self-Rated Emotional Health				
Excellent	1,785	91.6	6.5	*2.0*
Very Good	2,675	81.9	14.6	3.6
Good	2,994	62.8	26.1	11.1
Fair	1,277	29.0	31.6	39.5
Poor	394	*8.5*	18.6	73.0
Psychological Diagnosis: Lifetime				
Yes	1,015	35.0	22.4	42.6
No	8,104	71.9	18.6	9.6
Psychological Problems Past Year				
Yes	934	29.3	24.2	46.6
No	8,167	72.2	18.4	9.3
Received Psych Treatement Last Year				
(If "yes" to psychological problems)				
Yes	195	*23.0*	*20.5*	56.5
No	737	31.0	24.9	44.0

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Take Psychoactive Medication (If "yes" to psychological problems)				
Yes	382	22.2	20.3	57.6
No	549	34.2	26.5	39.3
Usually Spend More Than 10 Minutes/Day Attending to Own Health Problems				
Yes	1,014	40.8	21.7	37.6
No	8,117	71.0	18.7	10.4
Hospitalized Overnight During Past Year				
Yes	1,017	51.2	21.9	26.9
No	8,115	69.7	18.6	11.7
Number of Contacts With Doctors				
None	1,918	73.7	16.7	9.6
One to Five	5,268	72.0	18.0	10.0
Six to Ten	984	55.4	25.9	18.7
Eleven to Twenty	651	45.3	24.4	30.3
Twenty-one or more	280	42.0	16.3	41.7
MEDICAL CONDITIONS				
High Blood Pressure				
Yes	3,637	60.2	21.6	18.2
No	5,495	72.5	17.4	10.2
Diabetes				
Yes	996	58.4	20.0	18.9
No	8,136	68.8	21.5	12.3
Cancer				
Yes	510	63.8	20.1	16.1
No	8,623	68.0	18.9	13.1
Chronic Lung Disease				
Yes	750	47.7	23.9	28.4
No	8,383	69.6	18.5	11.9
Heart Disease				
Yes	1,193	53.6	22.3	24.2
No	7,936	69.9	18.5	11.6
Stroke				
Yes	253	44.3	25.2	30.5
No	8,878	68.4	18.8	12.8
Arthritis/Rheumatism				
Yes	3,524	58.3	22.2	19.5
No	5,607	73.6	17.0	9.4
Asthma				
Yes	566	50.4	23.4	26.2
No	8,565	68.9	18.7	12.4
Back Problems				
Yes	3,169	57.6	21.9	20.5
No	5,961	73.2	17.4	9.4

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60) Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Foot Problems				
Yes	3,255	53.9	23.0	23.1
No	5,872	75.1	16.9	8.1
Kidney / Bladder Problems				
Yes	988	47.8	22.4	29.8
No	8,135	70.1	18.6	11.3
Stomach / Intestinal Problems				
Yes	864	46.4	24.4	29.2
No	8,262	69.9	18.4	11.7
High Cholesterol				
Yes	2,200	61.9	21.4	16.7
No	6,783	70.0	18.1	12.0
Broken Bone Since Age 45				
Yes	1,285	62.9	19.3	17.9
No	7,847	68.6	19.0	12.5
Unconscious Due to Head Injury				
Yes	1,096	61.3	20.2	18.6
No	8,007	68.7	18.8	12.5
Experience Frequent Pain				
Yes	2,261	44.9	24.6	30.5
No	6,864	75.0	17.2	7.8
HEALTH BEHAVIOR				
Currently Smoke Cigarettes				
Yes	2,502	59.8	21.5	18.8
No, but have previously	3,309	71.5	17.7	10.8
Never	3,321	70.0	18.4	11.6
Number of Alcoholic Drinks per Day				
Never drink alcohol	3,600	63.0	19.5	17.5
Fewer than one per day	4,111	70.5	19.3	10.3
One or Two per day	948	74.0	16.4	9.6
Three or four per day	338	65.2	19.0	15.8
Five or more per day	128	56.8	*16.8*	*26.4*
Frequency of Heavy Physical Exercise				
Three or more times per week	1,179	78.5	13.3	8.2
Once or twice per week	907	76.6	17.5	6.0
One to Three times per month	750	76.1	17.0	7.0
Less than once per month	1,741	72.8	18.9	8.3
Never	4,544	59.1	21.3	19.6
RATING SATISFACTION				
How Satified Are You With:				
House or Apartment				
Very satisfied	5,209	75.2	15.8	9.0
Somewhat satisfied	2,395	61.6	23.1	15.3
Even	625	57.0	24.0	19.0
Somewhat unsatisfied	516	45.3	26.4	28.3
Very unsatisfied	218	33.0	*20.2*	46.9

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Neighborhood				
Very satisfied	5,475	72.8	16.8	10.4
Somewhat satisfied	2,306	62.8	22.2	15.0
Even	532	60.2	21.4	*18.5*
Somewhat unsatisfied	580	51.2	25.7	23.1
Very unsatisfied	214	41.9	19.9	38.1
Own Health / Physical Condition				
Very satisfied	4,261	81.8	13.0	5.2
Somewhat satisfied	2,963	67.5	22.0	10.5
Even	572	52.3	29.5	18.2
Somewhat unsatisfied	776	34.3	31.2	34.5
Very unsatisfied	529	17.5	22.1	60.5
Financial Situation				
Very satisfied	2,419	83.3	12.1	4.6
Somewhat satisfied	3,543	72.3	19.1	8.6
Even	973	62.0	23.6	14.3
Somewhat unsatisfied	1,290	50.2	25.4	24.4
Very unsatisfied	877	33.0	24.5	42.6
Friendships				
Very satisfied	5,887	75.4	16.0	8.6
Somewhat satisfied	2,504	58.0	24.3	17.8
Even	416	43.5	25.0	31.5
Somewhat unsatisfied	204	36.4	26.7	37.0
Very unsatisfied	84	*15.4*	*23.3*	61.3
Marriage				
Very satisfied	5,583	76.4	16.5	7.2
Somewhat satisfied	839	56.6	24.7	18.7
Even	146	40.9	*22.8*	36.3
Somewhat unsatisfied	97	*36.3*	*33.6*	*30.1*
Very unsatisfied	70	*27.9*	*31.8*	*40.3*
Not Married	2,215	55.1	21.9	23.1
Job				
Very satisfied	3,053	82.9	12.5	4.6
Somewhat satisfied	1,949	70.0	20.1	9.9
Even	436	59.6	27.5	*12.9*
Somewhat unsatisfied	340	49.3	34.0	*16.7*
Very unsatisfied	127	*33.8*	*28.4*	*37.8*
Not Working	3,207	56.2	21.1	22.7
Family Life				
Very satisfied	6,350	75.7	16.3	8.1
Somewhat satisfied	2,038	55.5	25.7	18.8
Even	338	39.8	25.5	34.7
Somewhat unsatisfied	259	31.8	24.6	43.7
Very unsatisfied	92	*21.7*	*13.6*	64.7
Way You Handle Problems in Life				
Very satisfied	4,120	81.5	12.9	5.6
Somewhat satisfied	3,823	63.2	22.4	14.4
Even	719	45.9	29.6	24.4
Somewhat unsatisfied	367	21.1	29.6	49.2
Very unsatisfied	75	*8.9*	*13.8*	77.3

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Life As A Whole				
Very satisfied	5,344	82.0	13.3	4.7
Somewhat satisfied	2,848	56.7	26.4	16.9
Even	504	27.5	32.5	40.0
Somewhat unsatisfied	291	*14.1*	27.3	58.6
Very unsatisfied	119	*8.5*	*14.1*	77.4
Rating of Time Spent With Spouse				
Extremely enjoyable	1,891	82.0	13.4	4.5
Very enjoyable	3,710	74.0	17.6	8.4
Somewhat enjoyable	1,078	51.4	27.4	21.2
Not too enjoyable	138	*30.4*	*28.1*	41.5
How Free Time is Spent				
Activities together	3,666	74.0	17.3	8.8
Some together / some separate	2,061	75.4	16.9	7.8
Different / separate activities	1,094	59.0	23.2	17.8
ATTITUDES, PERCEPTIONS, EXPECTATIONS				
How is Your Ability to Think Quickly				
Excellent	1,794	78.3	15.1	6.6
Very Good	3,286	74.1	17.5	8.4
Good	2,645	64.3	21.8	14.0
Fair	1,103	43.7	24.6	31.8
Poor	263	28.7	*18.9*	52.5
Chances of Living to 75 or Older				
0 - No chance	627	39.5	21.6	39.0
1	160	45.9	*27.5*	*26.6*
2	307	50.7	25.8	23.5
3	347	52.9	23.2	23.9
4	337	60.6	19.5	19.9
5	1,929	66.9	20.1	13.0
6	438	64.7	22.4	12.9
7	905	69.9	20.8	9.3
8	1,320	76.6	16.3	7.1
9	640	79.0	15.4	*5.6*
10 - absolutely certain	1,947	76.3	15.3	8.4
Chances of Living to 85 or Older				
0 - No chance	1,679	49.9	23.2	26.9
1	537	63.1	19.0	18.0
2	866	69.1	19.7	11.3
3	822	66.6	20.1	13.4
4	645	66.8	24.0	9.2
5	1,439	74.0	17.1	8.9
6	528	73.9	17.6	*8.6*
7	618	75.2	16.7	8.1
8	646	75.1	17.0	7.9
9	300	81.8	*11.1*	*7.1*
10 - absolutely certain	858	77.9	13.7	8.4

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60) Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Chances of Major Economic Depression During the Next 10 Years				
0 - No chance	399	72.8	17.0	*10.2*
1	193	76.3	*18.2*	*5.5*
2	572	78.6	13.8	*7.6*
3	769	73.4	16.9	9.7
4	709	70.0	18.2	11.8
5	2,346	69.5	19.3	*11.2*
6	690	64.2	22.1	13.8
7	908	67.6	20.0	12.5
8	913	62.4	22.0	15.6
9	413	61.3	17.4	21.3
10 - absolutely certain	1,013	58.7	20.1	21.3
Chances of Double-Digit Inflation During the Next 10 Years				
0 - No chance	274	66.2	20.1	*13.7*
1	116	71.5	*16.1*	*12.5*
2	377	76.3	14.6	*9.2*
3	680	76.0	13.1	10.9
4	663	72.7	19.7	7.6
5	2,366	70.3	18.3	11.4
6	751	72.1	18.6	9.3
7	1,048	65.8	20.9	13.3
8	1,015	63.2	21.9	14.9
9	428	63.2	21.4	15.4
10 - absolutely certain	1,124	58.8	19.9	21.4
UNCERTAINTY:				
Gamble: 0.5(2Y)+0.5(Y/3) vs. Y				
Take new opportunity w/ uncertainty	2,102	63.9	21.0	15.1
Stay with certain outcome	6,866	69.1	18.5	12.4
Gamble: 0.5(2Y)+0.5(Y/2) vs. Y				
Take new opportunity w/ uncertainty	2,173	66.8	20.0	13.2
Stay with certain outcome	6,761	68.2	18.8	13.0
FINANCIAL PLANNING HORIZON				
Next few months	1,659	56.6	20.7	22.7
Next year	931	64.7	18.4	16.8
Next few years	2,982	68.3	19.8	12.0
Next five - ten years	2,535	72.7	18.9	8.5
Next ten or more years	755	77.5	14.2	8.4
ECONOMIC CHARACTERISTICS				
Employment Status				
Working	5,959	73.6	18.0	8.5
Unemployed	336	54.8	26.0	19.2
Temp. Layoff/Illness	159	54.8	*26.7*	*18.4*
Homemaker	1,388	65.5	19.5	15.0
Retired	848	72.0	16.4	11.6
Disabled	886	27.9	23.5	48.6
Other	87	*54.4*	*28.9*	*16.8*

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Any Work for Pay at Present Time				
Yes	6,212	73.3	18.2	8.6
No	2,909	55.2	20.9	23.9
Occupation Group				
Managerial specialty operation	730	79.5	15.7	*4.8*
Professional specialty operation and technical support	818	77.2	17.5	*5.4*
Sales	372	75.2	17.1	*7.7*
Clerical, administrative support	919	67.8	22.9	9.3
Service: private household, cleaning and building services	55	*64.7*	*21.6*	*13.7*
Service: protection	100	66.6	*23.6*	*9.8*
Service: food preparation	189	60.0	*22.6*	*17.4*
Health services	138	60.8	*22.5*	*16.7*
Personal services	320	61.3	22.0	16.8
Farming, forestry, fishing	89	73.0	*14.3*	*12.7*
Mechanics and repair	209	72.2	*22.8*	*5.0*
Construction trade and extractors	129	80.1	*13.7*	*6.2*
Precision production	199	77.4	*14.0*	*8.7*
Operators: machine	417	66.6	16.9	16.5
Operators: transport, etc.	288	72.6	19.5	*7.9*
Operators: handlers, etc.	142	67.8	*23.0*	*9.2*
Member of Armed Forces	6	*100.0*	-	-
Self-Employed				
Yes, work for self	1,089	78.2	14.5	7.3
No, work for someone else	5,127	72.2	19.0	*8.9*
Tenure with Current Employer				
Less than two years	934	70.4	20.3	9.3
Three years	294	67.8	19.7	*12.5*
Four years	247	70.9	*18.7*	*10.5*
Five through ten years	898	72.5	16.8	10.8
Ten to nineteen years	1,247	70.5	20.1	9.4
Twenty years or more	1,497	75.5	18.5	6.0
Covered by Union Contract				
Yes	1,383	73.0	18.0	9.0
No	3,737	71.9	19.3	8.8
Days Lost From Work Due to Illness				
None				
One to five days	1,570	70.0	22.1	7.9
Six to ten days	366	63.1	24.2	12.7
Eleven to twenty days	158	58.1	*23.0*	*19.0*
More than twenty days	278	60.0	24.4	*15.6*
Education - Highest Grade				
Less than 12 years	2,597	55.6	21.3	23.0
12 years	3,259	68.0	18.9	13.1
13-15 years	1,685	72.5	18.5	9.0
16 or more years	1,587	77.8	16.6	5.5
Education - High School Degree				
(If Highest Grade is 12 or lower)				
High School Diploma	2,969	68.2	18.9	12.9
GED	473	66.3	18.7	15.1
No diploma/GED	2,373	54.5	21.6	23.9

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Education - College Degree				
(If Highest Grade is 13 or more)				
Yes	1,846	77.4	16.8	5.8
No	1,399	72.3	18.4	9.3
Volunteer Work (100+ Hours/Year)				
Yes	999	76.1	15.6	8.2
No	4,702	60.6	21.6	17.8
Care for Parent (100+ Hours/Year)				
Yes	254	58.9	23.8	17.3
No	2,490	64.6	20.4	15.0
Care for Parent-In-Law (100+ Hrs/Yr)				
Yes	74	*68.2*	*16.9*	*14.9*
No	1,351	68.0	21.2	10.8
HOURS FLEXIBILITY				
Could You Reduce Regular Hours				
Yes	1,436	74.1	18.4	7.5
No	3,638	71.4	19.1	9.4
Would You Like to Reduce Hours With Proportional Pay Reduction				
Yes	602	65.4	23.0	11.6
No	3,068	72.7	18.3	9.0
Desired Hours (for "Yes" to Reduce)				
Less than twenty hours per week	39	*61.9*	*29.1*	*9.0*
Twenty to twenty-four	124	65.5	*24.9*	*9.6*
Twenty-five to twenty-nine	41	*67.8*	*18.0*	*14.2*
Thirty to thirty-four	207	62.3	24.0	*13.7*
Thirty-five to forty	164	66.7	*22.2*	*11.1*
More than forty hours per week	21	*81.9*	*8.8*	*9.3*
Would Employer Allow Half-Time or Less				
Yes	512	73.1	18.1	*8.8*
Yes, only temporarily	24	*65.3*	*29.6*	*5.0*
No	550	75.3	17.7	*7.0*
How Would Pay Decrease if Half-Time				
In proportion to hours	424	71.9	18.1	*10.0*
More than proportionate	14	*51.1*	*27.7*	*20.2*
Less than proportionate	48	*91.7*	*8.3*	-
Would Health Insurance Benefits Change				
Reduced	65	*72.4*	*18.9*	*8.7*
Eliminated	66	*73.5*	*15.4*	*11.1*
Kept same	164	77.7	*18.6*	*3.7*
Don't have health insurance benefits	185	68.2	*19.0*	*12.7*
Would Pension Eligibility Change				
Yes	150	76.9	*13.7*	*9.4*
No	117	74.7	*22.5*	*2.8*
Don't have pension benefits	224	71.2	*16.7*	*12.1*

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
Could You Increase Regular Hours				
Yes	2,001	74.8	17.6	7.6
No	3,087	70.5	19.8	9.7
Would You Like to Increase Hours With Proportional Pay Increase				
Yes	825	63.5	22.2	14.3
No	2,281	72.9	18.9	8.3
JOB CHARACTERISTICS				
Variation in Hours Worked Per Week				
Same each week	4,010	72.1	18.8	9.0
Vary a lot	1,108	72.6	19.3	8.1
Paid Sick Leave				
None	1,679	70.1	18.0	11.9
One to five days	579	70.9	20.4	8.7
Six to ten days	894	74.9	17.6	7.5
Eleven to twenty days	950	73.4	18.8	7.9
More than twenty days	167	72.2	*22.1*	*5.7*
Number of Employees in Firm				
Under ten	850	71.0	20.4	8.6
Ten to fifty	1,204	73.4	17.9	8.7
Fifty to two hundred	985	75.1	17.1	7.9
Two hundred to one thousand	746	73.2	17.2	9.7
More than one thousand	495	74.5	18.5	*7.0*
Have Pension Plan With This Employer				
Yes	3,335	74.0	18.6	7.4
No	1,746	68.7	19.8	11.5
Employer Offers Pension Plan (if "no" to having pension plan with employer)				
Yes	402	68.2	20.8	*11.1*
No	1,285	69.2	19.2	11.7
My Job Requires Lots of Physical Effort				
All or almost all of the time	1,342	70.5	16.7	12.8
Most of the time	1,170	69.0	21.3	9.7
Some of the time	1,758	73.7	18.4	7.9
None or almost none of the time	1,913	77.1	17.0	6.0
My Job Requires Lifting Heavy Loads				
All or almost all of the time	556	70.9	14.7	14.4
Most of the time	473	67.0	22.0	11.1
Some of the time	1,789	72.4	19.1	8.5
None or almost none of the time	3,369	75.0	17.6	7.4
My Job Requires Stooping, Kneeling, or Crouching				
All or almost all of the time	844	73.8	16.3	10.0
Most of the time	834	65.6	22.4	12.0
Some of the time	2,366	73.6	12.0	8.5
None or almost none of the time	2,138	75.6	17.4	7.0

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
My Job Requires Good Eyesight				
All or almost all of the time	3,284	75.1	16.8	8.1
Most of the time	2,180	72.2	19.0	8.8
Some of the time	499	68.0	21.5	10.5
None or almost none of the time	213	71.2	*19.4*	*9.4*
My Job Requires Intense Concentration				
All or almost all of the time	2,953	73.9	17.8	8.4
Most of the time	2,240	73.0	18.5	8.5
Some of the time	793	72.3	18.1	9.6
None or almost none of the time	197	72.6	*19.4*	*8.1*
My Job Requires Skill in Dealing With Other People				
All or almost all of the time	3,898	74.4	17.7	7.9
Most of the time	1,458	72.7	18.6	8.7
Some of the time	614	71.3	18.4	10.3
None or almost none of the time	218	63.7	*21.1*	*15.2*
My Job Requires Work With Computers				
All or almost all of the time	1,121	72.7	20.2	7.1
Most of the time	584	76.3	18.1	*5.6*
Some of the time	1,108	77.5	16.5	6.1
None or almost none of the time	3,371	71.4	17.9	10.7
My Job Requires Me to Analyze Data/Info				
All or almost all of the time	1,380	75.7	18.1	6.2
Most of the time	1,076	76.5	16.4	7.1
Some of the time	1,333	73.2	19.0	7.8
None or almost none of the time	2,385	70.2	18.4	11.4
My Job Requires Me to Keep Up With the Pace Set by Others				
All or almost all of the time	1,795	72.8	18.6	8.6
Most of the time	1,447	72.1	18.8	9.1
Some of the time	1,055	72.7	19.2	8.2
None or almost none of the time	1,870	75.1	16.4	8.4
My Job Requires Me to Do the Same Things Over and Over				
All or almost all of the time	2,323	68.8	19.4	11.8
Most of the time	1,654	70.7	20.2	9.1
Some of the time	1,526	77.6	17.1	5.3
None or almost none of the time	661	83.2	11.6	*5.2*
My Job Requires That I Learn New Things				
All or almost all of the time	1,592	74.5	17.9	7.7
Most of the time	1,510	74.0	18.4	7.6
Some of the time	2,300	74.2	17.7	8.2
None or almost none of the time	773	65.8	19.8	14.4
I Have Freedom to Decide How I Do My Own Work				
All or almost all of the time	2,305	78.1	16.1	5.8
Most of the time	2,151	75.5	16.6	7.9
Some of the time	1,034	66.0	23.5	11.5
None or almost none of the time	692	61.4	22.1	16.5

See Notes on last page.

TABLE A8
CES-D CONSTRUCT VALIDITY: CROSS-TABULATIONS WITH SIGNIFICANT VARIABLES

WAVE 1 OF THE HRS	N	ESTIMATED CES-D SCORE (Full 20 item scale, 0-60)		
		Under 10	10 to 15	16 & over
TOTAL	9,136	67.8	19.0	13.3
The People I Work With Are Helpful And Friendly				
All or almost all of the time	2,889	78.6	14.9	6.5
Most of the time	2,558	71.7	20.1	8.3
Some of the time	597	58.8	25.4	15.7
None or almost none of the time	90	*44.0*	*18.7*	*37.4*
SOCIAL RELATIONSHIPS				
Relatives in Neighborhood				
Yes	1,984	62.3	19.1	18.6
No	3,714	63.7	21.3	15.0
Good Friends in Neighborhood				
Yes	3,979	65.3	19.3	15.4
No	1,722	58.6	23.3	18.0
How Many Neighbors Do You Know?				
All of them	1,174	66.4	17.8	15.8
Most of them	1,668	67.8	20.1	12.1
Some of them	2,448	61.1	21.7	17.2
None of them	407	48.9	22.8	28.2
How Frequent Chat/Visit With Neighbors				
Daily	562	59.8	19.5	20.8
Several times per week	955	67.4	19.5	13.1
Several times per month	1,297	66.9	19.7	13.4
Several times per year	810	66.0	22.2	11.8
Hardly ever or never	1,652	61.2	20.8	18.0

Notes: Data are from Wave 1 of the HRS, 1992. Sample consists of age-eligible self-respondents (not proxy) with no missing items for the CES-D.

Using estimated coefficients from the NLS-Mature Women survey, the full 20-item CES-D score (range 0-60) was predicted from the 11 items reported in the HRS. The first column contains respondents with low symptoms of depression, while the middle column contains respondents with relatively higher reports of symptoms but still lower than the standard cutoff for clinical depression. The far-right column contains respondents scoring above the traditional cutoff of 16 or higher.

See Notes on last page.

TECHNICAL APPENDIX

TECHNICAL APPENDIX: SAS CODE FOR CONSTRUCTED VARIABLES

HRS: WAVE 1

```
libname c >c:\your directory=;
data c.yourname;
set c.rawdata;

*In the Arawdata@ dataset, the CES-D variables have been Aunimputed@, that is, the corresponding imputations flags were used to identify observations whose CES-D item(s) had been imputed and the value of the CES-D item(s) was set to missing.  See Section IV of the working paper. ;

* Drop observations that are proxy respondents (use APROXY from the tracker file) or are not age eligible (V45=5 or could use ELIGIBLE=1 from tracker file);

if aproxy ne 0 or v45=5 then delete;
* create cesd summary measure;

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are assigned a missing value for the total CES-D score. Individual analysts may want to use their own imputation scheme for missing values;

array dep(11) v519--v529;

* count number of missing items from CES-D scale (11 total items in Wave 1);
w1miss=0;
do i=1 to 11;
 if dep(i)=. then w1miss=w1miss+1;
end;

* Do CES-D score processing only for those not missing any items;

if w1miss=0 then do;

* for items that are not reverse-scored, change scale of responses from 1,2,3,4 to 0,1,2,3;

array dep2 (9) v519-v521 v523 v524 v526-v529;
  do i=1 to 9;
   dep2(i)=4-dep2(i);
  end;

* for reverse-scored items (happy, enjoyed life), rescale by subtracting 1 (I was happy none of the time receives value=3);
```

```
  v522=v522-1;
  v525=v525-1;

*Total score is the sum of all 11 items;

  w1cesd=sum(of v519--v529);
end;
```

HRS: WAVE 2

```
libname c 'c:\your directory';

data c.yourname;
set c.rawdata;

*Use variables from the tracker file (CPROXY, ELIGIBLE) to select only age-eligible self-respondents
(not proxy);

if cproxy ne 0 or eligible=0 then delete;

*Create CES-D summary score;

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are
assigned a missing value for the total CES-D score. Individual analysts may want to use their own
imputation scheme for missing values;

array dep(8) w465-w472;

* count number of missing items from CES-D scale (8 total items in Wave 2);

w2miss=0;
do i=1 to 8;
   if dep(i) ne 1 and dep(i) ne 5 then w2miss=w2miss+1;
end;

* Do CES-D score processing only for those not missing any items;

if w2miss=0 then do;
```

```
* for items that are not reverse-scored, change responses from 1=yes 5=no to 1=yes 0=no;

 array dep2(6) w465-w469 w471;

do i=1 to 6;
   if dep2(i)=5 then dep2(i)=0;
end;

* for reverse-scored items (happy, enjoyed life), rescale 1=yes to 0, 5=no to 1);

  if w470=1 then w470=0; if w470=5 then w470=1;
  if w472=1 then w472=0; if w472=5 then w472=1;

*Total score is the sum of all 8 items;

  w2cesd=sum(of w465-w472);
end;

**Create CES-D for module respondents HRS Wave 2, Module 1;

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are
assigned a missing value for the total CES-D score. Individual analysts may want to use their own
imputation scheme for missing values;

array dep3(11) w9256-w9266;

* count number of missing items from CES-D scale (11 total items in Module 1);

modmiss=0;
do i=1 to 11;
   if dep3(i)>4 or dep3(i)=. then modmiss=modmiss+1;
end;

* Do CES-D score processing only for those not missing any items;

if modmiss=0 then do;

* for items that are not reverse-scored, change scale of responses from 1,2,3,4 to 0,1,2,3;
```

```
array dep4(9) w9256-w9258 w9260 w9261 w9263-w9266;
do i=1 to 9;
   dep4(i)=4-dep4(i);
end;


* for reverse-scored items (happy, enjoyed life), rescale by subtracting 1 (I was happy none of the time
receives value=3);

  w9259=w9259-1;
  w9262=w9262-1;

*Total score is the sum of all 11 items;

  modcesd=sum(of w9256-w9266);
end;
run;
```

HRS: WAVE 3

```
libname c 'c:\your directory';

data c.yourname;
set c.rawdata;

*Use variables from the tracker file (ELIGIBLE, EPROXY) to select only age-eligible self-respondents
(not proxy);

if e218 ne 1 then delete;      **At time of writing, EPROXY had not been created. Use E218
                                  instead;
if eligible ne 1 then delete;

*drop 2 cases detailed in data description if using preliminary data. Will be cleaned up for final data;

if hhidpn=47555030 or hhidpn=31300010 then delete;

*create CES-D score;

array dep (8) e985-e992;
```

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are assigned a missing value for the total CES-D score. Individual analysts may want to use their own imputation scheme for missing values;

```
* count number of missing items from CES-D scale (8 total items in Wave 3);

w3miss=0;
do i=1 to 8;
  if dep(i)>5 then w3miss=w3miss+1;
end;

* Do CES-D score processing only for those not missing any items;

if w3miss=0 then do;

  * for items that are not reverse-scored, change responses from 1=yes 5=no to 1=yes 0=no;


array dep2 (6) e985-e987 e989 e991 e992;
do i=1 to 6;
  if dep2(i)=5 then dep2(i)=0;
end;

* for reverse-scored items (happy, enjoyed life), rescale 1=yes to 0, 5=no to 1;

if e990=1 then e990=0; if e990=5 then e990=1;
if e988=1 then e988=0; if e988=5 then e988=1;

* Total score is the sum of all 8 items;

w3cesd=sum(of e985-e992);
end;
```

***Create CIDI-SF for MDE score**;

```
**check to see whether R did not answer either screener question**;

if (e1006>5 or e1006=.) and (e1028>5 or e1028=.) then cidimiss=1;
 else cidimiss=0;
```

```
*if R volunteered that R is on anti-dep, R is skipped to e1028 and then to end,
 so create indicators to use if desired;

if e1006=3 or e1028=3 then cidimeds=1; else cidimeds=0;

*Begin CIDI;

*This code keeps track of symptoms separately for each stem question: DSYMP1-7 for the
Depression stem and ASYMP1-7 for the Anhedonia (loss of interest) stem. Finally, SYMP1-7 is the
number of symptoms regardless of which screener question was endorsed.  This level of detail is not
needed for all analyses and the program can be modified if desired by the analyst;

array symps (21) dsymp1-dsymp7 asymp1-asymp7 symp1-symp7;

*Initialize symptom variables;

do i=1 to 21;
   if cidimiss=0 then symps(i)=0;
end;

*Check first stem question (d) for depression;
*To be counted as depression, R must say yes to E1006 (Have you been depressed for 2-wk period)
and must answer 1 or 2 to E1007 (most or all of the day), and must answer 1 or 2 to E1008 (most or
all the days during 2-wk period).  If this is the case, R is asked further about symptoms. If any of these
conditions are not met, R is skipped to Anhedonia stem question;

if e1006=1 and (e1007=1 or e1007=2) and (e1008=1 or e1008=2)
  then do;

*Create indicators for each of the 7 symptoms: 1 if yes, 0 otherwise;
    *Create an indicator variable that R went through (d) screen;

    sfd=1;

    *Lost interest in things (anhedonia);

     if e1009=1 then dsymp1=1;

    *Felt tired;
```

```
    if e1010=1 then dsymp2=1;

   *Change in appetite (increase or decrease);

    if (e1011=1 or e1012=1) then dsymp3=1;

  *Trouble sleeping for nearly every night or every night. If R says Ayes@ to have trouble
    sleeping, R answers E1014. If E1014 is 1 or 2, then R is counted as having sleep trouble;

    if (e1014=1 or e1014=2) then dsymp4=1;

   *Trouble concentrating;

    if e1015=1 then dsymp5=1;

   *Feeling down on self;

    if e1016=1 then dsymp6=1;

   *Thoughts of death;

    if e1017=1 then dsymp7=1;
end;

*Check second stem question if no to first, (a)--for anhedonia.  This second stem is only asked of those
R who did not answer symptom questions under stem 1 depression (i.e., sfd=0).  To be counted as
having significant loss of interest (anhedonia), R must say yes to E1028 (have you lost interest in things
for 2-wk period), and must answer 1 or 2 to E1029 (most or all of the day), and must answer 1 or 2 to
E1030 (most or all days during 2-wk period).  If this is the case R is asked about further symptoms. If
this is not the case, R is skipped to the next section of the interview;

if sfd=0 and e1028=1 and (e1029=1 or e1029=2) and (e1030=1 or e1030=2)
  then do;

*Create indicators for each of the 7 symptoms: 1 if yes, 0 otherwise;

   *Felt tired;

    if e1031=1 then asymp2=1;
```

```
    *Change in appetite (increase or decrease);

     if (e1032=1 or e1033=1) then asymp3=1;

    *Trouble sleeping for nearly every night or every night.  If R says Ayes@ to have trouble
     sleeping, R answers E1014. If E1014 is 1 or 2, then R is counted as having sleep trouble;

     if (e1035=1 or e1035=2) then asymp4=1;

    *Trouble concentrating;

     if e1036=1 then asymp5=1;

    *Feeling down on self;

     if e1037=1 then asymp6=1;

    *Thoughts of death;

     if e1038=1 then asymp7=1;
end;

*Create variable indicating symptom regardless of stem question (i.e. one "felt tired" variable which is
equal to 1 if R endorsed "felt tired" under the Depression stem or the Anhedonia stem).  Do this by
summing corresponding symptoms from each stem question (i.e. SYMP1= DSYMP1+ASYMP1, etc.)
 These are the SYMP1 to SYMP7 variables.

do i=1 to 7;
   symps(i+14)=symps(i)+symps(i+7);
end;

*Create the total CIDI score by summing symptoms 1 through 7;

ciditot=sum (of symp1-symp7);

*Create two dichotomous variables for suggested cut points of A3 or more symptoms@ (cidi3pl) and A5
or more symptoms@ (cidi5pl);

if ciditot>2 then cidi3pl=1; else cidi3pl=0;
```

```
if ciditot>4 then cidi5pl=1; else cidi5pl=0;
run;
```

AHEAD: WAVE 1

```
*Note that AHEAD Wave 1 included 9 CES-D items total. In this program, only the 8 that are used in
the following waves are processed. If comparability over time is not an issue, the analyst can modify this
program to process the additional CES-D item;

libname c 'c:\your directory';
data c.yourname;
set c.rawdata;

*Use variables from the tracker file (ELIGIBLE, BPROXY) to select only age-eligible self-respondents
(not proxy). Note that ELIGIBLE=2 indicates age-eligible AHEAD respondents (rather than
ELIGIBLE=1 for HRS);

if eligible ne 2 then delete;
if bproxy ne 0 then delete;

*Create CES-D score;

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are
assigned a missing value for the total CES-D score. Individual analysts may want to use their own
imputation scheme for missing values;

array dep(8) v307--v312 v314-v316;
* count number of missing items from CES-D scale (8 total items in Wave 1);

a1miss=0;
do i=1 to 8;
  if dep(i) lt 1 then a1miss=a1miss+1;
end;

* Do CES-D score processing only for those not missing any items;

if a1miss=0 then do;

* for items that are not reverse-scored, change responses from 1=yes 5=no to 1=yes 0=no;
```

```
array dep2(6) v307--v310 v312 v315 v316;
do i=1 to 6;
   if dep2(i)=5 then dep2(i)=0;
end;

* for reverse-scored items (happy, enjoyed life), rescale 1=yes to 0, 5=no to 1;

if v311=1 then v311=0; if v311=5 then v311=1;
if v314=1 then v314=0; if v314=5 then v314=1;

*Total score is the sum of all eight items;

a1cesd=sum(of v307--v312 v314--v316);
end;
run;
```

AHEAD: WAVE 2

```
libname c ›c:\your directory=;
data c.yourname;
set c.rawdata;

*Use variables from the tracker file (ELIGIBLE, DPROXY) to select only age-eligible self-respondents
(not proxy). Note that ELIGIBLE=2 indicates age-eligible AHEAD respondents (rather than
ELIGIBLE=1 for HRS);

if eligible ne 2 then delete;
if q218 ne 1 then delete;          *At time of writing, DPROXY was not available. Use Q218;

*Create CES-D score;

*Handling missing values: for constructed variables, observations with any missing CES-D item(s) are
assigned a missing value for the total CES-D score. Individual analysts may want to use their own
imputation scheme for missing values;

array dep (8) q985--q1001;

*count number of missing items from CES-D scale (8 total items in Wave 2);
```

```
a2miss=0;
do i=1 to 8;
   if dep(i)>5 then a2miss=a2miss+1;
end;

*Do CES-D score processing only for those not missing any items;
if a2miss=0 then do;

* for items that are not reverse-scored, change responses from 1=yes 5=no to 1=yes 0=no;

array dep2 q985--q989 q993 q999 q1001;
do i=1 to 6;
    if dep2(i)=5 then dep2(i)=0;
end;

*for reverse-scored items (happy, enjoyed life), rescale 1=yes to 0, 5=no to 1;

if q991=1 then q991=0; if q991=5 then q991=1;
if q995=1 then q995=0; if q995=5 then q995=1;

*Total score is the sum of all eight items;

a2cesd=sum(of q985--q1001);
end;
```

***Create CIDI-SF for MDE score;**

```
**check to see whether R did not answer either screener question**;

if (q1006>5 or q1006=.) and (q1028>5 or q1028=.) then cidimiss=1;
 else cidimiss=0;

*if R volunteered on anti-dep, R is skipped to q1028 and then to end,
 so create indicators to use if desired;

if q1006=3 or q1028=3 then cidimeds=1; else cidimeds=0;

*Begin CIDI;
```

TECHNICAL APPENDIX: SAS CODE FOR CONSTRUCTED VARIABLES

*This code keeps track of symptoms separately for each stem question: DSYMP1-7 for the Depression stem and ASYMP1-7 for the Anhedonia (loss of interest) stem. Finally, SYMP1-7 is the number of symptoms regardless of which screener question was endorsed. This level of detail is not needed for all analyses and the program can be modified if desired by the analyst;

```
array symps (21) dsymp1-dsymp7 asymp1-asymp7 symp1-symp7;

*Initialize symptom variables;

do i=1 to 21;
   if cidimiss=0 then symps(i)=0;
end;

*Check first stem question (d) for depression;

*To be counted as depression, R must say yes to Q1006 (Have you been depressed for 2-wk period) and must answer 1 or 2 to Q1007 (most or all of the day), and must answer 1 or 2 to Q1008 (most or all the days during 2-wk period). If this is the case, R is asked further about symptoms. If any of these conditions are not met, R is skipped to Anhedonia stem question;

if q1006=1 and (q1007=1 or q1007=2) and (q1008=1 or q1008=2) then do;

*Create indicators for each of the 7 symptoms: 1 if yes, 0 otherwise;
   * Create an indicator variable that R went through (d) screen;

    sfd=1;

   *Lost interest in things (anhedonia);

    if q1009=1 then dsymp1=1;

   *Felt tired;

    if q1010=1 then dsymp2=1;

   *Change in appetite (increase or decrease);
    if (q1011=1 or q1012=1) then dsymp3=1;

   *Trouble sleeping for nearly every night or every night;
```

```
     if (q1014=1 or q1014=2) then dsymp4=1;

    *Trouble concentrating;

     if q1015=1 then dsymp5=1;

    *Feeling down on self;

     if q1016=1 then dsymp6=1;

    *Thoughts of death;

     if q1017=1 then dsymp7=1;
end;
```

*Check second stem question if no to first, (a)--for anhedonia. This second stem is only asked of those R who did not answer symptom questions under stem 1 depression (i.e., sfd=0). To be counted as having significant loss of interest (anhedonia), R must say yes to Q1028 (have you lost interest in things for 2-wk period), and must answer 1 or 2 to Q1029 (most or all of the day), and must answer 1 or 2 to Q1030 (most or all days during 2-wk period). If this is the case R is asked about further symptoms. If this is not the case, R is skipped to the next section of the interview;

```
if sfd=0 and q1028=1 and (q1029=1 or q1029=2) and (q1030=1 or q1030=2)
  then do;

*Create indicators for each of the 7 symptoms: 1 if yes, 0 otherwise;

*Felt tired;

     if q1031=1 then asymp2=1;

    *Change in appetite (increase or decrease);

     if (q1032=1 or q1033=1) then asymp3=1;

    *Trouble sleeping for nearly every night or every night;
     if (q1035=1 or q1035=2) then asymp4=1;

    *Trouble concentrating;
```

```
    if q1036=1 then asymp5=1;

   *Feeling down on self;

    if q1037=1 then asymp6=1;

   *Thoughts of death;

    if q1038=1 then asymp7=1;
end;

*Create variable indicating symptom regardless of stem question (i.e. one "felt tired" variable which is
equal to 1 if R endorsed "felt tired" under the Depression stem or the Anhedonia stem).  Do this by
summing corresponding symptoms from each stem question (i.e. SYMP1= DSYMP1+ASYMP1, etc.)
 These are the SYMP1 to SYMP7 variables.

do i=1 to 7;
 symps(i+14)=symps(i)+symps(i+7);
end;

*Create the total CIDI score by summing symptoms 1 through 7;

ciditot=sum (of symp1-symp7);

*Create two dichotomous variables for suggested cut points of A3 or more symptoms@ (cidi3pl) and A5
or more symptoms@ (cidi5pl);

if ciditot>2 then cidi3pl=1; else cidi3pl=0;
if ciditot>4 then cidi5pl=1; else cidi5pl=0;

run;
```