

The Life Engagement Test: Assessing Purpose in Life

Michael F. Scheier,^{1,5} Carsten Wrosch,² Andrew Baum,³ Sheldon Cohen,⁴ Lynn M. Martire,³ Karen A. Matthews,³ Richard Schulz,³ and Bozena Zdaniuk³

Accepted for publication: December 01, 2005
Published online: March 24, 2006

This article describes a 6-item scale, the Life Engagement Test, designed to measure purpose in life, defined in terms of the extent to which a person engages in activities that are personally valued. Psychometric data are presented including information about the scale's factor structure, internal consistency, test-retest reliability, convergent validity, discriminant predictive validity, and norms. The data suggest that the Life Engagement Test is psychometrically sound across different gender, age, and ethnic groups and is appropriate for wider use. Discussion centers on the use of the Life Engagement Test in behavioral medicine and health psychology research and recent associations that have begun to emerge between the scale and health-relevant outcomes.

KEYWORDS: purpose in life; life engagement; assessment; factor structure; psychometrics.

Death has been defined as the absence of behavior (Kaplan, 1990). We agree that behavior is important for health and that it does go hand-in-hand with being alive. Some have even suggested that it is engagement in behavior that sustains life (Carver and Scheier, 1998). Given the central role that behavior plays in living, it is important to ask why people act. What is it that causes people to behave and remain engaged in what they do?

Recent models of behavioral self-regulation (Carver and Scheier, 1981, 1990, 1998), themselves descendents of generations of expectancy-value models of motivation (Atkinson, 1964; Vroom, 1964; Feather, 1982; Shah and Higgins, 1997), suggest that two elements are important in creating behavior: (a) the ability to identify goals that are valued and (b) the perception that those goals are attainable. Of these two elements, it is the value dimension that is of interest here. Valued goals are important because they provide a purpose for living. Valued goals also

provide the mechanism by which a person remains behaviorally engaged in life. According to this view, behavior occurs either because the behavior represents a valued goal in and of itself (e.g., exercising for exercise sake) or because it is instrumental in achieving a more abstract, higher order goal that is valued (e.g., exercising in order to be "healthy").

This brief report describes a new scale designed to measure purpose in life. It is our belief that purpose in life represents an important but overlooked psychosocial predictor of health outcomes. Life is full of situations in which desired activities must be abandoned—e.g., the person who still loves to work, but is forced to retire because of age; the carpenter who gets great satisfaction working with wood, but whose arthritis is so severe that he or she can no longer grip the required tools. In these contexts, the person must find alternative meaningful activities in which to engage. If new activities are not found, the person's life feels empty and is without purpose (cf. Wrosch *et al.*, 2003a). We believe that feeling states such as these will have important adverse effects on psychological and physical well-being (Wrosch *et al.*, 2003b).

Given that purpose in life might be useful to measure, why do we need a new scale? Are there not existing scales already available that would be

¹Department of Psychology, Carnegie Mellon University, Pittsburgh, Pennsylvania.

²Concordia University, Quebec.

³University of Pittsburgh, Pennsylvania.

⁴Carnegie Mellon University, Pennsylvania.

⁵To whom correspondence should be addressed e-mail: scheier@cmu.edu.

suitable for use? There are at least two reasons why a new scale is needed. First, existing scales are often time insensitive. For example, they might ask whether the person's life *has been filled* with purpose rather than asking whether the person *is currently experiencing* purpose in life. This makes it difficult to assess changes in purpose in life over time, which one might want to do, for example, in order to monitor changes that occur as someone progresses through the later stages of a degenerative or fatal disease.

Second, other scales often contain items that measure constructs in addition to purpose in life; e.g., items that measure life satisfaction, contentment, or meaning. Such confounding makes it difficult to determine which components contained within a scale are responsible for producing any associations that emerge. In this regard, construction of the current scale explicitly grew out of the theoretical framework provided by contemporary models of behavioral self-regulation. Because of this focus, we call our scale the Life Engagement Test, or LET. The intent of the scale is to provide an index of purpose in life by assessing the extent to which a person considers his or her activities to be valuable and important.

METHODS AND RESULTS

Scale Format, Instructions for Administration, and Scoring

The LET consists of six items (see Table I), three items framed in a positive direction (Items 2, 4, and 6) and three items framed in a negative direction (Items 1, 3, and 5). The following instructions are used to administer the scale: "Please answer the following questions about yourself by indicating the extent of your agreement using the following scale: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree. Be as honest as you can throughout, and try not to let your response to one question influence your response to other questions. There are no right or wrong answers."

The LET is scored in two steps. First, Items 1, 3, and 5 are reverse coded (5 = 1, 4 = 2, 3 = 3, 2 = 4, and 1 = 5). Second, the six items are summed.

Samples Used to Identify Psychometric Properties

Eight different samples were used to establish the psychometric properties of the LET. The first six samples were drawn from persons participating in one of the four main projects of the first phase

of the Pittsburgh Mind-Body Center. Sample 1 consisted of community-dwelling men and women participating in a study on infectious disease. Samples 2 and 3 consisted of female osteoarthritis patients and their male spouses, respectively, participating in a study of psychosocial factors in adjustment to osteoarthritis. Sample 4 consisted of a group of women participating in a study examining changes in cardiovascular risk factors as a function of undergoing transition through the menopause. Samples 5 and 6 consisted of early and late stage breast cancer patients, respectively, participating in a study of adjustment to breast cancer. Samples 7 and 8 consisted of college undergraduates. Table II presents basic demographic data for these various samples.

Factor Structure

To examine the factor structure of the LET, we conducted exploratory factor analyses across the different samples (using principal component analyses with varimax rotation and Kaiser normalization, retaining factors with Eigen values >1). The results of these factor analyses revealed a one-factor solution for all samples, which accounted for between 43% and 62% of the variance among the items. The factor loadings of the six items of the LET are reported in Table I. As can be seen, we obtained high factor loadings for all of the items of the LET, ranging across samples from .57 to .86, averaging .71.

Scale Norms and Internal Consistency

Table III displays the means, standard deviations, and reliability coefficients of the LET across the eight samples. We obtained acceptable Cronbach's alphas in all cases, ranging between .72 and .87, averaging .80. Although the means across the samples were close in value, given the sample sizes, the variation among the sample means was significant, $F(7, 2244) = 6.17, p < .001$. Follow-up Tukey tests revealed that Sample 7 was significantly lower than Samples 1, 4, and 5. (The rest of the sample means did not differ.)

Gender, Age, and Ethnic Differences

To determine if there were any differences in the psychometric properties of the LET as a function of gender, age, or ethnicity, we reevaluated the scale's factor structure, norms, and reliability by

Table I. The Life Engagement Test: Items and Factor Loadings

Items of the life engagement test	Sample							
	1	2	3	4	5	6	7	8
1. There is not enough purpose in my life. (R) ^a	.76	.81	.72	.73	.78	.79	.74	.59
2. To me, the things I do are all worthwhile	.67	.67	.72	.70	.77	.85	.67	.60
3. Most of what I do seems trivial and unimportant to me. (R) ^a	.66	.78	.81	.80	.86	.90	.80	.70
4. I value my activities a lot	.66	.62	.73	.71	.81	.69	.69	.64
5. I don't care very much about the things I do. (R) ^a	.59	.72	.67	.76	.79	.85	.69	.71
6. I have lots of reasons for living	.57	.70	.58	.56	.69	.61	.63	.65

Note. Sample 1 = community-based sample of younger adults (*n*=193).

Sample 2 = female osteoarthritis patients (*n*=183).

Sample 3 = male spouses of osteoarthritis patients (*n*=168).

Sample 4 = community-based sample of middle-aged women (*n*=378).

Sample 5 = women with early stage breast cancer (*n*=198).

Sample 6 = women with late stage breast cancer (*n*=86).

Sample 7 = undergraduate students (*n*=359).

Sample 8 = undergraduate students (*n*=511).

^aNegatively formulated items were reverse scored.

stratifying across all samples (as the availability of identifying data allowed) first by gender, then by age (trichotomized into tertiles), and finally by ethnicity (Caucasian versus African American, the only ethnic group for which a meaningful amount of data were available). The same one-factor solution emerged in all of the subanalyses conducted. Cronbach's alphas were also acceptable in all subgroups (ranging from .73 to .83). There were no mean differences as a function of gender or age. African American partic-

ipants scored significantly higher on the LET than Caucasians (mean = 25.5 versus mean = 24.7, respectively, $t(1296) = -2.80, p < .01$), but the absolute amount of the difference in scores was relatively small (.84).

Test-Retest Reliability

To determine the test-retest reliability of the LET, the women in Samples 5 (*N* = 178) and 6

Table II. Characteristics of the Samples

	Sample							
	1	2	3	4	5	6	7	8
% Female	50.8	100	0	100	100	100	40.6	38.5
Average age in years	37	68	70	65	51	50	na ^a	na
Age range in years	21—55	49—86	47—90	60—69	26—78	27—69	na	na
% Married or living in marriage like relationship	48.2	92.3	100	71.09	63.10	66.3	na	na
% Caucasian	56.0	84.2	92.3	93.1	87.9	87.2	na	na
% African American	37.3	13.1	5.4	5.8	11.1	8.1	na	na

Note. Sample 1 = community-based sample of younger adults (*n*=193).

Sample 2 = female osteoarthritis patients (*n*=183).

Sample 3 = male spouses of osteoarthritis patients (*n*=168).

Sample 4 = community-based sample of middle-aged women (*n*=378).

Sample 5 = women with early stage breast cancer (*n*=198).

Sample 6 = women with late stage breast cancer (*n*=86).

Sample 7 = undergraduate students (*n*=359).

Sample 8 = undergraduate students (*n*=511).

^ana = not available.

Table III. The Life Engagement Test: Means, Standard Deviations (SD), and Cronbach's Alphas

	Sample							
	1	2	3	4	5	6	7	8
Mean (SD)	25.1 (3.6)	24.3 (3.9)	24.8 (3.4)	24.9 (3.4)	25.3 (3.7)	24.1 (4.0)	23.6 (3.7)	24.4 (2.8)
Cronbach's alpha	.73	.81	.80	.80	.87	.87	.79	.72

Note. Sample 1 = community-based sample of younger adults ($n = 193$).

Sample 2 = female osteoarthritis patients ($n = 183$).

Sample 3 = male spouses of osteoarthritis patients ($n = 168$).

Sample 4 = community-based sample of middle-aged women ($n = 378$).

Sample 5 = women with early stage breast cancer ($n = 198$).

Sample 6 = women with late stage breast cancer ($n = 86$).

Sample 7 = undergraduate students ($n = 359$).

Sample 8 = undergraduate students ($n = 511$).

($N = 62$) and a subset of the men and women in Samples 7 ($N = 55$) and 8 ($N = 61$) were administered the LET twice, approximately 4 months apart. The test-retest correlations ranged from .61 to .76, suggesting that the LET is moderately stable, at least over the period of several months.

Convergent Validity

To examine the convergent validity of the LET, we correlated the LET with a variety of other psychosocial measures, many of which have been associated with health-relevant outcomes in prior research. We also correlated the LET with several health-relevant variables directly. The attributes measured included perceived stress (Cohen *et al.*, 1983), self-mastery (Pearlin and Schooler, 1978), depressive symptoms [as assessed by either a 10-item abbreviated version (Andresen *et al.*, 1994) of the CES-D (Radloff, 1977) or by the Brief Symptom Inventory (Derogatis and Melisaratos, 1983)], optimism (Scheier *et al.*, 1994), life satisfaction (Diener *et al.*, 1985), self-esteem (Rosenberg, 1965), hostile affect (Cook and Medley, 1954), anger-in expression style (Spielberger *et al.*, 1985), emotional stability, extraversion, agreeableness, openness to experience, conscientiousness (all from Goldberg, 1992), general health, health-related physical and mental functioning (all from Ware and Sherbourne, 1992), marital adjustment (Locke and Wallace, 1959), anxiety, somaticism and hostility from the Brief Symptom Inventory (Derogatis and Melisaratos, 1983), perception of sleep efficiency (Buysse *et al.*, 1989), social network diversity (Cohen *et al.*, 1997), social network size (Cohen *et al.*, 1997), and perceptions of social support (Cohen *et al.*, 1985). Abbreviated versions of some of the assessment instruments were used to make the overall protocol length tolerable, with

item reduction based primarily on prior psychometric analyses (e.g., Barefoot *et al.*, 1989; for discussion of the general validity of using abbreviated scales, see Shrout and Yager, 1989).

Table IV presents the correlations between the LET and these different measures across the eight samples examined (note that not all samples got all measures, which explains why some of the cells have missing values). As can be seen in Table IV, the LET was widely correlated with the psychosocial and health-relevant variables that were assessed, in intuitively plausible directions. For example, significant positive associations emerged between the LET and optimism, life satisfaction, general health, and self-esteem, and significant negative correlations emerged between the LET and perceived stress, hostile attitudes, and depression. Moreover, the magnitude of the correlations suggest that the LET is related to these other factors, but not so highly related as to suggest that the constructs are the same.

We explicitly acknowledge that some of the correlations in Table IV are low; e.g., the correlations with reports of pain and sleep efficiency are somewhat lower than what might be expected. It is unclear why some of these correlations are low, but it may be that purpose in life has less of an impact on these particular aspects of functioning than it does on others. A definitive answer to this question, however, will have to await further research.

Discriminant Predictive Validity

The LET was specifically designed to assess purpose in life by assessing the extent to which people engaged in activities that they found valuable and significant. We focused the LET in this way because we believe it is this aspect of purpose in life

Table IV. Convergent Validity: Correlations Between the Life Engagement Test and the Other Psychosocial Factors

	Correlation with the Life Engagement Test							
	Sample							
	1	2	3	4	5	6	7	8
1. Optimism	.39**	.43**	.41**	.54**	.61**	.51**	.54**	.48**
2. Self-mastery	.52**	.55**	.43**	.46**	.53**	.63**	—	—
3. Self-esteem	.44**	.48**	.43**	.48**	.61**	.53**	—	—
4. Hostile affect	-.33**	-.22**	-.33**	-.17**	-.36**	-.21	—	—
5. Anger-in	-.32**	-.42**	-.40**	-.26**	-.29**	-.39**	—	—
6. Emotional stability	.34**	.40**	.36**	.24**	.48**	.30**	.28**	—
7. Extraversion	.25**	.20**	.19*	.24**	.31**	.48**	.31**	—
8. Agreeableness	.32**	.28**	.43**	.09	.34**	.25*	.30**	—
9. Openness	.23**	.21**	.24**	.29**	.29**	.41**	.39**	—
10. Conscientiousness	.32**	.34**	.30**	.17**	.31**	.12	.32**	—
11. Physical Functioning	—	—	—	.07	.18**	.32**	—	—
12. Social Functioning	—	—	—	.47**	.26**	.28**	—	—
13. Role Disruption — Physical Health	—	—	—	.24**	.15*	.31**	—	—
14. Role Disruption — Emotional Health	—	—	—	.19**	.35**	.42**	—	—
15. Mental Health	—	—	—	.32**	.49**	.44**	—	—
16. Vitality	—	—	—	.43**	.32**	.34**	—	—
17. Pain	—	—	—	.29**	.12	.21*	—	—
18. General Health	—	—	—	.34**	.38**	.30**	—	—
19. Social support	.40**	.39**	.53**	.39**	.50**	.46**	—	—
20. Social network size	.32**	.37**	.30**	.26**	.29**	.22*	—	—
21. Social network diversity	.27**	.29**	.27**	.18**	.31**	.24*	—	—
22. Marital adjustment	.26**	.25**	.40**	.28**	.48**	.35**	—	—
23. Depression (CES-D derived)	-.33**	-.49**	-.45**	-.49**	-.42**	-.47**	—	—
24. Perceived stress	-.44**	-.51**	-.49**	-.44**	-.44**	-.52**	—	—
25. Satisfaction with life	.36**	.50**	.34**	.44**	.58**	.51**	—	—
26. Sleep efficiency	-.14	.12	.27**	.19**	.06	.09	—	—
27. Depressive symptomatology (BSI derived)	—	—	—	—	—	—	—	-.36**
28. Anxiety (BSI derived)	—	—	—	—	—	—	—	-.19**
29. Somaticism (BSI derived)	—	—	—	—	—	—	—	-.16**
30. Hostility (BSI derived)	—	—	—	—	—	—	—	-.20**

Note. Sample 1 = community-based sample of younger adults ($n = 193$).

Sample 2 = female osteoarthritis patients ($n = 183$).

Sample 3 = male spouses of osteoarthritis patients ($n = 168$).

Sample 4 = community-based sample of middle-aged women ($n = 378$).

Sample 5 = women with early stage breast cancer ($n = 198$).

Sample 6 = women with late stage breast cancer ($n = 86$).

Sample 7 = undergraduate students ($n = 359$).

Sample 8 = undergraduate students ($n = 511$).

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

that is critical to defining the construct. To determine the central role played by this aspect of life purpose, we administered the LET and another commonly used measure of purpose in life, the 9-item version of Ryff's (Ryff, 1989) Purpose in Life Scale

to a new sample, to determine which purpose in life scale provided the better prediction of subjective well-being. In that the Purpose in Life Scale has some of the same limitations as other existing purpose in life scales, e.g., the presence of items

Table V. Zero-Order Correlations and Partial Correlations Between the Life Engagement Test, Ryff's (Ryff, 1989) Purpose in Life Scale, and Indicators of Subjective Well-Being

Subjective well-being	Zero-order correlations		Partial correlations	
	LET	PILS	LET	PILS
Life satisfaction	.51**	.44**	.31**	.11
Self-esteem	.59**	.49**	.38**	.11
Self-mastery	.47**	.46**	.23**	.18*
Positive affect	.59**	.60**	.27**	.31**
Negative affect	-.28**	-.16*	-.24**	.06
Depressive symptomatology	-.42**	-.37**	-.23**	-.10
Perceived stress	-.46**	-.33**	-.33**	.01

Note. LET = Life Engagement Test and PILS = Purpose in Life Scale. The partial correlations between the Life Engagement Test and the indicators of subjective well-being were controlled for the Purpose in Life Scale, and vice versa.

** $p < .01$; * $p < .05$.

measuring related constructs and the framing of items in a way that makes it hard to assess changes in purpose in life over time, we expected that the LET would be a better predictor of well-being than would the Purpose in Life Scale. The sample studied (separate from the eight samples described previously) consisted of 137 undergraduates and the subjective well-being indicators included life satisfaction (Diener *et al.*, 1985), self-esteem (Rosenberg, 1965), self-mastery (Pearlin and Schooler, 1978), positive and negative affect experienced during the past year (Watson *et al.*, 1988), depressive symptomatology (Radloff, 1977), and perceived stress (Cohen *et al.*, 1983).

The correlation between the LET and the Purpose in Life Scale was .73. As Table V shows, significant correlations emerged between the LET and the Purpose in Life Scale and each of the subjective well-being indicators assessed. More importantly, the correlations between the LET and the subjective well-being indicators all remained significant when the analyses controlled for the Purpose in Life Scale. In contrast, when the LET was controlled, only two of the seven associations between the Purpose in Life Scale and the indicators of subjective well-being remained significant. This pattern of results remained stable if simultaneously controlling for participants' gender, age, and race. Taken together, these data strongly suggest that it is the component of purpose in life that is measured by the LET that is important in determining the relationships between purpose in life and subjective well-being.

DISCUSSION

The purpose of this brief report is to provide behavioral medicine and health psychology researchers with a new scale that can be used to assess purpose in life. The content of the scale is shaped by recent theories of behavioral self-regulation, which suggest that purpose in life is largely derived from having valued activities in which to engage. A large volume of data was presented examining the factor structure of the scale, its internal consistency, test-retest reliability, and associations with health-relevant variables and other psychosocial factors many of which have been shown to have important implications for health. The LET was also shown to be more strongly related to indicators of subjective well-being than is at least one commonly used existing scale of purpose in life. There was little evidence of gender, age, or ethnic differences on the LET (although African Americans did tend to score higher than Caucasians). Taken together, the data assembled suggest that the LET is sound psychometrically and is ready to be used in research.

Relevance to Behavioral Medicine and Health Psychology

Clearly, life engagement is a broad construct that could be of interest to a wide variety of psychosocial researchers. Why then publish the Life Engagement Test here? Although we believe that the scale may be of interest to researchers more generally, we are most interested in seeing the scale used

by those doing work in health psychology and behavioral medicine. In this paper, we have shown that life engagement correlates with a variety of other psychosocial factors, such as dispositional optimism, social network size, and emotional expression style, which are known to link to health outcomes. We have also shown that life engagement is associated with self-rated health and health-related physical and mental functioning.

We are currently exploring associations between life engagement and selected biological and disease outcomes, and some of these preliminary analyses are proving quite interesting. For example, in Sample 4, high LET scores are associated with lower levels of aortic calcification, controlling for standard cardiovascular disease risk factors and many of the psychosocial variables presented in Table IV for Samples 1 through 6 (Matthews *et al.*, 2005). Although admittedly only a beginning, we hope that these findings (when taken together) offer the enticement needed to convince other behavioral medicine and health psychology researchers to incorporate the Life Engagement Test into their own protocols in order to further explore associations between life engagement and physical well-being.

ACKNOWLEDGMENTS

Preparation of this article was supported by funds awarded to the Pittsburgh Mind-Body Center at the University of Pittsburgh and Carnegie Mellon University (NIH HL65111, HL65112, HL76858, and HL76852). Preparation of this article also benefited from the assistance offered by Suzanne Colvin and Ginger Placone, and the authors thank them for their help.

REFERENCES

- Andresen, E. M., Malmgren, J. A., Carter, W. B., and Patrick, D. L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). *Am. J. Prev. Med.* 10: 77–84.
- Atkinson, J. W. (1964). *An Introduction to Motivation*. Van Nostrand, Princeton, NJ.
- Barefoot, K. C., Dodge, K. A., Peterson, B. L., Dahlstrom, W. G., and Williams, R. B. (1989). The Cook-Medley Hostility Scale: Item content and ability to predict survival. *Psychosom. Med.* 62: 17–25.
- Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., and Kupfer, D. J. (1989). The Pittsburgh sleep quality index. *Psychiatry. Res.* 28: 193–213.
- Carver, C. S., and Scheier, M. F. (1981). *Attention and Self-regulation: A Control-Theory Approach to Human Behavior*. Springer Verlag, New York.
- Carver, C. S., and Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychol. Rev.* 97: 19–35.
- Carver, C. S., and Scheier, M. F. (1998). *On the Self Regulation of Behavior*. Cambridge University Press, New York.
- Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., and Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *J. Am. Med. Assoc.* 277: 1940–1944.
- Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *J. Health. Soc. Behav.* 24: 385–396.
- Cohen, S., Mermelstein, R., Kamarck, T., and Hoberman, H. (1985). Measuring the functional components of social support. In Sarason, I. G., and Sarason, B. (Eds.), *Social Support: Theory, Research and Applications*, Martinus Nijhoff, The Hague, pp. 73–94.
- Cook, W. W., and Medley, D. M. (1954). Proposed hostility and pharisaic-virtue scales for the MMPI. *J. Appl. Psychol.* 38: 414–418.
- Derogatis, L. R., and Melisaratos, N. (1983). The brief symptom inventory: An introductory report. *Psychol. Med.* 13: 595–605.
- Diener, E., Emmons, R. A., Larson, R. J., and Griffin, S. (1985). The satisfaction with life scale. *J. Pers. Assess.* 49: 71–75.
- Feather, N. T. (Ed.). (1982). *Expectations and Actions: Expectancy-Value Models in Psychology*. Erlbaum, Hillsdale, NJ.
- Goldberg, L. R. (1992). The development of markers for the big-five factor structure. *Psychol. Assess.* 4: 26–42.
- Kaplan, R. M. (1990). Behavior as the central outcome in health care. *Am. Psychol.* 45: 1211–1220.
- Locke, H., and Wallace, K. (1959). Short marital-adjustment and prediction tests: Their reliability and validity. *Marriage Fam. Living* 21: 251–255.
- Matthews, K. A., Owens, J. F., Edmunowicz, D., and Kuller, L. H. (2005). *Positive and negative affect/cognitions and risk for coronary and aortic calcification in healthy women*. Manuscript under review.
- Pearlin, L. I., and Schooler, C. (1978). The structure of coping. *J. Health. Soc. Behav.* 19: 2–21.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Appl. Psychol. Meas.* 1: 385–401.
- Rosenberg, M. (1965). *Society and Adolescent Self-Image*. Princeton University Press, Princeton, NJ.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57: 1069–1081.
- Scheier, M. F., Carver, C. S., and Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *J. Pers. Soc. Psychol.* 67: 1063–1078.
- Shah, J., and Higgins, E. T. (1997). Expectancy X value effects: Regulatory focus as determinant of magnitude and direction. *J. Pers. Soc. Psychol.* 73: 447–458.
- Shrout, P. E., and Yager, T. J. (1989). Reliability and validity of screening scales: Effect of reducing scale length. *J. Clin. Epidemiol.* 42: 69–78.
- Spielberger, C. D., *et al.* (1985). The experience and expression of anger: Construction and validation of an anger expression scale. In Chesney, M. A., and Rosenman, R. H. (Eds.), *Anger and Hostility in Cardiovascular and Behavioral Disorders*. Hemisphere, Cambridge.

- Vroom, V. H. (1964). *Work and Motivation*. Wiley, New York.
- Ware, J. E., Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. *Med. Care* 30: 473–483.
- Watson, D., Clark, L. A., and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *J. Pers. Soc. Psychol.* 54: 1063–1070.
- Wrosch, C., Scheier, M. F., Carver, C. S., and Schulz, R. (2003a). The importance of goal disengagement in adaptive self-regulation: When giving up is beneficial. *Self Identity* 2: 1–20.
- Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., and Carver, C. S. (2003b). Adaptive self-regulation of unattainable goals: Goal disengagement, goal re-engagement, and subjective well-being. *Per. Soc. Psychol. Bull.* 29: 1494–1508.