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Physical function and health related quality of life in culturally diverse elders: evidence of environmental press

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PHYSICAL FUNCTION AND HEALTH-RELATED QUALITY OF LIFE IN CULTURALLY DIVERSE ELDERS: EVIDENCE OF ENVIRONMENTAL PRESS

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Robyn Bossier

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Abstract

PURPOSE**:** The purpose of this project was to identify group differences in physical function and HRQL between older adults living in different environments, and to compare information from these groups to data from a random sample of elders pulled from the general population. METHODS: Seventy-eight older adults were evaluated for physical function using the continuous-scale physical functional performance test (CS-PFP) and HRQL using the SF-36 v.2. Subjects were 26 predominantly African American participants (LOW group; age 72.2 ± 8.1 years), 26 Caucasian adults (HIGH group; age 77.6 ± 4.8 years), and 26 adults selected from a population-based study (POP group; age 73.4 ± 6.4 years). RESULTS: MANCOVA (age as a covariate) revealed group differences in physical function and HRQL. Follow-up LSD comparisons revealed that the LOW group had greater upper body strength compared to both the HIGH and POP groups (61.2 ± 3.7 vs. 43.6 ± 3.6 and 35.4 ± 3.6, respectively), and greater lower body strength (42.2 ± 3.3 vs. 36.5 ± 3.6) and total CS-PFP score (55.5 ± 3.5 vs. 44.4 ± 3.4) than POP. With respect to HRQL, the POP group had poorer SF-36 role physical (RP), physical function (PF), and physical component subscale (PCS) scores than the LOW and HIGH groups (PF: POP = 53.3 ± 5.8, LOW = 76.6 ± 5.3, HIGH = 75.5 ± 5.4; RP: POP = 56.6 ± 6.9, LOW = 80.9 ± 6.4, HIGH = 85.8 ± 6.4; PCS: POP = 38.3 ± 2.1, LOW = 49.6 ± 2.0, HIGH = 48.0 ± 2.0). The LOW had poorer mental health (MH) and mental component subscale (MCS) scores than the HIGH and POP groups (MH: LOW = 69.2 ± 2.6, HIGH = 88.4 ± 2.6, POP = 85.1 ± 2.6; MCS: LOW = 51.5 ± 1.4, HIGH = 57.7 ± 1.5, POP = 58.2 ± 1.6). CONCLUSION: These findings are consistent with the theory that environmental press may interact with functional ability to impact HRQL. Supported by the National Institute on Aging [P01 (AG022064091A1)]

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Introduction

The anticipated growth rate of the senior population over the next twenty years has received ample attention in the literature. What is less frequently discussed is the expected increase in the cultural diversity of the senior population, and its implications for health disparities that affect certain sub-populations of older adults (Center for Disease Control [CDC], 2000). More specifically, recent data from the CDC indicate that the incidence of CV disease is 40% greater among African Americans compared to Caucasians. This trend is also true for persons with low income and less than a high school degree. The data with respect to orthopedic conditions (e.g. arthritis) and its limitations of activities of daily living are equally compelling with 32% African Americans affected compared to 27% of Caucasians. With respect to income levels, orthopedic conditions affect 36% of families with poor income levels compared to 24% of middle/high income families. Moreover, other health outcomes associated with health disparities include physical inactivity and physical and social activity limitation. African Americans appear to be less active both nationally and at the state level, and they are 3% more likely to experience a higher degree of mobility limitations compared to Caucasians (CDC). Similarly, families with low incomes (<$20,000) and persons with less education are both 20% more likely to report severe mobility limitations compared to families with higher incomes ($75,000 or greater) and with more education (CDC).

Of particular relevance are health disparities among older adults with limited educational experiences and low-income, who often exhibit poorer health outcomes in comparison to their more affluent, educated peers (Campbell, Crews, Moriarity, Zack & Blackman, 1999). The impact of low-income and poor education on health disparities among older adults is complex and multifaceted. In general, income and education are associated with the availability of

material and non-material resources (e.g., knowledge, social support; Clark, 1996). With respect to material resources, it is likely that lack of exposure to health-related information and resources that aid the adoption of health promoting behaviors contribute significantly to negative health outcomes (Randall, 2001). In addition, lower income households are less likely to acquire the resources to prevent falls or accidents inside the home, which is an important consideration in light of the annual rate of more than 10,000 deaths and 350,000 hospitalizations related to falls in older adults (CDC)

Non-material resources include elements of social support and self-efficacy, both of which influence sense of self-control and may have implications for health outcomes. Evidence suggests that low-income individuals have a greater occurrence of unwanted life events associated with the inability to purchase resources; therefore, feeling less in control (Clark, 1996), and resulting in heightened emotional and psychological stress. Moreover, low SES older adults perceive health behaviors as less valuable, resulting in less functional ability in activities of daily living (ADLs) in comparison to more educated, affluent peers. Older adults who live alone also have an increased risk of losing their physical independence (Gurley, Lum, Sande, Lo, & Katz, 1996; Sawari, Fredman, Langenber, & Magaziner, 1998), and they have a higher mortality rate than those who live with others (Gurley et al, 1996).

The idea that environment and personal competencies interact to influence health outcomes is not new. Lawton (1983) presented the theory of environmental press that addresses this issue. The personal competencies identified in this model include physical and functional health, cognitive and affective functioning, and quality of life (QOL). One's home, social, and neighborhood environments are the environmental variables. From Lawton's theory we can

postulate that at any level of function, environmental factors can influence the well being of the older population.

The purpose of this project was to identify group differences in physical function and health-related quality of life (HRQL) between older adults living in different environments, and to compare information from these groups to data from random sample of elders pulled from the general population. More specifically we propose to look at three groups of individuals; those with low environmental supports (LOW), operationally defined as an urban dwelling group of seniors characterized as primarily African Americans, lower-income and low education level, a group of residents of a "Premier Continuing Care Retirement Community" (HIGH) characterized by Caucasian race, affluent, and educated, and finally we include a group of older adults that is a sub-sample from a larger population-based study. All participants live within a 40-mile radius of Southern US city with a population of approximately 400,000 persons and an older adult population of approximately 100,000 persons.

We hypothesized that there will be significant group differences in physical function and HRQL among the groups with low and high environmental support. We predict that the group with low environmental support will have poorer physical function and HRQL.

Environmental Gerontology: An Overview

Social and physical environments play a critical role on one's health, functional ability, and HRQL. The goals of Healthy People 2010 underscore the importance of including assessments of the environment and intervention at the level of physical and social environments in measuring and addressing health outcomes and health disparities across all populations.

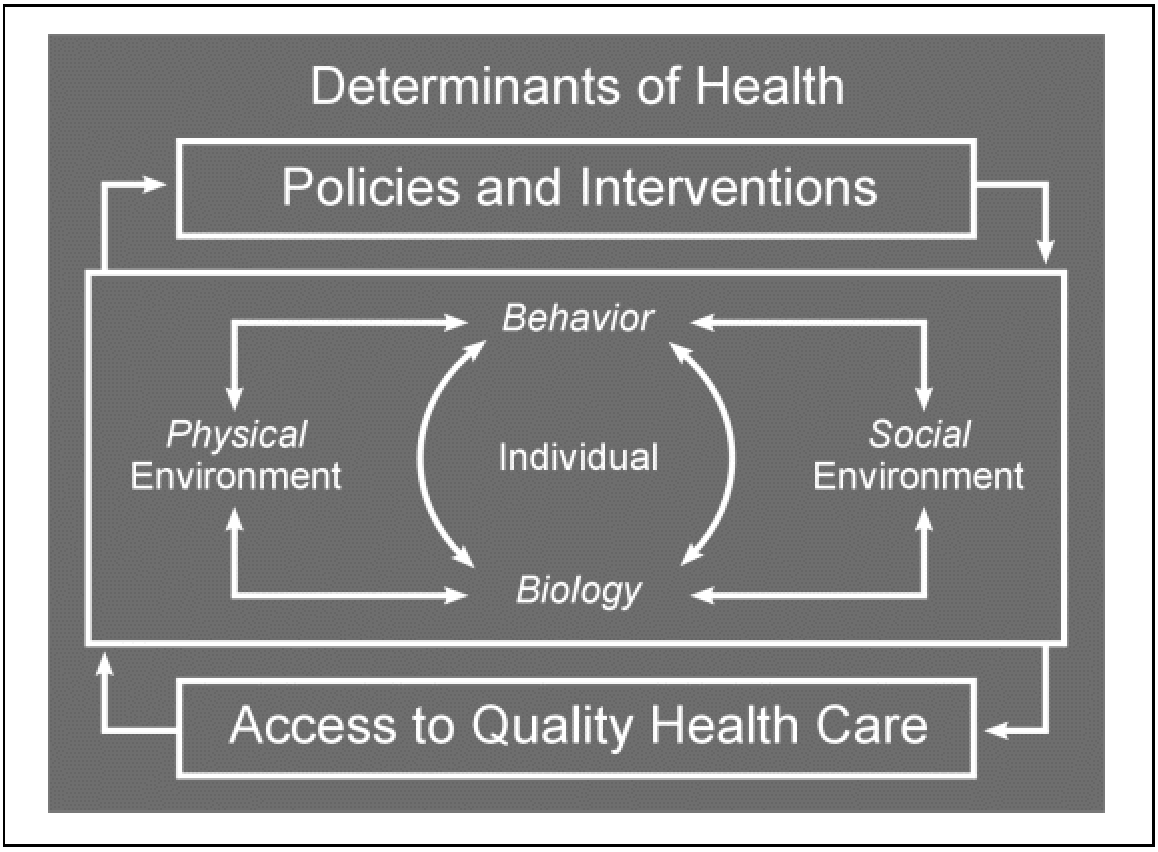


Figure 2.1. Healthy People 2010 Determinants of Health

According to Healthy People 2010, health is described by the number of chronic conditions or diseases. Cardiovascular disease (CVD) is the most prevalent disease among all ages and populations; however, African Americans have more than a 40% greater risk of dying from some form of heart disease than white Americans (Healthy People 2010). Conversely, orthopedic conditions are more prevalent among white Americans compared to African

Americans, but these conditions are the leading cause of activity limitations among African Americans compared to the second leading cause in Caucasians (Healthy People 2010). This health outcome is consistent with the Center of Disease Controls' data on health statistics for U.S. adults in that of the total number of African Americans studied, 11% reported severe mobility difficulty compared to only 9% of the white Americans reporting the same (CDC, 2000). There is also evidence of family incomes affecting one's perception of mobility difficulty, indicating a negative relationship between socioeconomic status and functional ability and physical activity (Healthy People 2010; CDC, 2000). Families with lower incomes have a 20% greater occurrence of severe mobility difficulties in comparison to families with higher household incomes (CDC, 2000). Considering in 1994-95, men classified as low income were six to seven times more likely to be without insurance than men with higher income, therefore revealing the relationship between the accessibility of health care and preventative care with income (Randall, 2001).

As defined in the previous paragraph, health is considered a component of both quality of life (QOL) and health-related quality of life (HRQL), even though each refers to health in different aspects. QOL expresses one's satisfaction with his or her lives and environment, which includes health, recreation, culture, rights, values, beliefs, and aspirations (Healthy People 2010). However, Lox, Martin, and Petruzzello (2003) refer to HRQL as a subcomponent of QOL that portrays the "goodness" of the dimensions of life that can be influenced by health. The dimensions that they refer to are physical function, emotional well-being, and the ability to fulfill family and other social roles. Therefore, we can assume that the reference of QOL will reflect overall satisfaction of all aspects of life compared to HRQL that refers to only physical, emotional, social, cognitive, and health status dimensions (Lox, Martin, & Petruzzello).

Considering QOL is the overall state of satisfaction, it is important to identify all levels of each dimension. The World Health Organization (1993) defines all of these components and the factors that affect them. Psychological health refers to sensory functions; thinking, learning, memory, and concentrating; self-esteem; and body image and appearance. Physical health is associated with pain, energy and fatigue, sexual activity, and amount of sleep. One's level of independence also influences QOL, by how mobile one is, how well one can complete activities of daily living, the amount of dependence one has on medicinal and nonmedicinal substances, and the extent of communication and work capacities. Environment plays a significant role in determining one's QOL as well. Safety, home environment, work satisfaction, financial resources, health and social care, and transportation all define this dimension. The intensity of one's social relationships and spirituality complete the dimensions of QOL (Lox, Martin, & Petruzzello, 2003).

It is important to understand the definition of QOL to comprehend HRQL and to easily identify one's overall health. Measuring HRQL allows researchers to determine not only health, but also people's perceptions about their health and the impact it has on their lives. This identification will enable researchers, clinicians, and patients to recognize therapeutic techniques that will enhance all three components of health (physical, mental, and social well-being; Lox, Martin, & Petruzzello, 2003). The most widely used and recognized measurement tool for HRQL is the SF-36 questionnaire, assessing perceptions of one's level of functioning with regards to particular dimensions of HRQL (Lox, Martin, & Petruzzello). This questionnaire reflects the determinants of health, described by Healthy People 2010, and assists in determining health outcomes. Biology, behavior, and environments are represented on the questionnaire and can therefore identify one's HRQL.

Environmental Gerontology Theory

In 1983, and in an effort to model such person-environment interactions, Lawton introduced his theory of environmental press, in which the complex interaction of environmental influences and behavioral competence on older adults' psychological well-being is described. Lawton acknowledges the importance of the physical and social environment, but uses the model to explain that the environment is only one component of a total behavioral system, which in its totality dictates living "the good life (Lawton, 1983)."

In his model of "the good life", Lawton presents the four following constructs: psychological well-being, perceived quality of life, behavioral competence, and objective environment (see figure 2.2).

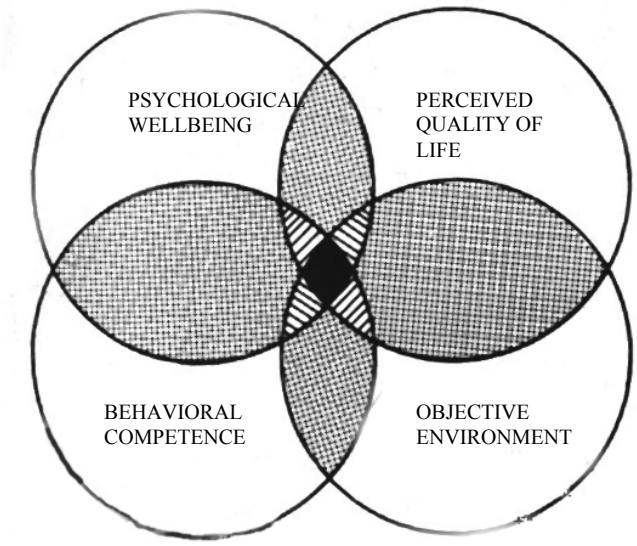


Figure 2.2. M. Powell Lawton's Model of "The Good Life"

If all sectors channel into the "self", the self will have more self-control in its environment, which is correlated with favorable living conditions (Lawton, 1983). Lawton found that the older

population exhibits “the good life” when health and function are matched with available resources.

Psychological Well Being

Lawton (1983) describes psychological well-being as one’s subjective assessment of the quality of one’s inner experience. This sector can also be defined as the want to feel good or neutral rather than distressed or unhappy. Lawton’s (1983) four aspects of psychological well-being (neuroticism, happiness, positive affect, and congruence between desired and attained goals) are all separate, private evaluations one can make of his or her psychological state. Neuroticism refers to feelings of anxiety, depression, worry, and other distressing psychological symptoms. Lawton (1983) defines happiness as frequent judgments of positive affects over a long period of time, and positive affects as feelings of active pleasure as an emotional state. Michael, Graham, Coakley, and Kawachi (1999) also define healthy aging, in conjunction with the maintenance of physical function, as maintaining lean body mass, not smoking, regular exercise, and high social networks. Together these components affect psychological well-being in the sense that one’s HRQL and physical function are influenced as these components are altered (Michael, Graham, Coakley, & Kawachi). Finally, the congruence between desired and attained goals is essential in classifying psychological well-being for researchers.

Quality of Life (QOL)

QOL has been dealt with earlier; however, in Lawton’s model there are some important considerations also worth noting here. Known also as sense of efficacy, QOL consists of judgments that a person creates about each major aspect of his or her life (Lawton, 1983). The overlapping circles in figure 2.2 point to the complexity with which the other factors interact with and affect QOL.

Quality of life is also similar to the construct of psychological well-being insofar as persons evaluate levels of satisfaction among each domain in the construct; however, Lawton's (1983) research exhibits the separateness of this component and psychological well-being in terms of levels of satisfaction, representing the separateness of these two components. Lawton also makes a point to discuss the importance of further research for measurement methods for QOL compared to all other sectors of "the good life" model.

Personal Competencies

Behavioral competencies include physical and functional health, cognitive and affective functioning, and QOL. To measure these competencies, one will need to define behaviors that assume the occurrence of some aspect of competence (Lawton, 1983). Lawton also proposed a system of hierarchy of these categories to represent their complexity, which is typically assessed by the using the Multilevel Assessment Instrument (MAI). The domains are described as followed, beginning with the most minimal levels of complexity and increasing there after.

Physical and functional health refers to one's biological functioning and one's physical activities of daily living (ADL), respectively. Measurable physical and functional behaviors that can be indicators of good health include breathing, walking, or caring for one's physical needs (Lawton, 1983). Cognitive functioning is defined as one's creative innovation, problem solving, symbolic thinking, operant conditioning, classical conditioning, memory, perception, and sensory reception (Lawton). Affective functioning is similar to cognitive functioning in its description; however, this aspect describes the outcomes of one's cognitive functioning, including exploration, recreation, and stimulus variation. MAI measures one's mental status, cognitive symptoms, and time use (inspiring activities). Quality of life is described as a subset of one's personal competencies. The interactions between family and friends help to quantify QOL

as a behavioral competency in the MAI assessment. The theory of Environmental Gerontology suggests that behavioral competencies are critical elements that define the extent to which older adults adapt to demands of their environments, and thereby influence characterized "good life" (Lawton, 1983).

Of particular importance to this investigation is the association between physical function and QOL in older adults. There are numerous studies that document this association. A 2001 review by Spirduso and Cronin (2001) provides a synopsis of those studies that have demonstrated a dose-response between physical function and QOL among older adults. Among some of the more notable studies of large samples are McPhillips et al. (1989), Mor et al. (1989), Seeman et al. (1995), and Strawbridge, W.J., Shema, S.J., Balfour, J.L., Higby, H.R., & Kaplan, G.A. (1998). McPhillips et al. investigated perceived versus actual physical function, health status, and well-being. Data revealed that those who perceived their function to be less limited exercised almost twice as much as those who reported differently. Consistent with physical function, those who reported their health as Better/Same and those who felt better regarding emotional functioning exercised twice as much as those who reported differently (McPhillips et al.); most importantly, results indicate a positive association between physical function and QOL. Strawbridge et al. examined community living older males and females who were separated into self-reported exercise groups. These groups reported the affects of their activity level on the same three aspects as McPhillips et al. Frail individuals reported the poorest scores among all exercise groups in physical function, health status, and well-being (Strawbridge et al.) Mor et al. and Seeman et al. revealed the importance of physical activity on the prevention of declining function and becoming unable to complete ADLs and instrumental ADLs. In Mor et al.'s study people who reported an absence of exercise routines and those who never walk were

approximately 1.5 times more likely to decline in function and ADLs. Together these studies present a wealth of evidence indicating the importance of research to more clearly define other factors that may affect physical function and QOL.

In the time period following Spirduso's review (2001), additional data have appeared in the literature. For example, in one recent study, Stewart et al. (2003) studied the affects of fitness, habitual physical activity, and fatness on HRQL and mood, and they found that even small amounts of consistent physical activity will contribute to a better HRQL and mood. Moreover, recently published data from our own laboratory (Wood et al., 2005) demonstrate not only the association between physical function and HRQL, but also point towards the influence of social issues that may interact with physical function to affect HRQL. More specifically Wood et al. found that gender moderates the association between physical function and HRQL. Their data revealed that while older adult males and females demonstrate positive associations between physical function scores (CS-PFP measurements) and several HRQL scores (SF-36 scores); the degree of association was considerably stronger among older males suggesting that other sources of variance play a greater role among older females.

Little data are available describing how physical function interacts with other determinants of HRQL on older adults. We are less educated on particular moderators such as race, income, and education. However, we can hypothesize from Wood et al.'s (2005) data that these are potential moderators between physical function and HRQL. Sato, Demura, Kobayashi, and Nagasawa, (2002) discuss more generalized characteristics that influence quality of life, such as a combination of personal characteristics, health status, mental, social, and environmental factors. These authors also incorporated the physical functional characteristics of their subjects

into their research, and described the negative affect that the natural decline in ADL and reduction of movement has on one's satisfaction level resulting in a reduction of activity.

The Objective Environment

There are numerous environmental constructs that are either known or theorized to influence function and/or QOL, as well as HRQL. Many economic indicators reveal external conditions that are likely to affect the quality of one's life. Such indicators include disease morbidity rates, housing dilapidation, and crime rate (Lawton, 1983). This construct needs to be distinct from perceived quality of life, in that the objective environment should be measured in a quantitative sense. Determining numerical characteristics of one's environment is the main objective for this construct in comparison to understanding the manner in which the environment is perceived from the individual (Lawton). However, conceptualizing and measuring the seemingly limitless number of environmental supports can be overwhelming. To assist in modeling the environment and to further appreciate and better operationalize the environmental constructs, Clark (1996) further defined environmental supports as material and non-material resources.

Resources in the Environment

Material Resources

Campbell et al. (1999) studied surveillance summaries from the 1994 National Health Interview Survey (NHIS) Core, NHIS disability supplement (NHIS-D1), and the 1994 NHIS Second Supplement on Aging (SOA II) regarding sensory impairments, activity limitations, and HRQL among older adults. Importantly, older adults (55-64 years of age) who have less than a high school education or an annual income of <$15,000 reported a significantly high number of unhealthy days, suggesting that accessibility to material resources can have an impact on QOL,

and more importantly HRQL (Campbell et al.). Because of the greater emphasis on health changes, such material resources as exposure to health promotions that assist in positive health behaviors have shown to have a direct affect on HRQL (Randall, 2001).

The ability to purchase goods and services seems to have a positive impact on sense of self-control (Clark, 1996). Clark researched the effects of exercise on their functional health status among socially and demographically defined groups of at-risk older adults. Within the scope of this study, sense of control was directly related to the frequency of undesirable life events, both of which were inversely associated with sense of control (Clark).

Non-Material Resources

Non-material resources are thought to affect one's HRQL through its influence on one's mental health, especially later in life. Social support and self-efficacy appear to be particularly influential factors that contribute to mental well-being.

While Lawton's model has existed for some time, it has only been somewhat recent that evidence has been appearing to support the model. Lichtenberg, MacNeill, and Mast (2000) examined the model by a broad range of personal competencies after patients were discharged from the hospital. They found strong support for the inclusion of personal competencies, and that the impact of these competencies was linked to participants' functional abilities (i.e., instrumental activities of daily living; IADLs). Although this study only tested half of Lawton's model (the competency variables), each competency variable was related to one's living environment indirectly. Lichtenberg et al. provided evidence of the struggles of urban African Americans to maintain independence and a better QOL in poorer environments. Such evidence of racial disparities that occur because of disease incidence, functional disabilities, and the

consequent effects of poverty have a negative influence on this particular relationship of competency and environment (Lichtenberg et al.).

Professor Vernellia R. Randall of the University of Dayton School of Law has researched the disparities in treatment decisions and its role in QOL. Randall (2001) also refers to the stresses that individuals with lower socioeconomic statuses acquire and the reflection it has on one's health. Stressors of one's environment impose on the emotional and psychological well-being, resulting in poorer health (Randall). Clark (1996) also examined the effects of one's socioeconomic status on self-efficacy and overall health, referring mainly to the material and non-material resources available in one's life. Clark indicated that people who tend to have fewer resources (i.e. lower socioeconomic individuals) are likely to have poorer QOL, as well as overall health, caused by the heightened emotional and psychological stress. In combination, these factors tend to result in a feeling of less self-control, and if not treated, it can lead to a progressively diminished mental health status (Clark).

Methods

The procedures described herein were approved by the institutional review boards of Louisiana State University, the Louisiana State University Health Sciences Center, Pennington Biomedical Research Center, and St. James Place Continuing Care Retirement Community in Baton Rouge, La.

Participants

Seventy-eight older adults in Louisiana provided informed consent to participate in this study. The inclusion/exclusion criteria for the study dictated that participants must be 60 years of age or older, and that participants at high risk for adverse responses during exercise (American College of Sports Medicine, 2005) were excluded from the study.

The 78 participants were comprised of 26 predominantly African American elders from a lower socio-economic class (LOW; age 72.2 $\pm$ 8.1 years), 26 Caucasian adults from a higher socio-economic class residing in a "premier" continuing care retirement community (HIGH; age 77.6 $\pm$ 4.8 years), and 26 adults selected from a population-based Louisiana Healthy Aging Study (POP; age 73.4 $\pm$ 6.4). The LOW group, lower socioeconomic individuals are participants from the Leo S. Butler Center and Catholic Presbyterian Housing Community located in Baton Rouge, La. These individuals are categorized as low socioeconomic because the majority of these individuals are of low, fixed income. The HIGH group, higher socioeconomic individuals, are residents of the Baton Rouge, Louisiana residential community St. James Place. This premier community requires residents to have significant financial means as the minimum monthly rental charge alone far exceeds poverty level income. Therefore, these residents are presumed to have significant financial resources. The participants in the population-based study were identified and recruited at random by way of the 2000 voters' registration roles.

Instruments

Health-Related Quality of Life (HRQL)

The participants were assessed for HRQL with the SF-36 version 2.0, which has been validated for assessing HRQL in persons over 65 years of age (Ware & Kozinski, 2000). This assessment contains eight subscales including *physical function, role physical, bodily pain, general health, vitality, social function, mental health, and role emotional,* as well as *physical and mental health* summary scores. Each of the subscale and summary scores has a range of 0-100 with 100 conveyed to mean a high quality of life. This instrument has been validated among several populations including the older adult population, and it is recognized as an important health outcome (Ware & Kozinski).

Physical Function Performance

A reduced version of the CS-PFP (Cress et al., 1996) was used to assess performance-based physical function. The CS-PFP requires the participant to execute a series of ADL-standardized activities. The time in which he/she completed the task was recorded, along with the distance covered and/or weight carried. These measurements were converted to a set of continuous-scale scores. The following five physical domains were provided in this test battery: upper body strength, lower body strength, upper body flexibility, balance and coordination, endurance, and total PFP score (Cress et al.). The scores for each subscale and the total PFP score have a possible range 0-100, with 100 being highly functional. The test has been validated for use in this population (Cress et al.), and the reproducibility of the CS-PFP scores and subscales are very good, with intraclass correlation coefficients in the range of r= 0.79 - 0.94. Participants were given specific directions for each task and they were instructed to perform each task safely, but to work at maximal effort. For more information regarding the administration of

the CS-PFP please see Cress et al. or the World Wide Web at http://www.coe.uga.edu/cs-pfp/cspfp_test.html.

Procedure

Participants reported to the laboratory on two separate occasions. Eligible participants completed in the first session a written informed consent, health status questionnaire, and the SF-36 questionnaire to measure health related quality of life (HRQL). The second session involved measurements of height and weight and the continuous-scale physical functional performance test (CS-PFP10). The time between sessions varied. In the case of the HIGH participants and the population-based sample of participants, the two testing sessions were completed within 2 weeks of each other. Testing the LOW participants was somewhat more challenging, and the average length of time between sessions in this group was approximately three and half weeks.

Participants' medical histories were examined for the presence of various diseases and number of prescriptive medications taken. Diseases were classified as being Cardiorespiratory, Orthopedic, Neurological, or "Other" diseases. Conditions that are grouped in the cardiorespiratory diseases category were anemia, asthma, chronic bronchitis, emphysema, heart problems, high blood pressure, stroke, phlebitis, coronary heart failure, and chronic obstructive pulmonary disease. Neurological diseases included eye problems, epilepsy, hearing loss, and/or Parkinson's disease. Orthopedic diseases/conditions included rheumatoid and osteoarthritis and any back/neck strain. Finally, the "Other" category included diabetes, thyroid problems, and/or cancer. Group (LOW vs. HIGH vs. POP) differences in prevalence of cardiovascular, neurological, orthopedic, and other diseases were analyzed using Pearson's Chi Square test for homogeneity.

Statistical Analysis

All data were analyzed using SPSS 11.0 system for Windows. ANOVAs were used to analyze age, height, and weight. Chi-Square analyses were used in gender, race, and the prevalence of CVD, orthopedic, neurological, and other diseases. The total number of diseases and number of medications was analyzed by Mann Whitney U. MANCOVA was used to examine income-category (LOW vs. HIGH vs. POP) differences in the SF-36 physical and mental scores (PCS, MCS). MANCOVA alpha was set at $p < .05$. Pearson correlation was used to assess associations among SF-36 subscales and CS-PFP total scores. In each case, alpha was corrected to $p < .005$. An alpha level of $p < .05$ was required for statistical significance.

Results

Table 4.1 provides a list of acronyms for the continuous scale of physical function performance (CS-PFP) and SF-36 survey subscales and summary scores.

Table 4.1 List of Acronyms for Outcome Variables

Variable Assessed	Description
CS-PFP Assessment	
UBS	Upper Body Strength
UBFLEX	Upper Body Flexibility
LBS	Lower Body Strength
BALCOR	Balance & Coordination
ENDUR	Endurance
PFPTOT	Total PFP
SF-36 v. 2	
SF36PF	Physical Functioning
SF36RP	Role Physical
SF36BP	Bodily Pain
SF36GH	General Health
SF36VT	Vitality
SF36SF	Social Functioning
SF36RE	Role-Emotional
SF36MH	Mental Health
SF36PCS	Physical Component Scores
SF36MCS	Mental Component Scores

Participant Characteristics

The participant characteristics are listed in Table 4.2. Simple ANOVA revealed that the HIGH group was significantly older than both the POP and LOW groups (77.6 ± 1.3 vs. 73.4 ± 1.3 and 72.2 ± 1.3). Because of significant between group differences for age (HIGH group older than LOW and POP, $p<0.05$), it was used as a covariate in group comparisons of function and HRQL. Results of the Chi-square indicate that the participants in the HIGH group had a notably lower occurrence of cardiovascular disease (CVD) than the POP and LOW groups (46% vs. 80% and 85%). However, more participants in the HIGH group had other diseases compared to the POP and LOW groups (85% vs. 35% and 42%). Results of the Mann-Whitney-U indicate

that participants in the HIGH group were taking significantly more prescription medications than the participants in the LOW group (4.54 ± 2.98 vs. 2.46 ± 1.45) and the LOW group's number of prescription medications were different from the POP group (2.46 ± 1.45 vs. 4.32 ± 2.27).

Table 4.2 Descriptive Characteristics

	POPULATION	LOW	HIGH
[1]**Age**	73.4 ± 1.3	72.2 ± 1.3	77.6 ± 1.3
[2]**Gender**	6 male 20 female	6 male 20 female	6 male 20 female
[2]**Race**	1 Black 25 White	18 Black * 8 White	26 White †
[1]**Height (cm)**	162.8 ± 13.3	161.4 ± 9.0	165.8 ± 9.2
[1]**Weight (kg)**	69.8 ± 14.3	78.1 ± 22.6	69.1 ± 13.9
[2]**CVD**	80%	85%	46%*†
[2]**Orthopedic**	64%	46%	73%
[2]**Neurological**	32%	35%	35%
[2]**Other diseases**	35%	42%	85%*†
[3]**Total diseases**	2.12 ± 1.01	2.04 ± 0.96	2.27 ± 0.92
[3]**Number of Meds**	4.32 ± 2.27	2.46 ± 1.45*	4.54 ± 2.98*†

[1,3] Values are Mean ± sd
[2] Values are incidence rates as a frequency
* = different from POP, $p<0.05$, via simple [1]ANOVA, [2]Chi-Square, [3]Mann Whitney U.
† = different from LOW, $p<0.05$, via simple [1]ANOVA, [2]Chi-Square, or [3]Mann Whitney U.

CVD = cardiovascular diseases including atherosclerosis, hypertension, stroke, arrhythmias
Other diseases = cancer, thyroid problems, diabetes
Total diseases = total number of diseases categories for which the participants has a positive history
Number of Meds = number of prescription medications taken

Participant medical history information was coded for history of cardiovascular diseases, orthopedic diseases or problems, neurological diseases or conditions, and/or "other" conditions known to influence physical function.

Group Differences in Outcome Variable

MANCOVAs were performed to examine group differences in physical function and health-related quality of life (HRQL). Age was used as the covariate, and findings of significance were followed by LSD pairwise comparisons to determine specific group differences for each parameter. The LSD comparisons identified that the LOW group had greater upper body strength in relation to the HIGH and POP group (61.2 ± 3.7 vs. 43.6 ± 3.3 and 35.4 ± 3.6), and greater lower body strength (48.5 ± 3.7 vs. 42.2 ± 3.3) and total CS-PFP score (55.5 ± 3.5 vs. 49.5 ± 3.1) than the POP group (See Figure 4.1b).

Table 4.3 Physical Function according to Social Group

VARIABLE	POPULATION		HIGH		LOW	
UBS	35.4	±3.6	43.6	±3.3	61.2*†	±3.7
UBFLEX	63.3	±3.6	60.3	±3.4	64.9	±3.8
LBS	36.5	±3.6	42.2	±3.3	48.5*	±3.7
BALCOR	46.7	±3.6	52.3	±3.3	56.4	±3.8
ENDUR	47.8	±3.5	52.3	±3.2	55.4	±3.6
PFPTOT	44.5	±3.3	49.5	±3.1	55.5*	±3.5

Values are age-adjusted means and standard deviations.
CS-PFP average scores indicating actual physical functionally of all groups of interest.
* Different from Population ($p<.05$)
† Different from HIGH ($p<.05$)

SF-36 quantitatively analyzed each group's self-reported HRQL. Many of the components revealed differences among the groups (See Table 4.4). The LOW and HIGH groups scored significantly higher on the physical functioning (PF), role physical (RP), and physical component subscale (PCS) than the POP group (PF: 76.6 ± 5.3 and 75.5 ± 5.4 vs. 53.8 ± 5.7; RP: 81.0 ± 5.3 and 75.5 ± 6.4 vs. 56.6 ± 6.7; PCS: 49.7 ± 2.0 and 48.0 ± 2.0 vs. 38.3 ± 2.1) (See Figure 4.1a). The HIGH group scores for general health (GH) were significantly higher than both the LOW and POP groups (81.9 ± 3.4 vs. 69.0 ± 3.4 and 69.9 ± 3.7) (See Figure 4.1d). In contrast, the LOW group had poorer mental health (MH) and mental component

subscale (MCS) scores than both the HIGH and POP groups (MH: 69.2 ± 2.6 vs. 88.4 ± 2.6 and 85.1 ± 2.8; MCS: 51.5 ± 1.4 vs. 57.7 ± 1.5 and 58.2 ± 1.6) (See Figure 4.1c). .

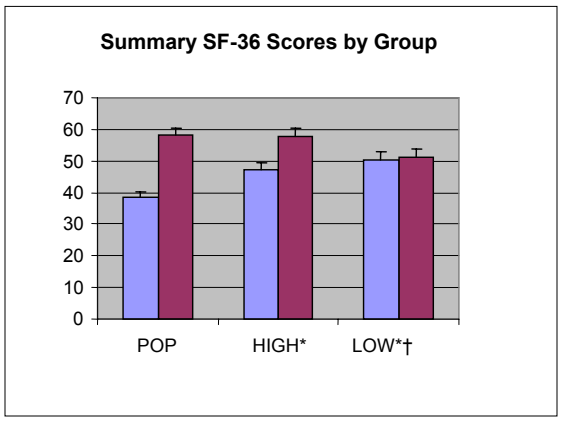
Associations among Physical Function and HRQL according to Groups

Pearson correlation was used to examine strength of associations among the outcome variables. Separate correlations were run for each group (LOW, HIGH, and POP). The results of the correlation revealed that All PFP scores were associated with SF-36 PF, RP, and PCS in the LOW and HIGH groups (r values in the range of .48 to .66 in the HIGH group, and .40 to .63 in the LOW group). In addition, SF-36-VT was associated with LBS, BALCOR, ENDUR, and TOTAL PFP scores in the HIGH group (r values = .40, .43, .43, .41, respectively), and in the LOW group the SF-36-SF scores were associated with UBFLEX, BALCOR, ENDUR, and TOTAL PFP scores (r values = .40, .41, .40, .39, respectively). Interestingly, among the POP group, no associations between CS-PFP scores and SF-36 scores achieved statistical significance. Figure 4.2 a-c illustrates the associations between total PFP score and the PCS summary score of the SF-36.

Table 4.4 Health-Related Quality of life according to Social Group

VARIABLE	POPULATION		HIGH		LOW	
SF36PF	53.8	+/- 5.7	75.5*	+/- 5.4	76.6*	+/- 5.3
SF36RP	56.6	+/- 6.7	85.8*	+/- 6.4	81.0*	+/- 6.3
SF36BP	65.0	+/- 5.2	76.7	+/- 4.8	80.9	+/- 4.8
SF36GH	69.9	+/- 3.7	81.9*	+/-3.4	69.0†	+/- 3.4
SF36VT	59.3	+/- 3.7	71.2*	+/- 3.5	62.8	+/- 3.4
SF36SF	85.3	+/- 3.9	92.4	+/- 3.7	96.3*	+/- 3.6
SF36RE	89.1	+/- 4.7	94.0	+/- 4.4	92.1	+/- 4.3
SF36MH	85.1	+/- 2.8	88.4	+/- 2.6	69.2*†	+/- 2.6
SF36PCS	38.3	+/- 2.1	48.0*	+/- 2.0	49.7*	+/- 2.0
SF36MCS	58.2	+/- 1.6	57.7	+/- 1.5	51.5*†	+/- 1.4

Values are age-adjusted means and standard deviations
* = different from Population, $p<0.05$
† = different from HIGH, $p<0.05$



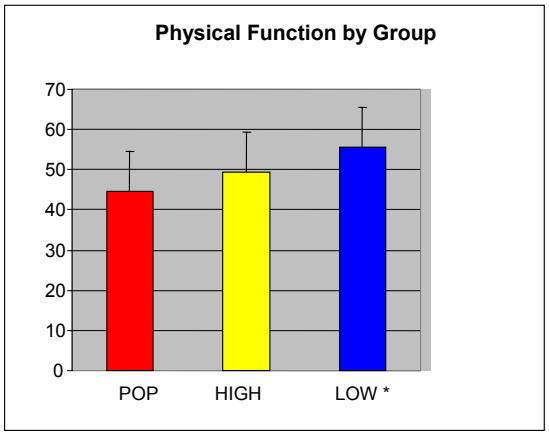


Figure 4.1b Total physical function from CS-PFP comparisons by group
* = different from POP, p<0.05

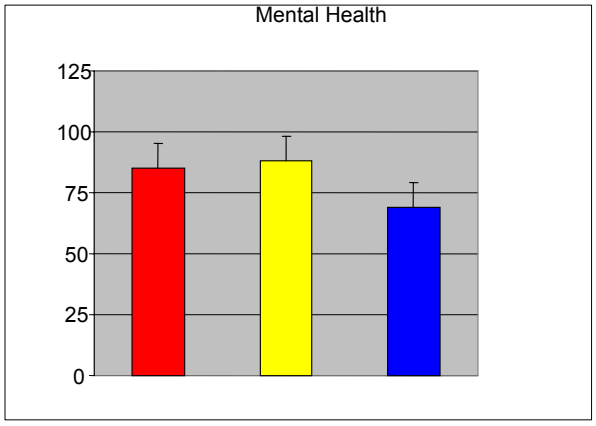


Figure 4.1c Mental health scores by group
* = different from POP, p<0.05
† = different from HIGH, p<0.05

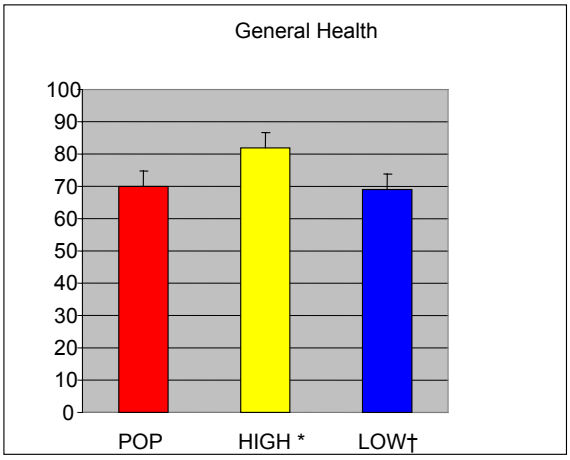


Figure 4.1d General health scores by group
* = different from POP, p<0.05
† = different from HIGH, p<0.05

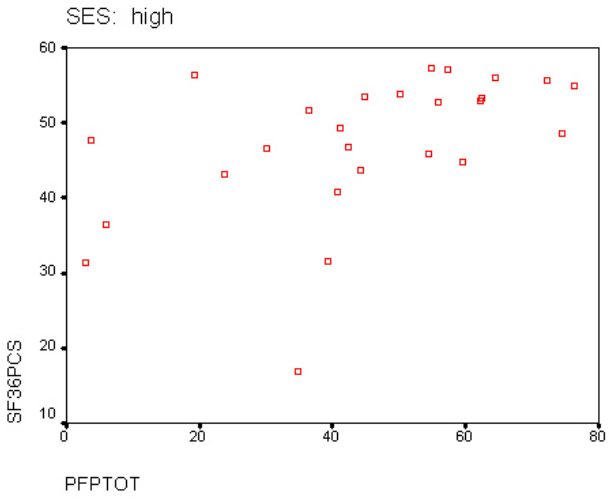


Figure 4.2a. Associations among HIGH group

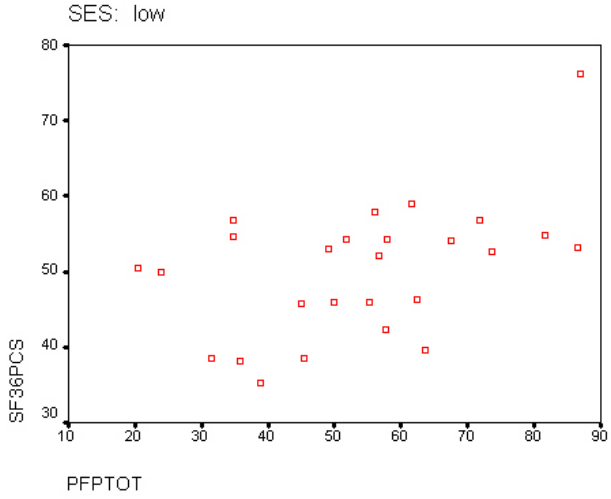


Figure 4.2b. Associations among LOW group

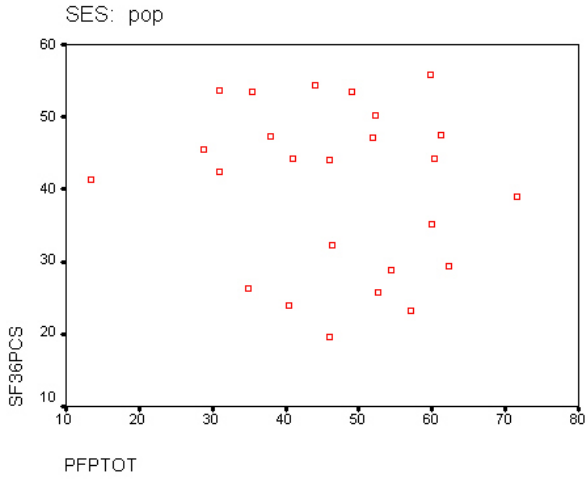


Figure 4.2c. Associations among POP group

Discussion

This study examined the physical function and health-related quality of life (HRQL) of older adults in different cultural environments. There were a total of 78 elders who were assessed on the CS-PFP and SF-36 tests that included 26 community-dwelling residents (LOW), 26 residents of a Continuing Care Retirement Community (HIGH), and 26 randomly selected participants from a larger population-based study (POP). The LOW group was predominately African American with a mean household income of less than $30,000 per year, and the group was depicted as having low environmental support. The HIGH group were Caucasian residents of a "premier independent-living" facility in Baton Rouge, La, and they were described as having high environmental support. It is important to note that the HIGH group was older than the LOW and POP groups.

Along with physical function and HRQL, prevalence of disease was also examined as a result of one's environment. The categories of diseases included cardiovascular disease (CVD), orthopedic, neurological, and "other" diseases (i.e., diabetes, thyroid problems, and cancer). According to Healthy People 2010 statistics, mortality rates for heart disease are 40% higher in African Americans compared to Caucasians, which is consistent with the prevalence of CVD in the studied participants (85% vs. 46%). The prevalence of orthopedic diseases was also significantly different among groups. Arthritis, osteoporosis, and chronic back problems tend to be more prevalent among white Americans than African Americans. For example, arthritis is the most common chronic condition in white Americans, while it is the only the third most common condition among African Americans; however, African Americans are at greater risk of activity limitation as a result of orthopedic conditions compared to white Americans (Healthy People 2010).

The purpose of this research was to identify group differences in physical function and HRQL between older adults living in different environments, and to compare information from these groups to data from a random sample of elders pulled from the general population. Lawton's (1983) environmental press theory suggests that one's environment plays a critical role in everyday functioning and one's QOL. We hypothesized that we would find significant differences in PF and HRQL between the groups of participants with low and high environmental supports. The data supported our general hypothesis; however, we predicted that the HIGH group would have better physical function compared to the group with less support, but this was not the case. In fact, the group with low support had a higher total physical function score as compared to their more affluent counterparts, as well as in comparison to the population-based sample.

We observed that the LOW participants had greater age-adjusted functional upper body strength in comparison to both their HIGH and POP counterparts. The HIGH and POP groups are also more likely to have assistance with everyday chores and activities as they grow older, along with having greater access to material resources, which in turn hinders his or her physical function. There have been few published studies regarding physical function according to SES or living environments. Clark (1996) reviewed data from two focus group sessions to discuss age, socioeconomic status, and exercise self-efficacy; however his conclusions did not directly associate lower environmental support with decreased functional ability, only sense of control. Clark does emphasize the importance of research on older adults (associations between SES included) and their risks of deteriorating health functional status.

In light of the better physical function scores of the LOW group, it is not surprising that the LOW participants reported greater physical function (SF-36 PF) and had higher SF-36 PCS

scores when compared to the sample drawn from the general population. However, it is of interest to note that the self-reported physical function (SF-36 PF and PCS scores) of the HIGH participants *were not* lower than those of the LOW participants. Moreover the HIGH participants reported greater General Health than both the LOW and POP groups. Of further interest were the findings indicating that the LOW group had a significantly lower HRQL for the mental health category compared to the POP and HIGH groups. These results indicate lower HRQL in the LOW group compared to both the POP and HIGH groups even though these participants reported greater actual and perceived physical function compared to the general population. The participants seem to feel their health (HRQL) is poorer in comparison to their actual functional ability.

Associations between PF and HRQL constructs according to group also yielded some interesting results. Of particular interest was the appearance of an association between physical functional indices and SF-36 social functioning in the LOW group only. This could be a result of the LOW participants typically being more dependent on physical function to participate in social activities. Participants in the HIGH group have transportation and accessibility provided for them, unlike the LOW participants who tend to be responsible for their own accessibilities for these activities.

Of note was the absence of significant associations among the physical function and HRQL constructs in the POP group. With a relatively small number of participants in the groups (n = 26), it is not altogether surprising that the POP group would have greater sources of variation in the data compared to the relatively homogenous LOW and HIGH groups. An interesting phenomenon is observed if we look at the association between PFP total function scores and the SF-36 PCS summary score (figure 4.2a-c). Figure 4.2c reveals that the distribution

of scores for the POP group appears to have two clusters of data that appear to resemble the LOW group (figure 4.2a) and the HIGH group (4.2c). It would be of interest to revisit the POP group for additional demographic data to examine whether SES accounts for the variability in the distribution of scores.

Collectively these findings support the theory of environmental press insofar as participants living in a highly supportive environment (HIGH) do not report deficits in function that appear to exist when compared to LOW elders, and in fact they report greater general health and mental health. The latter could potentially be related to a lower incidence of cardiovascular disease than their counterparts, but it is also plausible that the supports provided by the environment enhance the HIGH participant's appraisal of their ADL competence. Further research is necessary to make this determination.

The effect that the environment has on one's mental and physical health is evident in the discussed research. Lawton (1983) revealed this association between HRQL (psychological well being and perceived quality of life), physical function (behavioral competence), and the environment. We were able to measure HRQL and physical function in the SF-36 and CS-PFP assessments; however, the environment was not acquired. We had to assume the categorized environments, which we obtained from the personal demographics and characteristics. This limitation is important for future investigation to understand the theory of environmental press. Most importantly, the data indicates that although lower SES individuals are more functional, their environment contributes to poorer mental health, implicating the relevance that the environment has on public health issues. It is also important to point out that even with greater physical function, the LOW group had an overall poorer general health score. Even though health can be defined several different ways, perception of function seems to reveal more about

HRQL in individuals with differing cultural backgrounds in comparison to actual function. Therefore, emphasizing the associations between HRQL and culturally different environments should be the next step in research. Identifying this association will assist in promoting healthy lifestyles and educating the individuals who do not have the resources to obtain this information to have higher HRQL.

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Appendix A: Statistics

Correlations[a]

		SF36PF	SF36RP	SF36BP	SF36GH	SF36VT	SF36SF	SF36RE	SF36MH	SF36PCS	SF36MCS	UBS	UBFLEX	LBS	BALCOR	ENDUR	PFPTOT
SF36PF	Pearson Correlatio	1	.363	.556**	.194	.367	.134	.232	.218	.712**	-.088	.612**	.479*	.607**	.507**	.536**	.578**
	Sig. (2-tailed)	.	.069	.003	.344	.065	.514	.254	.285	.000	.668	.001	.013	.001	.008	.005	.002
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36RP	Pearson Correlatio	.363	1	.179	.254	.535**	.615**	.603**	.664**	.401*	.527**	.455*	.629**	.510**	.487*	.491*	.522**
	Sig. (2-tailed)	.069	.	.381	.210	.005	.001	.001	.000	.042	.006	.019	.001	.008	.012	.011	.006
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36BP	Pearson Correlatio	.556**	.179	1	.467*	.218	-.076	-.166	-.074	.812**	-.425*	.299	.066	.179	.113	.130	.164
	Sig. (2-tailed)	.003	.381	.	.016	.286	.713	.418	.719	.000	.030	.138	.748	.381	.581	.528	.422
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36GH	Pearson Correlatio	.194	.254	.467*	1	.434*	-.165	.009	.352	.500**	.076	.168	-.082	.029	-.014	.000	.023
	Sig. (2-tailed)	.344	.210	.016	.	.027	.420	.967	.078	.009	.712	.412	.692	.888	.948	.998	.911
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36VT	Pearson Correlatio	.367	.535**	.218	.434*	1	.290	.290	.624**	.420*	.449*	.323	.330	.335	.312	.320	.338
	Sig. (2-tailed)	.065	.005	.286	.027	.	.151	.150	.001	.033	.021	.107	.100	.094	.120	.111	.091
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36SF	Pearson Correlatio	.134	.615**	-.076	-.165	.290	1	.503**	.369	.082	.471*	.247	.414*	.361	.401*	.409*	.391*
	Sig. (2-tailed)	.514	.001	.713	.420	.151	.	.009	.063	.690	.015	.224	.036	.070	.042	.038	.049
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36RE	Pearson Correlatio	.232	.603**	-.166	.009	.290	.503**	1	.642**	-.042	.797**	.051	.451*	.276	.266	.261	.260
	Sig. (2-tailed)	.254	.001	.418	.967	.150	.009	.	.000	.837	.000	.803	.021	.173	.188	.197	.200
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36MH	Pearson Correlatio	.218	.664**	-.074	.352	.624**	.369	.642**	1	.095	.817**	.242	.471*	.302	.326	.333	.335
	Sig. (2-tailed)	.285	.000	.719	.078	.001	.063	.000	.	.644	.000	.234	.015	.134	.104	.096	.094
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36PCS	Pearson Correlatio	.712**	.401*	.812**	.500**	.420*	.082	-.042	.095	1	-.355	.587**	.325	.483*	.403*	.428*	.472*
	Sig. (2-tailed)	.000	.042	.000	.009	.033	.690	.837	.644	.	.075	.002	.105	.013	.041	.029	.015
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36MCS	Pearson Correlatio	-.088	.527**	-.425*	.076	.449*	.471*	.797**	.817**	-.355	1	-.092	.302	.078	.120	.112	.094
	Sig. (2-tailed)	.668	.006	.030	.712	.021	.015	.000	.000	.075	.	.657	.134	.706	.558	.585	.649
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
UBS	Pearson Correlatio	.612**	.455*	.299	.168	.323	.247	.051	.242	.587**	-.092	1	.612**	.858**	.742**	.754**	.839**
	Sig. (2-tailed)	.001	.019	.138	.412	.107	.224	.803	.234	.002	.657	.	.001	.000	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
UBFLEX	Pearson Correlatio	.479*	.629**	.066	-.082	.330	.414*	.451*	.471*	.325	.302	.612**	1	.768**	.805**	.800**	.817**
	Sig. (2-tailed)	.013	.001	.748	.692	.100	.036	.021	.015	.105	.134	.001	.	.000	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
LBS	Pearson Correlatio	.607**	.510**	.179	.029	.335	.361	.276	.302	.483*	.078	.858**	.768**	1	.960**	.960**	.987**
	Sig. (2-tailed)	.001	.008	.381	.888	.094	.070	.173	.134	.013	.706	.000	.000	.	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
BALCOR	Pearson Correlatio	.507**	.487*	.113	-.014	.312	.401*	.266	.326	.403*	.120	.742**	.805**	.960**	1	.997**	.985**
	Sig. (2-tailed)	.008	.012	.581	.948	.120	.042	.188	.104	.041	.558	.000	.000	.000	.	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
ENDUR	Pearson Correlatio	.536**	.491*	.130	.000	.320	.409*	.261	.333	.428*	.112	.754**	.800**	.960**	.997**	1	.987**
	Sig. (2-tailed)	.005	.011	.528	.998	.111	.038	.197	.096	.029	.585	.000	.000	.000	.000	.	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
PFPTOT	Pearson Correlatio	.578**	.522**	.164	.023	.338	.391*	.260	.335	.472*	.094	.839**	.817**	.987**	.985**	.987**	1
	Sig. (2-tailed)	.002	.006	.422	.911	.091	.049	.200	.094	.015	.649	.000	.000	.000	.000	.000	.
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26

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

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

a. SES = low

Figure A.1 Correlations between Physical Function and HRQL constructs (LOW SES)

Correlations[a]

		SF36PF	SF36RP	SF36BP	SF36GH	SF36VT	SF36SF	SF36RE	SF36MH	SF36PCS	SF36MCS	UBS	UBFLEX	LBS	BALCOR	ENDUR	PFPTOT
SF36PF	Pearson Correlatio	1	.488*	.142	.166	-.092	.342	.098	-.073	.788**	-.396*	.592**	.585**	.657**	.633**	.645**	.649**
	Sig. (2-tailed)	.	.011	.489	.416	.653	.087	.634	.722	.000	.045	.001	.002	.000	.001	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36RP	Pearson Correlatio	.488*	1	.258	.588**	.288	.663**	.205	.000	.795**	.004	.462*	.606**	.525**	.561**	.580**	.563**
	Sig. (2-tailed)	.011	.	.204	.002	.154	.000	.315	.998	.000	.986	.017	.001	.006	.003	.002	.003
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36BP	Pearson Correlatio	.142	.258	1	.016	-.035	.611**	.436*	-.101	.509**	.061	-.341	-.087	-.177	-.186	-.165	-.194
	Sig. (2-tailed)	.489	.204	.	.937	.866	.001	.026	.622	.008	.768	.089	.671	.388	.364	.421	.342
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36GH	Pearson Correlatio	.166	.588**	.016	1	.156	.265	-.130	-.012	.496*	-.046	.241	.369	.265	.306	.330	.308
	Sig. (2-tailed)	.416	.002	.937	.	.445	.191	.526	.955	.010	.824	.235	.064	.190	.129	.099	.126
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36VT	Pearson Correlatio	-.092	.288	-.035	.156	1	.248	.522**	.470*	-.039	.598**	.302	.264	.403*	.428*	.425*	.406*
	Sig. (2-tailed)	.653	.154	.866	.445	.	.222	.006	.015	.848	.001	.133	.193	.041	.029	.030	.039
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36SF	Pearson Correlatio	.342	.663**	.611**	.265	.248	1	.670**	.146	.608**	.341	.045	.233	.162	.177	.214	.177
	Sig. (2-tailed)	.087	.000	.001	.191	.222	.	.000	.476	.001	.088	.826	.252	.430	.386	.294	.386
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36RE	Pearson Correlatio	.098	.205	.436*	-.130	.522**	.670**	1	.382	.119	.589**	.028	.034	.080	.102	.118	.092
	Sig. (2-tailed)	.634	.315	.026	.526	.006	.000	.	.054	.561	.002	.891	.871	.696	.619	.566	.656
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36MH	Pearson Correlatio	-.073	.000	-.101	-.012	.470*	.146	.382	1	-.253	.845**	.140	.027	.208	.237	.239	.213
	Sig. (2-tailed)	.722	.998	.622	.955	.015	.476	.054	.	.213	.000	.495	.897	.308	.243	.239	.297
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36PCS	Pearson Correlatio	.788**	.795**	.509**	.496*	-.039	.608**	.119	-.253	1	-.364	.376	.553**	.484*	.480*	.504**	.492*
	Sig. (2-tailed)	.000	.000	.008	.010	.848	.001	.561	.213	.	.067	.058	.003	.012	.013	.009	.011
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
SF36MCS	Pearson Correlatio	-.396*	.004	.061	-.046	.598**	.341	.589**	.845**	-.364	1	-.118	-.157	-.055	-.025	-.015	-.048
	Sig. (2-tailed)	.045	.986	.768	.824	.001	.088	.002	.000	.067	.	.567	.442	.791	.904	.941	.815
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
UBS	Pearson Correlatio	.592**	.462*	-.341	.241	.302	.045	.028	.140	.376	-.118	1	.783**	.927**	.899**	.896**	.931**
	Sig. (2-tailed)	.001	.017	.089	.235	.133	.826	.891	.495	.058	.567	.	.000	.000	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
UBFLEX	Pearson Correlatio	.585**	.606**	-.087	.369	.264	.233	.034	.027	.553**	-.157	.783**	1	.802**	.841**	.849**	.858**
	Sig. (2-tailed)	.002	.001	.671	.064	.193	.252	.871	.897	.003	.442	.000	.	.000	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
LBS	Pearson Correlatio	.657**	.525**	-.177	.265	.403*	.162	.080	.208	.484*	-.055	.927**	.802**	1	.972**	.970**	.985**
	Sig. (2-tailed)	.000	.006	.388	.190	.041	.430	.696	.308	.012	.791	.000	.000	.	.000	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
BALCOR	Pearson Correlatio	.633**	.561**	-.186	.306	.428*	.177	.102	.237	.480*	-.025	.899**	.841**	.972**	1	.998**	.995**
	Sig. (2-tailed)	.001	.003	.364	.129	.029	.386	.619	.243	.013	.904	.000	.000	.000	.	.000	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
ENDUR	Pearson Correlatio	.645**	.580**	-.165	.330	.425*	.214	.118	.239	.504**	-.015	.896**	.849**	.970**	.998**	1	.995**
	Sig. (2-tailed)	.000	.002	.421	.099	.030	.294	.566	.239	.009	.941	.000	.000	.000	.000	.	.000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
PFPTOT	Pearson Correlatio	.649**	.563**	-.194	.308	.406*	.177	.092	.213	.492*	-.048	.931**	.858**	.985**	.995**	.995**	1
	Sig. (2-tailed)	.000	.003	.342	.126	.039	.386	.656	.297	.011	.815	.000	.000	.000	.000	.000	.
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26

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

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

a. SES = high

Figure A.2 Correlations between Physical Function and HRQL constructs (HIGH SES)

Correlations[a]

		SF36PF	SF36RP	SF36BP	SF36GH	SF36VT	SF36SF	SF36RE	SF36MH	SF36PCS	SF36MCS	UBS	UBFLEX	LBS	BALCOR	ENDUR	PFPTOT
SF36PF	Pearson Correlation	1	.511**	.466*	.372	.470*	.552**	.295	.542**	.882**	.122	-.059	.014	.032	.050	.058	.031
	Sig. (2-tailed)	.	.009	.019	.067	.018	.004	.152	.005	.000	.563	.779	.949	.881	.811	.784	.884
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36RP	Pearson Correlation	.511**	1	.387	.239	.567**	.601**	.277	.367	.743**	.249	-.139	-.112	-.093	-.097	-.126	-.123
	Sig. (2-tailed)	.009	.	.056	.250	.003	.002	.179	.071	.000	.231	.509	.594	.659	.644	.547	.557
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36BP	Pearson Correlation	.466*	.387	1	.206	.271	.267	.263	.333	.688**	.030	-.221	-.323	-.398*	-.362	-.410*	-.391
	Sig. (2-tailed)	.019	.056	.	.323	.189	.196	.203	.104	.000	.887	.288	.115	.049	.075	.042	.053
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36GH	Pearson Correlation	.372	.239	.206	1	.538**	.387	.431*	.519**	.474*	.500*	-.151	-.271	-.023	.084	-.018	-.035
	Sig. (2-tailed)	.067	.250	.323	.	.006	.056	.032	.008	.017	.011	.473	.191	.913	.691	.933	.870
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36VT	Pearson Correlation	.470*	.567**	.271	.538**	1	.562**	.471*	.512**	.567**	.640**	-.035	-.088	.069	.121	.056	.054
	Sig. (2-tailed)	.018	.003	.189	.006	.	.003	.017	.009	.003	.001	.869	.674	.742	.563	.791	.799
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36SF	Pearson Correlation	.552**	.601**	.267	.387	.562**	1	.262	.737**	.576**	.642**	-.355	-.114	-.082	.036	-.060	-.095
	Sig. (2-tailed)	.004	.002	.196	.056	.003	.	.205	.000	.003	.001	.082	.589	.697	.865	.777	.650
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36RE	Pearson Correlation	.295	.277	.263	.431*	.471*	.262	1	.396	.270	.672**	-.086	-.317	-.087	-.019	-.110	-.101
	Sig. (2-tailed)	.152	.179	.203	.032	.017	.205	.	.050	.192	.000	.682	.122	.680	.929	.600	.631
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36MH	Pearson Correlation	.542**	.367	.333	.519**	.512**	.737**	.396	1	.488*	.721**	-.303	-.007	-.027	.154	.047	-.004
	Sig. (2-tailed)	.005	.071	.104	.008	.009	.000	.050	.	.013	.000	.141	.975	.899	.462	.824	.986
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36PCS	Pearson Correlation	.882**	.743**	.688**	.474*	.567**	.576**	.270	.488*	1	.108	-.133	-.150	-.126	-.113	-.131	-.138
	Sig. (2-tailed)	.000	.000	.000	.017	.003	.003	.192	.013	.	.609	.526	.474	.550	.592	.531	.509
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SF36MCS	Pearson Correlation	.122	.249	.030	.500*	.640**	.642**	.672**	.721**	.108	1	-.247	-.165	-.004	.158	.017	-.007
	Sig. (2-tailed)	.563	.231	.887	.011	.001	.001	.000	.000	.609	.	.233	.432	.983	.450	.937	.973
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
UBS	Pearson Correlation	-.059	-.139	-.221	-.151	-.035	-.355	-.086	-.303	-.133	-.247	1	.473*	.837**	.573**	.733**	.797**
	Sig. (2-tailed)	.779	.509	.288	.473	.869	.082	.682	.141	.526	.233	.	.017	.000	.003	.000	.000
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
UBFLEX	Pearson Correlation	.014	-.112	-.323	-.271	-.088	-.114	-.317	-.007	-.150	-.165	.473*	1	.641**	.622**	.690**	.706**
	Sig. (2-tailed)	.949	.594	.115	.191	.674	.589	.122	.975	.474	.432	.017	.	.001	.001	.000	.000
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
LBS	Pearson Correlation	.032	-.093	-.398*	-.023	.069	-.082	-.087	-.027	-.126	-.004	.837**	.641**	1	.862**	.949**	.974**
	Sig. (2-tailed)	.881	.659	.049	.913	.742	.697	.680	.899	.550	.983	.000	.001	.	.000	.000	.000
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
BALCOR	Pearson Correlation	.050	-.097	-.362	.084	.121	.036	-.019	.154	-.113	.158	.573**	.622**	.862**	1	.950**	.933**
	Sig. (2-tailed)	.811	.644	.075	.691	.563	.865	.929	.462	.592	.450	.003	.001	.000	.	.000	.000
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
ENDUR	Pearson Correlation	.058	-.126	-.410*	-.018	.056	-.060	-.110	.047	-.131	.017	.733**	.690**	.949**	.950**	1	.991**
	Sig. (2-tailed)	.784	.547	.042	.933	.791	.777	.600	.824	.531	.937	.000	.000	.000	.000	.	.000
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
PFPTOT	Pearson Correlation	.031	-.123	-.391	-.035	.054	-.095	-.101	-.004	-.138	-.007	.797**	.706**	.974**	.933**	.991**	1
	Sig. (2-tailed)	.884	.557	.053	.870	.799	.650	.631	.986	.509	.973	.000	.000	.000	.000	.000	.
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25

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

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

a. SES = pop

Figure A.3 Correlations between Physical Function and HRQL constructs (POP SES)

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. ***Thank you for completing this survey!***

For each of the following questions, please mark an ☒ in the one box that best describes your answer.

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

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

2. <u>Compared to one year ago</u>, how would you rate your health in general <u>now</u>?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
☐1	☐2	☐3	☐4	☐5

3. The following questions are about activities you might do during a typical day. Does <u>your health now limit you</u> in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	☐1	☐2	☐3
b Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐1	☐2	☐3
c Lifting or carrying groceries	☐1	☐2	☐3
d Climbing several flights of stairs	☐1	☐2	☐3
e Climbing one flight of stairs	☐1	☐2	☐3
f Bending, kneeling, or stooping	☐1	☐2	☐3
g Walking more than a mile	☐1	☐2	☐3
h Walking several hundred yards	☐1	☐2	☐3
i Walking one hundred yards	☐1	☐2	☐3
j Bathing or dressing yourself	☐1	☐2	☐3

4. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐1	☐2	☐3	☐4	☐5
b <u>Accomplished less</u> than you would like	☐1	☐2	☐3	☐4	☐5
c Were limited in the <u>kind</u> of work or other activities	☐1	☐2	☐3	☐4	☐5
d Had <u>difficulty</u> performing the work or other activities (for example, it took extra effort)	☐1	☐2	☐3	☐4	☐5

5. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Cut down on the <u>amount of time</u> you spent on work or other activities	☐1	☐2	☐3	☐4	☐5
b <u>Accomplished less</u> than you would like	☐1	☐2	☐3	☐4	☐5
c Did work or other activities <u>less carefully than usual</u>	☐1	☐2	☐3	☐4	☐5

6. During the <u>past 4 weeks</u>, to what extent has your <u>physical health or emotional problems</u> interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
☐1	☐2	☐3	☐4	☐5

7. How much <u>bodily</u> pain have you had during the <u>past 4 weeks</u>?

None	Very mild	Mild	Moderate	Severe	Very Severe
☐1	☐2	☐3	☐4	☐5	☐6

8. During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐1	☐2	☐3	☐4	☐5

9. These questions are about how you feel and how things have been with you <u>during the past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the <u>past 4 weeks</u>...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Did you feel full of life?	☐1	☐2	☐3	☐4	☐5
b Have you been very nervous?	☐1	☐2	☐3	☐4	☐5
c Have you felt so down in the dumps that nothing could cheer you up?	☐1	☐2	☐3	☐4	☐5
d Have you felt calm and peaceful?	☐1	☐2	☐3	☐4	☐5
e Did you have a lot of energy?	☐1	☐2	☐3	☐4	☐5
f Have you felt downhearted and depressed?	☐1	☐2	☐3	☐4	☐5
g Did you feel worn out?	☐1	☐2	☐3	☐4	☐5
h Have you been happy?	☐1	☐2	☐3	☐4	☐5
i Did you feel tired?	☐1	☐2	☐3	☐4	☐5

10. During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐1	☐2	☐3	☐4	☐5

11. How TRUE or FALSE is <u>each</u> of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a I seem to get sick a little easier than other people	☐1	☐2	☐3	☐4	☐5
b I am as healthy as anybody I know	☐1	☐2	☐3	☐4	☐5
c I expect my health to get worse	☐1	☐2	☐3	☐4	☐5
d My health is excellent	☐1	☐2	☐3	☐4	☐5

THANK YOU FOR COMPLETING THESE QUESTIONS!

Vita

Robyn Bossier is a native of Baton Rouge, Louisiana. She received her bachelor's degree from the Department of Kinesiology from Louisiana State University in May of 2003. She will obtain a master of science degree from the Department of Kinesiology at Louisiana State University in December of 2005. Finally, she has acquired a full-time position as a clinical exercise physiologist at Our Lady of the Lake Hospital in Baton Rouge, Louisiana.