



## **PMBC Core Measures**

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### Introduction

*PMBC's mission is to understand common pathways -- psychological, behavioral, and psychobiological -- that connect environmental factors with the onset of and recovery from diverse physical illnesses.*

### History of PMBC

Established in 2000, the Pittsburgh Mind-Body Center (PMBC) is a joint center administered by the University of Pittsburgh and Carnegie Mellon University and is funded by the National Institutes of Health, with additional support from the two participating Universities. It is dedicated to promoting scientific excellence in understanding mind-body interactions as they determine health. It offers the latest knowledge on its website about measurement and theory in key areas of mind-body science; provides advance training in specific areas relevant to mind-body science and health through workshops, symposia, and its annual Summer Institute; and advances scientific knowledge through identification of key research questions and engaging scientists new to mind-body science to address questions of relevance to health. In addition, a number of services are available to local investigators and Mind-Body Scholars affiliated with the Center, such as consultation on specific research issues, pilot funds, and the Clinical Mind-Body Scholars Program.

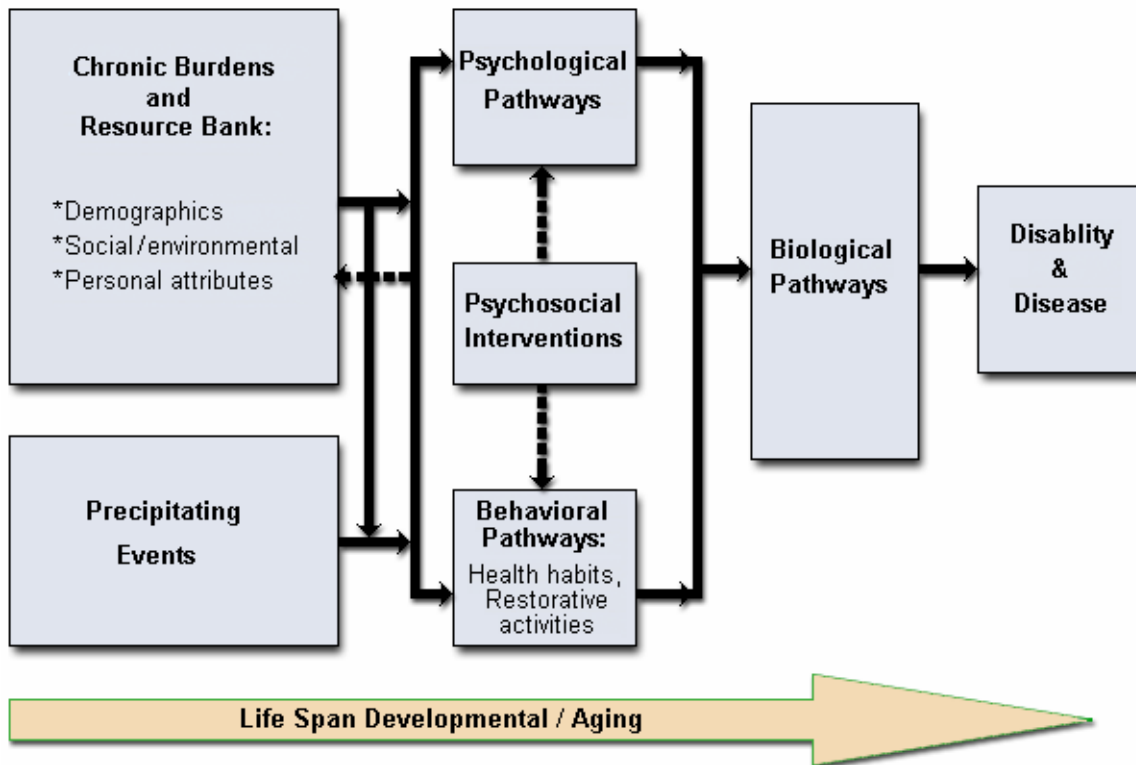
For more information, please refer to the website:

<http://www.pghmbc.org>

### Common Pathways Model

To guide its efforts, PMBC has developed and elaborated over the years the “common pathways” model, delineating the shared pathways—psychological, behavioral, and biological — connecting chronic life burdens and resources with the onset of and recovery from diverse physical illnesses. It assumes that shared pathways cannot be discovered by studying one disease at a time without consideration of other diseases. Thus, our efforts are multidisciplinary and multi-disease focused.

### Common Pathways Model



In brief, our model contains five classes of variables. The first category includes chronic or stable burdens and resources, which we have subdivided into factors according to level of analysis: demographic factors (e.g., social class), factors involving personal attributes (e.g., hostility), and factors relating to the person’s social/environmental context (e.g., supportive marital relationships). As a group, these factors can be construed as background variables that influence susceptibility to or recovery from illness. Taken individually, these factors can also have multiplicative effects as well that are typically not evaluated because researchers usually only operate at one level of analysis. A second general class of variables pertains to precipitating events that may trigger downstream changes in the pathways. These factors can range from stressful life events defined broadly to more specific events, like initial medical diagnoses. The third general category of variables is the pathways or factors that are proposed to mediate the relationships between chronic burdens and resources or precipitating events and disease and disability. We have somewhat arbitrarily divided the pathways into psychological, behavioral, and biological categories. However, a general theme of PMBC is that these are highly



interrelated and interconnected. The psychological pathways refer to cognitive or affective responses, such as negative affect and feelings of stress, whereas the behavioral pathways refer to important health behaviors, e.g., physical activity, and enjoyable activities. Enjoyable activities refer to activities that rejuvenate or restore individuals to some equilibrium, such as a valued hobby or sleep. There are many important biological pathways that are relevant on a disease-specific basis, but those that are the foci of the Center model refer to biological processes that are proposed to be linked to psychological and behavioral factors and to a number of disease endpoints (e.g., cortisol or epinephrine fluctuations). A final part of the model is disease-specific outcomes and disability, the latter being assessed more broadly as functional status.

The assumption underlying the center's theme is that the search for shared pathways can have a multiplier effect and lead to a greater understanding of the development of a number of important diseases, in addition to the target disease. Similarly, interventions based on manipulation of the shared pathways can be used to test hypotheses about the utility of those concepts in ameliorating the effects of different diseases and disabilities on quality of life.

These pathways – psychological, behavioral, and biological—were evaluated in the first phase of PMBC via 4 research projects examining aspects of the model as it pertained to infectious disease, breast cancer, osteoarthritis, and subclinical atherosclerosis. Brief descriptions of these four studies appear below:

1. **Risks of Respiratory Illness (PI: Sheldon Cohen, Ph.D.).** The major aim of this project was to determine the characteristics of our social relationships that influence susceptibility to infectious illness and to identify how these social factors get "inside the body". By capitalizing on recent advances in the measurement of interpersonal relationships, this study hoped to identify the most potent aspects of both marital and non-marital relationships for health. 193 healthy subjects were first evaluated on their social relationships and on relevant hormonal and immune measures. Subsequently, they were inoculated with one of two viruses that cause a mild influenza illness in about 40% of people who are exposed. Analyses focused on the effects of marriage and marital quality and of characteristics of non-marital relationships on who became ill.
2. **Osteoarthritis Interventions (PI: Lynn M. Martire, Ph.D.).** This project focused on older adults who were being treated for osteoarthritis (OA), the most common chronic illness in the older population and one that is often characterized by pain and functional limitations. OA has the potential to compromise the health and quality of life of not only the patient but also family members such as the spouse, as a result of the patient's negative responses to symptoms and the burden of providing emotional support and task assistance to the patient. This study



sought to determine if OA patients and their spousal caregivers experience greater health benefits from an educational intervention targeted at both individuals than from education directed only at the patient, and whether couples receiving either type of intervention benefit more than couples who receive no intervention. In addition, this study examined the extent to which observed effects occur as a result of improvements in relationship quality as well as changes in psychological, behavioral, and biological factors.

3. **Risks of Subclinical CVD (PI: Karen A. Matthews, Ph.D.).** The major objective of this project was to identify the characteristics of women who are at high risk for the development of coronary heart disease. It used novel measures of subclinical cardiovascular disease to investigate new mind/body relationships early in the disease process. This project tested women's perceptions of stress, their attitudes and coping responses, and their physiological reactions to the stress in their lives as potential markers of high risk.
  
4. **Breast Cancer Interventions (PI: Michael F. Scheier, Ph.D.).** This project was designed to provide psychosocial interventions for women with breast cancer that would enhance their adjustment and psychological well-being. The study recruited 198 early stage breast cancer patients in active treatment following their surgery and 86 late stage breast cancer patients being seen by oncologists. Women were randomly assigned to either (1) an education group, providing information about breast cancer and treatment, (2) to a peer discussion group, focusing on maintenance of hope, or (3) to a control group which received no study intervention. The aim of the study was to systematically examine whether different interventions are effective in enhancing adjustment for women in different stages of disease and to look at the psychosocial and bio-behavioral mechanisms and processes by which these interventions have their effect. Participants were assessed at entry into the study, following their participation in the 8-week intervention and 6 months after completion of the intervention.



The sample characteristics for each study and for the combined sample are presented in the table below.

**Sample characteristics for Pittsburgh Mind-Body Center studies**

Study	Final Sample Size	Gender (%)		Age		Race (%)		
		Female	Male	Mean	Range	White	African - American	Other
<i>Risks of Respiratory Illness</i>	193	98 (50.8)	95 (49.2)	36.5	20-54	108 (56)	72 (37.3)	13 (6.7)
<i>Osteoarthritis Interventions</i>	543	280 (51.6)	263 (48.4)	68.9	47-90	472 (86.9)	59 (10.9)	12 (2.2)
<i>Risks of Subclinical CVD</i>	379	379 (100)	NONE	64.6	60-70	353 (93.1)	22 (5.8)	4 (1.1)
<i>Breast Cancer Interventions</i>	284	284 (100)	NONE	51	26-78	249 (87.7)	29 (10.2)	6 (2.1)
<i>Combined Sample</i>	1399	1041 (74.4)	358 (25.6)	59.6	20-90	1182 (84.5)	182 (13)	35 (2.5)



### PMBC Core Measures

As part of each of the four studies described above, we administered a large set of psychosocial measures, drawn from the “common pathways” model. Based upon analyses from these studies, we designated a set of 14 “core measures” that appeared to be the most promising using a variety of different criteria, including their central role in the Pittsburgh Mind Body Model, their independent association with health outcomes as well as behavioral and biological risk factors for health outcomes, and their robust psychometric properties as reported in the literature and documented by the Pittsburgh Mind-Body Center. These scales are listed in the table below and encompass diverse personality and dispositional attributes, social relationships, and social behaviors. We suggest these “core measures” may be useful in a number of research studies that evaluate the role of psychosocial factors in disease.

Scale	Number of Items	Area of Measurement*	PMBC Model
Anger-In subscale of Anger Expression (AX) Scale	8	Tendency to suppress anger or keep it in	Personal Attributes
Center for Epidemiological Studies Depression Scale (10-item CES-D)	10	Depressive symptomatology	Psychological Pathways
Cook-Medley Hostility Scale (Ho) – Cynicism Subscale	6	Cynical, mistrustful and aggressive attitudes toward others	Personal Attributes
General Health Perception Question	1	Self-assessed health	Disability/Disease
Goldberg’s Adjective Scale - 25 item version (Big Five Personality Factors)	25	Five personality dimensions (extraversion, agreeableness, conscientiousness, emotional stability, openness)	Personal Attributes
Interpersonal Support Evaluation List (ISEL; 12 item version)	12	Perceived availability of three types of social support (appraisal, belonging, and tangible)	Social/ Environmental



Life Engagement Test (LET)	6	Extent to which a person is purposefully engaged in the current activities of life. Sense of purpose in life	Psychological Pathways
Marital Adjustment Test	16	Marital adjustment and satisfaction among persons in long-term committed relationships	Social/ Environmental
Mastery Scale	7	Feelings of control over important life outcomes	Personal Attributes
Optimism (Revised Life Orientation Test-LOT-R)	6	Optimism about the future	Personal Attributes
Perceived Stress Scale	10	Perception of stressfulness of life	Psychological Pathways
Pittsburgh Enjoyable Activities Test (PEAT)	10	Frequency of engaging in activities thought to be enjoyable and restorative.	Behavioral Pathways
Rosenberg Self-esteem Scale	4	Self-Esteem	Personal Attributes
Social Network Scale	23	Participation in social relationships: diversity of social network and number of people in network.	Social/ Environmental

For each measure, we provide a brief description of the instrument, key citations, and psychometric characteristics based on data collected by PMBC from diverse populations. Specific information provided includes 1) mean values and standard deviations for males and females of varying ages from 4 different study populations, 2) Cronbach alpha, 3) associations with other psychosocial measures selected to examine convergent validity, 4) associations with health behaviors and health outcomes, and 5) summary of confirmatory factor analysis.

Descriptions of psychosocial factors, health behaviors and health outcomes correlated with core measures are presented in the tables below. (Personal Attributes are described above.)



## 1. Psychological Pathways

Scale	Number of items	Description	Source Document
Affect - Reduced POMS (Profile of Mood States)	18	To assess positive and negative affect (anxiety, depressed mood, anger, well-being, vigor, calm)	Usala, P.D., & Hertzog, C. ( 1989). Measurement of Affective States in Adults. Evaluation of an Adjective Rating Scale Instrument. <u>Research on Aging</u> , 11, 403-426.
The Satisfaction With Life Scale (SWLS)	5	To measure global life satisfaction.	Diener, E., Emmons, R.A., Larson, R.J., & Griffin, S. (1985). The Satisfaction With Life Scale. <u>Journal of Personality Assessment</u> , 49, 71-75.
Goal Engagement	3	To measure the degree to which one creates goals in her/his life and stays engaged with them	New measure created for PMBC-I studies.

## 2. Health Behaviors

Scale	Number of items	Description	Source Document
Alcohol Consumption Questionnaire (Alcohol)	9	Higher score indicates higher rate of average daily alcohol consumption.	Cohen, S., Tyrrell, D. A.J., Russell, M.A., Jarvis, M.J., & Smith, A.P. (1993). Smoking, alcohol consumption, and susceptibility to the common cold. <u>American Journal of Public Health</u> , 83, 1277-1283.
Pittsburgh Enjoyable Activities Test (Enjoyable Activities)	10	Higher score indicates a higher frequency of engaging in enjoyable activities.	Pressman, S.D., Matthews, K.A., Cohen, S., Martire, L.M., Scheier, M., Baum, A., & Schulz, R. (under review). The Association Of enjoyable leisure activities with psychological and physical well-being.
The Pittsburgh Sleep Quality Index (Sleep Efficiency)	8	Higher score indicates higher efficiency and quality of sleep.	Buysse, D.J., Reynolds, C.F., Monk, T.H., Berman, S.R., & Kupfer, D.J. (1989). The Pittsburgh Sleep <u>Quality Index</u> . <u>Psychiatry Research</u> , 28, 193-213.
History and Current Status of Smoking (Smoking)	9	Smoking status = Yes or No	Cohen, S., Tyrrell, D. A.J., Russell, M.A., Jarvis, M.J., & Smith, A.P. (1993). Smoking, alcohol consumption, and susceptibility to the common cold. <u>American Journal of Public Health</u> , 83, 1277-1283.

## 3. Health Outcomes: The MOS 36-Item Short Form Health Survey (SF-36)

**Source document:** Ware, J.E., Snow, K.K., Kosinski, M., & Gandek, B. (1993). SF-36 Health Survey Manual and Interpretation Guide. Boston, MA: Nimrod Press.



Scale	Number of items	Description	Sample item
Physical Functioning	10	Higher score indicates better physical functioning.	Walking more than a mile
Social Functioning	2	Higher score indicates better social functioning.	During the past 4 weeks, to what extent has your physical health or emotional problems interfered with normal social activities with family, friends, neighbors, or groups?
Role-Physical	4	Higher score indicates better role-physical functioning.	Cut down the amount of time spent on work or other activities
Role Emotional	3	Higher score indicates better role-emotional functioning.	Accomplished less than you would like.
Mental Health	5	High score indicates better mental health.	Have you been a very nervous person?
Vitality	4	High score indicates more vitality.	Did you feel full of pep?
Bodily Pain	2	High score indicates the lack of bodily pain.	How much bodily pain have you had during the past 4 weeks?
General Health	5	High score indicates better general health perceptions.	I seem to get sick a little easier than other people.
Physical Component Summary Score	Aggregate measure	Higher score indicates better physical functioning.	Norm-based scoring (mean = 50, sd = 10)
Mental Component Summary Score	Aggregate measure	Higher score indicates better mental health.	Norm-based scoring (mean = 50, sd = 10)

All analyses were performed on baseline data obtained from the 4 aforementioned studies carried out by PMBC Investigators. All scales are scored such that higher scores reflect higher levels of the construct being measured.



### **Anger-In subscale of Anger Expression (AX) Scale**

Anger Expression Scale is designed to assess tendencies to express anger openly (Anger-out) and to suppress anger or keep it in (Anger-in). Anger suppression is thought to have deleterious effects on mental and physical functioning, and has been linked to CHD, cancer, and infectious disease.

Because of its role in predicting health outcomes, we selected only Anger-in to be included in the list of core measures.

#### Primary Reference:

Spielberger, C. D. et al. (1985). The experience and expression of anger: Construction and validation of an anger expression scale. In M. A. Chesney & R. H. Rosenman (Eds.), Anger and hostility in cardiovascular and behavioral disorders. Hemisphere: Cambridge.

#### Additional References:

Burns, J.W. (1997). Anger management style and hostility: Predicting symptom-specific physiological reactivity among chronic low back pain patients. Journal of Behavioral Medicine, 20, 505-522.

Frasure-Smith, N., Lesperance, F., & Talajic, M. (1995). The impact of negative emotions on prognosis following myocardial infarction: Is it more than depression? Health Psychology, 14, 388-398.

Johnson, E. H., Collier, P., Nazzaro, P., & Gilbert, D.C. (1992). Psychological and physiological predictors of lipids in black males. Journal of Behavioral Medicine, 15, 285-298.

Kerns, R.D., Rosenberg, R., & Jacob, M.C. (1994). Anger expression and chronic pain. Journal of Behavioral Medicine, 17, 57-67.

Knight, R. G., Chisholm, B. J., Paulin, J. M., & Waal-Manning, H. J. (1988). The Spielberger Anger Expression Scale: Some psychometric data. British Journal of Clinical Psychology, 27, 279-281.

Linden, W., Chambers, L., Maurice, J., & Lenz, J. W. (1993). Sex differences in social support, self-deception, hostility, and ambulatory cardiovascular activity. Health Psychology, 12, 376-380.



Porter, L.S., Stone, A. A., & Schwartz, J.E. (1999). Anger expression and ambulatory blood pressure: A comparison of state and trait measures. Psychosomatic Medicine, *61*, 454-463.

Waldstein, S.R., Polefrone, J.M., Bachen, E.A., Muldoon, M.F., Kaplan, J.R., & Manuck, S.B. (1993). Relationship of cardiovascular reactivity and anger expression to serum lipid concentrations in healthy young men. Journal of Psychosomatic Research, *37*, 249-256.

Wenneberg, S.R., Schneider, R.H., Walton, K.G., MacLean, C.R., Levitzky, D.K., Mandarino, J.V., Waziri, R., & Wallace, R.K. (1997). Anger expression correlates with platelet aggregation. Behavioral Medicine, *22*, 174-177.



### Basic Psychometrics for Anger-In Subscale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
1-4	8-32	13.8 (3.5)	14.2 (3.4)	13.3 (3.2)	15.1 (3.4)	14.0 (3.5)	14.0 (3.3)	14.1 (3.7)	13.4 (3.3)	13.7 (3.7)	.75	.73	.71	.72	.75	.71	.78	.75	.78

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Anger-In subscale with other Personal Attributes variables

	Agreeableness	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger Out	Cynicism	Hostile Affect	Aggressive Responding	Mastery	Optimism	Self-esteem
1	<b>-0.324</b>	<b>-0.247</b>	<b>-0.353</b>	<b>-0.283</b>	-.102	<b>.289</b>	<b>.307</b>	<b>.395</b>	<b>.229</b>	<b>-.306</b>	<b>-.311</b>	-.133
2	<b>-0.341</b>	-0.086	<b>-0.462</b>	<b>-0.345</b>	<b>-.093</b>	<b>.143</b>	<b>.215</b>	<b>.338</b>	<b>.147</b>	<b>-.378</b>	<b>-.339</b>	<b>-.218</b>
3	<b>-0.144</b>	<b>-0.137</b>	<b>-0.356</b>	<b>-0.228</b>	-.052	.017	<b>.337</b>	<b>.432</b>	.087	<b>-.387</b>	<b>-.348</b>	<b>-.218</b>
4	<b>-0.264</b>	<b>-0.189</b>	<b>-0.527</b>	<b>-0.407</b>	<b>-.142</b>	-.059	<b>.275</b>	<b>.359</b>	-.008	<b>-.441</b>	<b>-.398</b>	<b>-.307</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of Anger-In subscale with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.038	<b>-.168</b>	.003	.029
2	-.019	<b>-.155</b>	<b>-.180</b>	.011
3	.028	-.084	<b>-.119</b>	.061
4	-.068	<b>-.178</b>	<b>-.248</b>	-.040

### Correlations of Anger-In subscale with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .021	(3) <b>-.162</b>	3	-.027	<b>-.218</b>	<b>-.156</b>	<b>-.291</b>	<b>-.406</b>	<b>-.300</b>	-.090	<b>-.207</b>	-.005	<b>-.400</b>
(2) <b>-.182</b>	(4) <b>-.112</b>	4	-.061	<b>-.214</b>	<b>-.211</b>	<b>-.270</b>	<b>-.399</b>	<b>-.312</b>	-.054	<b>-.188</b>	-.028	<b>-.388</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Anger Expression Scale

The analysis was done on items from both Anger-in and Anger-out subscales. Two factor structure was tested with factors allowed to covary. In combined sample, the fit was poor (all indices <.90). The fit could be considerably improved by allowing items from one scale to load on the other scale factor. By study: results very similar to those in combined sample. Item 'I keep things in' should be allowed to load on 'Anger-Out' factor in order to considerably improve fit.



### **Center for Epidemiological Studies Depression Scale (10-item CES-D)**

This measure is designed to assess depressive symptomatology. Depression has been associated with increased risk for physical morbidity and mortality. It is also linked to dysregulated endocrine and immune systems. The original scale is 20 items; the shorter 10 item version is frequently used in epidemiologic studies (see Andresen et al., 1994, Shrout et al., 1997, and Schulz et al., 2000 for psychometric properties of 10 item scale).

#### Primary References:

Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, *1*, 385-401.

Andresen, E.M., Carter, W.B., Malmgren, J.A., Patrick, D.L. (1994). Screening for depression in well older adults: Evaluation of a short form of the CES-D. American Journal of Preventive Medicine, *10(2)*, 77-84.

#### Additional References:

Cohen, S., & Rodriguez, M.S. (1995). Pathways linking affective disturbances and physical disorders. Health Psychology, *14*, 374-380.

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Herbert, T.N., & Cohen, S. (1993). Depression and immunity: A meta-analytic review. Psychological Bulletin, *113*, 472-486.

Krantz, D.S., Glass, D.C., Contrada, R., & Miller, N. (1981). Behavior and health: Mechanisms and research issues. Items (Social Science Research Council Newsletter), *35*, 1-6.

Linkins, R.W., & Comstock, G.W. (1990). Depressed mood and development of cancer. American Journal of Epidemiology, *132*, 962-972.

Persky, V.W., Kempthorne-Rawson, J., & Shekelle, R.B. (1987). Personality and risk of cancer: 20-year follow-up of the Western Electric Study. Psychosomatic Medicine, *49*, 435-449.

Santor, D.A., & Coyne, J.C. (1997). Shortening the CES-D to improve its ability to detect cases of depression. Psychological Assessment, *9*, 233-243.



Schulz, R., Beach, S.R., Ives, D.G., Martire, L.M., Ariyo, A.A., & Kop, W.J. (2000). Association between depression and mortality in older adults. Archives of Internal Medicine, 160, 1761-1768.

Schulz, R., Newsom, J., Mittlemark, M., Burton, L., Hirsch, C., & Jackson, S. (1997). Health effects of caregiving: The Caregiver Health Effects Study: An ancillary study of the Cardiovascular Health Study. Annals of Behavioral Medicine, 19, 110-116.

Shrout, P.A., & Yager, T.J. (1989). Reliability and validity of screening scales: Effects of reducing scale length. Journal of Clinical Epidemiology, 42, 69-78.



### Basic Psychometrics for 10-item CES-D Scale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
0-3	0-30	6.1 (5.0)	6.3 (4.2)	6.1 (4.2)	6.5 (4.2)	6.0 (4.8)	6.8 (5.0)	5.1 (4.5)	5.0 (4.6)	7.5 (6.0)	.82	.68	.71	.65	.81	.81	.79	.82	.86

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of CES-D with other Psychological Pathways variables

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Perceived Stress	Life Engagement
1	<b>.422</b>	<b>.656</b>	<b>.323</b>	<b>-.503</b>	<b>-.446</b>	<b>-.386</b>	<b>-.529</b>	<b>.612</b>	<b>-.333</b>
2	<b>.672</b>	<b>.637</b>	<b>.480</b>	<b>-.631</b>	<b>-.544</b>	<b>-.553</b>	<b>-.535</b>	<b>.686</b>	<b>-.496</b>
3	<b>.572</b>	<b>.728</b>	<b>.450</b>	<b>-.679</b>	<b>-.610</b>	<b>-.434</b>	<b>-.476</b>	<b>.676</b>	<b>-.489</b>
4	<b>.637</b>	<b>.727</b>	<b>.500</b>	<b>-.725</b>	<b>-.605</b>	<b>-.541</b>	<b>-.408</b>	<b>.717</b>	<b>-.423</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale  
Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of CES-D with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	<b>.162</b>	<b>-.301</b>	-.137	.052
2	-.043	<b>-.314</b>	<b>-.319</b>	-.022
3	.084	<b>-.235</b>	<b>-.338</b>	.069
4	-.098	<b>-.382</b>	<b>-.356</b>	<b>.132</b>

### Correlations of CES-D with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) <b>-.140</b>	(3) <b>-.350</b>	3	<b>-.185</b>	<b>-.510</b>	<b>-.365</b>	<b>-.520</b>	<b>-.764</b>	<b>-.595</b>	<b>-.288</b>	<b>-.379</b>	<b>-.131</b>	<b>-.718</b>
(2) <b>-.427</b>	(4) <b>-.310</b>	4	<b>-.584</b>	<b>-.429</b>	<b>-.613</b>	<b>-.772</b>	<b>-.599</b>	<b>-.348</b>	<b>-.331</b>	<b>-.198</b>	<b>-.774</b>	<b>-.310</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of CES-D

One factor structure was tested. The fit was poor in combined sample and in individual studies. All fit indices below .90. Large error covariance between two positively worded items ('I felt hopeful about the future' and 'I was happy') and between 'Everything I did was an effort' and 'I could not get going'. When errors for these pairs of items are allowed to covary the fit improves to good. Similar results found in individual studies.



### **The Cook-Medley Hostility Scale (Ho) – Cynicism Subscale**

The Cook-Medley Hostility Scale is a 50 item measure, extracted from the MMPI, which has been used to assess cynical hostility. A large literature links scores on the full Cook-Medley with CHD, all-cause mortality, and cardiovascular risk factors. Three subscales derived from this instrument (Cynicism, Aggressive Responding, and Hostile Affect) were found by Barefoot and colleagues (1989) to be especially useful in the prediction of mortality. These three subscales of the Cook-Medley Hostility Scale are designed to assess people's cynical, mistrustful and aggressive attitudes toward others. The Cynicism scale was chosen for inclusion in the PMBC battery to represent a measure of hostility because of its satisfactory psychometric properties. Only 6 of the 13 items in this subscale were administered as part of the PMBC studies. The following changes in these six items were made.

- “exaggerate their misfortunes” changed to “exaggerate their problems.”
- “willing to allow for others” changed to “willing to give for others.”

#### Primary Reference:

Cook W.W., & Medley, D.M. (1954). Proposed hostility and pharisaic-virtue scales for the MMPI. Journal of Applied Psychology, 38, 414-418.

Barefoot, K.C., Dahlstrom, W.G., Williams, & R.B. Jr. (1983). Hostility, CHD incidence, and total mortality: A 25-year follow-up study of 255 physicians. Psychosomatic Medicine, 45, 59-63.

#### Additional References:

Barefoot, K.C., Dodge, K.A., Peterson, B.L., Dahlstrom, W.G., & Williams, R.B. (1989). The Cook-Medley Hostility Scale: Item content and ability to predict survival. Psychosomatic Medicine, 51, 46-57.

Davis, M.C., Matthews, K.A., & McGrath, C.E. (2000). Hostile attitudes predict elevated vascular resistance during interpersonal stress in men and women. Psychosomatic Medicine, 62, 17-25.

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Niaura, R., Banks, S.M., Ward, K.D., Stoney, C.M., Spiro, A. 3rd., Aldwin, C.M., Landsberg, L., & Weiss, S.T. (2000). Hostility and the metabolic syndrome in older males: The normative aging study. Psychosomatic Medicine, *62*, 7-16.

Smith, T.W., & Frohm, K.D. (1985). What's so unhealthy about hostility: Construct validity and psychosocial correlates of the Cook and Medley Ho scale. Health Psychology, *4*, 503-520.

Suarez, E.C., Bates, M.P., & Harralson, T.L. (1998). The relation of hostility to lipids and lipoproteins in women: Evidence for the role of antagonistic hostility. Annals of Behavioral Medicine, *20*, 59-63.

Suarez, E.C., Shiller, A.D., Kuhn, C.M., Schanberg, S., Williams, R.B. Jr., & Zimmermann, E.A. (1997). The relationship between hostility and beta-adrenergic receptor physiology in health young males. Psychosomatic Medicine, *59*, 481-487.

Vogele, C. (1998). Serum lipid concentrations, hostility and cardiovascular reactions to mental stress. International Journal of Psychophysiology, *28*, 167-179.



### Basic Psychometrics for Cynicism Subscale of Hostility

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
0-1	0-6	2.3 (1.8)	3.1 (1.8)	2.6 (1.8)	3.1 (1.8)	2.4 (1.7)	2.2 (1.7)	2.7 (1.7)	1.7 (1.6)	2.2 (1.7)	.71	.70	.71	.66	.69	.69	.68	.67	.71

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Cynicism Subscale of Hostility with other Personal Attributes variables

	Agreeableness	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger In	Anger Out	Hostile Affect	Aggressive Responding	Mastery	Optimism	Self-esteem
1	<b>-0.219</b>	-0.037	<b>-0.182</b>	-0.082	<b>-.154</b>	<b>.307</b>	<b>.176</b>	<b>.398</b>	<b>.269</b>	<b>-.254</b>	<b>-.311</b>	.020
2	<b>-0.179</b>	-0.045	<b>-0.233</b>	-0.011	-.054	<b>.215</b>	<b>.187</b>	<b>.371</b>	<b>.389</b>	<b>-.287</b>	<b>-.280</b>	<b>-.101</b>
3	-0.014	-0.029	<b>-0.158</b>	0.012	-.048	<b>.337</b>	<b>.117</b>	<b>.337</b>	<b>.251</b>	<b>-.253</b>	<b>-.298</b>	-.047
4	<b>-0.179</b>	-0.021	-0.113	-0.065	-.004	<b>.275</b>	-.008	<b>.264</b>	<b>.236</b>	<b>-.227</b>	<b>-.270</b>	<b>-.144</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of Cynicism Subscale of Hostility with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.099	<b>-.179</b>	-.133	<b>.200</b>
2	-.011	<b>-.207</b>	<b>-.104</b>	<b>.099</b>
3	.010	<b>-.148</b>	<b>-.182</b>	.097
4	<b>-.119</b>	<b>-.193</b>	-.051	.073

### Correlations of Cynicism Subscale of Hostility with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) <b>-.059</b>	(3) <b>-.151</b>	(3)	-.065	<b>-.201</b>	-.031	<b>-.192</b>	<b>-.261</b>	<b>-.232</b>	-.098	<b>-.172</b>	-.018	<b>-.275</b>
(2) <b>-.218</b>	(4) <b>-.102</b>	(4)	-.034	<b>-.140</b>	-.085	-.081	<b>-.129</b>	-.102	-.109	<b>-.118</b>	-.071	<b>-.126</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Cynicism Subscale of Hostility

The analysis was done on items from all three subscales of the Cook-Medley Hostility Scale. Three factor first order structure was tested with factors allowed to covary. The fit was poor in combined sample and in individual studies. The fit could be considerably improved by allowing a number of items from one scale to load on factors representing other scales. Items theorized to form Cynicism subscale were more consistently grouped around one factor than items theorized to form Aggressive Responding or Hostile Affect subscales.



### **General Health Perception Question**

(One question of The MOS 36-Item Short-Form Health Survey (SF-36))

General Health Perception is measured with the first question from the SF-36 survey: “In general, would you say your health is”, with answer options ranging from (1) poor to (5) excellent. Responses to this question have been found to correlate with important health outcomes.

#### Primary Reference:

Ware, J.E. Jr., Snow, K.K., Kosinski, M., & Gandek, B. (1993). SF-36 Health Survey. Manual and Interpretation Guide. Boston, MA: Nimrod Press.

#### Additional References:

Bailis, D. S., Segall, A., & Chipperfield, J. G. (2003). Two views of self-rated general health status. Social Science & Medicine, *56*, 203-217.

Benyamini, Y., Blumstein, T., Lusky, A., & Modan, B. (2003). Gender differences in the self-rated health- mortality association: Is it poor self-rated health that predicts mortality or excellent self-rated health that predicts survival? The Gerontologist, *43*(3), 396-405.

Idler, E.L. & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. Journal of Health and Social Behavior, *38*(1), 21-37.

Schulz, R., Mittelmark, M.B., Kronmal, R.A., Polak, J.F., Hirsch, C.H., German, P., & Bookwala, J. (1994). Predictors of perceived health status in elderly men and women: The Cardiovascular Health Study. Journal of Aging and Health, *6*, 419-432.



### Basic Psychometrics for General Health Perception Question

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha									
		All	P1			P2			P3	P4	All	P1			P2			P3	P4	
			All	F	M	All	F	M				A	F	M	A	F	M			
1-5	N/A	3.7 (1.1)	4.2 (.7)	4.2 (.7)	4.2 (.6)	3.3 (1.1)	3.4 (1.1)	3.2 (1.0)	4.1 (.8)	3.3 (1.2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of General Health Perception Question with Psychological Pathways

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Perceived Stress (Perceived Stress Scale [PSS])	Life Engagement (Life Engagement Test)
1	-.065	-.068	.085	.111	<b>.176</b>	<b>.199</b>	-.140	.085	-.122	.097
2	<b>-.310</b>	<b>-.314</b>	<b>-.173</b>	<b>.330</b>	<b>.495</b>	<b>.285</b>	<b>-.427</b>	<b>.438</b>	<b>-.434</b>	<b>.327</b>
3	<b>-.226</b>	<b>-.287</b>	<b>-.137</b>	<b>.271</b>	<b>.383</b>	<b>.117</b>	<b>-.350</b>	<b>.285</b>	<b>-.284</b>	<b>.264</b>
4	<b>-.163</b>	<b>-.249</b>	-.106	<b>.200</b>	<b>.293</b>	<b>.118</b>	<b>-.240</b>	<b>.402</b>	<b>-.298</b>	<b>.335</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale  
Coefficients in BOLD are significant at  $p < .05$  level*



**Correlations of General Health Perception Question with Health Behaviors**

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	-.018	<b>.195</b>	<b>.189</b>	-.066
2	.014	<b>.225</b>	<b>.158</b>	-.047
3	.073	<b>.216</b>	<b>.109</b>	-.038
4	.102	<b>.226</b>	.110	.012

**Correlations of General Health Perception Question with SF-36 subscales**

Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
3	<b>.444</b>	<b>.432</b>	<b>.505</b>	<b>.284</b>	<b>.230</b>	<b>.383</b>	<b>.832</b>	<b>.467</b>	<b>.600</b>	<b>.215</b>
4	<b>.524</b>	<b>.279</b>	<b>.368</b>	<b>.252</b>	<b>.257</b>	<b>.317</b>	<b>.827</b>	<b>.394</b>	<b>.590</b>	<b>.219</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*



### **Goldberg's Adjective Scale - 25 items (Big Five Personality Factors)**

This measure assesses participants' standing along five major dimensions of personality: (1) extraversion, (2) agreeableness, (3) conscientiousness, (4) emotional stability, and (5) openness. There is a growing consensus that these five traits provide the fundamental underpinnings of human personality. Several of these traits have been shown to have health consequences or to be related to underlying physiological responses. To reduce respondent burden, a 25-item version rather than the original 100-item scale was employed. Several data sets were examined and the five highest loading items from each factor were used to create the 25-item version.

#### Goldberg's Adjective Scale (25 items)

- a. The original Goldberg scale (Goldberg, 1992) contained 100 items.
- b. A 50-item modified version was created by adopting high loading items from the original instrument, including 5 reversed items out of the 10 chosen for each of the five traits, and substituting several new adjectives ("Resentful," "Tense," "Uninformed," "Depressed") for items that were judged to be low in frequency of use (Cohen et al., 1997). Psychometric characteristics of the revised 50-item scale (internal reliabilities for each of the 5 subscales all  $\geq .78$ ; 3-week test-retest reliabilities all  $\geq .79$ ) are reported in Feldman et al. (1999).
- c. As part of the PMBC-I planning process, this modified version was further shortened by selecting the 3 positively stated items and 2 negatively stated items from each 10-item subscale that loaded most highly on each of the five factors.

#### Primary Reference:

Goldberg, L. R. (1992). The development of markers for the big-five factor structure. Psychological Assessment, 4, 26-42.

#### Additional References:

Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. Journal of the American Medical Association, 277, 1940-1944.

Feldman, P.J., Cohen, S., Doyle, W.J., Skoner, D.P. & Gwaltner, J.M. (1999). The impact of personality on the reporting of unfounded symptoms and illness. Journal of Personality and Social Psychology, 77, 370-378.

Friedman, L.C., Baer, P.E., Lewy, A., Lane, M., & Smith, F.E. (1988). Predictors of psychosocial adjustment to breast cancer. Journal of Psychosocial Oncology, 6, 75-94.



Miller, G.E., Cohen, S., Rabin, B.S., Skoner, D.P., & Doyle, W.J. (1999). Personality and tonic cardiovascular, neuroendocrine, and immune parameters. Brain, Behavior, and Immunology, 13, 109-123.

Rothbart, M.K., Ahadi, S.A., & Evans, D.E. (2000). Temperament and personality: Origins and outcomes. Journal of personality and Social Psychology, 78, 122-135.



### Basic Psychometrics for Goldberg's Adjective Scale

MEASURE	Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
			All	P1			P2			P3	P4	All	P1			P2			P3	P4
				All	F	M	All	F	M				A	F	M	A	F	M		
Extraversion	1-5	5-25	17.2 (4.1)	17.0 (4.2)	17.8 (4.4)	17.0 (4.2)	17.0 (3.9)	17.4 (3.8)	16.5 (3.8)	17.2 (4.1)	17.9 (4.2)	.78	.78	.81	.72	.75	.77	.73	.77	.82
Agreeableness	1-5	5-25	22.1 (3.0)	21.9 (3.0)	22.2 (2.7)	21.9 (3.0)	22.1 (2.4)	22.6 (2.1)	21.7 (2.6)	21.8 (4.1)	22.7 (2.0)	.78	.79	.74	.82	.64	.53	.70	.87	.66
Conscientiousness	1-5	5-25	19.8 (3.5)	20.1 (3.1)	20.4 (3.1)	20.1 (3.1)	19.9 (3.2)	20.0 (3.5)	19.7 (2.9)	19.8 (3.9)	19.6 (3.6)	.76	.73	.72	.74	.70	.74	.65	.79	.82
Emotional Stability	1-5	5-25	20.2 (3.8)	21.0 (3.5)	21.1 (3.4)	21.0 (3.5)	20.1 (3.6)	19.7 (3.6)	20.5 (3.6)	19.8 (4.4)	20.3 (3.4)	.82	.80	.77	.82	.78	.78	.79	.89	.79
Openness	1-5	5-25	18.4 (3.6)	19.7 (3.3)	19.7 (3.5)	19.7 (3.3)	17.9 (3.6)	17.5 (3.7)	18.3 (3.5)	18.4 (3.7)	18.4 (3.4)	.72	.66	.70	.60	.71	.72	.70	.71	.78

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*



**Correlations of Goldberg’s Adjective Scale with other Personal Attributes variables**

	Project	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger In	Anger Out	Cynicism	Hostile Affect	Aggressive Responding	Mastery	Optimism	Self Esteem
Agreeableness	1	<b>.282</b>	<b>.558</b>	.106	<b>.162</b>	<b>-.324</b>	<b>-.367</b>	<b>-.219</b>	<b>-.379</b>	<b>-.292</b>	<b>.152</b>	<b>.229</b>	<b>.249</b>
	2	<b>.295</b>	<b>.404</b>	<b>.223</b>	<b>.232</b>	<b>-.341</b>	<b>-.294</b>	<b>-.179</b>	<b>-.271</b>	<b>-.176</b>	<b>.284</b>	<b>.272</b>	<b>.264</b>
	3	<b>.623</b>	<b>.734</b>	<b>.363</b>	<b>.392</b>	<b>-.144</b>	<b>-.195</b>	<b>-.014</b>	<b>-.146</b>	<b>-.018</b>	<b>.091</b>	<b>.121</b>	<b>.082</b>
	4	<b>.274</b>	<b>.424</b>	<b>.116</b>	<b>.148</b>	<b>-.264</b>	<b>-.362</b>	<b>-.179</b>	<b>-.382</b>	<b>-.243</b>	<b>.306</b>	<b>.302</b>	<b>.227</b>
Conscientiousness	1		<b>.239</b>	<b>.190</b>	<b>.196</b>	<b>-.247</b>	<b>-.193</b>	<b>-.037</b>	<b>-.200</b>	<b>-.041</b>	<b>.247</b>	<b>.132</b>	<b>.181</b>
	2		<b>.205</b>	<b>.036</b>	<b>.271</b>	<b>-.086</b>	<b>-.078</b>	<b>-.045</b>	<b>-.080</b>	<b>.058</b>	<b>.201</b>	<b>.145</b>	<b>.247</b>
	3		<b>.543</b>	<b>.210</b>	<b>.290</b>	<b>-.137</b>	<b>-.123</b>	<b>-.029</b>	<b>-.162</b>	<b>.000</b>	<b>.202</b>	<b>.162</b>	<b>.178</b>
	4		<b>.180</b>	<b>.068</b>	<b>.231</b>	<b>-.189</b>	<b>-.071</b>	<b>-.021</b>	<b>-.080</b>	<b>.035</b>	<b>.173</b>	<b>.094</b>	<b>.207</b>
Emotional Stability	1			<b>.220</b>	<b>.157</b>	<b>-.353</b>	<b>-.331</b>	<b>-.182</b>	<b>-.428</b>	<b>-.118</b>	<b>.287</b>	<b>.381</b>	<b>.290</b>
	2			<b>.148</b>	<b>.198</b>	<b>-.462</b>	<b>-.310</b>	<b>-.233</b>	<b>-.440</b>	<b>-.101</b>	<b>.497</b>	<b>.425</b>	<b>.258</b>
	3			<b>.375</b>	<b>.336</b>	<b>-.356</b>	<b>-.216</b>	<b>-.158</b>	<b>-.254</b>	<b>-.051</b>	<b>.306</b>	<b>.264</b>	<b>.160</b>
	4			<b>.321</b>	<b>.161</b>	<b>-.527</b>	<b>-.185</b>	<b>-.113</b>	<b>-.428</b>	<b>-.018</b>	<b>.531</b>	<b>.526</b>	<b>.340</b>
Extraversion	1				<b>.178</b>	<b>-.283</b>	<b>.178</b>	<b>-.082</b>	<b>-.035</b>	<b>.022</b>	<b>.165</b>	<b>.237</b>	<b>.130</b>
	2				<b>.193</b>	<b>-.345</b>	<b>.128</b>	<b>-.011</b>	<b>-.082</b>	<b>.078</b>	<b>.178</b>	<b>.220</b>	<b>.231</b>
	3				<b>.273</b>	<b>-.228</b>	<b>.180</b>	<b>.012</b>	<b>-.053</b>	<b>.179</b>	<b>.205</b>	<b>.207</b>	<b>.253</b>
	4				<b>.409</b>	<b>-.407</b>	<b>.152</b>	<b>-.065</b>	<b>-.164</b>	<b>.124</b>	<b>.332</b>	<b>.322</b>	<b>.374</b>
Openness	1					<b>-.102</b>	<b>-.035</b>	<b>-.154</b>	<b>-.146</b>	<b>-.017</b>	<b>.310</b>	<b>.268</b>	<b>.342</b>
	2					<b>-.093</b>	<b>.023</b>	<b>-.054</b>	<b>-.102</b>	<b>.004</b>	<b>.266</b>	<b>.256</b>	<b>.409</b>
	3					<b>-.052</b>	<b>.058</b>	<b>-.048</b>	<b>.006</b>	<b>.029</b>	<b>.173</b>	<b>.278</b>	<b>.318</b>
	4					<b>-.142</b>	<b>.109</b>	<b>-.004</b>	<b>-.038</b>	<b>.019</b>	<b>.275</b>	<b>.300</b>	<b>.383</b>

*Coefficients in BOLD are significant at p < .05 level*



**Correlations of Goldberg's Adjective Scale with Health Behaviors**

	Project	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
Agreeableness	1	-.123	.069	.029	<b>-.152</b>
	2	-.087	<b>.165</b>	.066	-.068
	3	.006	.050	.082	-.039
	4	-.011	<b>.202</b>	.080	-.064
Conscientiousness	1	<b>.146</b>	.092	<b>-.185</b>	.086
	2	.043	<b>.108</b>	.091	.013
	3	<b>.108</b>	.004	.054	-.029
	4	-.016	-.062	.073	-.035
Emotional Stability	1	-.105	<b>.182</b>	.061	-.087
	2	.004	<b>.212</b>	<b>.283</b>	.000
	3	.002	.075	<b>.177</b>	-.009
	4	.052	<b>.243</b>	<b>.217</b>	-.042
Extraversion	1	-.003	<b>.189</b>	.122	.136
	2	-.024	<b>.179</b>	.017	.027
	3	.024	<b>.142</b>	.002	-.055
	4	.050	<b>.192</b>	.055	-.001
Openness	1	-.027	<b>.278</b>	-.006	-.093
	2	.063	<b>.209</b>	.043	-.022
	3	.068	.088	.087	-.025
	4	-.056	<b>.166</b>	<b>.128</b>	-.074



### Correlations of Goldberg's Adjective Scale with Health Measures

	General Health Perception - 1 question		Project	SF-36 Phys Functioning	SF-36 Social Funct	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
	Proj 1, 2	Proj 3, 4											
Agreeableness	(1) .010	-.080	3	.005	-.053	.069	.066	<b>.129</b>	.053	.043	-.017	-.002	.078
	(2) <b>.142</b>	.103	4	.071	.107	.016	<b>.144</b>	<b>.298</b>	<b>.144</b>	.068	<b>.199</b>	.015	<b>.236</b>
Conscientiousness	(1) .065	.070	3	.090	.088	<b>.107</b>	<b>.182</b>	<b>.204</b>	<b>.194</b>	<b>.161</b>	<b>.154</b>	.086	<b>.192</b>
	(2) <b>.174</b>	.094	4	.024	.017	.026	.027	.058	<b>.139</b>	.090	.048	.050	.057
Emotional Stability	(1) -.008	.092	3	.040	<b>.104</b>	<b>.126</b>	<b>.185</b>	<b>.389</b>	<b>.233</b>	<b>.184</b>	<b>.148</b>	.040	<b>.296</b>
	(2) <b>.376</b>	<b>.224</b>	4	<b>.144</b>	<b>.373</b>	<b>.201</b>	<b>.383</b>	<b>.657</b>	<b>.371</b>	<b>.200</b>	<b>.330</b>	.064	<b>.580</b>
Extraversion	(1) .126	.087	3	.058	.018	.085	<b>.130</b>	<b>.190</b>	<b>.207</b>	.009	.064	.011	<b>.175</b>
	(2) .007	<b>.126</b>	4	-.045	.098	.005	<b>.145</b>	<b>.243</b>	<b>.188</b>	-.051	<b>.118</b>	-.091	<b>.257</b>
Openness	(1) .088	<b>.105</b>	3	.017	-.042	.061	-.014	.075	.084	.009	.085	.042	.026
	(2) <b>.158</b>	.072	4	.039	.024	-.069	.031	<b>.194</b>	.033	.002	.067	-.042	.113

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Goldberg's Adjective Scale

First order structure of 5 factors was tested with factors allowed to covary. In combined sample, the fit was poor (all indices < .90). The fit could be considerably improved by allowing a number of items from one scale to load on factors representing other scales. By study: results very similar to those obtained in combined sample.



### **Interpersonal Support Evaluation List (ISEL; 12 items)**

ISEL assesses perceived availability of four types of social support (appraisal, belonging, self-esteem, and tangible). Availability of social support has been linked to reduced mortality (Rosengren, Orth-Gomer, Wedel, & Wilhemsen, 1993) and improved psychological state (Cohen & Wills, 1985). Original scale consists of 40 items (ten items in each of the four subscales measuring separate aspects of social support). The modified version for PMBC includes only three subscales (the self-esteem subscale was excluded because it overlaps with the self-esteem measure) and only the four highest-loading items for each subscale. Overall support can also be evaluated by summing up all the items. We report on the psychometrics of the overall support measure.

#### Primary Reference:

Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. (1985). Measuring the functional components of social support. In I.G. Sarason, & B. Sarason (Eds.), Social support: Theory, research and applications (pp. 73-94). The Hague: Martinus Nijhoff.

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Dobkin, P.L., Fortin, P.R., Joseph, L., Esdaile, J.M., Danoff, D.S., & Clarke, A.E. (1998). Psychosocial contributors to mental and physical health in patients with systemic lupus erythematosus. Arthritis Care and Research, *11*, 23-31.



Franks, P., Campbell, T.L., & Shields, C.G. (1992). Social relationships and health: The relative roles of family functioning and social support. Social Science & Medicine, 34, 779-788.

King, K.B., Reis, H.T., Porter, L.A., & Norsen, L.H. (1993). Social support and long-term recovery from coronary artery surgery: Effect on patients and spouses. Health Psychology, 12, 56-63.

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### Basic Psychometrics for ISEL 12 item scale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
0-3	0-36	28.8 (5.7)	29.2 (5.4)	29.9 (5.6)	28.5 (5.2)	27.6 (5.8)	27.4 (6.0)	27.8 (5.7)	29.0 (5.6)	30.3 (5.6)	.86	.80	.84	.75	.85	.86	.84	.88	.90

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of ISEL with Social Variables

Project Number	Marital Adjustment (Locke-Wallace Marital Adjustment Test [LWMAT])	Social Network Diversity Index (Social Network Index: Cohen et al., 1997)	Number of People in Social Network
1	<b>.464</b>	<b>.208</b>	<b>.221</b>
2	<b>.409</b>	<b>.269</b>	<b>.296</b>
3	<b>.454</b>	<b>.303</b>	<b>.427</b>
4	<b>.442</b>	<b>.290</b>	<b>.303</b>

*Coefficients in BOLD are significant at  $p < .05$  level*

### Correlations of ISEL with Psychological Pathways

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Perceived Stress (Perceived Stress Scale [PSS])	Life Engagement (Life Engagement Test)
1	-.020	-.115	-.001	<b>.180</b>	.129	.003	<b>-.273</b>	<b>.304</b>	<b>-.333</b>	<b>.402</b>
2	<b>-.325</b>	<b>-.323</b>	<b>-.330</b>	<b>.431</b>	<b>.276</b>	<b>.280</b>	<b>-.448</b>	<b>.369</b>	<b>-.445</b>	<b>.466</b>
3	<b>-.192</b>	<b>-.260</b>	<b>-.203</b>	<b>.361</b>	<b>.360</b>	<b>.123</b>	<b>-.318</b>	<b>.393</b>	<b>-.322</b>	<b>.386</b>
4	<b>-.198</b>	<b>-.300</b>	<b>-.216</b>	<b>.431</b>	<b>.296</b>	<b>.245</b>	<b>-.387</b>	<b>.465</b>	<b>-.322</b>	<b>.493</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression*



### Correlations of ISEL with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.099	<b>.222</b>	-.087	.039
2	.035	<b>.324</b>	<b>.093</b>	.020
3	-.013	<b>.315</b>	<b>.104</b>	-.042
4	.071	<b>.424</b>	<b>.212</b>	-.077

### Correlations of ISEL with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .005	(3) <b>.223</b>	(3)	<b>.123</b>	<b>.109</b>	<b>.195</b>	<b>.231</b>	<b>.284</b>	<b>.364</b>	<b>.236</b>	<b>.247</b>	<b>.156</b>	<b>.268</b>
(2) <b>.212</b>	(4) <b>.237</b>	(4)	<b>.145</b>	<b>.214</b>	<b>.157</b>	<b>.304</b>	<b>.397</b>	<b>.252</b>	.106	<b>.223</b>	.062	<b>.374</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of ISEL

Second Order confirmatory factor analysis was tested with ISEL-Total factor underlying 3 subscale factors. Model fit borders on good (indices slightly below and above .90) in combined sample and in Subclinical CVD and Osteoarthritis studies. In Respiratory Illness and Breast Cancer study, model does not converge: ISEL-Total factor is linearly dependent on ISEL-Tangible factor. In all samples, additional cross-loadings are suggested in order to improve fit.



### **Life Engagement Test (LET)**

This measure assesses the extent to which a person is purposefully engaged in the current activities of life. Sense of purpose has been found to correlate positively with life satisfaction, positive mood states, and happiness. It is negatively associated with depression, has been linked to better self-reported health, and less emotional distress. This is a new measure. Existing scales (i.e., Ryff's Purpose Scale, Antonovsky's Meaning Subscale of the SOC Scale, Cella's Purpose Scale and Thompson's Meaning Scale) often contain a mix of past-, present- and future-focused items as well as items confounding engagement with evaluations of past achievement of life satisfaction. The new six-item LET was designed (1) to focus on life engagement as defined by being psychologically involved with and committed to life's activities, (2) to minimize the extent to which items were based on an affective reaction to life engagement or past achievement (3) to focus exclusively on the present time perspective (to facilitate evaluation of change in life engagement over time), and (4) to contain an equal number of positively and negatively worded items.

#### Primary Reference:

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Ryff, C.D., & Keyes, C.L.M. (1995). The structure of psychological well-being revisited. Journal of Personality and Social Psychology, 69, 719-727.

Ryff, C.D., Lee, Y.H., Essex, M.J., & Schmutte, P.S., (1994). My children and me: Midlife evaluations of grown children and self. Psychology of Aging, 9, 195-205.



### Basic Psychometrics for Life Engagement Test

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
1-5	6-30	24.7 (3.6)	25.1 (3.6)	25.5 (3.3)	24.7 (3.8)	24.4 (3.6)	24.3 (3.8)	24.5 (3.5)	24.9 (3.4)	24.9 (3.8)	.81	.73	.67	.77	.81	.82	.79	.80	.87

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of LET with other Psychological Pathways variables

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Perceived Stress (Perceived Stress Scale [PSS])
1	<b>-.285</b>	<b>-.179</b>	<b>-.245</b>	<b>.286</b>	<b>.309</b>	.130	<b>-.333</b>	<b>.362</b>	<b>-.442</b>
2	<b>-.342</b>	<b>-.378</b>	<b>-.329</b>	<b>.458</b>	<b>.443</b>	<b>.296</b>	<b>-.496</b>	<b>.451</b>	<b>-.541</b>
3	<b>-.343</b>	<b>-.460</b>	<b>-.221</b>	<b>.457</b>	<b>.502</b>	<b>.260</b>	<b>-.489</b>	<b>.440</b>	<b>-.439</b>
4	<b>-.245</b>	<b>-.407</b>	<b>-.225</b>	<b>.477</b>	<b>.339</b>	<b>.287</b>	<b>-.423</b>	<b>.566</b>	<b>-.455</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale  
Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of LET with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	-.070	<b>.379</b>	-.139	<b>-.186</b>
2	.021	<b>.230</b>	<b>.137</b>	.025
3	-.048	<b>.247</b>	<b>.186</b>	-.059
4	.087	<b>.301</b>	.062	.002

### Correlations of LET with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .097	(3) <b>.264</b>	(3)	.067	<b>.285</b>	<b>.244</b>	<b>.342</b>	<b>.472</b>	<b>.426</b>	<b>.186</b>	<b>.315</b>	.088	<b>.466</b>
(2) <b>.326</b>	(4) <b>.269</b>	(4)	<b>.268</b>	<b>.199</b>	<b>.366</b>	<b>.462</b>	<b>.334</b>	<b>.170</b>	<b>.370</b>	<b>.169</b>	<b>.427</b>	<b>.269</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of LET

One factor structure was tested and confirmed in combined sample and in each study – all fit indices are above .90, indicating good fit of the model.



### **Marital-Adjustment Test**

This measure is designed to measure marital adjustment and satisfaction among married participants and those in long-term committed relationship. Conflict and lack of satisfaction in married couples has been linked to increased SNS activation (Levenson, & Gottman, 1983, 1985) and modulation of immune response (Kiecolt-Glaser, Malarkey, Chee, Newton, Cacioppo, Mao, & Glaser, 1993).

#### Primary Reference:

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#### Additional References:

Keefe, F.J., Caldwell, D.S., Baucom, D., Salley, A., Robinson, E., Timmons, K., Beaupre, P., Weisberg, J., & Helms, M. (1999). Spouse-assisted coping skills training in the management of knee pain in osteoarthritis: Long-term follow-up results. Arthritis Care & Research, 12, 101-111.

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Levenson, R.W., & Gottman, J.M. (1983). Marital interaction: Physiological linkage and affective exchange. Journal of Personality and Social Psychology, 45, 587 -597.

Levenson, R.W., & Gottman, J.M. (1985). Physiological and affective predictors of change in relationship satisfaction. Journal of Personality & Social Psychology, 49, 85-94.



### Basic Psychometrics for Marital Adjustment Test

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
varies	2-158	117.9 (26.0)	113.1 (26.3)	109.1 (28.6)	118.9 (21.7)	119.2 (25.7)	117.8 (26.7)	120.5 (24.8)	117.1 (27.2)	117.5 (24.9)	.75	.74	.75	.69	.73	.74	.73	.79	.74

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Marital Adjustment Test with Social Variables

Project Number	ISEL (Interpersonal Support Evaluation List)	Social Network Diversity Index (Social Network Index : Cohen et al., 1997)	Number of People in Social Network
1	<b>.464</b>	.040	.022
2	<b>.409</b>	.072	<b>.122</b>
3	<b>.454</b>	.064	<b>.138</b>
4	<b>.442</b>	<b>.205</b>	<b>.168</b>

*Coefficients are significant at  $p < .05$  level*



**Correlations of Marital Adjustment Test with Psychological Pathways**

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Perceived Stress (Perceived Stress Scale [PSS])	Life Engagement (Life Engagement Test)
1	-.237	-.210	-.243	.166	-.060	.106	-.212	<b>.416</b>	<b>-.277</b>	.255
2	<b>-.325</b>	<b>-.372</b>	<b>-.331</b>	<b>.461</b>	<b>.240</b>	<b>.284</b>	<b>-.363</b>	<b>.453</b>	<b>-.359</b>	<b>.287</b>
3	<b>-.312</b>	<b>-.441</b>	<b>-.390</b>	<b>.529</b>	<b>.311</b>	<b>.290</b>	<b>-.439</b>	<b>.610</b>	<b>-.458</b>	<b>.282</b>
4	<b>-.236</b>	<b>-.275</b>	<b>-.247</b>	<b>.339</b>	<b>.174</b>	<b>.294</b>	<b>-.328</b>	<b>.585</b>	<b>-.341</b>	<b>.445</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale*

**Correlations of Marital Adjustment Test with Health Behaviors**

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.022	.160	-.051	-.057
2	.037	<b>.245</b>	.097	.032
3	.012	<b>.260</b>	.092	.059
4	<b>.153</b>	<b>.209</b>	.006	.005



### Correlations of Marital Adjustment Test with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) -.006	(3) <b>.147</b>	(3)	.095	<b>.152</b>	<b>.137</b>	<b>.232</b>	<b>.469</b>	<b>.328</b>	<b>.179</b>	<b>.183</b>	.047	<b>.374</b>
(2) <b>.201</b>	(4) <b>.206</b>	(4)	.140	<b>.157</b>	.129	<b>.322</b>	<b>.386</b>	.098	.022	<b>.244</b>	.019	<b>.334</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Marital Adjustment Test

One factor structure was tested. The fit was poor in combined sample and in individual studies. All fit indices below .90. Large error covariance between various items. Item “On the go” does not load significantly on the Marital Satisfaction Factor.



## **The Mastery Scale**

This scale is designed to assess the extent to which the individuals generally feel as though they manifest personal mastery over important life outcomes. Mastery has been linked to depressive symptoms.

### Primary Reference:

Pearlin, L.I., & Schooler, C. (1978). The structure of coping. Journal of Health and Social Behavior, 19, 2-21.

### Additional References:

Dew, M.A., Ragni, M.V., & Nimorwicz, P. (1990). Infection with human immunodeficiency virus and vulnerability to psychiatric distress. A study of men with hemophilia. Archives of General Psychiatry, 47, 737-44.

Folkman, S. & Lazarus, R.S. (1986). Stress process and depressive symptomatology. Journal of Abnormal Psychology, 95, 107-113.

Kaplan, L., & Boss, P. (1999). Depressive symptoms among spousal caregivers of institutionalized mates with Alzheimer's: boundary ambiguity and mastery as predictors. Family Process, 38, 85-103.

Marshall, G.N. & Lange, E.L. (1990). Optimism, self-mastery, and symptoms of depression in women professionals. Journal of Personality and Social Psychology, 59, 132-139.

Matthews K.A., Owens, J.F., Edmundowicz, D., Lee, L., & Kuller, L.H. (2006). Positive and negative attributes for coronary and aortic calcification in healthy women. Psychosomatic Medicine, 68, 355-361.

### Basic Psychometrics for Mastery scale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
1-4	7-28	21.2 (3.3)	21.8 (3.2)	21.9 (3.0)	21.8 (3.2)	20.8 (3.3)	20.6 (3.3)	21.1 (3.2)	21.7 (3.4)	20.9 (3.2)	.76	.72	.71	.74	.75	.73	.76	.80	.75

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Mastery scale with other Personal Attributes variables

	Agreeableness	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger In	Anger Out	Cynicism	Hostile Affect	Aggressive Responding	Optimism	Self-esteem
1	<b>0.152</b>	<b>0.247</b>	<b>0.287</b>	<b>0.165</b>	<b>0.310</b>	<b>-0.306</b>	-0.078	<b>-0.254</b>	<b>-0.229</b>	-.052	<b>.367</b>	<b>.491</b>
2	<b>0.284</b>	<b>0.201</b>	<b>0.497</b>	<b>0.178</b>	<b>0.266</b>	<b>-0.378</b>	-0.069	<b>-0.287</b>	<b>-0.343</b>	<b>-.123</b>	<b>.557</b>	<b>.365</b>
3	0.091	<b>0.202</b>	<b>0.306</b>	<b>0.205</b>	<b>0.173</b>	<b>-0.387</b>	-0.029	<b>-0.253</b>	<b>-0.299</b>	-.038	<b>.618</b>	<b>.453</b>
4	<b>0.306</b>	<b>0.173</b>	<b>0.531</b>	<b>0.332</b>	<b>0.275</b>	<b>-0.441</b>	0.028	<b>-0.227</b>	<b>-0.328</b>	.041	<b>.576</b>	<b>.490</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



**Correlations of Mastery scale with Health Behaviors**

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.081	<b>.325</b>	-.109	-.041
2	<b>.101</b>	<b>.245</b>	<b>.135</b>	.003
3	.092	<b>.277</b>	<b>.218</b>	-.017
4	.076	<b>.296</b>	<b>.224</b>	-.081

**Correlations of Mastery scale with Health Measures**

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .106	(3) <b>.297</b>	(3)	.083	<b>.205</b>	<b>.154</b>	<b>.272</b>	<b>.519</b>	<b>.434</b>	<b>.158</b>	<b>.370</b>	.070	<b>.451</b>
(2) <b>.375</b>	(4) <b>.325</b>	(4)	-.019	-.024	-.112	-.050	-.046	.037	-.022	-.006	-.037	-.023

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

**Confirmatory Factor Analysis of Mastery scale**

One factor structure tested and confirmed in CS. All fit indices above .90. By study: worse fit in Respiratory Illness and Breast Cancer study – fit indices below .90; very good fit in Osteoarthritis study; good fit in Subclinical CVD study.



### **Optimism (Revised Life Orientation Test- LOT-R)**

This scale is designed to measure dispositional optimism. Dispositional optimism is considered beneficial for psychological and physical well-being. It is related to faster recovery after coronary artery bypass surgery (Scheier, et al. 1989) and lower rates of re-hospitalization following angioplasty (Helgeson & Fritz, 1999).

#### Primary Reference:

Scheier, M.F., Carver C.S., & Bridges, M.W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. Journal of Personality and Social Psychology, *67*, 1063-1078.

#### Additional References:

Helgeson, V.S., & Fritz, H.L. (1999). Cognitive adaptation as a predictor of new coronary events following percutaneous transluminal coronary angioplasty. Psychosomatic Medicine, *61*, 488-495.

Marshall, G.N., & Lange, E.L. (1990). Optimism, self-mastery, and symptoms of depression in women professionals. Journal of Personality and Social Psychology, *59*, 132-139.

Raikkonen K., Matthews, K.A., Flory, J.D., Owens, J.F., & Gump, B.B. (1999). Effects of optimism, pessimism, and trait anxiety on ambulatory blood pressure and mood during everyday life. Journal of Personality and Social Psychology, *76*, 104-113.

Scheier, M.F., Matthews, K.A., Owens, J.F., Schulz, R., Bridges, M.W., Magovern, G.J., & Carver, C.S. (1999). Optimism and re-hospitalization following coronary artery bypass graft surgery. Archives of Internal Medicine, *59*, 829-835.

Scheier, M.F., Matthews, K.A., Owens, J.F., Magovern, G.J., Sr., Lefebvre, R.C., Abbott, R.A., & Carver, C.S. (1989). Dispositional optimism and recovery from coronary artery bypass surgery: The beneficial effects on physical and psychological well-being. Journal of Personality and Social Psychology, *57*, 1024-1040.



### Basic Psychometrics for Optimism

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
0-4	0-24	16.4 (3.9)	15.6 (4.1)	15.8 (4.3)	15.6 (4.1)	16.1 (3.7)	16.1 (3.8)	16.0 (3.6)	17.2 (3.7)	16.5 (4.3)	.81	.78	.80	.74	.76	.78	.75	.81	.86

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Optimism with Personal Attributes variables

	Agreeableness	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger In	Anger Out	Cynicism	Hostile Affect	Aggressive Responding	Mastery	Self-Esteem
1	<b>.229</b>	.132	<b>.381</b>	<b>.237</b>	<b>.268</b>	<b>-.311</b>	-.116	<b>-.311</b>	<b>-.348</b>	-.115	<b>.367</b>	<b>.314</b>
2	<b>.272</b>	<b>.145</b>	<b>.425</b>	<b>.220</b>	<b>.256</b>	<b>-.339</b>	<b>-.138</b>	<b>-.280</b>	<b>-.406</b>	<b>-.167</b>	<b>.557</b>	<b>.385</b>
3	<b>.121</b>	<b>.162</b>	<b>.264</b>	<b>.207</b>	<b>.278</b>	<b>-.348</b>	-.082	<b>-.298</b>	<b>-.283</b>	-.097	<b>.618</b>	<b>.459</b>
4	<b>.302</b>	.094	<b>.526</b>	<b>.322</b>	<b>.300</b>	<b>-.398</b>	-.103	<b>-.270</b>	<b>-.430</b>	-.035	<b>.576</b>	<b>.521</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of Optimism with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	-.073	<b>.435</b>	.083	-.111
2	-.022	<b>.237</b>	<b>.100</b>	-.012
3	.096	<b>.265</b>	<b>.151</b>	-.073
4	.103	<b>.337</b>	<b>.178</b>	-.036

### Correlations of Optimism with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .140	<b>.311</b>	(3)	.089	<b>.237</b>	<b>.183</b>	<b>.260</b>	<b>.444</b>	<b>.403</b>	<b>.139</b>	<b>.403</b>	<b>.103</b>	<b>.406</b>
(2) <b>.420</b>	<b>.274</b>	(4)	<b>.273</b>	<b>.308</b>	<b>.279</b>	<b>.424</b>	<b>.523</b>	<b>.389</b>	<b>.208</b>	<b>.376</b>	<b>.189</b>	<b>.491</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Optimism

One factor structure was tested. In combined sample, the fit was adequate (fit indices slightly above or below .90). The fit could be improved by allowing the residuals of positively worded items to covary. Similar results in individual studies.



## Perceived Stress Scale

This measure is designed to assess the degree to which people perceive their lives as stressful. High levels of stress are associated with poor self-reported health, elevated blood pressure, depression, and susceptibility to infection.

The 10 item version of this scale that was used in the PMBC research was first published by Cohen & Williamson (1988).

### Primary Reference:

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.

Cohen, S. *Dr. Cohen's scales*. Retrieved July 30, 2008 from <http://www.psy.cmu.edu/~scohen>

### Additional References:

Cohen, S., Frank, E., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M., Jr. (1998). Types of stressors that increase susceptibility to the common cold in healthy adults. Health Psychology, 17, 214-223.

Cohen, S., & Williamson, G.M. (1988). Perceived Stress in a Probability Sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The Social Psychology of Health* (31-67). Newbury Park, California: Sage.

Glaser, R., & Kiecolt-Glaser, J. K. (1997). Chronic stress modulates the virus-specific immune response to latent herpes simplex virus Type 1. Annals of Behavioral Medicine, 19, 78-82.

Glaser, R., Pearson, G.R., Bonneau, R.H., Esterling, B.A., Atkinson, C., & Kiecolt-Glaser, J.K. (1993). Stress and the memory T-cell response to the Epstein-Barr virus in healthy medical students. Health Psychology, 12, 435-442.

Stone, A.A., Mezzacappa, E.S., Donatone, N.A., & Gonder, M. (1999). Psychosocial stress and social support are associated with prostate-specific antigen levels in men: Results from a community screening program. Health Psychology, 18, 482-486.



### Basic Psychometrics for Perceived Stress Scale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
0-4	0-40	14.3 (6.5)	14.5 (6.4)	14.3 (6.3)	14.7 (6.6)	13.9 (6.3)	14.8 (6.2)	12.9 (6.2)	13.1 (6.3)	16.2 (6.9)	.90	.88	.88	.89	.89	.88	.89	.90	.91

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Perceived Stress Scale with other Psychological Pathways variables

Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life (Satisfaction with Life Scale [SWLS])	Life Engagement
1	<b>0.506</b>	<b>0.521</b>	<b>0.379</b>	<b>-0.482</b>	<b>-0.351</b>	<b>-0.384</b>	<b>0.612</b>	<b>-0.626</b>	<b>-.442</b>
2	<b>0.689</b>	<b>0.580</b>	<b>0.522</b>	<b>-0.632</b>	<b>-0.452</b>	<b>-0.556</b>	<b>0.686</b>	<b>-0.564</b>	<b>-.541</b>
3	<b>0.672</b>	<b>0.625</b>	<b>0.576</b>	<b>-0.615</b>	<b>-0.508</b>	<b>-0.551</b>	<b>0.676</b>	<b>-0.499</b>	<b>-.439</b>
4	<b>0.652</b>	<b>0.655</b>	<b>0.537</b>	<b>-0.649</b>	<b>-0.54</b>	<b>-0.554</b>	<b>0.717</b>	<b>-0.414</b>	<b>-.455</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale  
Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of Perceived Stress Scale with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.109	<b>-.317</b>	-.025	.087
2	-.078	<b>-.281</b>	<b>-.269</b>	.024
3	.063	<b>-.281</b>	<b>-.305</b>	.052
4	<b>-.129</b>	<b>-.288</b>	<b>-.267</b>	.065

### Correlations of Perceived Stress Scale with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) <b>-.122</b>	(3) <b>-.284</b>	(3)	<b>-.119</b>	<b>-.396</b>	<b>-.256</b>	<b>-.472</b>	<b>-.744</b>	<b>-.556</b>	<b>-.259</b>	<b>-.342</b>	-.060	<b>-.685</b>
(2) <b>-.434</b>	(4) <b>-.316</b>	(4)	<b>-.601</b>	<b>-.401</b>	<b>-.565</b>	<b>-.771</b>	<b>-.488</b>	<b>-.380</b>	<b>-.386</b>	<b>-.225</b>	<b>-.728</b>	<b>-.316</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Perceived Stress Scale

One factor structure was tested. In combined sample, the fit was adequate (fit indices slightly above or below .90). The fit could be improved by allowing the residuals of some items to covary, indicating overlap of variance (redundancy in items). Similar results in individual studies except for Subclinical CVD study – poor fit.



### **Pittsburgh Enjoyable Activities Test (PEAT)**

This is a new measure and has not been published yet (as of 11/1/2008). It is designed to assess the frequency of engaging in enjoyable activities. Hobbies and other enjoyable leisure activities have been linked to survival after breast cancer surgery, depression in older population, and recovery after heart surgery.

#### No Primary References

#### Additional References:

Gump, B.B., & Matthews, K.A. (2000). Are vacations good for your health? The 9-year mortality experience after the Multiple Risk Factor Intervention Trial. Psychosomatic Medicine, 62, 608-612.

Iwasaki, Y., Mackay, K.J., Mactavish, J.B., Ristock, J., & Bartlett, J. (2006). Voices from the margins: Stress, active living, and leisure as a contributor to coping with stress. Leisure Sciences, 28, 163-180.

Jansen, D.A., & von Sadovszky, V. (2004). Restorative activities of community-dwelling elders. Western Journal of Nursing Research, 26, 381-99; discussion 400-4.

Stevens, A.B., Coon, D., Wisniewski, S., Vance, D., Arguelles, S., Belle, S., Mendelsohn, A., Ory, M., & Haley, W. (2004). Measurement of leisure time satisfaction in family caregivers. Aging and Mental Health, 8, 450-459.

Tominaga, K., Andow, J., Koyama, Y., Numao, S., Kurokawa, E., Ojima, M., & Nagai, M. (1998). Family environment, hobbies and habits as psychosocial predictors of survival for surgically treated patients with breast cancer. Japanese Journal of Clinical Oncology, 28, 36-41.



### Basic Psychometrics for the Pittsburgh Enjoyable Activities Test

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
1-5	10-50	22.2 (5.6)	22.2 (5.8)	22.3 (6.0)	22.1 (5.7)	21.3 (5.7)	21.7 (5.3)	21.0 (6.0)	23.5 (5.3)	21.9 (5.4)	.67	.71	.73	.69	.66	.63	.69	.62	.64

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of the Pittsburgh Enjoyable Activities Test with other Behavioral Pathways variables

Project Number	Alcohol	Sleep Efficiency	Smoking
1	-.125	.135	<b>-.220</b>
2	.038	.089	-.003
3	.046	.036	<b>-.162</b>
4	-.011	<b>.195</b>	<b>-.216</b>

*Coefficients in BOLD are significant at  $p < .05$  level*

### Correlations of Enjoyable Activities with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) <b>.195</b>	(3) <b>.216</b>	(3)	<b>.183</b>	<b>.130</b>	.094	<b>.131</b>	<b>.240</b>	<b>.318</b>	.096	<b>.159</b>	<b>.107</b>	<b>.209</b>
(2) <b>.225</b>	(4) <b>.309</b>	(4)	<b>.370</b>	<b>.233</b>	<b>.300</b>	<b>.391</b>	<b>.309</b>	<b>.140</b>	<b>.248</b>	<b>.186</b>	<b>.183</b>	<b>.376</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*



### Confirmatory Factor Analysis of the Pittsburgh Enjoyable Activities Test

One factor structure was tested. The fit was poor in combined sample and in individual studies. All fit indices below .90. Large error covariance between two items ('Quiet time by yourself' and 'Unwinding') and between other pairs of items. When errors for these two items are allowed to covary the fit improves to borderline good. Similar patterns were found in individual studies.



### **Rosenberg Self-Esteem Scale**

This scale is designed to measure self-esteem. Self-esteem, in conjunction with mastery and optimism, predicted low rates of re-hospitalization following angioplasty (Helgeson & Fritz, 1999).

Note: One minor item change “at least on an equal plane with others” changed to “at least on an equal basis with others.”

#### Primary Reference:

Rosenberg, M. (1965). Society and adolescent self-image. Princeton, NJ: Princeton University Press.

#### Additional References:

Helgeson, V.S., & Fritz, H.L. (1999). Cognitive adaptation as a predictor of new coronary events following percutaneous transluminal coronary angioplasty. Psychosomatic Medicine, 61, 488-495.

Johnson, S.L., Meyer, B., Winett, C., & Small, J. (2000). Social support and self-esteem predict changes in bipolar depression but not mania. Journal of Affective Disorders, 58, 79-86,

Krause, N. (1995). Religiosity and self-esteem among older adults. Journal of Gerontology: Psychological Sciences, 50B , 236-246.

Vohs, K.D., Bardone, A.M., Joiner, T.E. Jr., Abramson, L.Y., & Heatherton, T.F. (1999). Perfectionism, perceived weight status, and self-esteem interact to predict bulimic symptoms: a model of bulimic symptom development. Journal of Abnormal Psychology, 108, 695-700.

### Basic Psychometrics for Self-Esteem Scale

Response Range for Items	Possible Range for Measure	Mean (SD)									Cronbach alpha								
		All	P1			P2			P3	P4	All	P1			P2			P3	P4
			All	F	M	All	F	M				A	F	M	A	F	M		
1-4	4-16	13.4 (1.8)	13.8 (1.8)	13.7 (1.8)	13.8 (1.8)	13.0 (1.8)	12.9 (1.8)	13.0 (1.7)	13.4 (1.8)	13.6 (1.9)	.84	.84	.83	.84	.82	.80	.83	.85	.85

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Self-Esteem Scale with other Personal Attributes variables

	Agreeableness	Conscientiousness	Emotional Stability	Extraversion	Openness	Anger In	Anger Out	Cynicism	Hostile Affect	Aggressive Responding	Mastery	Optimism
1	<b>0.249</b>	<b>0.181</b>	<b>0.290</b>	0.130	<b>0.342</b>	-0.133	0.031	0.020	-0.101	.084	<b>.491</b>	<b>.314</b>
2	<b>0.264</b>	<b>0.247</b>	<b>0.258</b>	<b>0.231</b>	<b>0.409</b>	<b>-0.218</b>	-0.012	<b>-0.101</b>	<b>-0.143</b>	.034	<b>.365</b>	<b>.385</b>
3	0.082	<b>0.178</b>	<b>0.160</b>	<b>0.253</b>	<b>0.318</b>	<b>-0.218</b>	0.069	-0.047	<b>-0.123</b>	.085	<b>.453</b>	<b>.459</b>
4	<b>0.227</b>	<b>0.207</b>	<b>0.340</b>	<b>0.374</b>	<b>0.383</b>	<b>-0.307</b>	0.070	<b>-0.144</b>	<b>-0.182</b>	.024	<b>.490</b>	<b>.521</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



### Correlations of Self-Esteem Scale with Health Behaviors

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
1	.044	<b>.216</b>	-.033	-.085
2	.061	<b>.110</b>	.080	-.061
3	.025	<b>.166</b>	<b>.116</b>	-.007
4	-.021	<b>.233</b>	.051	-.081

### Correlations of Self-Esteem Scale with Health Measures

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) <b>.171</b>	(3) <b>.292</b>	(3)	.008	<b>.153</b>	<b>.176</b>	<b>.179</b>	<b>.338</b>	<b>.301</b>	<b>.141</b>	<b>.320</b>	.086	<b>.299</b>
(2) <b>.205</b>	(4) <b>.158</b>	(4)	<b>.228</b>	<b>.293</b>	<b>.208</b>	<b>.342</b>	<b>.588</b>	<b>.317</b>	<b>.130</b>	<b>.385</b>	<b>.120</b>	<b>.484</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

### Confirmatory Factor Analysis of Self-Esteem Scale

One factor structure tested and confirmed in combined sample. All fit indices considerably above .90; Chi-Sq non-significant despite large N. By study: results very similar to those in combined sample.



## Social Networks

This measure is designed to assess participation in 12 social relationships. These include relationships with a spouse, parents, parents-in-law, children, friends, workmates, etc. The Index measures two aspects of social networks: network diversity and number of people in the network. Belonging to diverse social networks is associated with less susceptibility to infection, lower mortality, survival from myocardial infarction (Berkman, 1995), and cancer survival (Helgeson & Cohen, 1996).

### Primary Reference:

Cohen, S., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M. (1997). Social ties and susceptibility to the common cold. The Journal of the American Medical Association, *277*, 1940-1944.

Cohen, S. *Dr. Cohen's scales*. Retrieved July 30, 2008, from <http://www.psy.cmu.edu/~scohen>

### Additional References:

Berkman, L.F. (1995). The role of social relations in health promotion. Psychosomatic Medicine, *57*, 245-254.

Cohen, S., Doyle, W.J., Turner, R., Alper, C.M., & Skoner, D.P. (2003). Sociability and susceptibility to the common cold. Psychological Science, *14*, 389-395.

Cohen, S., Frank, E., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M., Jr. (1998). Types of stressors that increase susceptibility to the common cold in healthy adults. Health Psychology, *17*, 214-223.

Helgeson, V., & Cohen, S. (1996). Social support and adjustment to cancer: Reconciling descriptive, correlational, and intervention research. Health Psychology, *15*, 135-148.

Michael, Y.L., Colditz, G.A., Coakley, E., & Kawachi, I. (1999) Health behaviors, social networks, and healthy aging: Cross-sectional evidence from the Nurses' Health Study. Quality of Life Research, *8*, 711-722.



### Basic Psychometrics for Social Network scales

MEASURE	# Items	# Constructs	Response Range for Items	Possible Range for Measure	Mean (SD)								Cronbach alpha												
					All	P1			P2			P3	P4	All	P1			P2			P3	P4			
						All	F	M	All	F	M				A	F	M	A	F	M					
Network Diversity	13	N/A	varies	0-12	6.1 (1.8)	5.4 (1.9)	5.7 (1.7)	5.1 (2.0)	6.1 (1.7)	6.3 (1.7)	5.9 (1.7)	6.2 (1.8)	6.5 (1.9)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of People in Social Network	13	N/A	varies	0-69	18.2 (8.7)	15.7 (8.0)	16.4 (7.5)	15.0 (8.5)	18.2 (8.9)	18.5 (8.6)	17.9 (9.3)	18.8 (8.8)	19.2 (8.4)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*P1 = Project 1- Respiratory illness; P2 = Project 2- Osteoarthritis; P3 = Project 3 – Subclinical CVD; P4 = Project 4 – Breast cancer*

### Correlations of Social Network scales with Social Variables

Project Number	Marital Adjustment (Locke-Wallace Marital Adjustment Test [LWMAT])	ISEL (Interpersonal Support Evaluation List)
Social Network Diversity Index		
1	.040	<b>.208</b>
2	.072	<b>.269</b>
3	.064	<b>.303</b>
4	<b>.205</b>	<b>.290</b>
Number of People in Social Network		
1	.022	<b>.221</b>
2	<b>.122</b>	<b>.296</b>
3	<b>.138</b>	<b>.427</b>
4	<b>.168</b>	<b>.303</b>

*Coefficients in BOLD are significant at  $p < .05$  level*



**Correlations of Social Network scales with Psychological Pathways**

	Project Number	POMS - Anxiety	POMS - Depressed	POMS - Anger	POMS-Well-being	POMS - Vigor	POMS - Calm	CES-D Depression	Satisfaction with Life Scale [SWLS]	Perceived Stress Scale [PSS]	Life Engagement Test	Goal Engagement
Social Network Diversity Index												
	1	-.050	-.085	.019	<b>.211</b>	.038	.013	<b>-.235</b>	<b>.206</b>	<b>-.205</b>	<b>.269</b>	<b>.161</b>
	2	<b>-.099</b>	<b>-.097</b>	-.042	<b>.236</b>	<b>.234</b>	<b>.121</b>	<b>-.156</b>	<b>.242</b>	<b>-.166</b>	<b>.255</b>	<b>.164</b>
	3	-.052	-.053	-.012	.062	<b>.136</b>	.019	<b>-.125</b>	<b>.160</b>	-.051	<b>.182</b>	<b>.134</b>
	4	-.067	<b>-.156</b>	-.053	<b>.193</b>	.116	.068	<b>-.148</b>	<b>.374</b>	-.105	<b>.301</b>	<b>.193</b>
Number of People in Social Network												
	1	<b>-.146</b>	<b>-.155</b>	-.031	<b>.344</b>	<b>.199</b>	.118	<b>-.277</b>	<b>.248</b>	<b>-.282</b>	<b>.323</b>	<b>.253</b>
	2	<b>-.159</b>	<b>-.158</b>	-.069	<b>.304</b>	<b>.290</b>	<b>.198</b>	<b>-.185</b>	<b>.248</b>	<b>-.235</b>	<b>.323</b>	<b>.229</b>
	3	<b>-.127</b>	-.099	-.073	<b>.195</b>	<b>.219</b>	<b>.106</b>	<b>-.213</b>	<b>.219</b>	<b>-.141</b>	<b>.262</b>	<b>.136</b>
	4	-.040	<b>-.147</b>	-.030	<b>.227</b>	<b>.167</b>	.091	<b>-.174</b>	<b>.333</b>	-.101	<b>.282</b>	<b>.188</b>

*POMS = Profile of Mood States ; CES-D = Center for Epidemiologic Studies – Depression Scale*



**Correlations of Social Network scales with Health Behaviors**

Project Number	Alcohol	Enjoyable Activities	Sleep Efficiency	Smoking
Social Network Diversity Index				
1	<b>-.167</b>	<b>.235</b>	<b>-.148</b>	-.114
2	<b>-.126</b>	<b>.371</b>	.081	.036
3	-.069	<b>.273</b>	.030	-.064
4	-.008	<b>.305</b>	.044	<b>-.131</b>
Number of People in Social Network				
1	-.123	<b>.457</b>	-.043	-.140
2	<b>-.109</b>	<b>.332</b>	.056	.059
3	-.070	<b>.316</b>	.072	-.025
4	.002	<b>.317</b>	-.015	<b>-.138</b>

**Correlations of Social Network scales with Health Measures**

General Health Perception -1 question		Project	SF-36 Physical Functioning	SF-36 Social Functioning	SF-36 Role Physical	SF-36 Role Emotional	SF-36 Mental Health	SF-36 Vitality	SF-36 Bodily Pain	SF-36 General Health	SF-36 Physical Component	SF-36 Mental Component
Proj 1, 2	Proj 3, 4											
(1) .129	(3) <b>.113</b>	3	.059	.009	<b>.107</b>	.061	.066	<b>.132</b>	.032	.065	.065	.061
(2) <b>.150</b>	(4) <b>.140</b>	4	<b>.263</b>	<b>.123</b>	.037	.101	<b>.125</b>	.107	<b>.125</b>	<b>.136</b>	<b>.159</b>	.090
(1) <b>.195</b>	(3) <b>.162</b>	3	.080	.046	<b>.192</b>	<b>.118</b>	<b>.157</b>	<b>.201</b>	<b>.123</b>	<b>.104</b>	<b>.113</b>	<b>.128</b>
(2) <b>.173</b>	(4) .099	4	<b>.173</b>	<b>.148</b>	.045	<b>.123</b>	<b>.158</b>	<b>.143</b>	.010	<b>.149</b>	.074	<b>.156</b>

*Note: Only Projects 3 & 4 collected data for a full SF-36 measure. Projects 1-4 asked a General Health Perception question.*

Confirmatory Factor Analysis of Social Network scales - These two measures are summary indices and CFA is not applicable.



## PMBC INSTRUMENTS

Note: The instruments below were administered in the 4 studies during the first phase of PMBC. Scale items have been put in bold to indicate the subscales that were chosen for inclusion in the PMBC core battery

Anger-in subscale of Anger Expression Scale .....	64
Center for Epidemiological Studies Depression Scale (CES-D).....	66
Cook-Medley Hostility Scale Cynicism Subscale.....	68
General Health Perception Question .....	71
Goldberg's Adjective Scale.....	72
Interpersonal Support Evaluation List.....	75
Life Engagement Test (LET) .....	78
Marital Adjustment Test.....	79
Mastery Scale .....	84
Revised Life Orientation Test- (LOT-R).....	86
Perceived Stress Scale.....	88
Pittsburgh Enjoyable Activities Test (PEAT) .....	90
Rosenberg Self-esteem Scale .....	92
Social Network Scale .....	93



SPIELBERGER ANGER EXPRESSION SCALE

INSTRUCTIONS:

A number of statements which people have used to describe themselves when they are ANGRY or FURIOUS are given below. Please read each statement and place an "X" over the circle that represents how often you feel or act in this way when you are ANGRY or FURIOUS:

WHEN ANGRY OR FURIOUS...

	Almost Never 1	Some- -times 2	Often 3	Almost Always 4
1. I express my anger.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>2. I keep things in.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>3. I pout or sulk.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>4. I withdraw from people.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I make sarcastic remarks to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I do things like slam doors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>7. I boil inside, but I don't show it.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I argue with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>9. I tend to harbor grudges that I don't tell anyone about.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I strike out at whatever infuriates me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>11. I am secretly quite critical of others.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>12. I am angrier than I am willing to admit.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I say nasty things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>14. I am irritated a great deal more than people are aware of.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I lose my temper.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. If someone annoys me, I am apt to tell him or her how I feel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## **Scoring**

Source of algorithm:

Spielberger, C. D. et al. (1985). The experience and expression of anger: Construction and validation of an anger expression scale. In M. A. Chesney & R. H. Rosenman (Eds.), Anger and hostility in cardiovascular and behavioral disorders. Hemisphere: Cambridge.

Higher scores indicate greater tendency to suppress anger.

Algorithm:

1. **Anger – In Scale (AX/In)**. Sum of the following items:
  - (2) I keep things in
  - (3) I pout or sulk
  - (4) I withdraw from people
  - (7) I boil inside but don't show it
  - (9) I tend to harbor grudges that I don't tell anyone about
  - (11) I am secretly quite critical of others
  - (12) I am angrier than I am willing to admit
  - (14) I am irritated a great deal more than people are aware of



CENTER FOR EPIDEMIOLOGICAL STUDIES DEPRESSION SCALE (CES-D)

INSTRUCTIONS:

Please read a list of the ways you may have felt or behaved recently. For each statement, place an "X" over the circle to indicate how often you felt this way during the PAST WEEK.

	Rarely or none of the time (less than 1 day) 0	Some of the time (1-2 days) 1	Occasionally (3-4 days) 2	Most of the time (5-7 days) 3
1. I was bothered by things that don't usually bother me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I had trouble keeping my mind on what I was doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I felt depressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I felt that everything I did was an effort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I felt hopeful about the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I felt fearful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. My sleep was restless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I was happy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I felt lonely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I could not get "going".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## **Scoring**

Source of algorithm:

CHES Project, CHS Project, REACH Project

Higher score indicates more depressive symptoms.

Algorithm:

Sum the following items:

- (1) I was bothered by things that don't usually bother me
- (2) I had trouble keeping my mind on what I was doing
- (3) I felt depressed
- (4) I felt that everything I did was an effort
- (5) I felt hopeful about the future (**R**)
- (6) I felt fearful
- (7) My sleep was restless
- (8) I was happy (**R**)
- (9) I felt lonely
- (10) I could not get 'going'



## THE COOK-MEDLEY HOSTILITY SCALE

### INSTRUCTIONS:

Please answer the following questions about yourself by placing an "X" over the circle under either the "TRUE" or "FALSE" option.

	TRUE (1)	FALSE (0)
1. <b>I think a great many people exaggerate their problems to get the sympathy and help of others.</b>	<input type="radio"/>	<input type="radio"/>
2. <b>I think most people would lie to get ahead.</b>	<input type="radio"/>	<input type="radio"/>
3. <b>Most people will use somewhat unfair means to gain profit or advantage, rather than to lose it.</b>	<input type="radio"/>	<input type="radio"/>
4. <b>It is safer to trust nobody.</b>	<input type="radio"/>	<input type="radio"/>
5. <b>Most people inwardly dislike putting themselves out to help other people.</b>	<input type="radio"/>	<input type="radio"/>
6. <b>People generally demand more respect for their own rights than they are willing to give for others.</b>	<input type="radio"/>	<input type="radio"/>
7. People often disappoint me.	<input type="radio"/>	<input type="radio"/>
8. When someone does me wrong, I feel I should pay her/him back if I can, just for the principle of the thing.	<input type="radio"/>	<input type="radio"/>
9. It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.	<input type="radio"/>	<input type="radio"/>
10. Some of my family have habits that bother and annoy me very much.	<input type="radio"/>	<input type="radio"/>



COOK-MEDLEY CONTINUED

	TRUE (1)	FALSE (0)
11. I can be friendly with people who do things which I consider wrong.	<input type="radio"/>	<input type="radio"/>
12. I don't blame people for trying to grab everything they can get in this world.	<input type="radio"/>	<input type="radio"/>
13. I do not blame a person for taking advantage of someone who lays himself/herself open to it.	<input type="radio"/>	<input type="radio"/>
14. I am not easily angered.	<input type="radio"/>	<input type="radio"/>
15. I would certainly enjoy beating a crook at her/his own game.	<input type="radio"/>	<input type="radio"/>
16. At times I have had to be rough with people who were rude or annoying.	<input type="radio"/>	<input type="radio"/>
17. There are certain people whom I dislike so much I am pleased when they are in trouble for something they have done.	<input type="radio"/>	<input type="radio"/>
18. I am often inclined to go out of my way to win a point with someone who has opposed me.	<input type="radio"/>	<input type="radio"/>
19. I do not try to cover up my poor opinion or pity of a person just so he/she will not know how I feel.	<input type="radio"/>	<input type="radio"/>
20. I strongly defend my own opinions.	<input type="radio"/>	<input type="radio"/>



## **Scoring**

Source of algorithm:

- (1) Barefoot, K.C., Dodge, K.A., Peterson, B.L., Dahlstrom, W.G., & Williams, R.B. (1989).  
The Cook-Medley Hostility Scale: Item content and ability to predict survival.  
Psychosomatic Medicine, 51, 46-57.
- (2) PMBC-I

Higher scores indicate greater tendency to express cynicism.

Algorithm: Sum of the six items:



SF-36

**INSTRUCTIONS:**

This survey asks for your views about your health.

Answer every question by placing an "X" over the appropriate circle. If you are unsure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is:

- 5 Excellent
- 4 Very good
- 3 Good
- 2 Fair
- 1 Poor

**Scoring**

This question is scored in the direction of higher score indicating better health



## GOLDGERG ADJECTIVE SCALE (BIG FIVE PERSONALITY FACTORS)

### INSTRUCTIONS:

Below is a list of common human traits. For each trait, place an "X" over the circle that best indicates how accurately (how well) that trait describes you. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are **GENERALLY** or **TYPICALLY**, as compared with other persons you know of the same sex and roughly the same age.

	Not at all Accurate	A little Accurate	Moderately Accurate	Quite a bit Accurate	Extremely Accurate
	1	2	3	4	5
1. Bashful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Organized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Resentful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Innovative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Shy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Rude	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Neat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Tense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Uninformed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## BIG 5 – CONTINUED

For each trait, place an "X" over the circle that best indicates how accurately (how well) that trait describes you as you typically are.

	Not at all Accurate	A little Accurate	Moderately Accurate	Quite a bit Accurate	Extremely Accurate
	1	2	3	4	5
11. Talkative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Unkind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Inefficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Unimaginative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Extraverted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Pleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Disorganized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Quiet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Harsh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Careless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Imaginative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## **Scoring**

This is a measure containing 5 subscales measuring 5 superordinate personality factors: extraversion, agreeableness, conscientiousness, emotional stability, and openness.

# items: 25 (5 for each of the five personality factors)

Source of algorithm:

- (1) Goldberg, L. R. (1992). The development of markers for the big-five factor structure. Psychological Assessment, 4, 26-42.
- (2) PMBC I

Higher score indicates more endorsement of a particular personality trait.

Algorithm (R=reverse scored):

1. **Extraversion** – Sum of the following items:  
(1) bashful (**R**), (6) shy (**R**), (11) talkative, (16) extraverted, (21) quiet (**R**)
2. **Agreeableness** – Sum of the following items:  
(2) cold (**R**), (7) rude (**R**), (12) unkind (**R**), (17) pleasant, (22) harsh (**R**)
3. **Conscientiousness** – Sum of the following items:  
(3) organized, (8) neat, (13) inefficient (**R**), (18) disorganized (**R**), (23) careless (**R**)
4. **Emotional Stability** – Sum of the following items:  
(4) resentful (**R**), (9) tense (**R**), (14) irritable (**R**), (19) nervous (**R**), (24) depressed (**R**)
5. **Openness** – Sum of the following items:  
(5) innovative, (10) uninformed (**R**), (15) unimaginative (**R**), (20) creative, (25) imaginative



INTERPERSONAL SUPPORT EVALUATION LIST (ISEL)  
INSTRUCTIONS:

This scale is made up of a list of statements each of which may or may not be true about you. For each statement place an “X” over the circle indicating how true that statement is about you.

	Definitely False 1	Probably False 2	Probably True 3	Definitely True 4
1. If I wanted to go on a trip for a day (for example, to the country or mountains), I would have a hard time finding someone to go with me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel there is no one I can share my most private worries and fears with.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If I were sick, I could easily find someone to help me with my daily chores.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. There is someone I can turn to for advice about handling problems with my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. If I decided one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I don't often get invited to do things with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment (the plants, pets, garden, etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



ISEL - CONTINUED

	Definitely False 1	Probably False 2	Probably True 3	Definitely True 4
9. If I wanted to have lunch with someone, I could easily find someone to join me.	O	O	O	O
10. If I was stranded 10 miles from home, there is someone I could call who could come and get me.	O	O	O	O
11. If a family crisis arose, it would be difficult to find someone who could give me a good advice about how to handle it.	O	O	O	O
12. If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.	O	O	O	O

**Scoring**

This is a measure containing 3 subscales which assess perceived availability of three types of social support: appraisal, belonging, and tangible. Overall social support score is also calculated.

Source of algorithm:

- (1) Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. (1985). Measuring the functional components of social support. In I.G. Sarason & B. Sarason (Eds.), Social support: Theory, research and applications (pp. 73-94). The Hague: Martinus Nijhoff.
- (2) PMBC I

Higher scores indicate more social support.

Algorithm (R=reverse scored):

**Appraisal.** Sum of the following items:

- (2) I feel that there is no one I can share my most private worries and fears with. ( **R** )
- (4) There is someone I can turn to for advice about handling problems with family.
- (6) When I need suggestions on how to deal with a personal problem, I know someone ...
- (11) If a family crisis arose, it would be difficult to find someone who could give me ... ( **R** )



**Belonging.** Sum of the following items:

- (1) If I wanted to go on a trip for a day (for example, to the country or mountains), I ... ( **R** )
- (5) If I decided one afternoon that I would like to go to a movie that evening, I could ...
- (7) I don't often get invited to do things with others. ( **R** )
- (9) If I wanted to have lunch with someone, I could easily find someone to join me.

**Tangible.** Sum of the following items:

- (3) If I were sick, I could easily find someone to help me with my daily chores.
- (8) If I had to go out of town for a few weeks, it would be difficult to find someone who ... ( **R** )
- (10) If I was stranded 10 miles from home, there is someone I could call who could come and ...
- (12) If I needed some help in moving to a new house or apartment, I would have a hard ... ( **R** )

**Overall Support.** Sum of all of the above items.



LIFE ENGAGEMENT TEST (LET)

INSTRUCTIONS:

Please answer the following questions about yourself by indicating the extent to which you agree or disagree with each statement. Place an "X" over the circle that represents your response.

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1. There is not enough purpose in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. To me, the things I do are all worthwhile.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Most of what I do seems trivial and unimportant to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I value my activities a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I don't care very much about the things I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I have lots of reasons for living.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Scoring**

Source of algorithm:

PMBC-I

Higher score indicates more sense of purpose and engagement in life.

Algorithm (R = reverse scored):

Sum of the following items:

- (1) There is not enough purpose in my life **(R)**
- (2) To me, the things I do are all worthwhile
- (3) Most of what I do seems trivial and unimportant to me **(R)**
- (4) I value my activities a lot
- (5) I don't care very much about the things I do **(R)**
- (6) I have lots of reasons for living





## MARITAL ADJUSTMENT - CONTINUED

10. When disagreements arise, they usually result in:
- you giving in
  - your partner giving in
  - agreement by mutual give and take
11. Do you and your partner engage in outside interests together?
- all of them
  - some of them
  - very few of them
  - none of them
12. In leisure time, do you generally prefer:
- to be “on the go”?
  - to stay at home?
13. Does your partner generally prefer:
- to be “on the go”?
  - to stay at home?
14. Do you ever wish you had not married or entered into a committed relationship?
- frequently
  - occasionally
  - rarely
  - never
15. If you had your life to live over, do you think you would:
- marry or commit to the same person?
  - marry or commit to a different person?
  - not marry or commit at all?
16. Do you confide in your partner?
- almost never
  - rarely
  - in most things
  - in everything



**Scoring**

Source of algorithm:

Locke, H., & Wallace, K. (1959). Short marital-adjustment and prediction tests: Their reliability and validity. Marriage and Family Living, 21, 251-255.

Higher score indicates more marital satisfaction.

Algorithm:

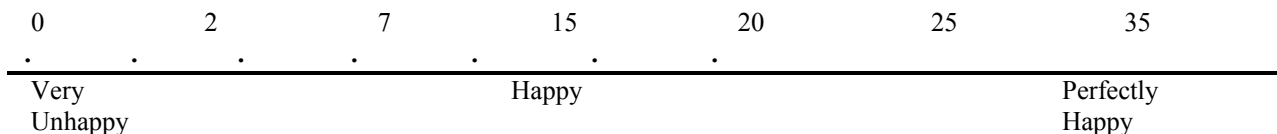
Sum of the following items:

- (1) Place an "X" over the circle on the line below which best describes the degree of happiness,...
- (2) Place an "X" over the circle to indicate the agreement or disagreement (...) on handling family finances
- (3) (...) on matters of recreation
- (4) (...) on demonstrations of affection
- (5) (...) on friends
- (6) (...) sex relations
- (7) (...) conventionality (right, good, proper conduct.
- (8) (...) philosophy of life
- (9) (...) ways of dealing with spouse's family
- (10) When disagreements arise, they usually result in...
- (11) Do you and your partner engage in outside interests together?
- (12) In leisure time, do you generally prefer ...
- (13) Does your partner generally prefer
- (14) Do you ever wish you had not married or entered into a committed relationship?
- (15) If you had your life to live over, do you think you would...
- (16) Do you confide in your partner?

**See the chart below for specific scores.**

MARITAL ADJUSTMENT TEST

1. Check the dot on the scale line below which best describes the degree of happiness, everything considered, of your present marriage. The middle point, "happy," represents the degree of happiness which most people get from marriage, and the scale gradually ranges on one side to those few who are very unhappy in marriage, and on the other, to those few who experience extreme joy or felicity in marriage.





State the approximate extent of agreement or disagreement between you and your mate on the following items. Please check each column.

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Always Disagree
2. Handling family finances	5	4	3	2	1	0
3. Matters of recreation	5	4	3	2	1	0
4. Demonstrations of affection	8	6	4	2	1	0
5. Friends	5	4	3	2	1	0
6. Sex relations	15	12	9	4	1	0
7. Conventionality (right, good, or proper conduct)	5	4	3	2	1	0
8. Philosophy of life	5	4	3	2	1	0
9. Ways of dealing with in-laws	5	4	3	2	1	0

10. When disagreements arise, they usually result in: husband giving in 0 , wife giving in 2, agreement by mutual give and take 10 .
11. Do you and your mate engage in outside interests together? All of them 10 , some of them 8 , very few of them 3 , none of them 0 .
12. In leisure time do you generally prefer: to be “on the go” -----, to stay at home ---? Does your mate generally prefer: to be “on the go” -----, to stay at home-----? (Stay at home for both, 10 points; “on the go” for both, 3 points; disagreement, 2 points.)
13. Do you ever wish you had not married? Frequently 0 , occasionally 3 , rarely 8 , never 15 .
14. If you had your life to live over, do you think you would: marry the same person 15 , marry a different person 0 , not marry at all 1?
- 15 Do you confide in your mate: almost never 0 , rarely 2 , in most things 10 , in everything 10 ?

**Notes:**

For questions 2 – 9 the more partners agree on a given issue, the higher the score.

For most variables in this scale, the values were entered according to the scoring algorithm (Locke & Wallace, 1959). However, for some variables, it was impossible to enter the values suggested by the author. These variables need to be recoded before the overall score is computed. See below.

Q. 10 – (When disagreements arise, they usually result in?): The values for the response options suggested by Locke and Wallace (1959) are:

0 = husband giving in

2 = wife giving in

10= agreement by mutual give and take

We changed these responses to:

0 = you giving in

0 = your partner giving in

10= agreement by mutual give and take

However, SPSS does not allow for two identical values to have different value labels. So, the values are assigned as follows:

1 = you giving in

0 = your partner giving in

10= agreement by mutual give and take



When computing the overall score, the variable should be recoded so that 1=0.

Q. 16 – (Do you confide in your partner?):

The values for the response options suggested by Locke and Wallace (1959) are:

0 = almost never

2 = rarely

10= in most things

10= in everything

However, SPSS does not allow for two identical values to have different value labels. So, the values are assigned as follows:

0 = almost never

2 = rarely

10= in most things

11= in everything

When computing the overall score, the variable should be recoded so that 11=10.

Q. 12 – (In leisure time, do you generally prefer?)

and

Q. 13 – (In leisure time, does your partner generally prefer?)

These two questions receive one combined score. It depends on the answers to both of these questions. Both questions have the following options:

1= *To be “on the go”?*

2= *To stay at home?*

If the answer to both questions is “*on the go*” the combined score for both of these variables should be 3 points. If the answer to both questions is “*stay at home*” the combined score should be 10 points. If there are two different answers, the combined score should be 2 points.



## THE MASTERY SCALE (PEARLIN)

### INSTRUCTIONS:

Please answer the following questions about yourself by indicating the extent to which you agree or disagree with each statement. Place an "X" over the circle that represents your response.

		Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1.	There is really no way I can solve some of the problems I have.	○	○	○	○
2.	Sometimes I feel that I am being pushed around in life.	○	○	○	○
3.	I have little control over the things that happen to me.	○	○	○	○
4.	I can do just about anything I really set my mind to do.	○	○	○	○
5.	I often feel helpless in dealing with the problems of life.	○	○	○	○
6.	What happens to me in the future mostly depends on me.	○	○	○	○
7.	There is little I can do to change many of the important things in my life.	○	○	○	○

### **Scoring**

Source of algorithm:

- (1) CHES Project
- (2) PMBC I

Higher score indicates greater mastery.

Algorithm (R=reverse scored):

Sum of the following items:



- (1) There is really no way I can solve some of the problems I have **(R)**
- (2) Sometimes I feel that I am being pushed around in life **(R)**
- (3) I have little control over the things that happen to me **(R)**
- (4) I can do just about anything I really set my mind to do
- (5) I often feel helpless in dealing with the problems of life **(R)**
- (6) What happens to me in the future mostly depends on me
- (7) There is little I can do to change many of the important things in my life **(R)**



REVISED LIFE ORIENTATION TEST (LOT-R) (OPTIMISM)

INSTRUCTIONS:

Please answer the following questions about yourself by indicating the extent to which you agree or disagree with each statement. Place an "X" over the circle that represents your response.

	Strongly Disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly Agree 4
1. <b>In uncertain times, I usually expect the best.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. It is easy for me to relax.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. <b>If something can go wrong for me, it will.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. <b>I am always optimistic about my future.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I enjoy my friends a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. It is important for me to keep busy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. <b>I hardly ever expect things to go my way.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I don't get upset too easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. <b>I rarely count on good things happening to me.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. <b>Overall, I expect more good things to happen to me than bad.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## **Scoring**

Source of algorithm:

- (1) Scheier, M.F., Carver C.S., & Bridges, M.W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. Journal of Personality and Social Psychology, *67*, 1063-1078.
- (2) PMBC-I

Higher score indicates more optimism.

Algorithm:

Sum of the following items:

- (1) In uncertain times, I usually expect the best.
- (3) If something can go wrong for me, it will. **(R)**
- (4) I'm always optimistic about my future.
- (7) I hardly ever expect things to go my way. **(R)**
- (9) I rarely count on good things happening to me. **(R)**
- (10) Overall, I expect more good things to happen to me than bad.

*Note:* Items 2, 5, 6, and 8 are filler items only. They are not scored as part of the revised scale.



PERCEIVED STRESS SCALE (COHEN)

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, please indicate your response by placing an “X” over the circle representing HOW OFTEN you felt or thought a certain way.

	Never 0	Almost Never 1	Sometimes 2	Fairly often 3	Very often 4
1. In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. In the last month, how often have you felt nervous and “stressed”?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



PERCEIVED STRESS - CONTINUED

	Never 0	Almost Never 1	Sometimes 2	Fairly often 3	Very often 4
9. In the last month, how often have you been angered because of things that were outside of your control?	O	O	O	O	O
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	O	O	O	O	O

**Scoring**

Source of algorithm:

Cohen, S., & Williamson, G.M. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), The social psychology of health. Newbury Park, CA: Sage.

Higher score indicates more perceived stress.

Algorithm (R = reverse scored):

Sum of the following items:

- (1) In the last month, how often have you been upset because of something that ...
- (2) In the last month, how often have you felt that you were unable to control ...
- (3) In the last month, how often have you felt nervous and “stressed”?
- (4) In the last month, how often have you felt confident about your ability to handle ... **(R)**
- (5) In the last month, how often have you felt that things were going your way? **(R)**
- (6) In the last month, how often have you found that you could not cope with all the ...
- (7) In the last month, how often have you been able to control irritations in your life? **(R)**
- (8) In the last month, how often have you felt that you were on top of things? **(R)**
- (9) In the last month, how often have you been angered because of things that were...
- (10) In the last month, how often have you felt difficulties were piling up so high ...



## THE PITTSBURGH ENJOYABLE ACTIVITIES TEST (PEAT)

### INSTRUCTIONS:

We are interested in how often in the last month you were able to spend time in activities that you enjoyed.

Over the past month, how often have you been able to spend time doing the following:

	Never 0	Less Than Once a Month 1	Once a Month 2	Once a Week 3	Every Day 4	Not Applicable/ Do Not Enjoy (missing)
1. Sports	0	0	0	0	0	0
2. Quiet time by yourself	0	0	0	0	0	0
3. Attending club/church/fellowship	0	0	0	0	0	0
4. Hobbies	0	0	0	0	0	0
5. Going out for meals with friends and relatives	0	0	0	0	0	0
6. Visiting family and friends	0	0	0	0	0	0
7. Doing other fun things with people	0	0	0	0	0	0
8. Taking vacations out of town	0	0	0	0	0	0
9. Being in parks and other outdoors settings	0	0	0	0	0	0
10. "Unwinding" at the end of the day	0	0	0	0	0	0



**Scoring**

Source of algorithm:  
PMBC-I

Higher score indicates higher frequency of engaging in enjoyable/restorative activities.

Algorithm:

Sum of the ten items



## SELF-ESTEEM SCALE (ROSENBERG)

### INSTRUCTIONS:

Please answer the following questions about yourself by indicating the extent to which you agree or disagree with each statement. Place an "X" over the circle that represents your response.

	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4
1. I feel that I have a number of good qualities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I am able to do things as well as most other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I feel that I'm a person of worth, or at least on an equal basis with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I take a positive attitude toward myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### **Scoring**

Source of algorithm:

Krause, N. (1995). Religiosity and self-esteem among older adults. Journal of Gerontology: Psychological Sciences, 50B, 236-246.

Higher score indicates higher self-esteem.

Algorithm:

Sum of the four items



## SOCIAL NETWORK INDEX

### INSTRUCTIONS:

These questions are concerned with how many people you talk with on a regular basis including family, friends, neighbors, etc. Please read and answer each question carefully. Answer follow-up questions where appropriate.

1. Which of the following best describes your marital status?

currently married and living together, or living with someone in a marriage-like relationship

never married



place an "X" over this circle if you have ever lived with someone in a marriage-like relationship

separated

divorced

widowed

2. How many children do you have?

none (SKIP TO Q. 3)

1

2

3

4

5

6

7 or more

2a. How many of your children do you talk with at least once every 2 weeks, either in person or on the phone?

none

1

2

3

4

5

6

7 or more

3. Are either of your parents living?

neither (SKIP TO Q. 4)

mother only

father only

both

3a. Do you talk with either of your parents at least once every two weeks, either in person or on the phone?

neither

mother only



- father only
- both

4. Are either of your in-laws (or partner's parents) living?

- neither (SKIP TO Q. 5)
- mother only
- father only
- both
- not applicable (SKIP TO Q. 5)

4a. Do you talk with either of your partner's parents at least once every 2 weeks, either in person or on the phone?

- neither
- mother only
- father only
- both

5. How many other relatives (other than your spouse, parents, and children) do you feel close to?

- |   |                         |                         |                                 |
|---|-------------------------|-------------------------|---------------------------------|
| <input type="radio"/> none (SKIP TO Q. 6) | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3         |
| <input type="radio"/> 4                   | <input type="radio"/> 5 | <input type="radio"/> 6 | <input type="radio"/> 7 or more |

5a. How many of these relatives do you talk with at least once every 2 weeks, either in person or on the phone?

- |                            |                         |                         |                                 |
|----------------------------|-------------------------|-------------------------|---------------------------------|
| <input type="radio"/> none | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3         |
| <input type="radio"/> 4    | <input type="radio"/> 5 | <input type="radio"/> 6 | <input type="radio"/> 7 or more |

6. How many close friends do you have? (Meaning people that you feel at ease with, can talk to about private matters, and can call on for help)

- |   |                         |                         |                                 |
|---|-------------------------|-------------------------|---------------------------------|
| <input type="radio"/> none (SKIP TO Q. 7) | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3         |
| <input type="radio"/> 4                   | <input type="radio"/> 5 | <input type="radio"/> 6 | <input type="radio"/> 7 or more |



6a. How many of these friends do you talk with at least once every two weeks, either in person or on the phone?

- none                       1                       2                       3  
 4                       5                       6                       7 or more

7. Do you belong to a church, temple, or other religious group?

- NO (SKIP TO Q. 8)                       YES

7a. How many members of your church or religious group do you talk with at least once every 2 weeks, either in person or on the phone? (This includes at group meetings and services.)

- none                       1                       2                       3  
 4                       5                       6                       7 or more

8. Do you attend any classes (school, university, technical training, or adult education) on a regular basis?

- NO (SKIP TO Q. 9)                       YES

8a. How many fellow students or teachers do you talk with at least once every two weeks, either in person or on the phone? (This includes at class meetings.)

- none                       1                       2                       3  
 4                       5                       6                       7 or more

9. How many of your neighbors do you talk with at least once every 2 weeks, either in person or on the phone?

- none                       1                       2                       3  
 4                       5                       6                       7 or more

10. Are you currently involved in any volunteer work?

- NO (SKIP TO Q. 11)                       YES



10a. How many people involved in this volunteer work do you talk with at least once every 2 weeks, either in person or on the phone, about volunteering-related issues?

- none                       1                       2                       3  
 4                       5                       6                       7 or more

11. Do you belong to any groups in which you talk to one or more members of the group about group-related issues at least once every 2 weeks? Examples include social clubs, recreational groups, trade unions, commercial groups, professional organizations, groups concerned with children like the PTA or Boy Scouts, groups concerned with community service, sports groups, etc.

- NO                                       YES

12. Are you employed outside of the home?

- NO (SKIP TO Q. 15)                                       YES

13. How many people do you supervise?

- none                       1                       2                       3  
 4                       5                       6                       7 or more

14. How many people at work (other than those you supervise) do you talk to at least once every two weeks, either in person or on the phone, regarding work-related issues?

- none                       1                       2                       3  
 4                       5                       6                       7 or more

15. Do you use your computer's electronic mail (e-mail) service to contact anyone from the following groups at least once every two weeks? Check ALL that apply.

- Do not use e-mail  
 Children  
 Parents  
 In-laws



- O Other relatives
- O Close friends
- O Church members
- O Fellow students
- O Neighbors
- O Fellow volunteers
- O Co-workers
- O Members of groups not already mentioned

**Scoring**

This is a measure assessing participation in 12 types of social relationships. Two indices are calculated: number of high-contact roles (network diversity) and number of people in social network.

Source of algorithm:

- (1) Cohen, S., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M. (1997). Social ties and susceptibility to the common cold. The Journal of the American Medical Association, 277, 1940-1944.
- (2) Mind-Body Project 1.

Higher scores indicate higher number of high-contact roles (greater network diversity) and higher number of people in social network.

Algorithm:

**Number of High-Contact Roles (Network Diversity).**

Definition: This is the number of social roles in which the respondent has regular contact (i.e., at least once every 2 weeks) with at least one person. The maximum number of high-contact roles is 12. They are: spouse, child, parent, parent-in-law, close relative, close friend, church/temple member, student, neighbor, volunteer, group member, and employee.

Computation: For each of the 12 possible high-contact roles, assign a 0 if the respondent does not have the role and a 1 if he/she does. The total number of high-contact roles is computed by summing the 0s and 1s. The table below shows which scale items are used in the computation and how each is scored.

<u>Role</u>	<u>Item #</u>	<u>Scores 1 if response is ...</u>
spouse	1	1 (currently married...)
child	2a	not 0 (none)
parent	3a	not 1 (neither)
parent-in-law	4a	not 1 (neither)
close relative	5a	not 0 (none)
close friend	6a	not 0 (none)



church/temple member	7a	not 0 (none)
student	8a	not 0 (none)
neighbor	9	not 0 (none)
volunteer	10a	not 0 (none)
group member	11	2 (YES)
employee	13 & 14	not 0 (none) for both items

### Number of People in Social Network

Definition: This is the total number of people with whom the respondent has regular contact (i.e., at least once every 2 weeks).

Computation: For each of the 12 possible roles, determine the number of people with whom the respondent has regular contact. The total number of people in the social network is computed by summing across the 12 roles. The table below shows which scale items are used in the computation and how each is scored.

<u>Role</u>	<u>Item #</u>	<u>Scoring</u>
spouse	1	scores 1 if respondent is married, otherwise scores 0
child	2a	use the number indicated
parent	3a	2,3=1; 4=2
parent-in-law	4a	2,3=1; 4=2
close relative	5a	use the number indicated
close friend	6a	use the number indicated
church/temple member	7a	use the number indicated
student	8a	use the number indicated
neighbor	9	use the number indicated
volunteer	10a	use the number indicated
group member	11	scores 1 if response is 2 (YES), otherwise scores 0
employee	13 & 14	Sum of 22 & 23