

Development, Reliability, and Validity of the Expectations Regarding Aging (ERA-38) Survey

Catherine A. Sarkisian, MD, MSPH,¹ Ron D. Hays, PhD,² Sandra Berry, MS,³
and Carol M. Mangione, MD, MSPH²

Purpose: To develop a reliable and valid instrument to measure older adults' expectations regarding aging. **Design and Methods:** Using focus groups, cognitive interviews, and multitrait scaling analysis, we developed a 38-item survey to measure expectations regarding aging (ERA-38). The survey consisted of 10 scales, each representing a domain of expectations. We mailed the survey to 588 English-speaking patients aged 65 years and older cared for by University of California, Los Angeles-affiliated physicians. **Results:** Four hundred twenty-nine participants (73%) completed the survey. The mean age was 76 years; 54% were women. Most were White (76%). All scales other than Pain demonstrated good internal consistency reliability ($\alpha \geq .73$) and item discrimination ($\geq .80$). Sixty-eight percent of respondents stated that all or most of the ERA-38 addressed things that were important. Construct validity was supported by correlations with age, activities of daily living, the Medical Outcomes Study Short Form-12 physical and mental component scores, and the Geriatric Depression Scale. **Implications:** Considerable support for the reliability and construct validity of the ERA-38 was obtained in this field study of 429 older adults. This instrument should be useful to investigators interested in measuring expectations regarding aging among older adults.

Key Words: Successful aging, Psychometrics, Quality of life, Expectations

Over 2 decades ago, Kart (1981, p. 78) stated, "Overattribution of symptoms to the aging process directs the attention of the elderly person away from real disease and/or environmental factors that may affect health. Such misattributions may have tragic consequences." Subsequently, multiple researchers have empirically demonstrated that older adults do frequently attribute health conditions to old age (Ettinger et al., 1994; Keller, Leventhal, Prohaska, & Leventhal, 1989; Sarkisian, Liu, Ensrud, Stone, & Mangione, 2001; Williamson & Fried, 1996). Attributing health conditions to aging has also been associated with greater acceptance of illness symptoms (Leventhal & Prohaska, 1986), delays in seeking treatment (Prohaska, Keller, Leventhal, & Leventhal, 1987), less use of preventive health measures (J. A. Goodwin, Black, & Satish, 1999), and increased mortality (Rakowski & Hickey, 1992). These findings lend support to Kart's argument that, in some circumstances, attributing health problems to aging may lead to worse health outcomes.

Although there remains a lack of consensus among the scientific community on the extent to which age-associated health problems should be considered part of aging (Blumenthal, 1993; J. S. Goodwin, 1991; McCue, 1995), the definition of what constitutes "normal" aging has shifted markedly during the past 25 years (Solomon, 1999). In a landmark paper in 1987, Rowe and Kahn pointed out that many of the age-related changes that physicians and society regard as normal aging are preventable; they promoted the model of "successful" aging as an alternative to "usual" aging. This notion of successful aging is closely linked to health promotion and disease prevention, in that the patient needs to play an active role to avoid physiologic decline and thus enjoy maintenance of full function as nearly as possible to the end of life (Rowe & Kahn, 1997). A number of important longitudinal studies have identified characteristics associated with successful aging (Palmore, 1979; Roos & Havens, 1991; Rowe & Kahn, 1994; Strawbridge,

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Address correspondence to Catherine A. Sarkisian, Department of Medicine, Division of Geriatrics, University of California, Los Angeles, 10945 Le Conte Avenue, Suite 2339, Los Angeles, CA 90095-1687. E-mail: csarkisian@mednet.ucla.edu

Divisions of ¹Geriatrics and ²General Internal Medicine and Health Services Research, Department of Medicine, University of California, Los Angeles.

³RAND Health Program, Santa Monica, CA.

Cohen, Shema, & Kaplan, 1996); designing and testing interventions to help older adults achieve successful aging is an area of active research (Larson, 1997).

As the medical research community progresses on its quest to help older adults achieve successful aging, understanding the extent to which older adults themselves expect to achieve and maintain high levels of physical and mental function is critical. If older adults feel that health problems are an expected part of aging, they may be less willing to engage in the self-care and health-promoting behaviors that make successful aging possible. For example, given that fatalistic health beliefs have been associated with delays in treatment seeking and lower rates of preventive care, having low expectations regarding aging may cause older adults to seek less health care for modifiable conditions such as depression and pain. If this is true, changing older adults' expectations regarding aging may have the potential to greatly increase the number of older adults receiving care for these and other undertreated conditions that have a negative impact on the quality of life of older adults. Simply knowing that a person has low expectations regarding aging is not useful in itself, however: For some older adults with immovable health conditions, having low expectations regarding aging may reflect a realistic coping mechanism (Calman, 1984; Clark, 1995; Keller et al., 1989), and intervening to change expectations would be unwarranted. Elucidating the complex relationship between expectations regarding aging, health, and health care is therefore of critical importance to patients, clinicians, and policymakers interested in establishing goals of care that will most enhance the quality of life of older adults.

We hypothesized that there is a hierarchy of expectations regarding aging. Because old age itself strongly correlates with attributing new disability and medical conditions to old age (Sarkisian, Liu, et al., 2001; Williamson & Fried, 1996), we hypothesized that expectations regarding aging would negatively correlate with age itself, so that older patients would have lower expectations regarding aging. In addition, we hypothesized that expectations regarding aging would have moderate (between .3 and .5; Cohen, 1992) correlations with traditional measures of health-related quality of life (HRQL). Our hypothesis that expectations regarding aging would have moderate correlations with HRQL was based on the well-described phenomenon that as health status worsens, people lower the standard by which they rate their own health (Calman, 1984; Pearlman & Uhlmann, 1988). Likewise, we hypothesized that expectations regarding aging would have moderate negative correlations (between $-.3$ and $-.5$) with level of medical comorbidity and geriatric depression.

A valid instrument measuring older adults' expectations regarding aging would allow clinical researchers to rigorously examine the relationship between expectations regarding aging, health behaviors, service use, and subsequent health. Specifically, the instrument could be used to determine whether and in which circumstances having low expectations regarding aging contributes to older adults missing out on important

health care. To this end, this report describes the development and psychometric assessment of a self-administered instrument to measure expectations regarding aging among older adults.

Methods

Participants

We collected data from community-residing older adults cared for by primary care physicians affiliated with the University of California, Los Angeles (UCLA). First, we sent letters to all 78 full-time clinicians in the UCLA Divisions of General Internal Medicine and Geriatrics, asking them to participate in a study to measure expectations regarding aging. Of the 43 physicians who volunteered to participate, we selected 20 from seven different clinical settings in the greater Los Angeles region. Physicians were nonrandomly selected on the basis of the sociodemographic characteristics of the patients served by their community practice in order to maximize the sample's diversity. For each selected physician, we identified a random sample of 40 of his or her patients aged 65 or greater by physically pulling every 20th chart from the physician's alphabetized files, starting at a computer-generated random letter of the alphabet. Because 2 of the physicians used an administrative system that differed from the others, we were unable to identify a random sample of their patients; therefore, these 2 physicians did not participate and were replaced to keep the number of participating physicians at 20. We then presented each participating physician with a list of his or her 40 potentially eligible patients and asked the physician to exclude those who were (a) not his or her patient, (b) deceased, (c) living in an institution, (d) non-English speaking, and/or (e) too medically ill or cognitively impaired to be able to complete a 30-min self-administered survey. Exclusion rates varied from 3% to 60%. The most common exclusion criteria cited was dementia, and the 3 participating geriatricians had the highest exclusion rates. Remaining eligible patient participants ($n = 588$ out of 800) were sent a signed letter from their physician inviting them to participate in the study by completing the survey enclosed with the letter. All participating patients provided signed documentation of informed consent, which was mailed back to the investigators along with the completed survey.

Survey Development

We conducted six one-on-one in-depth qualitative interviews and seven focus groups of older adults and physicians to identify the appropriate content for a survey to measure expectations regarding aging. There were 38 participants in the older adult focus groups; 37% were African American; mean age was 78; and 45% reported inability to carry out one or more instrumental activities of daily living (Lawton & Brody, 1969). Focus group details are reported elsewhere (Sarkisian, Hays, Berry, & Mangione,

2001). Qualitative content analysis of the focus group transcripts identified 26 domains of expectations regarding aging. We used the content from these focus groups to construct a survey based on these 26 domains; items in the survey were created using the exact language used by older adults whenever possible.

Early draft items using different types of response sets were pretested by using cognitive interviewing techniques of concurrent think-aloud interviews and follow-up probe questions with older adults waiting to see their physicians. Cognitive interviewing is effective in identifying problems with survey items and possible revisions to improve the clarity of the wording (Jobe & Mingay, 1990). For example, respondents were asked to explain in their own words what they thought each item was asking and to say what they were thinking as they answered. On the basis of the pretests, the measure was modified in an iterative fashion and constructed to include a series of statements describing expectations regarding aging, followed by a 4-point definitely true/somewhat true/somewhat false/definitely false response set (see Appendix). Approximately half of the items asked participants to think about their expectations for their own aging; the other half asked participants to think about their expectations for aging of older adults in general.

A 94-item version of the survey was administered in a pilot test to 58 older adults in two senior centers. We examined the frequencies of responses to each item of the pilot test and eliminated items with many missing responses and those at the extremes of the distribution. We performed preliminary multitrait scaling analysis (Hays & Wang, 1992) of the pilot data to evaluate item convergence and discrimination. In multitrait scaling analysis, item-scale correlations are examined to determine if each item correlates more highly with its hypothesized scale (corrected for item overlap with the scale) than with the other scales. We eliminated items with low correlations with their hypothesized scale (domain) and combined scales with poor item discrimination. (Pilot test data are not reported here, but are available on request.)

The revised 56-item instrument was subsequently mailed to the sample of 588 potential participants as described above. We repeated multitrait scaling analysis on the data from the sample described above in order to select final items and scales. Specifically, we eliminated 2 items with high ceiling effects ($\geq 90\%$ of sample responded definitely true or somewhat true), 2 items with correlations less than .30 with their hypothesized scale (the cutpoint used in the Medical Outcomes Study; Stewart, Hays, & Ware, 1992), 8 redundant items that overlapped with items having higher item-scale correlations, and 6 items that correlated weakly with all scales. Several scales were collapsed due to weak item discrimination: Most notably, items derived from the focus group domains of life satisfaction, loneliness, happiness, depression, anxiety, emotional well-being, and grief were collapsed into a single mental health scale. The scale representing physical function was split into 2 scales—General Health and Fatigue. The resulting final in-

strument consisted of 38 items, defining 10 scales: General Health (5 items), Cognitive Function (4 items), Mental Health (12 items), Functional Independence (5 items), Sexual Function (2 items), Pain (2 items), Sleep (2 items), Fatigue (4 items), Urinary Incontinence (1 item), and Appearance (1 item). Although respondents completed the 56-item Expectations Regarding Aging (ERA) instrument, because our goal was to create a survey that would be useful to investigators interested in measuring expectations regarding aging, we conducted all subsequent psychometric analyses on the 38-item ERA survey.

Data Collection

To measure potential demographic, medical, and psychosocial correlates of expectations regarding aging, we administered several other items to study participants in the same mailing as the ERA survey. These included (a) seven sociodemographic items, (b) the Medical Outcomes Study Short Form-12 (SF-12; Ware, Kosinski, & Keller, 1996), (c) 13 questions assessing ability to independently carry out basic and instrumental activities of daily living (ADLs; S. Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963; Lawton & Brody, 1969), (d) the Charlson Comorbidity Scale modified for self-administration (J. N. Katz, Chang, Sangha, Fossel, & Bates, 1996), and (e) the five-item Geriatric Depression Scale (GDS; Hoyle et al., 1999). Finally, to assess the content validity of the ERA-38, we asked participants a series of cognitive debriefing items about whether they felt the questions on the survey addressed things that were important to them personally.

Analysis

Mean scores for the ERA-38 as well as for each scale were transformed linearly to a 0–100 possible range, with lower scores more consistent with expecting decline in health and functional status and higher scores more consistent with expecting aspects of the Rowe and Kahn (1997) model of successful aging. For missing items, we used the “hot deck” method of imputation, in which missing ERA-38 items were replaced with a response from a randomly selected respondent matched on age (younger than 70, 70–74.9, 75–80, older than 80), gender, and depression status (scoring ≤ 2 on the 5-item GDS; Little & Rubin, 1987; StataCorp., 2001). We calculated the mean, median, standard deviation, range, and percentage of participants scoring the minimum (floor) and maximum (ceiling) for each item and scale. Internal consistency reliability was estimated for each scale and for the 38-item instrument overall using Cronbach’s coefficient alpha (Cronbach, 1951). For each scale, we evaluated item discrimination by calculating the mean percentage of times that items in the scale correlated significantly higher ($p < .05$) with the scale total than with any of the other scales.

Content validity assesses how well a measure represents the construct of interest (Hays, Anderson, & Revicki, 1998). The methodology used in the focus

group and cognitive interview phase of this investigation was selected to maximize the content validity of the questionnaire for older adults with and without several different medical conditions and with varying sociodemographic characteristics. To further assess the content validity of the ERA-38, we examined responses to the cognitive debriefing items described above.

Construct validity is the extent to which a measure “behaves” in a way that is consistent with hypotheses concerning the phenomenon of interest. Because we are not aware of any other published instruments designed to specifically measure older persons’ expectations regarding aging, it was not possible to compare the ERA-38 with another measure of expectations regarding aging. Instead, we examined the associations among the ERA-38 scale scores, as well as correlations of these scales and the total ERA-38 score with self-reported health indicators of successful aging as described below.

Responses to the SF-12 were used to compute a Physical Component Summary (PCS-12) score and a Mental Component Summary (MCS-12) score, using standardized weights based on a mean of 50 and a standard deviation of 10 in the general U.S. population, with higher scores indicating better health status (Ware, Kosinski, & Keller, 1995). We calculated the total number of ADLs (out of a possible 13) that participants reported they were able to carry out without assistance and the total number of comorbidities reported on the modified Katz-Charlson (J. N. Katz et al., 1996) comorbidity questionnaire. We calculated the percentage of participants who scored 2 or greater on the five-item GDS because this cutpoint has a sensitivity of 97% and a specificity of 85% for detecting clinical depression (Hoyl et al., 1999).

As described in the introduction, we hypothesized that the ERA-38 would correlate moderately with age, HRQL, medical comorbidity, and depression. We also hypothesized that the ERA Functional Independence scale would show the strongest association with the ADLs, the PCS-12, and medical comorbidity, and the ERA Mental Health scale would show the strongest correlations with the MCS-12 and the GDS scores. To examine our hypotheses and thereby assess the construct validity of the instrument, we measured the correlations between total ERA-38 score and each of the following measures: age, number of ADLs participants were able to carry out without assistance, PCS-12 score, MCS-12 score, number of medical comorbidities, and GDS score. We also examined the correlations between these measures and the ERA-38 Functional Independence and Mental Health scales.

To determine whether the ERA-38 is sensitive to differences in age, HRQL, and comorbidity, we conducted *t* tests of extreme groups. We compared the ERA-38 scores from (a) participants aged older than 85 years with those of patients aged younger than 70 years, (b) participants unable to complete three or more of the ADLs with those independent in all ADLs, (c) participants with the lowest quartile of PCS-12 and MCS-12 scores with those with the high-

est quartile of PCS-12 and MCS-12 scores, and (d) participants reporting more than four medical conditions with those reporting no medical conditions. We selected three or more ADLs and four or more comorbidities as cutpoints for the extreme groups on the basis of the distribution of the data (16% and 11% of the sample in each category, respectively) as well as the face validity of these cutpoints as meaningful in terms of burden of illness and disability on older adults. All analyses other than the imputations were conducted using SAS 8.0 (SAS Institute, 1999).

Results

Surveys were returned by 429 (73%) of eligible participants. The mean age was 76 years; 54% of participants were women. Most were White (76%), 8% were Latino, 6% were African American, and 5% were Asian American. More than half of the sample (56%) reported an annual income greater than \$40,000. The mean PCS-12 score was 42.7, and the mean MCS-12 score was 52.5. On average, participants reported 2.1 medical conditions. More than 22% of participants scored 2 or greater on the five-item GDS (this cutpoint has a sensitivity of 97% and a specificity of 85% for detecting clinical depression; Hoyl et al., 1999).

The scale with the greatest number of missing responses was the Sexual Function scale: 24 respondents (5.6%) left both items in this scale blank. The single-item Appearance scale was missing for 19 (4.4%), and the Urinary Incontinence scale was missing for 11 (2.6%) respondents. All seven of the remaining ERA-38 scales were missing for 2 or fewer respondents. The overall missing item rate was 3.8%. The ERA-38 had a Flesh-Kincaid reading level of grade 6.1 (Microsoft Word 2000, Redmond, WA).

Table 1 reports the descriptive statistics, internal consistency reliability estimates, and item discrimination rates of each of the 10 ERA-38 scales. Mean scores on the 10 scales ranged from 23.9 (Fatigue) to 67.4 (Urinary Incontinence). Standard deviations ranged from 18.3 (Fatigue) to 28.7 (Urinary Incontinence). Most of the scales were slightly positively skewed (range 0.06–0.80), with the exception of Urinary Incontinence, which was negatively skewed (–0.53). Eight of the 10 scales had at least some participants who scored the maximum (100) or minimum (0) possible score; no one scored 100 on General Health or 0 in Mental Health. Three of the scales demonstrated notable floor effects: 33% of respondents scored the minimum on Sexual Function, 25% scored the minimum on Pain, and 30% scored the minimum on Appearance.

With the exception of the Pain scale (Cronbach’s $\alpha = .58$), internal consistency reliability exceeded .73 for all scales. Item discrimination rates ranged from 44% (Pain) to 100% (Sexual Function and Sleep); again, the Pain scale’s poor performance was an outlier, as all other scales had item discrimination rates greater than or equal to 80%. No item correlated significantly higher with another scale than with its own.

Table 1. Descriptive Statistics, Reliability, and Item Discrimination of the Expectations Regarding Aging Survey

Scale/Domain	No. of Items	Mean Score ^a	Median Score ^a	SD	Skewness of Scale ^b	% Scoring Minimum	% Scoring Maximum	Internal Consistency ^c	Item Discrimination ^d
General health	5	27.1	26.7	20.3	0.61	12	0	.80	.80
Cognitive function	4	35.4	33.3	21.7	0.59	6	2	.80	.83
Mental health	12	53.4	52.8	19.5	0.06	0	1	.89	.97
Functional independence	5	40.6	40.0	20.2	0.43	3	1	.77	.82
Sexual function	2	26.9	33.3	24.7	0.80	33	3	.83	1.0
Pain	2	24.7	16.7	20.1	0.66	25	1	.58	.44
Sleep	2	43.2	33.3	26.1	0.35	8	5	.73	1.0
Fatigue	4	23.9	25.0	18.3	0.76	17	1	.79	.81
Urinary incontinence	1	67.4	66.7	28.7	-0.53	5	33	NA	1.0
Appearance	1	32.4	33.3	27.8	0.71	30	6	NA	1.0
Total score	38	39.6	38.6	15.8	0.41	0	0	.94	NA

^aPossible range 0 to 100, with lower scores more consistent with expecting decline in health and functional status and higher scores more consistent with the Rowe and Kahn (1997) model of successful aging.

^bUnbounded.

^cCronbach's coefficient alpha.

^dMean percentage of times that items in the scale correlated significantly higher with the scale total than with any of the other scales.

Table 2 presents the intercorrelations among the 10 scales. Because of the Pain scale's poor internal consistency reliability, its two items' correlations are reported individually. All correlations between scales (as well as the two Pain items) were significant ($p < .01$). The strongest correlation between scales was for General Health and Fatigue (.73); General Health also correlated strongly with Cognitive Function (.60), Mental Health (.60), Functional Independence (.57), and Pain Item 2 (.60). Pain Item 1 correlated strongly with Functional Independence (.56) and Fatigue (.50). The remaining scales—Sexual Function, Sleep, Urinary Incontinence, and Appearance—had correlations with other scales ranging from .12 (Urinary Incontinence with Appearance) to .50 (Sleep with Mental Health).

In cognitive debriefing, the majority (68%) of participants stated that *all or most* of the questions on the ERA-38 were about things that were important to them, and 69% stated that *all or most* of the questions were about things that were important for their physician to understand. Only 7 individuals (fewer than 2%) responded that they felt that *few or none* of the

questions were about things that were important, either to themselves or to their physicians. Nineteen participants (4%) stated that they felt some of the questions were embarrassing or too personal; open-ended follow-up responses indicated that most of these were referring to the Sexual Functioning questions.

Table 3 shows the correlations between the ERA-38 and the other constructs we hypothesized would be associated with expectations regarding aging. As hypothesized, the total ERA-38 score correlated significantly with greater ability to carry out ADLs (.19) and higher PCS-12 (.27) and MCS-12 (.35) scores. Of note, the correlations with ADLs and PCS-12 scores were of slightly smaller magnitude than hypothesized. Consistent with our hypotheses, the total ERA-38 score had significant negative correlations with the number of medical comorbidities (-.09), depressive symptoms (-.33), and age (-.24), but the association with medical comorbidity was smaller than hypothesized. The Mental Health scale correlated most strongly with the MCS-12 (.40) and with depressive symptoms (-.40). The Functional Independence scale correlated most strongly with the PCS-12 (.32);

Table 2. Correlations Among Expectations Regarding Aging (ERA-38) Survey Scales

Scale	1	2	3	4	5	6	7	8	9	10	11
1. General health	—										
2. Cognitive function	.60	—									
3. Mental health	.60	.54	—								
4. Functional independence	.57	.45	.59	—							
5. Sexual function	.46	.35	.44	.34	—						
6. Pain item 1 ^a	.48	.36	.43	.56	.27	—					
7. Pain item 2 ^a	.60	.45	.41	.44	.31	.41	—				
8. Sleep	.41	.39	.50	.30	.34	.27	.27	—			
9. Fatigue	.73	.58	.58	.56	.41	.50	.58	.39	—		
10. Urinary incontinence	.42	.36	.39	.29	.19	.22	.27	.21	.35	—	
11. Appearance	.44	.28	.45	.41	.31	.29	.18	.31	.32	.12	—

Note: Pearson product-moment coefficients, $p < .01$ for all.

^aBecause the two-item pain scale internal consistency reliability was only 0.58, each pain item is reported individually.

Table 3. Correlations of Expectations Regarding Aging (ERA-38) Survey With Hypothesized Constructs (Pearson Product-Moment Coefficients)

Construct	Total ERA-38 Score	General Health Scale	Mental Health Scale	Functional Independence Scale
Activities of daily living	.19**	.10*	.20**	.20**
Physical Component Summary-12	.27**	.15*	.25**	.32**
Mental Component Summary-12	.35**	.23**	.40**	.30**
Comorbidities	-.09*	-.03*	-.11*	<i>ns</i>
Depressive symptoms	-.33**	-.20**	-.40**	-.28**
Age	-.24**	-.19**	-.20**	-.14**

* $p \leq .05$; ** $p < .001$.

Functional Independence also correlated with the MCS-12 and inversely with depressive symptoms. Of note, the Functional Independence scale did not correlate with number of medical comorbidities.

Table 4 shows the results of the tests of comparison of ERA-38 scores between extreme groups. As illustrated, participants older than 85 years scored lower than those younger than 70 years (31.9 vs 43.3, $p = .0002$), participants with inability to conduct three or more ADLs scored lower than those without any ADL impairment (30.6 vs 41.8, $p < .0001$), participants in the lowest quartile of PCS-12 scores had lower ERA-38 scores than those in the highest quartile (34.0 vs 46.3, $p < .0001$), and participants scoring in the lowest quartile of the MCS-12 had lower ERA-38 scores than those in the highest quartile (30.3 vs 42.8, $p < .0001$). There was no statistically significant difference in the ERA-38 scores between participants with four or more medical comorbidities and those reporting no comorbidities.

Table 4. Comparison of Expectations Regarding Aging (ERA-38) Survey Scores Between Extreme Groups

Construct	Total ERA-38 Score	p value ^a
Age		.0002
>85 ($n = 47$)	31.9	
<70 ($n = 102$)	43.3	
Activities of Daily Living		<.0001
3 or more impairments ($n = 47$)	30.6	
No impairments ($n = 337$)	41.8	
Physical Component Summary-12 Score		<.0001
Lowest quartile ($n = 107$)	34.0	
Highest quartile ($n = 109$)	46.3	
Mental Component Summary-12 Score		<.0001
Lowest quartile ($n = 107$)	30.3	
Highest quartile ($n = 111$)	42.8	
Medical Comorbidity		.2996
4 or more ($n = 68$)	36.7	
None ($n = 64$)	39.4	

^aUsing two-sided t tests.

Discussion

The ERA-38 is a new survey whose purpose is to measure expectations regarding aging. In this field test among community-residing older adults, the ERA-38 demonstrated adequate internal consistency reliability for group-level comparison and had evidence of content and construct validity. The instrument required on average less than 15 min to administer and item-level missing data rates were low. These findings suggest that the ERA-38 successfully captures a newly identified construct and may be useful to investigators wishing to measure expectations regarding aging in other studies.

With the exception of the Pain scale, internal consistency reliability coefficients (Cronbach's alpha) for all scales exceeded the .70 reliability standard for group comparisons (Nunnally & Bernstein, 1994). Item discrimination across scales was good, with all scales other than Pain having at least 80% of items correlating significantly better with their own scale than with any others. Because pain is consistently found to be an important element of older adults' quality of life (Helme & Gibson, 1997) and because this theme was expressed in our focus groups, we retained these items despite their relatively poor internal consistency reliability and item discrimination. Nevertheless, our attempt to create a reliable Pain scale failed, and researchers planning on using this instrument should be aware that the Pain scale lacks adequate reliability to be used on its own.

For the most part, our tests of construct validity were consistent with our a priori hypotheses regarding constructs related to expectations regarding aging. As we hypothesized, ERA-38 scores correlated moderately with PCS-12 and MCS-12 scores and inversely with GDS scores and age. The tests of extreme groups provide further evidence of construct validity: Scores differed significantly in the direction we hypothesized between participants in extreme groups of age, ADL level, PCS-12 and MCS-12 score, and GDS score. The construct validity of the scales was strongly supported, with the Mental Health scale correlating most strongly with the MCS-12 and the GDS and the Functional Independence scale correlating most strongly with the PCS-12. Only our hypothesis regarding comorbidity was not supported, as the correlation between comorbidity and ERA-38 score was smaller than we hypothesized ($-.09$), and there was no statistically significant difference in the ERA-38 scores between participants with four or more medical comorbidities and those reporting no comorbidities. There are two possibilities to explain these findings: (a) our self-reported measure of comorbidity failed to capture illness severity well enough to be able to discriminate between those with low and high comorbidity and (b) expectations regarding aging are not strongly related to comorbidity. We suspect a combination of the two factors. The Charlson comorbidity instrument was designed for use with hospitalized patients rather than with community-residing older adults and does not include many of the chronic

conditions older adults experience that may affect their expectations regarding aging, such as falling and urinary incontinence (Charlson, Pompei, Ales, & MacKenzie, 1987). It is also likely that, despite our original hypothesis that increasing comorbidity would cause patients to lower their expectations, expectations regarding aging may in truth be far more strongly influenced by functional status and the psychosocial components of health, such as depressive symptoms, social functioning, and emotional well-being. The extent to which this is true cannot be answered by this cross-sectional study but should be investigated in future longitudinal studies.

The ERA-38 did not correlate more than .35 with any of the measures of HRQL; therefore, it is likely that this instrument is capturing a unique construct that is related to, but different from, HRQL. Our previous focus group work and cognitive debriefing interviews provide evidence that this construct is expectations regarding aging.

This instrument is not the first to measure expectations among older adults: A body of research on late-life future temporal perspective subsumes some aspects of expectations regarding aging (Rakowski, 1984–1985). Specifically, 20 years ago Rakowski and colleagues developed an instrument to assess perceived future health by using a brief “life-graph” procedure using a 5-point scale ranging from excellent to poor (Rakowski & Hickey, 1981). We are unaware of any instrument, however, that focuses on expectations regarding aging per se, or that encompasses many of the physical and mental domains of successful aging. Most recent measures of patients’ expectations focus on patients’ expectations for medical care (Kravitz, 1996; Kravitz, Callahan, Azari, Antonius, & Lewis, 1997)—a fundamentally different construct from expectations regarding aging. It is also important to emphasize that the ERA-38 is fundamentally different from existing measures of attitudes toward aging, such as the Aging Semantic Differential (Rosenanz & McNevin, 1969) and the Maxwell-Sullivan Attitude Scale (Maxwell & Sullivan, 1980), which have proven valuable in identifying positive and negative attitudes toward older persons. Unlike these attitudinal scales, the ERA-38 is not designed to identify positive or negative attitudes toward older persons, but rather to quantify the extent to which older adults expect age-associated decline in 10 different domains. The extent to which the ERA-38 correlates with future temporal perspective, expectations regarding medical care, and attitudes toward older persons should be investigated in future studies.

The greatest limitation to this study pertains to the sampling frame. Participants were recruited from a single geographic region of the country (greater Los Angeles), were all English speaking, and reported incomes higher on average than those found in population-based studies. Because participants were recruited through their physicians, and the physicians excluded many patients, the sample was biased toward older adults who seek regular medical care from academically affiliated physicians and toward those whom

physicians felt would be able to complete a survey. Future population-based studies should be conducted in order to determine the ERA-38’s psychometric performance in a larger, more representative sample. Also, as with any self-administered survey, although the response rate was excellent, response bias may have influenced the findings; it is likely that those who returned the survey were healthier and less depressed than those who did not, and they may have had higher expectations regarding aging. Participants were not asked to report their level of education; future studies using the ERA-38 should examine the relationship between education and expectations regarding aging.

It is important to point out that test–retest reliability was not examined in this study and should be conducted in future investigations before the measure is used to evaluate longitudinal change over time. It should also be noted that our use of the term *scale* to describe the two single-item domains of urinary incontinence and appearance is not entirely accurate; although we chose to keep these items on the basis of the strong content validity of these domains elicited in the focus groups, users of this instrument should be aware that these items lack sufficient reliability to be used on their own. Although the multitrait scaling results indicate that with the exception of Pain, all of the scales containing more than one item contained substantively different information, there were some high correlations among the scales. In particular, General Health and Fatigue shared 53% variance in common. Keeping this in mind, researchers using the ERA-38 should regard it as a measure that captures 10 correlated domains of expectations regarding aging.

Because all survey packets mailed to participants contained first the ERA survey, followed by the content validity items, SF-12, ADLs, and other instruments, there is a possibility of carry-over effects biasing responses to the instruments following the ERA survey. Because the content of many of the ERA items addresses age-related decline, it is plausible that respondents may have felt sad after completing these items, and this may have influenced their responses to the other instruments such as the SF-12 and the GDS. Future investigations using the ERA-38 should consider varying the order of simultaneous instruments to evaluate this possible source of bias. Likewise, psychometric assessment should be repeated on the 38-item instrument when it is administered on its own, not as part of the previous 56-item draft.

The length of the ERA-38 is on par with other health-related surveys used among older adults, such as the SF-36 (Walters, Munro, & Brazier, 2001; Ware, & Sherbourne, 1992). Although the ERA-38 should be useful to investigators interested in capturing a wide range of domains of expectations regarding aging, in the future, a shorter version of the ERA-38 could be developed that would be useful for inclusion in surveys in which expectations regarding aging are not a primary construct of interest. In addition, future studies should examine the performance of the ERA-38 among younger adults, as expectations regarding

aging may influence health behavior long before people become 65.

In conclusion, the ERA-38 is a new survey with adequate reliability and validity to measure expectations regarding aging. This survey should prove to be useful to investigators interested in measuring the influence of expectations regarding aging among older adults on other domains of health and patterns of health service use.

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Appendix

Expectations Regarding Aging Survey (ERA-38)

- This part of the survey has questions about what you expect about aging.
- Please check the **ONE** box to the right of the statement that best corresponds with how you feel about the statement. If you are not sure, go ahead and check the box that you think **BEST** corresponds with your feelings.

	Definitely True ▼	Somewhat True ▼	Somewhat False ▼	Definitely False ▼
1. When I get older I expect I will be able to do everything I want to.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
2. I expect that as I get older I will become more forgetful.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
3. I expect that as I get older it will become more difficult to do my daily activities.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
4. I expect that as I get older I will spend more time alone.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
5. I expect that as I get older I will spend less time with friends and family.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
6. I expect that as I get older I will have more aches and pains.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
7. I expect that as I get older I will not be able to work as well as I do now.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
8. I expect that as I get older I will get tired more quickly.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
9. I expect that as I get older I will enjoy my life.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
10. I expect that as I get older I will become more dependent on others.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
11. I expect that I will always be able to take care of myself.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
12. I expect that as I get older I will become less attractive.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
13. I expect that as I get older I will become lonelier.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
14. I expect that as I get older my quality of life will decrease.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
15. I expect that when I get older I will get depressed.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
16. I expect that as I get older my sexual desire will decrease.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
17. I expect that as I get older my body's ability to have sex will decrease.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
18. When I get older I expect I will have more trouble sleeping.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

The items below refer to older people in general.

- Please check the **ONE** box to the right of the statement that best corresponds with how you feel about the statement concerning **OLDER PEOPLE IN GENERAL**.
- If you are not sure, go ahead and check the box that you think **BEST** corresponds with your feelings.

	Definitely True ▼	Somewhat True ▼	Somewhat False ▼	Definitely False ▼
19. When people grow older, one thing or another is going to go wrong with their body.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
20. Part of aging is different parts of you are breaking down.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
21. When people get older, they need to lower their expectations of how healthy they can be.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
22. It's an accepted part of aging to have trouble remembering names.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
23. Forgetfulness is a natural occurrence just from growing old.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
24. It is impossible to escape the mental slowness that happens with aging.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
25. There isn't any way to escape the physical deterioration of aging.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
26. Age slows people down.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
27. The human body is like a car: when it gets old, it gets worn out.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
28. Having more aches and pains is an accepted part of aging.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
29. Decreased energy in older people is just part of nature taking its course.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
30. Every year that people age, their energy levels go down a little more.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
31. Needing to use adult diapers is just an expected part of getting old.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
32. Being lonely is just something that happens when people get old.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
33. Becoming more lonely is a natural part of the aging process.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
34. Old age is a time to enjoy life.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
35. Quality of life declines as people age.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
36. As people get older they worry more.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
37. It's normal to be depressed when you are old.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
38. It's a normal part of aging that older people have trouble sleeping.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

Scale	Items	Scale	Items
General Health	19, 20, 21, 25, 27	Pain	6 (Pain Item 1), 28 (Pain Item 2)
Cognitive Function	2, 22, 23, 24	Urinary Incontinence	31
Mental Health	4, 5, 9, 13, 14, 15, 32, 33, 34, 35, 36, 37	Sleep	18, 38
Functional Independence	1, 3, 7, 10, 11	Fatigue	8, 26, 29, 30
Sexual Function	16, 17	Appearance	12

Note: Items 1, 9, 11, and 34 need to be reversed prior to scoring.