LAY THEORIES OF HEALTH: MULTIDIMENSIONAL CONCEPTUALIZATIONS OF WHAT COMPRISES HEALTH IN YOUNG AND MIDDLE-AGED ADULTS

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Psychology)
in the University of Michigan
2008

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Be Joyful Always

I would prove myself a terrible fool were I remiss in dedicating this dissertation to the many, many wonderful people in my life who have supported me throughout my education and this project. You are too many to name.

However, I must devote a few words to my anchors – those people in my life who have made my "big 'I am'" possible. First, to my mother and father. I thank you, Hae Jin Barkey and Theodore LaPan (now deceased), for never letting me second-guess my own mind and personal potential. I cannot express the full measure of my gratitude for your love, support, guidance, and inspiration.

To my brother and sister, Christopher and Cynthia, who are now (amazingly) my closest friends and loudest fan club. What would I do without you?

To my dearest friend Rachel Judt, with whom I never have to "catch up" – you're right there, always, ready to support, entertain, and educate. Love you, babe.

And finally, to my husband, Chad Eric Downey, whose personal devotion to our marriage, to our son Cole Preston, and to helping me achieve my goals has been truly beyond what I thought I could ask for from a life partner. You have no idea how deeply I love you, and will always. Thank you, my heart.

Acknowledgements

A number of wonderful people, both known and unknown to me personally, were involved in making this dissertation possible. Dr. Edward Chang, my mentor throughout my graduate education at the University of Michigan, was the pivotal person who nurtured my confidence in my own professional and scholarly skill. I would like to thank you for being willing to look beyond my awkward, unpolished beginnings to see the potential that lay within. In addition, your enthusiasm for encouraging me to meet that potential seemed boundless, and I am so pleased to be able to make you proud of what we have accomplished together.

I also had the pleasure of learning from a remarkable set of other scholars in research, teaching, and clinical practice. These individuals include Sandra Graham-Bermann, Christopher Peterson, Donna Nagata, Nnamdi Pole, Laura Kohn-Wood, Patricia Deldin, Randy Roth, Luiz Gomez, Rudolph Hatfield, Roger Lauer, Albert Cain, Amy Saldinger, Jerry Miller, James Plunkett, Sharon Gold-Steinberg, Margaret Buttenheim, Kristen Chapman, Eileen Bond, Joseph Harvey, Robert Hatcher, Michelle Van Etten-Lee, Alex Barends, Jeffrey Urist, Susan Watts, Renee Lajiness-O'Neill, Jonathan Metzl, and James Hansell. I will always admire you and remember you warmly.

This dissertation could not have been completed without the hard work of my undergraduate research assistants. These bright, articulate, enthusiastic students included

Rachel Bates, Jaeeun Chung, Stephanie Hite, Angela Koelsch, Katherine Kudyba, Jennifer Ortiz, and Celeste VanPoppelen. I have no doubt that each of you has a fantastic future ahead, and I can't wait to hear of your further adventures in psychology and in life. Lastly, I would like to acknowledge my appreciation for the many people in the Ann Arbor and Ypsilanti, Michigan, community who were willing to volunteer their time to participate in this research project. I saw how some of you battle obstacles in your health, economic circumstances, employment, and social environment that I am fortunate enough not to have to battle; and yet you were willing to give something to me and to science by participating in this study. You may hardly remember me or the time you gave, but I will always remember you.

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List of Abbreviations

LTH	Lay Theories of Health
SEH	Social-Emotional Health
PHP	Positive Health Practices
AI	Absence of Illness
ASA	Absence of Stress and Anxiety
AR	Adequate Rest
MDH	Multidimensional Health
SF-36	Medical Outcomes Survey – Short Form
SF-36: PF	Physical Functioning Scale of SF-36
SF-36: RP	Role-Physical Scale of SF-36
SF-36: BP	Bodily Pain Scale of SF-36
SF-36: GH	General Health Scale of SF-36
SF-36: VT	Vitality Scale of SF-36
SF-36: SF	Social Functioning Scale of SF-36
SF-36: RE	Role-Emotional Scale of SF-36
SF-36: MH	Mental Health Scale of SF-36
LOT-R	Life Orientation Test – Revised
PA	Positive Affect Scale of Positive and Negative Affect Scales
NA	Negative Affect Scale of Positive and Negative Affect Scales
MOS-SS	Medical Outcomes Survey – Social Support
MOS-EI	Medical Outcomes Survey – Emotional-Informational Support
MOS-T	Medical Outcomes Survey – Tangible Support
DSES-S	Daily Spiritual Experiences Scale – Short Form

Abstract

The present research sought to identify the content, structure, and conceptual and behavioral correlates of lay theories of health in young and middle-aged adults. Lay theories of health are the unarticulated beliefs of laypeople about what it is to be healthy. These theories were assessed in a Prestudy through open-ended survey questioning of 262 adults at four community sites, as well as nationally over the Internet. After an initial coding and judgment process by trained research assistants, 325 distinct responses to the item asking participants to describe a "very healthy person" were identified. Further judgment resulted in an item pool of 259 items to be studied in the next stage of the research. These responses were then rated on their importance to health by laypeople and by experts in separate studies (Studies 1 and 1b). Lay and expert theories about dimensions of health were compared, and some differences were revealed. Items which were rated as most important to health by laypeople (95 items) were administered to a third sample of adult laypeople over the Internet (Study 2), along with some other reliable and valid wellness measures. Participants also rated a set of five empirically-derived profiles of fictional individuals on their healthiness and unhealthiness. These profiles were comprised of items which had been rated as important to health in Study 1 (e.g., by laypeople). Ratings of these profiles showed the hypothesized pattern of increasing with higher correspondence to an "ideal" health profile. Responses to the 95 layperson-generated items were analyzed through exploratory factor analytic procedures, and five dimensions of health were identified. These were labeled *Social-Emotional Health,*

Positive Health Practices, Absence of Illness, Absence of Stress and Anxiety, and *Adequate Rest*. A new measure of lay theories of health was created measuring these dimensions, as well as a summary score called *Multidimensional Health.* Initial validation of this measure was conducted through comparing it to the other measures of well-being administered in Study 2, and through its associations with self-reports of selected health behaviors. Findings were discussed in relation to clinical practice, research in other disciplines, and various theories of health behavior.

Chapter I

Introduction

Man looks at his world through transparent patterns or templets which he creates and then attempts to fit over the realities of which the world is composed. The fit is not always very good. Yet without such patterns the world appears to be such an undifferentiated homogeneity that man is unable to make any sense out of it. Even a poor fit is more helpful to him than nothing at all (Kelly, 1955, pp. 8-9).

In one of his most influential papers, Engel (1977) articulated his views on several major shortcomings of the then-prevalent biomedical model of health and illness. The biomedical model, according to Engel, asserted that all illness states could be fully explained by disruptions in physiology, or deviations from the normal structure or functioning of the body. Among his many criticisms of the biomedical model, Engel emphasized how biomedicine had failed to explain a number of phenomena encountered by health care professionals in many clinical settings. For example, the occurrence of a lack of correspondence between a patient's physiological state and his or her reported symptoms, and how patients with identical physiological profiles might respond differently to treatment, were events for which the biomedical model could not account. Engel proposed in that paper the use of a new term to reflect and encourage a growing recognition of social and psychological factors in relation to health and illness: the biopsychosocial model. While the term "biopsychosocial model" now is commonplace in introductory psychology textbooks, the publication of recent reviews of studies

investigating mind-body-society relationships indicates that evidence for the biopsychosocial model is still in the accumulation stage, with much work remaining to be done before the model is widely accepted by all professionals involved in health care (Ray, 2004).

Psychologists have played a significant role in contributing to current evidence for the biopsychosocial model of health and illness. One broad area of work involves gaining understanding of how individuals think about their health. This work has investigated the general illness experience, involving how individuals mentally structure and utilize knowledge about what it is to be ill (Skelton & Croyle, 1991), as well as beliefs that people hold about specific illnesses, such as diabetes or Alzheimer's disease (Furnham, 1988). Extant work has been, in a broad conceptual sense, in line with growing recent interest in the implicit theories of individuals, and how those implicit theories have an impact upon cognition, affect, and behavior (Lim, Plucker, & Im, 2002). The present work sought to expand existing knowledge of laypeople's implicit theories of health by addressing some possibly problematic methodological issues in current studies of implicit theories. Also, this study sought to utilize the knowledge acquired in a new empirical study of lay theories of health to construct a new measure of self-appraised health that allied with laypeople's implicit theories of health.

What are Implicit Theories, and Why Is Their Study Important?

Implicit theories are often defined as mental constructions about specific phenomena which, while often elaborate in structure, content, and function, are not well articulated by those who hold them (Lim, Plucker, & Im, 2002; Polaschek & Ward, 2002; Sternberg, Conway, Ketron, & Bernstein, 1981). This is in contrast to explicit theories,

which are "constructions of psychologists or other scientists that are based on or at least tested on data collected from people performing tasks presumed to measure psychological functioning" (Sternberg, 1985, p. 607). That is, explicit theories are formulated by experts in one of two ways: either experts use individual performance on certain tasks to gather data, and then use that data to articulate explanatory theories, or experts refer to existing work on a construct to articulate new theories, which they then proceed to test through scientific methods. Questions of validity arise as other experts attempt to assess whether the methods used to gather data are appropriate to the research question. If the methods used are deemed acceptable, then the theories generated are seen as valid and useful so long as relevant data support them. If the relevant data fail to support the explicit theory, then the theory is either altered to accommodate findings, or is rejected altogether (Kazdin, 2003).

It is apparent, then, that explicit theories are constructed, evaluated, and utilized according to highly structured protocol. Implicit theories, by comparison, are not created by any prescribed process, but are rather thought to simply exist in people's minds, awaiting discovery by researchers (Sternberg, 1985). While implicit theories are not believed to be created through a scientific process, they are still thought to share many features of scientific theories in regard to their nature and function. For example, Ward (2000) states how implicit theories contain assumptions that describe human nature in terms of core psychological processes and structures. The components of implicit theories tend to be fairly coherent, and are used by people to explain and predict behavior. Therefore, implicit theories are thought to be used by individuals in a fairly scientific manner (Ward, 2000), even though those individuals would not describe

themselves as engaging in a scientific process when utilizing an implicit theory. Rather, they might simply say that they are making judgments, or expressing opinions.

The Malleability of Human Characteristics: An Example of Research on Implicit Theories

A well-known example of an implicit theory which has undergone much empirical study has been investigated by Carol Dweck (e.g., Dweck & Leggett, 1988; Levy & Dweck, 1998). She and her colleagues have spent more than two decades investigating social perception in the United States, and specifically, what they describe as an implicit theory that individuals hold in their minds regarding the mutability of human characteristics. That is, the basic idea that personal attributes can or cannot be changed has been advanced by these researchers as an important implicit theory of motivation and personality. Two opposing variants of this implicit theory have been described, each of which are thought to be endorsed by different individuals, for different domains of human personality and functioning. *Entity theorists* are described as believing in the fixedness, or invariability, of human characteristics. In contrast, *incremental theorists* are described as believing in the malleability of human characteristics. Because these two kinds of theorists believe human characteristics to have fundamentally different natures, the two groups are predicted to perceive themselves and their own achievements differently, to set different goals for performance, and to make different inferences about others' behavior. Constructs such as intelligence (Ablard & Mills, 1996; Braten & Stromso, 2004; Butler, 2000; Dupeyrat & Marine, 2005; Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999; Spinath, Spinath, Riemann, & Angleitner, 2003), morality (Chiu, Dweck, Tong, & Fu, 1997; Hong et al., 2003), shyness

(Beer, 2002), athletic ability (Kasimatis, Miller, & Marcussen, 1996; Li, Harrison, & Solmon, 2004; Ommundsen, 2001), and personality (Erdley, Cain, Loomis, Dumas-Hines, & Dweck, 1997; Spinath, Spinath, Riemann, & Angleitner, 2003), as well as cognitive processes such as stereotyping (Begue & Apostolidis, 2001; Plaks, Stroessner, Dweck, & Sherman, 2001) have been investigated using the entity vs. incremental theorist framework. Results of these studies have largely supported the usefulness of this framework, though criticisms do exist. For example, Ross (1989) pointed out how individuals may not view a particular trait's malleability in the stark, dichotomous terms described by Dweck and Leggett (1988), but rather in a more continuous manner. That is, Ross (1989) interpreted extant research as leaving open the possibility that the implicit theorist may view certain personal attributes as more stable than others, but still recognize certain circumstances under which even highly stable attributes may change.

Interestingly, Dweck's (e.g., Levy & Dweck, 1998) work on implicit theories of human characteristics can serve as a sound example of a researcher-advanced explicit theory. As Dweck and Leggett (1988) described, this area of research began with the basic question of why different individuals would exhibit different patterns of goal-seeking behavior in the same environment. After identifying that certain individuals (mostly schoolchildren in this research) seemed to show a "helpless" response in the face of difficulties with learning, while other individuals seemed to show a "mastery-oriented" response in the same situation, these researchers began to examine the goals that both groups were pursuing in the performance situation. As it turned out, the two groups were pursuing different goals, either *performance goals* (where individuals were seeking reward or recognition for their achievements) or *learning goals* (where individuals were

seeking to improve their competence in an area or with a task). This led to postulation that different beliefs about the nature of intelligence as a human attribute were driving the pursuit of different goals. Specifically, if a person believed that intelligence were fixed and unchangeable, that person's main goal might be to attain recognition for a certain level of performance, whereas if a person believed that intelligence were malleable, that person's main goal might be to improve mastery of material in order to develop his or her own intelligence to the greatest extent possible. Research on this idea eventually led to the development of a theory about the kinds of ideas that people hold in mind regarding the malleability of many human characteristics; that is, the research led to an explicit theory about people's implicit theories. At every step of this research, the expert researchers advanced and tested their own explanations for their observations; therefore, Dweck's theory qualifies as an explicit theory. As described above, this explicit theory has generally held up to scientific scrutiny.

Distinguishing Between Implicit and Lay Theories

Dweck's theory not only serves as a good example of an explicit theory, but also illustrates an interesting difference between implicit theories on the one hand, and what are referred to as *lay theories* on the other. Stated briefly, implicit theories are more inclusive than lay theories, as lay theories represent a subset of implicit theories. Lay theories (also called lay beliefs, or commonsense theories or models) are informal, unarticulated mental constructions that guide interpretation of phenomena, as all implicit theories are. However, they represent a specific type of implicit theory, because they are those held by laypeople, or those lacking specialized knowledge of a particular field of scholarship (Calnan, 1987). Because lay theories are by definition held by people who do

not necessarily have knowledge of the scientific method, these theories may be less internally consistent in their assumptions, more content-oriented and less process-oriented, and less falsifiable than the implicit theories held by experts. Obviously, lay theories would also be less scientific than the explicit theories advanced by researchers. Research on lay theories has addressed a great variety of phenomena, from alcohol and drug addiction to interpersonal relationships (Furnham, 1988). Interest in lay theories has been motivated similarly to that in implicit theories. That is, because lay theories are thought to have a significant impact on cognition, behavior, and decision-making, their discovery in particular populations and under certain conditions is seen as vitally important (Calnan, 1987; Furnham, 1988).

Dweck's model of implicit theories of human characteristics (Dweck & Leggett, 1988) presents a good opportunity to illustrate the importance of maintaining the distinction between implicit and lay theories, and the danger that many researchers of both implicit and explicit theories hazard by failing to fully acknowledge the impact that their own *expert* implicit theories can have upon their work. It is easily seen, given the preceding account of the difference between implicit and lay theories, that Dweck's model may or may not address lay theories, as it is an explicit theory which has likely been shaped by the implicit theories of experts. Dweck and her colleagues argued that individuals have in their minds theories about the malleability of human characteristics, and that these theories are used but unarticulated by individuals. Therefore, one is led to believe that this theory about a particular characteristic's malleability or fixedness represents the layperson's theory of an attribute's malleability. In the process of formulating their theory, however, Dweck and her colleagues collected data using

particular approaches, mostly by creating self-report items which directly questioned research participants about their ways of viewing human characteristics (i.e., as malleable or fixed). These researchers then analyzed and interpreted their data in particular ways, leading to the current conceptualization they have advanced. Of great importance is the criticism that each step of the process could be argued to have been influenced by the implicit theories of these researchers, as much as by the implicit theories of the laypersons participating in the research. That is, there is no way to tell how the implicit theories of the researchers affected the self-report items they created, the interpretations at which they arrived, and the collective interpretations which they then consolidated into a singular, coherent theory. Unfortunately, this same criticism can be leveled against most current work on implicit theories. While the intention of investigating implicit theories is often stated as discovering how everyday individuals make sense of their world (Sternberg, 1985), research driven by the implicit theories of the researchers may never quite accomplish this goal, as this research may include things that laypersons omit, or fail to take account of things that laypersons include. Therefore, researchers wishing to investigate the implicit theories of laypeople *must do their best to preserve in their studies the accounts provided by laypeople themselves on a particular construct.*

Questions of Methodology: How to Keep a Layperson-Centered Focus?

Furnham (1988) identified three main ways to assess lay theories: using self-report methodologies (be they qualitative or quantitative), using test data, and directly observing research participant behavior. As in many other areas of psychological research, current work in lay theories of psychological phenomena is dominated by the self-report methodologies. Researchers most often use questionnaires or surveys, but

also sometimes use the self-report method of interviews. Furnham relates four criticisms of self-report methodologies, one being that questionnaires or structured interviews, which often use either fixed-response or limited-response formats, may be "imposing the researchers' own cognitive constructs on to the respondents, rather than allowing them to reveal the range and content of their *own constructs*" [author's italics] (p. 17). Besides emphasizing this problem, which we have already elaborated upon, Furnham also called attention to issues of sampling problems, response sets (faking good or bad, demand characteristics of the researcher or research environment, social desirability), underreporting (where participants are unable or choose not to report certain events or features) and overreporting (where participants choose to respond to items not because they possess knowledge on the events or features in question, but because the item is there on the survey).

Using open-ended questionnaires or interviews, in Furnham's view, reduces the need for concern about response sets, underreporting and overreporting, and confounding of lay and expert implicit theories. Regarding response sets, open-ended questioning may be more desirable than fixed-response questioning, because offering respondents fixed response choices invites the respondents to assess irrelevant characteristics of those response choices on their social desirability (Antonovsky, 1972), on their level of accord with experimental demands, etc. Regarding underreporting and overreporting by study participants, Furnham (1988) asserted that under- and overreporting may not be as significant a problem for lay theories research as it may be for research on other psychological phenomena. He described one possible exception to this belief: cases where researchers are hoping to determine the cognitive processes that laypeople use to

maintain a particular theory. In these cases, underreporting (or overreporting) may be a significant problem, because individuals may not be able to accurately report their own mental processes. However, particular methods can be utilized by the researchers to uncover what might be common processes across a given sample (e.g., factor analysis) (Sternberg et al., 1981). Finally, open-ended questioning may serve to reduce contamination of lay theory data by the implicit theories of researchers, by allowing participants to respond to items fully in their own words. The problem of sampling then remains as the difficulty that cannot be resolved by using open-ended questions, but sampling is a major issue in all psychological research. This is a common concern that can be addressed by the researcher's attempt to assemble a sample which is demographically stratified (Furnham, 1988).

It would seem, then, that open-ended questioning of participants on psychological phenomena might provide a very useful account of the theories that laypeople hold in mind about those phenomena. However, open-ended questioning can make statistical analysis difficult (Antonovsky, 1972), and so the challenge for the psychologist who seeks to generalize such findings to a larger population becomes one of balancing the need for data to be as participant-generated as possible while maintaining the ability to perform systematic inferential statistical analyses. Of extant research on lay theories which has used an open-ended questioning approach, how have researchers addressed this dilemma?

Sternberg et al. (1981) and Sternberg (1985) used an open-ended questioning approach as the foundation for their investigation of lay theories of intelligence. Responses to open-ended questioning were then rated in different ways by subsequent

participant samples in a systematic, progressive series of experiments. This methodology was intended to minimize experimenter intrusion upon the data collected; therefore, Sternberg's work on intelligence can be seen as an example of one approach to investigating lay theories from the "bottom up." Sternberg et al. (1981) conducted their investigation in three studies. In the first study, the researchers asked participants from the Yale college library, the local train station in New Haven, Connecticut, and a local supermarket in New Haven to list behaviors characteristic of intelligence, academic intelligence, everyday intelligence, and unintelligence. They were then asked to rate themselves on intelligence, academic intelligence, and everyday intelligence. From the participants' responses, master lists of named behaviors for each kind of intelligence and for unintelligence were compiled, with all named behaviors being included except in cases of obvious redundancy. The frequencies of appearance of each of the 170 listed behaviors, for each kind of intelligence, in each setting were then correlated. Results indicated that laypeople seemed to have mental prototypes for each kind of intelligence, with different kinds of intelligence seen as more similar to one another by different groups (i.e., students saw general intelligence and academic intelligence as more similar than community members in the other two settings did). This is consistent with the notion that laypeople hold in mind implicit theories about what intelligence is, and that these theories can be moderated by people's age or education.

In the second study, Sternberg et al. (1981) sought to determine the structure of the implicit theories of intelligence held by both experts and laypersons, and to assess how closely the implicit theories of the two groups corresponded. The researchers had both laypeople, and experts in the field of intelligence research, rate all 170 behaviors on

their importance and characteristicness to their personal concepts of the ideally intelligent, academically intelligent, and everyday intelligent person. Correlations within and between ratings of laypersons and experts indicated high agreement between the two groups on their implicit theories of intelligence. Factor analysis of the ratings of laypersons and of experts indicated some conceptual similarities between the two groups on how they conceptualize intelligence, with each group identifying factors of intelligence relating to verbal ability and practical problem-solving ability. Differences between the implicit theories of the two groups were also found, as laypersons identified social competence as the third factor relating to intelligence, while experts identified formal problem-solving ability (e.g., reasoning skills) as the third factor important to intelligence. This indicated that while expert and lay implicit theories of intelligence share important features, they do not show perfect correspondence.

In the third study, laypeople were provided descriptions of fictional individuals, and asked to rate their intelligence. The descriptions were comprised of varying numbers of items which loaded highly on the factors of intelligence derived from the laypeople's ratings in Study 2, as well as varying numbers of items from the list of unintelligent behaviors listed in Study 1. Therefore, descriptions were created which were meant to vary in their correspondence to ideal intelligence, as defined in the first two experiments. Each description was compared to both the experts' and laypeople's characteristicness ratings in Study 2, and mean and sum scores for intelligence were derived for each description from this comparison. These mean and sum scores were then correlated with the laypeople's ratings of the fictional individual's intelligence. Results indicated very high correlations between both expert-derived and layperson-derived mean and sum

intelligence scores, and how participants rated each fictional individual's intelligence. This provided support for the idea that laypeople not only have implicit theories about intelligence, and that they have a structure similar (but not identical) to the implicit theories of experts, but also that laypeople use these implicit theories to judge the intelligence of others.

Sternberg (1985) extended the work of Sternberg et al. (1981) by investigating expert and lay implicit theories of intelligence, and their similarity or dissimilarity to lay theories of creativity and wisdom. Similarly to the Sternberg et al. study, Sternberg (1985) conducted this study in a series of studies. First, a prestudy was conducted, consisting of a mailed survey to professors in the fields of art, business, philosophy, and physics, as well as to laypeople. From the prestudy, lists of characteristics of an ideally intelligent, creative, or wise person from the professors' respective fields (or in general, for laypeople) were generated. In Study 1, 200 professors in the fields of art, business, philosophy, and physics rated each item generated in the prestudy by professors in their own fields, regarding the item's characteristicness to their conception of an ideally intelligent, creative, or wise individual in their occupation. Laypersons also rated the items in the same manner, but in reference to an ideally intelligent, creative, or wise person (without regard to occupation). Results of correlational analyses indicated that all groups considered intelligence to be more highly related to wisdom than either intelligence or wisdom was related to creativity, again illustrating similarities between lay and expert theories of intelligence.

In Study 2, college students were asked to sort three sets of 40 characteristics into a number of piles of their choosing, according to the criterion that the characteristics were

"likely to be found together" in a person. Each set was comprised of the top 40 behaviors (according to the laypersons' characteristicness ratings in Experiment 1) from the lists of intelligent, creative, and wise behaviors, though participants were not made aware of the common element between the behaviors presented. Multidimensional scaling analyses indicated that intelligence could be best represented by three dimensions. The first dimension was interpreted as *practical problem-solving ability* vs. *verbal ability*; the second dimension was interpreted as *intellectual balance and integration* vs. *goal orientation and attainment*; and the third dimension was interpreted as *contextual intelligence* vs. *fluid thought*. In contrast, the dimensions which emerged for creativity and wisdom contained noticeable differences from those for intelligence, indicating that laypeople hold distinct lay theories for different constructs. Unfortunately, experts were not included in the sample for Study 2, so there is no way to determine the similarity or difference of these dimensions to expert implicit theories.

In Study 3, as a test of the external validity of laypeople's implicit theories, laypeople were administered psychometric tests of cognitive and social intelligence as explicit measures of their intelligence and wisdom. Creativity was not included because of the lack of an adequate paper-and-pencil measure of this construct. Participants were also asked to rate themselves on how closely they resembled or expressed the characteristics rated in Study 1. In the analyses, the participants' self-ratings on the intelligence and wisdom items were first correlated with a prototype response pattern generated from laypersons' ratings in Study 1. That is, a hypothetical ideal individual response pattern was determined from the ratings in Study 1, and correlated with the self-ratings of participants in Study 3. The degree of this correlation was represented by a

score for that participant. These scores were then correlated with the psychometric measures derived from explicit theories. Results indicated that the prototype scores correlated with the psychometric measures they were supposed to, and did not correlate with those they should not have (i.e., intelligence with intelligence, but not with wisdom). This indicated that laypeople's implicit theories of intelligence and wisdom seem to correspond substantially with explicit theories of these constructs, supporting the external validity of lay theories.

In Study 4, laypersons were presented with simulated letters of recommendation for hypothetical adults, and asked to rate their intelligence, creativity, and wisdom. Letters of recommendation were generated in similar manner to that in the third experiment of Sternberg et al. (1981), and so varied in the degree to which they embodied these three constructs in the eyes of the participants of Study 1 in the Sternberg (1985) study. As would be expected from Study 1, the highest correlations between ratings of the three constructs were found between intelligence and wisdom, with lower correlations being found between these two constructs and creativity. Also, the predicted intelligence, wisdom, and creativity ratings (determined from the ratings obtained in Study 1) emerged as the strongest predictors of the actual ratings on each corresponding construct in a multiple regression analysis. This provided evidence for both the convergent and discriminant validity of lay theories of intelligence, creativity, and wisdom. Sternberg (1985) concluded from this series of studies that "people's conceptions of intelligence overlap with, but go beyond, the skills measured by conventional intelligence tests" (p. 624). In other words, the intelligence tests created by experts may be inadequate to capture intelligence as it is conceptualized in the "real world." Thus, interpersonal

judgments of intelligence (such as those that take place in daily classroom and career activities) will likely show significant differences from judgments resulting from formal intelligence testing.

It is unfortunate that the lay theories of very few psychological constructs have been investigated in such a systematic manner, especially given the great diversity of constructs about which laypersons surely hold organized but unarticulated theories. The methodology most often utilized by investigators of lay theories involves asking respondents their level of agreement or disagreement with fixed-response statements about the construct (Furnham, 1988). The work of Sternberg et al. (1981) and Sternberg (1985) is an indication that fixed-response methods may fail to capture a comprehensive picture of lay theories of a given construct.

Why Should We Seek to Understand Lay Theories of Health?

A failure to thoroughly investigate any particular lay theory of human functioning has implications for the biopsychosocial model of health and illness originally described by Engel (1977). Among other important assertions, the biopsychosocial model states that it is not only the knowledge of the physician, but also the beliefs of the patient, that have consequences for the patient's experience of health and illness. Research on individual beliefs regarding illness has been accumulating for some time, and it is becoming apparent that these beliefs have significant consequences for individual health behavior. For example, some research on lay beliefs about physical symptoms has indicated that people are unlikely to seek medical attention for symptoms they perceive as being psychologically caused (Bishop, 1987; Klonoff & Landrine, 1994); medical help-seeking has also been found to vary by the particular physical illness to which the

symptoms were thought to be related (e.g., symptoms of coronary heart disease and cancer were less likely to lead to help-seeking than those associated with urinary tract illnesses) (Bishop, 1987). The degree to which individuals perceive particular illnesses to be controllable or uncontrollable has been found to be related to internal and external health locus of control, which in turn has been related to engaging in preventive health behaviors (Lau & Hartman, 1983).

An even more striking example of the impact of implicit models of illness upon health behavior was illustrated in a study by Martin et al. (2004). In this study of men and women who had suffered myocardial infarction (MI; commonly known as heart attack), women were found to be less likely than men to have perceived their MI symptoms to cardiac causes, were less likely than men to have received input from others that their symptoms were heart-related, and were less likely than men to have received advice from others that medical attention was necessary. It was also found that women delayed seeking treatment for their MI symptoms longer than men did. The authors explained these findings in the context of lay theories about who the typical victim of MI tends to be, making clear the dire consequences that lay theories of certain illnesses can contribute to. Many more examples of the impact of illness beliefs on behavior exist (Taylor, 2003).

Though current studies assessing the theories of laypeople regarding illness may lead to important changes in how experts think about encouraging behavior change, these studies may be inadequate to achieving the goal of fully learning how these lay theories have an impact upon health. This is due to two main reasons. First, the methodologies utilized rarely attempt to distinguish whether the implicit theories under study should be

attributed to laypeople or to experts. Second, the lack of research on lay theories of what it means to be healthy (as opposed to what it means to be ill, or to have particular illnesses) represents an erroneous assumption that experiences of health and of illness have perfect reciprocal correspondence with one another in the minds of laypeople. If researchers hope to understand laypeople's theories about health, exclusively investigating lay theories of illness (regardless of the appropriateness of the method) will not suffice to answer the question.

Lay Theories of Illness: Methodological Problems, and Overemphasis on Illness as a Proxy for Overall Health

In 1948, the World Health Organization (WHO) defined health as "a complete state of physical, mental, and social well-being, and not merely the absence of disease or infirmity" (World Health Organization, 1948). In laying out this definition, the WHO made clear an expert theory regarding what comprises health, including how not being ill may be a necessary but not sufficient condition for a person being regarded as healthy; it also suggested an explicit model of the specific elements that should be seen as comprising health (Seeman, 1989). This definition was lauded in the psychological literature as a "radical definition…because [it] modifies the limited concept of health historically associated with Western medicine and suggests a broader agenda" (p. 1100). What one does not see in this particular definition, however, is the identification of the ultimate authority on one's health. That is, who decides whether one is healthy or unhealthy in body, mind, and social relationships? One can surmise that during the 1940's, particular educated individuals such as physicians, psychologists, public health policy makers, and other experts in related fields were likely viewed as the group of

people with the authority to declare people healthy or unhealthy. In that case, the explicit theories of health advanced by those experts would have been seen as important, and there would have been minimal interest in lay theories of health. The Health Belief Model, the Theory of Planned Behavior, and the construct of Health Locus of Control, reflect three explicit theories offered by researchers in more recent decades as a means of explaining various individual health behaviors in the face of illness-related information (Furnham, 1988; Taylor, 2003). What Engel (1977) essentially asserted, however, was that lay theories have significant consequences for the layperson's experience of health. It is our opinion that a number of researchers have taken to heart the message inherent in Engel's paper that investigating lay theories of health is a worthy endeavor; however, they have presumed to investigate lay theories of health by investigating lay theories of illness, and have done so using methodologies which (for reasons already described) may not be adequate to the task of fully investigating lay theories (Lawton, 2003). Still, a review of some of the extant research on lay theories of illness would be informative, as there can be little doubt that lay theories of illness would have implications for lay theories of health.

An early study of lay theories of illness was conducted by Antonovsky (1972) in an urban Israeli Jewish population. This study utilized the semantic differential technique to assess lay beliefs about four illnesses: cancer, heart disease, mental illness, and cholera. The semantic differential technique is a method of assessing a participant's level of agreement with a series of experimenter-created statements along continuous scales. Six scales were used in this study, assessing laypeople's beliefs about the seriousness, controllability, and salience of each of the four illnesses, as well as their

personal susceptibility to each. Results of interpreting mean ratings of agreement indicated that laypeople viewed the four illnesses differently on the four dimensions. For example, cancer was seen as the most serious and least controllable illness, heart disease was seen as the illness to which laypeople felt most susceptible, cholera was seen as the least serious and most preventable illness, and mental illness was seen as the least personally salient illness, as well as the one to which laypeople felt least susceptible. These ratings were highly similar among all age, sex, ethnic, and educational groups in this study. Antonovsky concluded that this study held important implications for the public health arena in Israel at the time, as it would have been reasonable to assume that these lay theories of the four illnesses studied would have had an impact upon individual health behavior.

Ben-Sira (1977) furthered the work begun by Antonovsky (1972) by utilizing the semantic differential technique to investigate lay theories of illness held by a representative sample of Israeli housewives. The four diseases investigated by Ben-Sira (1977) were heart diseases, obesity, respiratory diseases, and intestinal diseases. The participants were asked to rate each disease or class of diseases regarding its preventability, salience, the degree of susceptibility they felt to each, and the degree to which they felt they understood each. These particular diseases were selected for the study according to their perceived variability on the four dimensions in question. Findings lent support for the explicit theoretical prediction that as laypeople felt more susceptible to any of the four illnesses, the salience of the illness to them would show a corresponding increase, followed by efforts to increase personal understanding of the illness, and at last followed by increased knowledge regarding how to prevent the disease

from occurring. As in the Antonovsky (1972) study, demographic differences made little difference in the applicability of the model.

Not long after the Antonovsky (1972) and Ben-Sira (1977) studies were published, Leventhal, Meyer, and Nerenz (1980) outlined their research on lay theories of illness and treatment in hypertensive and malignant melanoma patients. This paper has been widely-cited since as representing the beginning of an important line of research on general lay theories of illness. Using interviews which were explicitly structured to gauge how laypeople defined and interpreted the threat of the two illnesses, and how they subsequently coped with these different diagnoses, Leventhal et al. developed a self-regulation model of illness. In this self-regulation model, Leventhal et al. theorized danger control as the organizing principle. That is, patients are motivated to reduce actual and perceived dangers from their illnesses, using particular cognitive and coping strategies. The researchers theorized that three different implicit theories of illness have significant impact upon the self-regulatory strategies of patients. In the first implicit theory, the *acute episode model of illness,* interviewed patients voiced beliefs that they could identify specific attributions for the onset of their illness (such as particular symptoms, life stress, and time and place), and that they expected treatment to be short-term and to be followed by cure. In the second implicit theory, called the *cyclic model,* interviewed patients reported a random or repetitive symptom pattern, often associated the onset of their illness with diet or drinking, and expected treatment to result in a temporary subsiding of symptoms followed by recurrence. In the third implicit theory, called the *chronic model,* interviewed patients reported the belief that age, heredity, or long-standing damage to organs were the cause for illness onset, and that treatment would

be continuing or long-term. These implicit theories appeared to the researchers to have been shaped by experience. Leventhal et al. also hypothesized that these implicit theories might have implications for the goal-setting behavior of patients, as well as for patients' evaluation of treatment and outcomes.

Other research on lay theories of illness has taken various directions. In one line of research, four basic components of how laypeople think about disease attributed to the work of Leventhal et al. (1980) were explored: the *identity* of the disease, the *consequences* of the illness, its *timeline*, and its *cause* (Lau & Hartman, 1983). Lau and Hartman then added *cure* to this list, and investigated "illness schemas" of college students about minor illnesses (such as colds and flu) through interviews which addressed the five components. Turk, Rudy, and Salovey (1986) utilized these same five components to develop the Implicit Models of Illness Questionnaire (IMIQ). After it was administered to diabetic educators with RN degrees, diabetic patients, and college students, factor analysis revealed a four-dimensional structure of beliefs about an illness: its *seriousness*, *controllability*, *changeability* of disease features over time, and degree of *personal responsibility* for cause or cure. These four new factors were replicated in a second sample of participants; however, subsequent studies using the IMIQ have confirmed neither the original five, nor the revised four factors (Schiaffino & Cea, 1995). Weinman, Petrie, Moss-Morris, and Horne (1996) created a second measure of illness beliefs utilizing the five factors of Lau and Hartman (1983), called the Illness Perception Questionnaire (IPQ) (Weinman et al., 1996). Despite only modest evidence for its reliability, the IPQ is currently used in some empirical studies as a measure of illness beliefs (Searle & Murphy, 2000).

Another line of research on lay theories of illness has focused on laypeople's perceptions of and beliefs about physical symptoms, and how laypeople organize information about symptoms into theories about illness. For example, Swartzman and Lees (1996) analyzed similarity ratings of "potential causes of physical discomfort," generated by a college student sample. Multidimensional scaling analyses indicated that students seemed to see the causes of illness as being *physical* or *nonphysical* (Dimension 1), *controllable* or *uncontrollable by health care professionals* (Dimension 2), and as being under *high* or *low personal control* (Dimension 3). In a similar group of studies, Bishop (1987) asked participants to sort 60 physical illness symptoms into piles representing symptoms which would co-occur in an illness. Multidimensional scaling procedures revealed four dimensions along which laypeople were thought to conceptualize these symptoms. These were the extent to which the symptom was *contagious or virally caused,* the degree to which the symptom was *caused by psychological factors*, the *location of the symptom in the body* (as being in the upper vs. lower body), and the *disruptiveness of the symptom to daily activities*. These dimensions were found to be significantly related to three types of symptom-related behavior: reduction of physical activity, engaging in general self-care, and seeking professional care.

In a review of several such studies, Bishop (1991) described research which supported what he called a *prototype model of disease representations*. In this model, "people's schemata of diseases can be thought of as idealized representations of the symptoms and other attributes associated with different diseases…the disease categories involved are not rigidly defined, but rather, 'fuzzy'" (p. 35). Thus, these prototypes are

analogous to lay theories. Bishop argued that these prototypes exist in memory, and when activated under appropriate circumstances, are used by individuals as the basis for interpreting their experiences of their symptoms. Empirical studies described by Bishop showed that these prototypes appear to be evidenced by predictable variations in laypeople's ability to quickly and accurately recall prototype-consistent vs. inconsistent symptoms. These prototypes also appear to include attributions relating to the five components of illness beliefs described by Leventhal et al. (1980) and Lau & Hartman (1983); namely, identity, consequences, timeline, cause, and cure (Bishop, 1991).

What Extant Work on Lay Theories of Illness Cannot Tell Us

Obviously, the studies reviewed above are valuable for the information that they do provide regarding lay theories of illness and infirmity; a great amount of other similar research has been performed in psychology and other disciplines (Hughner & Kleine, 2004; Lawton, 2003). However, we will restate that our concern about this research is twofold. First, the degree to which such studies are capturing lay theories is questionable. As Furnham (1988) and others have elucidated, effort must be made on the part of researchers of lay theories to limit the degree to which the researchers' own implicit theories intrude upon their investigation of the theories of laypersons. None of the studies of lay theories of illness reviewed above seemed to address this concern, even when statistical techniques were used which were intended to elucidate the implicit theories of laypeople. For example, while Swartzman and Lees (1996) and Bishop (1987) both used multidimensional scaling as a purported method of deriving lay theories, the items rated for scaling analyses were, to a significant extent, provided by the researchers. Therefore, it is possible that some implicit theory of the researchers

regarding how laypeople think about symptoms had an unacknowledged impact upon the process wherein items were included in these studies. Second, studying lay theories of illness cannot be viewed as a suitable substitute for the study of lay theories of what it is to be healthy (Hughner & Kleine, 2004; Lawton, 2003), something of critical importance to both treatment professionals and policymakers. This is because it is possible that such implicit theories of health exist in laypeople's minds, but differ from their implicit theories of illness in meaningful ways. This means that laypeople may use their theories of health in the same manner that they use lay theories relating to illness, but under different circumstances from those under which they might use their lay theories of illness.

Williams (1983) summarized the importance of research on concepts of health thus: as "the starting point…for studying the genesis of social ideas on the one hand, and the conceptual basis of preventive and remedial practice on the other" (p. 186). Moreover, lay theories of health and of illness may influence laypeople's cognitive, affective, and behavioral processes at different times. Regarding cognition, how new health and illness-related information (presented individually or through mass media) is perceived and assimilated, and how it is recalled later, might be primarily affected by lay theories of health under certain conditions, and primarily affected by lay theories of illness under other conditions. Also, individual perception of the need for seeking health-related information from experts, or for obtaining medical or psychological treatment, might be filtered through lay theories of health or illness at different times (Fitzpatrick, 1984, cited in Furnham, 1994b).

Lay theories of health or illness might have an impact upon individual affective experiences associated with perceived health and illness states, with individuals experiencing hope, contentment, anxiety, sadness, or a host of other emotions in situations which activate particular lay theories. Affective states viewed over time, of course, constitute moods; when extremes of mood are experienced for a sufficient length of time, psychological or psychiatric diagnoses may be made, and treatment may be initiated. Therefore, lay theories of health or illness may have implications for the mental health system, as the accurate or inaccurate perception of oneself as unhealthy may lead to mood-related disruptions in functioning, and then to either seeking mental health treatment, or to intervention from outside the individual.

Other individual health behaviors of interest to researchers, treatment professionals, and policymakers (possibly including diet and exercise habits, smoking, alcohol and drug use, and compliance with medical instructions or medication regimes) might vary according to lay theories of health or illness under different conditions (Ronis, 1992; Williams, 1983). With current trends showing individual health behavior to be one of the most important factors in worldwide mortality and morbidity from disease, as well as the costs associated with treating health problems (Taylor, 2003), attempts at assessing lay theories of health must be as great a priority as assessing lay theories of illness. Completing the picture of the impact that lay theories may have upon health and illness is the possibility that evaluation of the quality of information obtained from experts, and of the effectiveness of any treatment sought, may also be influenced by lay theories of health (Williams, 1983). The question of what leads individuals to seek expert information on health is a very interesting one, as it speaks to the perceived differences

between expert and lay theories. That is, it may be that the layperson who seeks expert information is acting out of a belief that expert theories have something to offer above and beyond what the layperson himself or herself has access to. This has at least two intriguing implications: one, that laypeople whose implicit beliefs about health or illness include a statement akin to "The experts don't know any more than I do about this" may not be likely to seek expert information or assistance. Two, as all experts were at one time laypeople, the information that experts seek from and provide to laypeople might be shaped by their own lay theories to a greater or lesser degree.

This brings us to an important point regarding our methodological approach. We must acknowledge our own bias as we set out to investigate our research question regarding lay theories of health. We tend to view health as a multidimensional construct, which differs from the absence of illness. This belief may have been shaped by our personal experiences, the values of those who have educated us, recent emphasis in the American media on "holistic health," or other unnamed factors. Our bias would certainly be apparent were we to investigate lay theories of health through the conventional method of generating our own items for a measure of the construct; however, this would present the same problem for our research that other studies of lay theories have contended with. Therefore, our methodological approach to the question will be different from what is conventional. Fundamentally, our very research question itself is likely influenced by our own implicit theories, and in the end there is no way to fully throw off our own assumptions. However, we will seek in our research to not only acknowledge, but also to limit how our biases impact our process.

Existing Work on Lay Theories of What Comprises Health, and Their Problems

In addition to these compelling reasons to investigate lay theories of health, recent calls from researchers associated with the Positive Psychology movement (i.e., Seligman & Czikszentmihalyi, 2000) urging psychologists to explore how it is that people not only suffer, but also how they thrive, makes an examination of lay theories of health very desirable. However, very few studies investigating lay theories of health currently exist. One line of research has investigated what laypeople believe are the causes of health. These studies identified factors such as emotional well-being, lifestyle, societal factors, and environment as having an impact upon individual states of health (Furnham, 1994a, 1994b; Furnham, Akande, & Baguma, 1999). As these studies utilized a researcher-created questionnaire to assess lay theories, however, we must remain aware that the implicit theories of the researchers may have impacted the findings in ways that cannot be determined.

Those studies that have attempted to limit how the implicit theories of the researchers might guide the data have taken a sociological (e.g., d'Houtaud & Field, 1984; Williams, 1983) or anthropological-type approach, where the narratives of specific groups of individuals regarding conceptualizations of health have been examined. In fact, scholarly work in these disciplines on lay theories of health has a long-established history, with a large number of studies examining ideas about health in specific populations using qualitative methods (Robertson, 2006). One example of this research was described by Calnan (1987) and Calnan and Johnson (1985). In an exploratory study, a small sample of women from two social classes of the United Kingdom was interviewed about conceptualizations of health. Thirty married women whose husbands had professional positions, and thirty married women whose husbands had working class

positions, were asked whether they saw themselves as healthy and why, what health is, and what is not being healthy. All of the women in this study aged 21 to 55 years (racial and ethnic demographics were not described). These samples of women indicated that they viewed health in both "positive" (indicating the presence of some characteristic or phenomenon) and "negative" terms (indicating the absence of some characteristic or phenomenon). Together, they voiced nine positive definitions for health: being energetic/active/getting plenty of exercise, feeling fit, feeling well/all right, eating the right things, being at the correct weight, having a positive outlook, having a good life/marriage, being able to work with anyone, and a few miscellaneous or unclassifiable definitions. They also voiced thirteen negative definitions for health: never being ill or having anything wrong, not getting many illnesses, not getting serious illnesses, not getting coughs and colds, only getting coughs and colds (as opposed to more serious illnesses), having clean health check-ups, rarely or never taking time off work, only being confined to bed due to illness once, rarely going to the doctor or hospital, recovering quickly from minor illnesses, not thinking or worrying about illness, having no recurrent illnesses, and a few miscellaneous or unclassifiable definitions. The professional women voiced more responses overall than the working class women, but the proportion of fewer positive to more negative definitions was similar among both social class groups (between 1:2, and 1:3 positive to negative).

Responses to the question of what healthiness and unhealthiness were yielded similar results in this sample. Ten responses were given to the question of what health is: getting through the day, never being ill, feeling strong, feeling fit, being active, being energetic, getting plenty of exercise, having a certain state or attitude of mind, being able

to cope with life's crises/stresses, and not being overweight. Fourteen responses were given to the question of what unhealthiness is: being below normal continually, having a poor lifestyle, having a lack of energy, being ill or having something wrong, having a serious illness, having a chronic illness, having an incurable illness, being in bed or in the hospital, going to the doctor, being depressed or unhappy, not coping with life, losing weight, being dependent on others, and being unable to work. Again, the professional women voiced more responses to these questions than the working class women, but the two groups were alike in voicing more responses to the question of what unhealthiness is, versus what healthiness is.

While generalizing from this study is impeded by a number of limitations (regarding methodology, sampling, data analysis, etc.), it does give rise to an interesting question. Specifically, the two social class groups in this study showed a tendency to voice more responses to questions about being unhealthy than they did to questions about being healthy. However, the actual responses to questions about unhealthiness seemed more similar to one another than the responses to questions about healthiness. Many of the responses to questions about unhealthiness clearly referred to illnesses of different intensities, ranging from having low energy, to having to stay in bed, to having a serious, chronic, or incurable illness. In contrast, responses to questions about healthiness seemed to range over a wider group of subjects, and might not be so easily collapsed into fewer categories (though the number of occurrences of each type of response was too small in this study to examine this question empirically). The possible wider range of response categories regarding health in this study may indicate that lay theories of health are more topically elaborate than lay theories of illness. If this is the case, it implies that current

discussions of the dimensions comprising lay theories of illness (i.e., identity, cause, etc.) may not be at all applicable to lay theories of health. One important possibility raised by the Calnan (1987) study is that lay theories of health may have social and emotional components as well as physical ones.

A fairly recent study involving lay theories of health by Arcury, Quandt, and Bell (2001) investigated health maintenance behaviors in older adults in rural North Carolina. A racially, educationally, and economically diverse sample of seventy men and women aged 60 and above were interviewed regarding their ideas about what personal practices were important for individuals of their age to engage in to maintain their health. During the interview, participants were asked not only to list important health behaviors, but also to elaborate on the meanings of their responses. For example, participants who listed "eating a healthy diet" as an important behavior were questioned on what a healthy diet meant to them. The researchers compiled a coding dictionary upon reading the transcripts, which contained a list of topics which the researchers felt were present in the interviews, and which aligned with the researchers' conceptual models. The interviews were then coded by topic, and the topics were classified into domains which the researchers felt best represented the many topics they identified. Seven domains were identified as most common in the interviews: *eating right*, *drinking water*, *'taking' exercise*, *staying busy*, *being with people*, *trusting in God and participating in church*, and *taking care of yourself*. There was some variability in the importance of each health behavior to different subgroups in the sample; for example, drinking water was seen as highly salient only to African-American women, while it was seen as having limited salience to European-American and Native American men and women, and African-

American men. The meanings of each domain were seen by these researchers to contain some overlap, which they described as reflecting four major themes. These themes were the *importance of balance and moderation*, a *holistic view of health*, the *importance of social integration*, and the nature of health as involving *personal responsibility*.

The Arcury, Quandt, and Bell (2001) study lends further evidence that lay theories of health may contain dimensions which align with the biopsychosocial model. The value of this study lies in the richness of its findings, in that these researchers described themselves as hoping to contribute to the establishment of an "anthropology of health" (p. 1542). While this study does not provide reliable tools to the psychological community which would allow further study of lay theories of health, it does provide a potentially useful avenue of dialogue between medical anthropology and health psychology which may be lacking at the present time.

Other research on lay theories of health have focused on how children and adolescents define health, and then generalized the findings to other populations. For example, Millstein and Irwin (1987) interviewed 218 adolescents, aged 11 to 18 years, about what it means to be healthy, and to be sick. The sample was obtained from an inner city public school district, was comprised of equal numbers of boys and girls, and was racially diverse (46% White, 23% Asian, 18% Black, 7% Hispanic, and 6% Other). Responses were reliably coded by two independent researchers into seven categories, representing somatic feeling states, symptomatic and diagnostic indicators of health/illness, general and role-specific functional capacity, affective states, preventive-maintenance behaviors, evaluation that one is healthy by another person, and restriction or qualification of certain illness states as not indicating poor health. In this study, as in

the Calnan (1987) study, participants were more verbal describing illness than health. There were significant differences across the sample in the themes used to describe health and illness, with profiles of health showing greater emphasis on general functional status, preventive-maintenance behaviors, and restriction/qualification of the health concept (i.e., "If I only have a cough, I'm not really sick"). In contrast, profiles of illness showed greater emphasis on somatic feeling states, indicators of illness, role functioning, and dependence on the evaluation of others. Health definitions varied with age, with older adolescents showing less emphasis on the absence of illness than younger adolescents did. Overall, the researchers concluded that health and illness should not be viewed as constructs on opposite ends of a single continuum, but rather as two distinct but overlapping constructs (Millstein & Irwin, 1987).

Some research on health self-appraisal (also called self-rated health) has drawn upon the findings of the Millstein and Irwin (1987) study and other similar research. Andersen and Lobel (1995) investigated predictors of health self-appraisal among a sample of college students. Health self-appraisal is a self-assessment of one's own level of health, measured in this study by a six-item questionnaire which did not explicitly define what was meant by health (i.e., "In general, I consider myself a healthy person"). Participants rated their agreement with these items on a five-point scale. Selection of other study measures, including measures of symptoms, diseases, neuroticism, and mood, was guided by previous research into lay conceptualizations of health (such as the Millsten & Irwin (1987) study). Vitality and illness vulnerability were found to be strongly associated with self-appraised health in this sample, who generally appraised their own health as "good." Symptoms, diseases, and neuroticism were all moderately

correlated with self-appraised health, and positive and negative mood were found to be weakly but significantly correlated with self-appraised health. Regression modeling indicated that a biopsychosocial model of self-appraised health (including diseases, positive mood, negative mood, illness vulnerability, and vitality) was found to account for 45% of the variance in self-appraised health, the largest proportion of the several models tested (Andersen & Lobel, 1995).

Clearly, while these studies reflect some effort to assess lay theories through open-ended questioning, their major problem regards the generalizability of their findings to other populations. It is to their credit that the researchers here described attempted to limit the influence of their own implicit and explicit theories on the resulting data. However, Calnan and Johnson (1985) exclusively investigated adult women of unstated ethnicity from two specific social classes, while Millstein and Irwin (1987) only investigated urban adolescents. These are two rather specialized samples, meaning that research utilizing their findings have questionable applicability to other populations (i.e., the college students in the Andersen and Lobel (1995) study). Given considerable evidence that implicit and lay theories of many constructs vary with race/ethnicity, age, gender, and culture (Furnham, 1994a, 1994b; Li, Harrison, & Solomon, 2004; Klonoff & Landrine, 1994; Landrine & Klonoff, 1992; Martin et al., 2004; McKown, 2004; Tata, 2000), it would be unwise to assume that these studies of lay theories of health have sufficiently explored the concept to apply to other populations. In a large-scale review of such research, Hughner & Kleine (2004) confirmed the opinion that the generalizability of findings in the area of lay theories of health is a critical issue, particularly when issues

of race, gender, class, socioeconomic status, and geographical location (and thereby the availability of health resources) are taken into account.

Efforts to investigate certain aspects of lay theories of health, in ways that allow for greater generalizability, have been attempted. For example, d'Houtaud and Field (1984) surveyed and categorized the responses of over 4,000 French adults regarding their ideas about health; clearly, however, ideas change over time, and large shifts in health care service have occurred over the past 30 years which could have greatly changed lay theories of health. In a much more recent study of self-rated general health status in a nationally representative population, Bailis, Segall, and Chipperfield (2003) used longitudinal data from the National Population Health Survey in Canada to investigate whether self-rated health was better predicted by one's spontaneous assessment of his or her health at a particular time, or by one's enduring self-concept as a healthy or unhealthy person. These researchers found that change over time in self-rated health status was significantly predicted by change in self-reported physical health, mental health, perceived social support, daily energy expenditure, and body mass index. This was seen as evidence that these factors play important roles in lay conceptualizations of health. The strongest predictor of Time 2 self-rated health was Time 1 self-rated health, lending support to the notion that individuals may hold enduring self-concepts as healthy or unhealthy people. This study does contribute to our knowledge of what comprises health in the minds of laypeople; however, these researchers stated in their article that their research was "constrained by the lack of a comprehensive measure of respondents' self-concept of health…which would allow an empirical comparison of the two views in terms of goodness-of-fit criteria" (p. 204-205).

Also, neither the d'Houtaud and Field (1984) nor Bailis, Segall, and Chipperfield (2003) studies examined samples in the United States, where there is certainly an equally great need to explore lay theories of health.

The Present Research

The present series of studies sought to investigate a number of unanswered questions in the existing literature on lay theories of health. Much of the present work followed the experimental procedures of Sternberg (1985) and Sternberg et al. (1981), as these researchers have used data collection and analysis techniques which have been largely data-driven (as opposed to explicit theory-driven). Accordingly, we investigated how adult laypeople define what it is to be healthy through open-ended survey questions, and determined the structure of lay theories of health through scaling procedures. This was strongly in line with Hughner & Kleine's (2004) recommendation, published in a review of the sociological literature on lay theories of health, that "future research [on lay theories of health] will need to fuse qualitative methods providing rich insight with quantitative methods with large sample and predictive capabilities" (p. 418). After determining the structure of lay theories (e.g., in terms of dimensions or components), we created a fairly comprehensive measure of lay theories of health, along the lines of what some researchers have deemed desirable (e.g., Bailis, Segall, and Chipperfield, 2003). In fact, Hughner and Kleine (2004) supported the utilization of such a measure, stating that "Survey instruments…may prove useful to assess incidence of various lay health views in a population [*sic*]…While sociological interviews will continue to inform in-depth understanding of lay beliefs, a wider variety of interpretive methods should be used for balanced investigation" (p. 416). We also conducted a series of validation studies which

worked to determine whether and how these dimensions or components of lay theories differ from those of experts, did or did not correspond with existing constructs measuring well-being, and were utilized by laypeople in assessing their own health, assessing the health of others, and engaging in health-related behavior.

Method

As stated above, the present series of studies generally followed the approach taken by Sternberg et al. (1981) and Sternberg (1985). Accordingly, each study involved slightly different methods of obtaining participants and gathering data. One commonality across the present series of studies was the particular age range targeted for study. While we believe in the importance of investigating implicit theories of health across the entire lifespan, limitations of time and resources restricted us at the present time to focusing on male and female adults, ages 18-50. We selected age 18 as the lower age limit because of research indicating that lay theories of health in adolescents become progressively more complex with age (Millstein & Irwin, 1987), possibly reflecting more adult-like cognitive maturity. We selected age 50 as the upper age target because of research indicating that use of health services increases in later adulthood, largely due to increased prevalence of chronic illness (Wolinsky, Mosely, & Cue, 1986). However, during the Prestudy (described below) we relaxed the upper age restriction to some degree, reasoning that our community-sampling approach would make strict adherence to an upper age limit of 50 difficult (e.g., when the researcher was choosing who to approach and solicit for participation at each of the community sites, visual determination of age was not possible, but many individuals who were interested in participating turned out to be older than 50). In addition, we chose to rely on empiricism as our ultimate test of item

reliability. That is, we believed that if specific items generated by individuals over age 50 were not seen as relevant by individuals aged 18-50 in Studies 1 and 2 (subsequent to the Prestudy), those items would disappear from the item pool due to the lack of empirical support. Therefore, if items produced by individuals older than 50 remained in the pool after Study 1, they were viewed as valid additions to the item pool for this project.

Chapter II

Prestudy

The purpose of the Prestudy was to generate an initial item pool for analysis in later stages of the project. Open-ended questioning of laypeople regarding the phrases they would use to describe a healthy person was the primary methodology of this study.

Participants

Participants for the Prestudy were solicited from five different groups of adult laypeople. These five samples were chosen due to our belief that each sample would be slightly different from one another in terms of racial/ethnic background, geographic location, educational level, and severity and intensity of past and present health concerns. These descriptive data are summarized in **Table 1**, and elaborated below.

Two-hundred twenty-three individuals comprised the full sample, pooled over the five sites. Regarding the percentages of participants who came from each site, 15.5% participated over the Internet, 24.5% were surveyed at the hospital, 16.8% were surveyed at the community medical clinic, 21.4% were surveyed at the mental health clinic, and 21.8% were surveyed in the university setting. Of the 223 participants, 221 individuals chose to indicate their gender (36.2% males, 63.8% females), marital status (44.1% single, 44.1% married, 8.6% divorced, 1.8% in a domestic partnership, .5% separated, .9% widowed), educational level (.9% grade school, 15.3% high school, 37.8% some college, 24.3% college degree, 20.3% graduate degree, 1.4% technical school) and immigrant status (90.0% non-immigrant, 10.0% immigrant; mean years in U.S. of

immigrants = 16.2 years). Two-hundred eighteen individuals chose to indicate their age (X = 35.54 years, SD = 14.61 years, range = 18-78). Two-hundred seventeen individuals chose to indicate their race (81.1% White, 6.0% Black/African-American, 6.0% Asian/Asian-American/Pacific Islander, 1.8% Latino, 1.4% Native American/Inuit. 1.8% Multiracial, 1.8% Other) and the urban vs. rural characteristics of their lifetime residences (21.2% mostly urban, large cities, 43.3% mostly suburban, 21.2% mostly urban, small cities, 14.3% mostly rural, small towns). Two-hundred fourteen individuals chose to indicate their religious identification (20.6% Protestant, 6.5% Jewish, 2.3% Buddhist, 18.7% Roman Catholic, 4.7% Muslim, 3.3% Hindu, 8.4% Agnostic/Atheist, 28.5% Other, 7.0% None). Two-hundred four individuals chose to indicate their yearly household income (23.0% less than $25,000, 14.7% $25,000 to $50,000, 19.1% $50,000 to $75,000, 17.6% $75,000 to $100,000, 25.5% above $100,000). Each group will be described separately below.

The first group was a sample of male and female community adults obtained through Internet solicitation for research participation (referred to hereafter as the "Internet group"). Fifty-eight individuals logged on to the website to take the survey. Seventeen of these individuals either logged off before responding, or proceeded through the survey without answering any questions. This left 41 surveys with at least one valid response to the main research question. Of the 41 surveys, 34 individuals chose to indicate their age (X = 38.18 years, SD = 9.66 years, range = 18-58), gender (20.6% males, 79.4% females), immigrant status (97.1% non-immigrant, 2.9% immigrant; mean years in U.S. of immigrants = 22.0 years), marital status (29.4% single, 58.8% married, 8.8% divorced, 2.9% in a domestic partnership), educational level (5.9% some college,

20.6% college degree, 73.5% graduate degree), religious identification (23.5% Protestant, 20.6% Jewish, 5.9% Muslim, 17.6% Hindu, 5.9% Roman Catholic, 17.6% Other, 8.8% None) and indicated the urban vs. rural characteristics of their lifetime residences (23.5% mostly urban, large cities, 41.2% mostly suburban, 26.5% mostly urban, small cities, 8.8% mostly rural, small towns). Thirty-three individuals chose to indicate their race (87.9% White, 6.1% Asian/Asian-American/Pacific Islander, 3.0% Native American/Inuit, 3.0% Multiracial) and their yearly household income (9.1% less than $25,000, 21.2% $25,000 to $50,000, 24.2% $50,000 to $75,000, 18.2% $75,000 to $100,000, 27.3% above $100,000).

The second group was a sample of male and female community adults obtained from the waiting areas of a large teaching hospital in Ann Arbor, Michigan (the "Hospital group"). Seventy individuals agreed to take the survey. Three surveys were returned with no responses, so those surveys were eliminated from the pool. This left 67 surveys with at least one valid response to the main research question. Of the 67 surveys, 52 individuals chose to indicate their age (X = 43.06 years, SD = 14.4 years, range = 18-77). Fifty-four individuals chose to indicate their gender (42.6% males, and 57.4% females), race (81.5% White, 14.8% Black/African-American, and 1.9% Asian/Asian-American/Pacific Islander, 1.9% Multiracial), immigrant status (98.1% non-immigrant, 1.9% immigrant; mean years in U.S. of immigrants = 40 years), marital status (27.8% single, 64.8% married, 5.6% divorced, 1.9% widowed), and the urban vs. rural characteristics of their lifetime residences (25.9% mostly urban, large cities, 40.7% mostly suburban, 14.8% mostly urban, small cities, 18.5% mostly rural, small towns). Fifty-six individuals indicated their educational level (3.6% grade school, 12.5% high

school, 33.9% some college, 35.7% college degree, 12.5% graduate degree, 1.8% technical school). Fifty-three individuals indicated their religious identification (28.3% Protestant, 1.9% Jewish, 1.9% Buddhist, 1.9% Muslim, 15.1% Roman Catholic, 11.3% Agnostic/Atheist, 32.1% Other, 7.5% None). Fifty-two individuals indicated their yearly household income (19.2% less than $25,000, 7.7% $25,000 to $50,000, 32.7% $50,000 to $75,000, 23.1% $75,000 to $100,000, 17.3% above $100,000).

The third group was a sample of male and female community adults obtained from the waiting areas of a no-fee, no-insurance community medical clinic (the "Community Medical group"). Forty-three individuals agreed to take the survey. One survey was returned with no responses, so that survey was eliminated from the pool. This left 42 surveys with at least one valid response to the main research question. Of the 42 surveys, 37 individuals chose to indicate their age (X = 37.19 years, SD = 14.20 years, range = 19-78), gender (42.1% males, and 57.9% females), and race (73.0% White, 5.4% Black/African-American, and 8.1% Asian/Asian-American/Pacific Islander, 2.7% Latino, 5.4% Multiracial, and 5.4% Other). Thirty-nine individuals indicated their immigrant status (79.5% non-immigrant, 20.5% immigrant; mean years in U.S. of immigrants = 14.9 years), marital status (35.9% single, 43.6% married, 15.4% divorced, 2.6% widowed, and 2.6% in a domestic partnership), and educational level (20.5% high school, 30.8% some college, 35.9% college degree, 7.7% graduate degree, 5.1% technical school). Thirty-six individuals indicated the urban vs. rural characteristics of their lifetime residences (25.0% mostly urban, large cities, 36.1% mostly suburban, 25.0% mostly urban, small cities, 13.9% mostly rural, small towns), as well as their religious identification (19.4% Protestant, 2.8% Buddhist, 13.9% Muslim, 2.8% Hindu, 2.8%

Agnostic/Atheist, 11.1% Roman Catholic, 44.4% Other, and 2.8% None). Thirty-five individuals indicated their yearly household income (60.0% less than $25,000, 28.6% $25,000 to $50,000, 2.9% $50,000 to $75,000, 2.9% $75,000 to $100,000, 5.7% above $100,000).

The fourth group was a sample of male and female community adults obtained from a fee-based community mental health clinic (the "Mental Health group"). Sixty-two individuals agreed to take the survey. Three surveys were returned with no responses, and one survey was completed by a minor, so those surveys were eliminated from the pool. This left 58 surveys with at least one valid response to the main research question. Of the 58 surveys, 47 individuals chose to indicate their age (X = 41.00 years, SD = 12.50 years, range = 18-65), gender (23.4% males, and 76.6% females), race (95.7% White, 2.1% Hispanic, and 2.1% Other), immigrant status (93.6% non-immigrant, 6.4% immigrant; mean years in U.S. of immigrants = 45.5 years), marital status (25.5% single, 55.3% married, 14.9% divorced, 2.1% widowed, and 2.1% in a domestic partnership), and educational level (6.4% high school, 42.6% some college, 27.7% college degree, 21.3% graduate degree, 2.1% technical school). Forty-six individuals indicated the urban vs. rural characteristics of their lifetime residences (17.4% mostly urban, large cities, 52.2% mostly suburban, 15.2% mostly urban, small cities, 15.2% mostly rural, small towns), as well as their religious identification (8.7% Protestant, 6.5% Jewish, 2.2% Buddhist, 8.7% Agnostic/Atheist, 30.4% Roman Catholic, 30.4% Other, and 13.0% None). Forty-one individuals indicated their yearly household income (24.4% less than $25,000, 12.2% $25,000 to $50,000, 22.0% $50,000 to $75,000, 24.4% $75,000 to $100,000, 17.1% above $100,000).

The fifth group was a sample of college-aged males and females obtained from the University of Michigan at Ann Arbor (the "College group"). Fifty-one individuals agreed to take the survey. Of the 51 surveys, 48 individuals chose to indicate their age (X = 18.9 years, SD = 1.57 years, range = 18-28), gender (47.9% males, and 52.1% females), race (68.1% White, 6.4% Black/African-American, 14.9% Asian/Asian-American 4.3% Hispanic, 2.1% Native American/Inuit, 2.1% Multiracial, 2.1% Other), marital status (97.9% single, 2.1% in a domestic partnership), educational level (35.4% high school, 64.6% some college) and the urban vs. rural characteristics of their lifetime residences (14.6% mostly urban, large cities, 45.8% mostly suburban, 27.1% mostly urban, small cities, 12.5% mostly rural, small towns). Forty-seven individuals indicated their immigrant status (80.9% non-immigrant, 19.1% immigrant; mean years in U.S. of immigrants = 45.5 years) and their religious identification (21.3% Protestant, 8.5% Jewish, 4.3% Buddhist, 14.9% Agnostic/Atheist, 25.5% Roman Catholic, 17.0% Other, and 2.1% None). Forty-three individuals indicated their yearly household income (7.0% less than $25,000, 9.3% $25,000 to $50,000, 9.3% $50,000 to $75,000, 16.3% $75,000 to $100,000, 58.1% above $100,000).

Materials

The Prestudy survey can be reviewed in Appendix A. It consisted of five open-ended questions, asking participants to list 10 characteristics of a very healthy person, an unhealthy person, a very physically healthy person, a very mentally healthy person, and a person with very healthy social relationships. The questions regarding "a very healthy person" and "an unhealthy person" were thought to be the most open to interpretation, and therefore the most likely to elicit spontaneous lay theories of health. The other three

questions were included to allow for comparisons between implicit theories of health, physical health, mental health, and social health, and because previous interview research of lay theories of health has indicated that health may include physical, mental, and social factors in the minds of laypeople (Calnan, 1985). These questions were presented in counterbalanced order to prevent order effects in responses. Laypeople were also given the chance to elaborate in paragraph form on their ideas about what comprises health. Also included in the Prestudy survey were a number of demographic questions, as well as questions regarding perceived health problems, frequency of health-related professional visits, and questions regarding health habits (such as smoking and exercise; modeled after Hooker & Kaus, 1994). Perceived health problems, health-related professional visits, and health habits were viewed as continuous variables in the Prestudy analyses, though frequencies of response to selected questions are also presented.

Procedure

With the exception of the online and college samples, participants were approached in person by the primary investigator or her research assistants, and asked about their willingness to volunteer for a 15-minute study of "the personal opinions on various health issues." The researchers did not approach individuals who appeared at the time to be in acute physical or psychological distress for their participation, or who appeared to be obviously above the upper age target of 50 years. Upon giving written informed consent to participate, each participant was provided with the Prestudy survey. In cases where the experimenter perceived that literacy or language issues appeared to be interfering with the participant's ability to complete the survey, the experimenter attempted to read the questions aloud to the participant, and record responses verbatim

(this occurred one time throughout data collection, at the Community Medical site). In cases where multiple members of a single family wished to participate, only one family member was permitted to complete the survey to ensure greater independence of response.

In the case of the online sample, participants were invited by the experimenter through electronic mail to participate in the study through an Internet survey service, PsychData (www.psychdata.com). The email invitation provided basic information about the study, and invited participants to log in to a secure server where the questionnaire and respondent answers were housed. These invitation emails were sent to various workplaces in the educational, industrial, and business fields, to universities and colleges, and to listservs (for example, invitations were publicized through a listserv for people interested in positive psychology). Informed consent was not obtained from these participants, as actual name identifiers and signatures were not collected from these participants. This procedure was approved by the University of Michigan Institutional Review Board for Behavioral Sciences research. In the case of the college sample, participants were solicited by the primary investigator from a group of students who had signed up to participate in another of the PI's research studies. The participation or nonparticipation of these students in the present research bore no bearing on their receiving credit for their involvement in this other study. These participants all provided written informed consent for participation, and completed the survey in groups of about 10 students. No incentives or compensation were provided to any of the study participants.

All study participants were debriefed after their participation was completed. The debriefing consisted of a brief explanation of the study's aim, "to learn about everyday people's ideas about what it means to be healthy, and how those ideas affect their thoughts and behaviors about their own health." Participants were also provided the primary investigator's contact information, as well as the University of Michigan Institutional Review Board's contact information, for any further questions they might have had. A survey was considered valid for the purposes of the Prestudy if at least one valid (legible and comprehensible) response was provided to any of the open-ended questions.

Results

The purpose of the Prestudy was to generate a master list of items to be tested further in Study 1. However, I will first present descriptive data on the self-reported health experiences **(Table 2)** and behaviors **(Table 3)** of Prestudy participants. This includes some examination of how the five groups differed on the measured health outcomes. I will then present results of regression analyses examining the influence of membership in various demographic groups on self-reported health behaviors and outcomes in this sample (**Table 4**). These findings are also presented below. I will then describe the process undertaken in finalizing the master list of items for further testing. I will then report some correlational analyses involving the frequencies with which these particular items appeared in the Prestudy responses in answer to the five open-ended survey questions (**Table 5**).

In the overall sample, 218 individuals indicated their views of how often they experienced minor health problems compared to other people their age (24.8% much less

than others their age, 23.9% somewhat less than others their age, 28.9% about the same as others their age, 17.9% somewhat more than others their age, 4.6% much more than others their age). Two hundred sixteen individuals indicated how often they experienced major health problems compared to other people their age (42.6% much less than others their age, 19.4% somewhat less than others their age, 15.7% about the same as others their age, 16.2% somewhat more than others their age, 6.0% much more than others their age). Two hundred seventeen individuals indicated how frequently they visited any professional for health-related issues (24.4% less than once per year, 28.6% 1-2 times per year, 25.3% 3-6 times per year, 9.7% 6-12 times per year, 12.0% more than 12 times per year).

Thirty-four individuals in the Internet group indicated their views of how often they experienced minor health problems compared to other people their age (20.6% much less than others their age, 38.2% somewhat less than others their age, 20.6% about the same as others their age, 20.6% somewhat more than others their age), as well as how often they experienced major health problems compared to other people their age (35.3% much less than others their age, 35.3% somewhat less than others their age, 8.8% about the same as others their age, 14.7% somewhat more than others their age, 5.9% much more than others their age), and how frequently they visited any professional for health-related issues (17.6% less than once per year, 44.1% 1-2 times per year, 29.4% 3-6 times per year, 8.8% 6-12 times per year).

Fifty-five individuals in the Hospital group indicated their views of how often they experienced minor health problems compared to other people their age (29.1% much less than others their age, 23.6% somewhat less than others their age, 29.1% about the

same as others their age, 12.7% somewhat more than others their age, 5.5% much more than others their age). Fifty-three individuals indicated their views of how often they experienced major health problems compared to other people their age (45.3% much less than others their age, 18.9% somewhat less than others their age, 13.2% about the same as others their age, 18.9% somewhat more than others their age, 3.8% much more than others their age), and how frequently they visited any professional for health-related issues (34.0% less than once per year, 20.8% 1-2 times per year, 26.4% 3-6 times per year, 11.3% 6-12 times per year, 7.5% more than 12 times per year).

Thirty-eight individuals in the Community Medical group indicated their views of how often they experienced minor health problems compared to other people their age (34.0% much less than others their age, 13.2% somewhat less than others their age, 18.4% about the same as others their age, 28.9% somewhat more than others their age, 15.3% much more than others their age), as well as how often they experienced major health problems compared to other people their age (52.6% much less than others their age, 7.9% somewhat less than others their age, 21.1% about the same as others their age, 10.5% somewhat more than others their age, 7.9% much more than others their age), and how frequently they visited any professional for health-related issues (36.8% less than once per year, 18.4% 1-2 times per year, 31.6% 3-6 times per year, 10.5% 6-12 times per year, 2.6% more than 12 times per year).

Forty-seven individuals in the Mental Health group indicated their views of how often they experienced minor health problems compared to other people their age (8.5% much less than others their age, 17.0% somewhat less than others their age, 38.3% about the same as others their age, 25.5% somewhat more than others their age, 10.6% much

more than others their age). Forty-six individuals indicated their views of how often they experienced major health problems compared to other people their age (21.7% much less than others their age, 19.6% somewhat less than others their age, 23.9% about the same as others their age, 21.7% somewhat more than others their age, 13.0% much more than others their age), and how frequently they visited any professional for health-related issues (4.3% less than once per year, 32.6% 1-2 times per year, 15.2% 3-6 times per year, 8.7% 6-12 times per year, 39.1% more than 12 times per year).

Forty-eight individuals in the College group indicated their views of how often they experienced minor health problems compared to other people their age (31.3% much less than others their age, 31.3% somewhat less than others their age, 33.3% about the same as others their age, 4.2% somewhat more than others their age) as well as their views of how often they experienced major health problems compared to other people their age (60.4% much less than others their age, 16.7% somewhat less than others their age, 10.4% about the same as others their age, 12.5% somewhat more than others their age), and how frequently they visited any professional for health-related issues (31.3% less than once per year, 29.2% 1-2 times per year, 25.0% 3-6 times per year, 8.3% 6-12 times per year, 6.3% more than 12 times per year).

In comparing the five groups on these health outcomes, one-way analysis of variance (one-way ANOVA) tests were first performed, with group membership as the independent variable. As stated above, results of these tests are presented in Tables 2 and 3. For the questions regarding minor and major health problems, responses indicating fewer health problems received lower scores (e.g., 1 represented “Much less than most people,” while 5 represented “Much more than most people”). For the question regarding

frequency of health-related professional visits, lower scores indicated fewer reported health visits.

Regarding self-perception of experiences of minor health problems, the one-way ANOVA test of means was highly significant, $F(4, 213) = 5.25$, $p < .001$. Post-hoc Tukey comparisons revealed that the Mental Health group reported significantly more minor health problems than the other groups ($X = 3.13$, vs. X's of 2.11-2.64 in the other four groups), each $p < .05$. Regarding self-perception of experiences of major health problems, the one-way ANOVA test of means was also significant, $F(4, 211) = 4.30$, $p < .01$. Post-hoc Tukey comparisons revealed that the Mental Health group reported significantly more major health problems than the College group ($X = 2.85$ vs. $X = 1.77$), $p = .001$. Regarding number of reported health-related visits per year, the one-way ANOVA test of means was also highly significant, $F(4, 212) = 8.05$, $p < .001$. Post-hoc Tukey comparisons revealed that Mental Health group reported visiting a health professional significantly more often than the other groups did ($X = 3.46$ vs. X's of 2.25-2.39 in the other four groups). Strikingly, 39.1% of individuals in the Mental Health group reported visiting a health professional more than 12 times per year, a proportion more than 5 times larger than in the Medical group (which had the second highest proportion of individuals reporting this frequency of health-related visits).

Regarding the health habits assessed in the Prestudy, the one-way ANOVA tests revealed significant differences across the five groups in frequency of smoking ($F(4, 212) = 2.89$, $p < .05$), engaging in exercise ($F(4, 212) = 2.56$, $p < .05$), getting medical checkups ($F(4, 212) = 4.16$, $p < .01$), alcohol use ($F(4, 211) = 2.78$, $p < .05$), eating nutritiously ($F(4, 211) = 2.98$, $p < .05$), and keeping poor personal hygiene ($F(4, 208) =$

4.71, $p = .01$). Post-hoc Tukey tests revealed that the Community Medical group reported more frequent smoking than the Internet group (X's 2.97 vs. 1.47, $p < .05$), less frequent exercise than the College group (X's 3.94 vs. 4.91, $p < .05$), and more frequently neglecting personal hygiene than the other four groups (X's 3.17 vs. 1.75-2.13, $p < .05$). The Mental Health group was also found to report more frequently seeking medical checkups than both the Community Medical group (X's 4.65 vs. 3.53, $p < .05$) and the College group (X's 4.65 vs. 3.64, $p < .05$).

To test the unique contributions of membership in various demographic groups on the health outcome measures (minor and major health problems, professional health visits, and health behaviors), I conducted a number of simultaneous regression tests. Each test examined the relations between all demographic predictors and the outcome measures. Results are presented in Table 4. On the whole, different demographic factors were found to contribute significantly to different health experiences and behaviors. For example, membership in the Mental Health group was found to be a unique predictor of self-reported experience of minor and major health problems (β's = .33 and .24, respectively, $p < .05$), but only predicted one of the ten assessed health behaviors (using safety measures; $\beta = -.50$, $p = .001$). Similarly, though I anticipated that chronological age would be a unique and significant predictor of nearly all of the outcome measures, it was only found to significantly predict getting medical checkups ($\beta = .32$, $p < .05$), drinking alcohol ($\beta = .24$, $p < .05$), using safety measures ($\beta = .30$, $p < .05$), and eating nutritiously ($\beta = .24$, $p < .05$). This appears to indicate the value of assessing multiple demographic variables in studies of health behaviors, as these demographic variables may play varying roles in influencing different kinds of health experiences and behaviors.

As stated above, the main purpose of the Prestudy was to generate a master list of items to be advanced to the next stage of the research project. The process of compiling a master list of items from the survey responses took several steps. All surveys from all samples were coded identically, by the same group of research assistants trained together by the primary investigator. Initially, responses to only the first question (about a "very healthy" person) were examined, as this was the most open-ended question. We reasoned that if a sufficient number of items were generated by this single question, then responses to only this question would be used in later stages of the project. However, if a greater number of items were desirable in Study 1, we reasoned that we could include items from the other open-ended questions.

All judgments were made by at least two raters, and a third rater on the team would be consulted if there was a dispute. The coding process involved first identifying responses that appeared on at least two different surveys in the whole sample. This followed the convention of Sternberg (1981), who eliminated items which were completely unique to only a single study participant. Items which were perfectly identical in more than one survey were included (for example, "energetic" appeared over 30 times in the entire sample in response to Question 1). Also, items which were not worded identically, but whose referents were identical, were also included. For example, "strong mind" and "mentally strong" would be judged as an item appearing on more than one survey, as their referents were judged to be identical. This resulted in 325 items being retained for further judgment. We judged this number of items to be more than adequate for the purposes of this project (for comparison, Sternberg et al., 1981,

examined less than half this number of items in examining lay theories of intelligence). Therefore, we did not include responses to the other open-ended questions in this study.

As this number of items was viewed as undesirably large for future samples to rate, we decided to attempt to further reduce the item pool by identifying and combining items which were conceptually similar to one another. That is, the research team members were trained to identify those items which were more identical than they were distinct, and to propose a wording for the final item which retained as much of the original language of the combined items as possible while still capturing the meaning of the two items. For example, "aware of their body" and "pays attention to their body" were combined into "aware of and pays attention to one's body." Disputes about appropriate wording for such items were resolved through team discussion. Each of the seven research assistants rated all of the 325 items in this way, and developed their own final list of proposed items. These lists were compared to the list proposed by the primary experimenter, and checked for correspondence to this list. Average agreement between each independent rater's list, and the primary investigator's list, was 81.2%, ranging from 96.0% to 74.1%. As this was a categorical rating of each item (e.g., include vs. exclude), no other reliability analysis was performed. Further disputes were resolved as a group. The final master list included 259 items, which was divided into two random groups of items (130 and 129 items in each list) for testing in Study 1 (by laypeople) and Study 2 (by health experts).

In order to perform an exploratory examination of the degree to which individuals in the five samples may have thought of various types of health as similar or different from one another, I then examined the frequencies with which each of the 259 items were

produced by individuals in response to each of the five open-ended questions of the Prestudy. This is also in accord with Sternberg (1985) and Sternberg et al. (1981). To do this, I tallied the number of times that each of the 259 items appeared either verbatim, or very close to verbatim, in each sample in response to each of the five open-ended questions (regarding a "very healthy person," "physically healthy person," "mentally healthy person," "person who has very healthy social relationships," and "unhealthy person"; for "unhealthy person," I tallied the number of times that each health item was listed in the negative or reverse to describe a healthy person). To conduct the correlational analyses, each item was then treated like a case, with the five types of health comprising scores to be compared. Theoretically, the more that a particular item was seen as indicative of particular types of health, the more often that item would appear as a descriptor of someone having that type of health (resulting in a high correlation between types of health for that item). Conversely, if types of health were seen as dissimilar from one another, each of the items should appear at very different frequencies in response to questions about those types of health. These correlations should be seen as averaging across items and groups (instead of participants) in order to determine which types of health were seen as most and least similar to one another.

Results of these tests are provided in Table 5. What is immediately apparent is that people in all five groups seemed to think of a prototypically-healthy person as being quite similar to a physically-healthy person (r's .68 to .77, all p's <.001). It is also clear that while individuals in all five groups did use the 259 items (in the negative) to describe a very unhealthy person, the correlation is far from 1.00 (which would indicate perfect correspondence between lay theories of health, and lay theories of being unhealthy).

Examination of the theories of each of the five groups reveals more about the lay theories of health of these groups. I will summarize the findings regarding each type of health in turn.

Regarding responses to the open-ended question about a "very healthy" person, significant positive correlations with all other types of health indicate that all five groups used significant numbers of the same descriptors to describe health, as they did to describe physical health, mental health, social health, and unhealthiness. For example, in the Internet group, *r*'s of .70 (p <.001) between health and physical health, .65 (p < .001) between health and mental health, .32 (p < .001) between health and social health, and .24 (p < .001) between health and unhealthiness, indicate that the responses given in the Prestudy to the general health question by this group map onto (at least) 4 other health-related concepts. Generally speaking, significant correlations also emerged between the other types of health, with the exception of the nonsignificant correlations between social health and unhealthiness in three of the five groups. In order to determine whether the five groups differed in their theories of health, all correlations were converted to *z*–scores. Then, *z*-scores for each group's correlation between two particular types of health were compared with all other groups' correlations of the same types of health. Due to the large number of second-order comparisons resulting from this approach, the significance level was reduced to .001 for these tests.

For the associations between health and physical health, no significant differences between groups emerged. For the associations between health and mental health, the Medical group was found to have significantly lower correlations between these types of health as the Mental Health (*r*'s .48 vs. .71; $z = -4.09$, $p < .001$) and College (*r*'s .48 vs.

.70; z = -3.44, p < .001) groups did. For the associations between health and social health, the Medical group was found to have significantly lower correlations between these types of health as the Mental Health (r's .19 vs. .57; z = -5.11, p < .001) and College (r's .19 vs. .45; z = -3.28, p = .001) groups did, and the Community Medical group was found to have significantly lower correlations between these types of health as the Mental Health (r's .26 vs. .57; z = -4.28, p < .001) group did. For the associations between health and unhealthiness, no significant differences between groups emerged; similarly, for the associations between physical health and mental health, no significant differences between groups emerged. For the associations between physical health and social health, the Internet group was found to have significantly lower correlations between these types of health as the Mental Health (r's .06 vs. .37; z = -3.69, p < .001) group did. For the associations between physical health and unhealthiness, no significant differences between groups emerged. For the associations between mental health and social health, the Medical group was found to have significantly lower correlations between these types of health as the Mental Health (r's .36 vs. .67; z = -4.87, p < .001) group did. For the associations between mental health and unhealthiness, and social health and unhealthiness, no significant differences between groups emerged.

Discussion

In the Prestudy, 223 adults representing a variety of demographic backgrounds were asked about their conceptualizations of what it means to be healthy. These individuals offered nearly 800 different phrases that they thought described a healthy person, which could be reliably narrowed and compiled into 259 different descriptors. This was a surprisingly large number of different responses, reflecting the complexity of

people's ideas about what health means. The willingness that these uncompensated individuals exhibited in participating in this research was notable; for example, those individuals who participated at the hospital did so while waiting for appointments or prescriptions, most often to help them with their own medical problems; similarly, participants at the community medical clinic contributed while waiting outdoors for a no-fee walk-in clinic to open. Many of these individuals were clearly physically uncomfortable (e.g., suffering from pain or illness, and/or chilled from standing outdoors in the late Michigan fall), but willingly participated despite these conditions. More than a few participants commented on how they hoped that their ideas would "make a difference in somebody's life, even if it's not mine" (as stated by one female participant), indicating their wish to have their ideas translated into meaningful knowledge. Others spontaneously related their own narratives of difficulties with health, or commented to the researchers how they should "probably start doing things that match up better with [their] own ideas about health" (quoted from a male participant in the hospital lobby). These kinds of reactions to the experience of participating in the present research, though not quantifiable in the usual sense, may be seen as some indication of laypeople's appreciation for opportunities to be listened to, where matters of health are concerned.

Regarding our findings at this stage, some interesting differences were noted. First of all, examination of the composition of samples indicates that seeking out community participants was the appropriate decision for this study (similarly to Sternberg, 1981). Much exploratory research in psychology involves college student samples, largely for convenience (Kazdin, 2003), but in the present study such an approach would clearly have led to an overrepresentation of health concepts salient to

healthy, young, educated, unmarried, high-SES individuals. Previous research on lay theories of health has surveyed urban adolescents (Millstein & Irwin, 1987), British housewives (Calnan & Johnson, 1985), and adults over age 70 in the rural Southern United States (Arcury, Quandt, & Bell, 2001). These are all important groups to assess, but the hope in the present study was to generate a list of items which could be viewed as being salient to a greater proportion of the U.S. population. Such an assessment was necessary, given the overall purpose of this project (to produce a self-report measure that could be validly used to assess lay theories of health in the U.S. adult population). Therefore, the fact that the Prestudy sample included adults of various ages, races, and both genders; various educational and SES levels; varied upbringing (in terms of urban, rural, or suburban settings); and differing religious convictions bodes well for the broad generalizability of these findings. Overall, though we did not succeed in assessing a fully representative sample, there was greater variability in this sample than in any previous research in this area.

Our hope for the Prestudy was that by obtaining samples varied in age (young and middle-aged adults), ethnic composition, and socioeconomic status, we could investigate some variations in lay theories along demographic lines. However, we also acknowledge that our ability to sufficiently sample from all age, ethnic, SES, and geographic groups was limited. Therefore, such complex analyses must await further study. Given this limitation, our bias in the subsequent stages of the present project was towards empirically-sound inclusiveness; that is, items or dimensions were only excluded when and if it was determined that those items or dimensions did not appear to be significantly relevant to subsequent samples.

As far as any self-reported health outcomes assessed in this study, we focused on personal experience of minor and major health problems, health-related professional visits, and a set of selected health behaviors. Differences were found between the five groups on a number of these outcomes. For example, individuals surveyed at the mental health clinic reported more minor and major health problems than the other groups, and reported making more visits to health professionals per year than the other groups did. In thinking about the possible meanings of these findings, a number of interpretations appear plausible. First, it may be that individuals at the mental health clinic truly experience more health problems than the other groups, and the survey successfully measured this difference. Somewhat similarly, the individuals surveyed at the mental health clinic may be more disabled by their health problems, and more distressed by them – therefore, mental health intervention was more necessary for this group than for individuals in the other groups. Alternatively, it may be the case that the often-noted relationship between mental and physical illness (Taylor, 2003) influenced these findings. That is, individuals who have been diagnosed with mood and anxiety disorders (the most common mental health issues) tend to experience more physical illnesses than nondepressed/nonanxious people, so it could be that poor mental health in this group was the causal or maintaining factor in the poorer physical functioning of these individuals.

However, the survey itself was constructed to be open to individual interpretation (e.g., minor and major health problems were not fully defined for participants, but were left somewhat ambiguous). Therefore, lay theories of health may have played a major part in influencing reporting of health problems. That is, for individuals surveyed at the mental health clinic, these items may have been interpreted with reference to both

physical illnesses, and mental health issues. Therefore, these individuals may have been thinking about mild depression (for example) as a "minor health problem," or uncontrolled bipolar disorder as a "major health problem," and therefore reported greater experience of such problems. Conversely, individuals at the hospital or at the community medical clinic may not have thought of such issues as health problems, whether or not they actually experience them (which certainly many must have, though I did not measure for them). Therefore, these groups may have reported less frequent relative difficulty with such problems. This cognitive process may also have been at play when reporting frequency of visits to "any health professional." For example, almost 4 in every 10 respondents in the Mental Health group reported visits more than 12 times per year - more than 4 times as often as individuals in any other group. This may be reflective of how individual psychotherapy appointments often occur on a weekly basis. These individuals may have thought of their mental health visits as included in their total count of health visits, while individuals surveyed at other sites may either not have seen any of their health professionals that often, or not thought of therapists (for example) as health professionals when surveyed in a non-mental health setting.

Examining the unique influence of each demographic variable on health outcomes and behaviors revealed that no one demographic characteristic accounts for all variability in such health behavior. However, these analyses did reveal that individuals in certain groups seem to engage in more positive or negative health behaviors than others, even when controlling for the influence of membership in other demographic groups. For example, being female was independently predictive of seeking medical checkups more often, and being of higher income was predictive of experiencing better sleep (the

significant finding regarding individuals with only a grade school education was probably an artifact of this data, as there were only two participants who fell into this education group).

What could enlighten these findings considerably would be an examination of the content of the responses produced by individuals in these various groups. For example, are women more likely than men to note "seeking medical checkups" as important to healthiness, or are people of higher income more likely to state "gets adequate sleep" as a characteristic of a healthy person? The possible questions are very numerous, and beyond the scope of the Prestudy. However, I did conduct correlational analyses which provide some indication of the degree to which different types of health are seen as similar or different by individuals in the five groups, based upon the frequencies with which the 259 Prestudy items were provided in response to open-ended questions about different types of health. On the whole, the correlations between health and physical health were the highest, indicating that people tended to give the same answers most often when asked about health and physical health. Strong correlations, however, were also found between health and mental health, as well as mental health and social health, with lower correlations between other types of health.

Interesting differences were revealed by further analyses of the degree of correlation between types of health in the five groups. While all groups saw health as equally and highly similar to physical health, the degree of correspondence between the concepts of health and mental health, and between health and social health, varied significantly by group in this study. In particular, individuals who were surveyed in the mental health center were more likely to provide descriptors of health that overlapped

considerably with their descriptors of physical health, mental health, and social health. They also provided descriptors in a manner that indicated their view of strong overlap between the concepts of physical, mental, and social health (in all of these cases, correlations in the Mental Health group between these concepts were the highest of all five groups). In contrast, the Medical group used the Prestudy descriptors in a manner which reflected a low degree of correspondence between health and mental health, and health and social health, relative to the other groups. This group also reported the lowest degree of correspondence between mental health and social health of all five groups.

A number of possible explanations for these differences warrant further investigation. For example, the implications of these findings may lend support to the notion that individuals seeking different kinds of health-related treatments may have different wellness goals in mind at the time that they seek services. As already mentioned, the Mental Health group reported experiencing more minor and major health problems, and seeking services more frequently, than the other groups did. The finding that individuals in the Mental Health group were more likely to view physical, mental, and social health as highly-related may indicate that the health problems that these individuals are seeking services for occur in multiple life areas, rather than (for example) just in the domain of physical health problems. For these individuals, the question of how many health problems they tend to have may bring to mind experiences as diverse as physical pain and disability, depression, and interpersonal conflict, any or all of which might contribute to that person seeking further services. This could be a preexisting schema difference that led these individuals to view psychotherapy as viable health treatment. Alternatively, these individuals may have been learned through treatment

(e.g., individual psychotherapy) that mentally classifying not only physical illnesses, but also emotional and interpersonal problems, as health issues can open up wider possibilities for intervention, and prevent unproductive thinking about one's problems (e.g., self-blame).

From the present analyses, at least, it appears that individuals who are seeking treatment in hospital or medical clinic settings are less likely than individuals in other settings to have mental/emotional or social issues in mind when they are asked to describe their ideas about health. In fact, the lay theories of health of individuals receiving medical care appear to be more compartmentalized than the theories of individuals receiving services in other settings, or who are not routinely receiving health services for problems (e.g., the present Internet sample, or college students). This compartmentalization may be explainable if one considers that medical problems often occur unexpectedly, and be perceived as uncontrollable by their sufferers; research has long emphasized the ways in which a lack of perceived control can create an unpleasant cognitive burden (e.g., Kofta & Sedek, 1998) and cause the uncontrollable circumstances to be granted priority over other issues. However, in this sample there is at least some evidence that the health problems of respondents in the Medical group were no more frequent or distressing than those of most other groups, bringing into question whether the compartmentalization of their lay theories of health is entirely a result of being a medical patient (or relative thereof).

Unfortunately for our health care system, and for Engel's wish for the biopsychosocial model to permeate health care delivery and scholarship, this compartmentalization of ideas may be resulting in significant negative outcomes for

patients and their families. Even if the differences observed thus far between the lay theories of health of different populations are due entirely to being surveyed in different settings, and having certain schemas evoked in those settings, this is little relief for the biopsychosocial model – for do we not wish for health care to be an integrative endeavor regardless of setting? It appears that there may be benefit to health care providers of all types finding ways to stimulate their patients to consider their wellness holistically, so that the multiple causes of various health problems can be explored and appropriately addressed. In addition, healing or growth for patients could be approached more holistically, if patients were activated towards seeking overall wellness regardless of the setting from which they are seeking services.

Chapter III

Study 1

Participants

Participants were a sample of young and middle-aged adults accessing an Internet website containing the experimental materials. These participants were invited through email invitations supported by PsychData to participate in a 15-minute study of "perceptions of physical and mental states." Invitations to participate in this study were disseminated through several channels. The study link was posted on several websites whose purpose is to centrally locate the Internet-based research of researchers in various areas of the world, on several areas of scholarship (e.g., the Social Psychology Network website, www.spn.org; the U.S. Department of Health and Human Services Clinical Trials archive, www.clinicaltrials.gov, etc). A participant recruitment service was also utilized (The Study Response Project, through Syracuse University) to access individuals who had previously registered as being willing to participate in online studies in exchange for entrance into prize drawings. I also utilized my personal social network in various ways to advance data collection, by requesting of my associates that they forward the study link to individuals in their personal networks in academic and non-academic circles.

In total, 247 individuals accessed the study. Demographic characteristics of the sample, along with tests of similarity of sample composition of the two randomized groups of participants, are presented in **Table 6.** Ninety-one individuals chose either not

to provide information about their chronological age (n = 55), or reported ages above or below our target range (n = 36), so those individuals were eliminated from the sample. This left 156 participants who could be identified as being in the specified age range of interest for this study. Examination of the age distribution of the sample indicated a nearly-uniform distribution, with a slight overrepresentation of individuals aged 22-25 (X = 33.03 years, SD = 9.33 years, range = 19-50). One-hundred fifty-three individuals indicated their gender (30.1% males, and 69.9% females), race (83.7% White, 2.6% Black/African-American, 5.2% Asian/Asian-American, 2.6% Hispanic, 5.2% Multiracial, and .7% Other), and their marital status (49.7% single, 36.6% married, 5.9% divorced, 7.8% in a domestic partnership). One-hundred fifty-five individuals indicated their immigrant status (92.9% non-immigrant, 7.1% immigrant; mean years in U.S. of immigrants = 17.4 years). One-hundred fifty-four individuals indicated their educational level (1.3% grade school, 8.4% high school, 21.4% some college, 38.3% college degree, 28.6% graduate degree, 1.9% technical school), and the urban vs. rural characteristics of their lifetime residences (20.1% mostly urban, large cities, 40.3% mostly suburban, 24.7% mostly urban, small cities, 14.9% mostly rural, small towns), as well as their religious identification (27.3% Protestant, 3.2% Jewish, 13.0% Roman Catholic, 2.6% Buddhist, 1.3% Muslim, 1.3% Hindu, 10.4% Agnostic/Atheist, 20.1% Other, and 20.8% None). One-hundred fifty individuals indicated their yearly household income (20.7% less than $25,000, 32.0% $25,000 to $50,000, 20.7% $50,000 to $75,000, 12.7% $75,000 to $100,000, 14.9% above $100,000).

This overall sample was automatically randomized by PsychData upon accessing the study, to rate one of the two lists of items obtained in the Prestudy. This

randomization process resulted in 80 individuals being assigned to one list (Group 1), and 76 individuals being assigned to the second list (Group 2). Descriptions of the samples can be reviewed in Table 5.

Materials

As noted, a large number of items describing health were generated in the Prestudy. The aim of Study 1 was to determine which of this pool of items were the most central to lay concepts of health. The website consisted of four main screens (or sets of screens): one to obtain informed consent for participation; the second set to obtain importance ratings,;the third set to obtain the same demographic information obtained in the Prestudy survey (listed in Appendix A; at the recommendation of some respondents to the Prestudy, an item on sexual orientation was added to the existing demographic questions), along with confidential online data submission instructions; and the fourth set of screens to present a brief summary of the research purpose (for debriefing).

Procedure

As already noted, the master list of items retained from the Prestudy pertaining to health was divided into two lists, and presented in random order to participants. Participants were asked to rate the importance of all items to what it means to be healthy, on a 0 ("not at all important") to 10 ("extremely important") scale. Participants were not forced to provide responses to items (e.g., they could advance screens without providing a response to any item on a screen). No personally identifying information was collected in this study; that is, though individuals indicated informed consent for participation by "clicking" a box on the screen, this is considered unofficial consent (e.g., no signatures, written or electronic, were collected). For those individuals accessing the site through the

Study Response Project, a fill-in box on the consent screen provided them the opportunity to enter their unique Study Response Project identifiers. This information was not used in this study, but was returned to the Study Response Project coordinator so that prizes could be awarded. All of these procedures were reviewed by the University of Michigan Institutional Review Board, who judged the study to qualify for exempt status.

Results

The goal of Study 1 was to determine which of the 259 Prestudy items should be retained for further study in Study 2. This required that ratings for the two lists of items be examined as a single item pool, in order to select the items from the combined list that could be reliably viewed as being rated the most important to lay theories of health. In order to do this, it was important that I determine whether there were significant and meaningful differences between the two random samples which might systematically bias item selection. This was because not all participants rated all items, but rather rated a randomized subset of approximately half of the items. To test for such biases, I engaged in a three-step approach: examining differences in the demographic composition and health behaviors/experiences of the two groups; examining differences in average rating styles of the two groups (e.g., mean ratings of all items) as well as any unique contribution of demographic group membership on rating style; and noting any meaningful differences between the numbers of items retained from each list.

Before describing tests of differences between the two groups on various demographic variables, it is first important to note general biases in the sample which cause it to differ from the general U.S. population. For example, there is an overrepresentation of women, individuals with high levels of education, and individuals

with family income well above the national median in this sample. This sample also contains an underrepresentation of racial minorities, and individuals from a rural background. These biases are a weakness of the study, and are likely the result of using an Internet-only methodology (rather than targeting individuals across the demographic spectrum through other means). Future research should seek to expand the knowledge obtained in this project by targeting such populations.

Testing for Group Differences in the Study 1 Sample

In order to test for bias in the two groups, I ran Chi-squared goodness-of-fit tests on each demographic variable. Expected values of each category for each demographic variable were calculated based upon the composition of the entire sample (e.g., males made up 30.1% of the full sample, so the expected value of males in each group was calculated based on this percentage). This method was chosen in order to determine whether the composition of each group differed significantly from what would be expected if the assignment of participants were truly random in this study. As shown in **Table 6**, neither of the groups differed significantly from expectation on any demographic variable. For example, the chi-squared tests of gender differences in both Group 1 ($\chi^2 = .75$, *ns*) and Group 2 ($\chi^2 = .73$, *ns*) indicated that the proportions of males to females in each group did not differ significantly from expectation. These findings provided evidence that the existing bias in the sample on all the demographic data collected (compared to the U.S. population) were not disproportionately loaded in one group or the other.

Regarding health behaviors and experiences, I conducted *t*-tests of means of the two groups for all health outcome variables. These results are presented in **Table 7**. As

the table indicates, group differences were not found on 12 of the 13 assessed health outcomes. The only health outcome variable where a significant difference did emerge was frequency of health-related professional visits (*X*'s 2.08 vs. 2.46, $t(153) = -2.18$, $p < .05$). Examination of the distribution of responses to this item indicated that in Group 1, the modal response was "1-2 visits per year," with notably fewer participants indicating agreement with any other response. In Group 2, by contrast, there was near-uniform frequency of response to three responses ("Less than once a year," "1-2 times per year," and "3-6 times per year") with notably fewer participants agreeing with the remaining responses. An important similarity in the responses of the two groups was the fact that fairly few participants indicated making health-related professional visits more than 6 times per year (6 individuals in Group 1, vs. 13 individuals in Group 2). Though this *t*-test of mean health visits was significant, this small difference was far outweighed by the overwhelming evidence that the two groups were highly similar in demographic composition and most health outcomes. Therefore, it was decided that the randomization of participants to groups was successful, and the ratings of items could be pooled to determine which items to retain for Study 2.

Importance Ratings of Prestudy Items

The list of retained items is provided in **Appendix C**. This list was determined by first calculating the mean importance ratings for each individual item. These mean ratings ranged from a low of 2.49 (*SD* = 2.05) to a high of 10.38 (*SD* = 1.07). To determine whether there was a rating bias in either of the two participant groups (e.g., a tendency for individuals in one group to rate their items differently from the other group), descriptive statistics and normality plots were examined for each group, and a *t*-test of

means was performed. In Group 1, the mean rating of all items was 7.43 (*SD* = 1.56), ranging from 2.92 to 10.40. In Group 2, the mean rating of all items was 7.51 (*SD* = 1.85), ranging from 1.97 to 11.00. The *t*-test of means was nonsignificant, $t(154) = -.32$, *ns*. Taken together, these findings indicated that there was a similar tendency in both samples to rate items slightly above the midpoint of the scale (which would have been 6.00 on this 11-point scale). This was a reasonable outcome, given that all items had initially been identified by at least two laypeople as characteristic of very healthy individuals. The decision was made to retain all items receiving a score of 8.00 or higher, for two reasons: 1) to remain largely consistent with Sternberg et al. (1985), who argued for retaining 80 items for further study at a similar point in their study of intelligence; and 2) because this point represented the top third of the rating scale, capturing those items which were seen by most participants as most important to their ideas of health. This resulted in a total of 95 of the original 256 items (37.1%) being retained for further study. Forty-nine of these items came from Group 1's list, while 46 of the items came from Group 2's list (51.6% vs. 48.4%, respectively). This near-even split of items indicated an almost ideal outcome for this stage of the project.

As I was also interested in examining whether any particular demographic characteristic uniquely predicted mean item ratings, I conducted a simultaneous multiple regression analysis of all demographic variables in predicting ratings. The only demographic variable to uniquely and significantly predict item ratings was being of Black/African-American race, $\beta = .22$, $p < .05$. However, there were only 4 individuals in this study who identified as being in this racial group, so this finding may be an artifact of this data and should not be overemphasized.

Discussion

Few findings from this stage of the project require further elaboration. Basically, the goal of Study 1 was to determine the subset of items that should be retained for further analysis in Study 2. As I wished to pool item ratings across both randomized groups, it was necessary to determine whether group differences in demographic composition, health outcomes, or rating style were serious enough to warrant an alternative approach. My extensive testing of the two groups indicated that they were largely identical in all of these respects, with the exception of self-reported health-related professional visits. However, this single group difference represented a small effect size, and was judged not to be highly clinically meaningful. Therefore, the ratings provided by the two groups were used together to determine which items should be retained. The resulting list pulled nearly equally from both random lists of items, and appeared to represent in a meaningful way the items which were judged most important to lay theories of health. These 95 items were further examined in Study 2, as described below.

Chapter IV

Study 1b

It has been asserted by some scholars that authority and knowledge about medical health issues should not be seen as the exclusive domain of physicians; in fact, some evidence suggests that laypeople can be quite influential in drawing physicians' attention to previously unstudied medical conditions (Arksey, 1994) and that physicians may apply their "objective" knowledge of health in biased ways (Miresco & Kirmeyer, 2006). This is not to say that lay knowledge or theories about health should be thought to be more accurate than that of health experts; indeed, laypeople are often incorrect in their ideas about the causes, symptoms, and prognoses of health experiences (Prior, 2003). However, as seeking assistance with various health issues is very often a matter of individual choice, based on individual ideas, investigating whether the health concepts of laypeople and experts differ is a worthy endeavor with much scholarly backing (e.g., Furnham, 1988; Hughner & Kleine, 2004). To allow some initial comparisons between the implicit theories of laypeople and health professionals regarding what comprises health, practicing health professionals in the fields of medicine, psychology, social work, and the clergy were invited though email invitations to rate the importance of each Prestudy item to their idea of health. Specifically, these professionals rated all 259 Prestudy items on the same 0-10 scale that laypeople had in Study 1.

Method

Participants

Participants were a sample of health professionals accessing an Internet website containing the experimental materials. These participants were invited through email invitations supported by PsychData to participate in a 15-minute study of "professional perceptions of health." Invitations to participate in this study were posted on the research-focused websites listed in Study 1. Also, I contacted several colleges and universities with graduate programs in medicine, social work, clinical psychology, and other health-related service fields to request that a link to the study be forwarded to faculty, medical staff, and students. I also contacted several listservs that advertised themselves as having memberships largely composed of religious professionals and clergy, and invited their memberships to participate in the study.

In total, 170 individuals accessed the study. Selected demographic characteristics of the sample, along with tests of similarity of sample composition of the two randomized groups of expert participants, are presented in **Table 9.** In terms of general demographics, 143 individuals indicated their gender (27.6% males, and 57.1% females), race (77.6% White, 4.5% Black/African-American, 9.0% Asian/Asian-American, 3.7% Hispanic, .7% Native American/Inuit, 3.7% Multiracial, and .7% Other). One-hundred thirty-four individuals indicated their immigrant status (92.5% non-immigrant, 7.5% immigrant; mean years in U.S. of immigrants = 17.4 years). Regarding professional training, 158 individuals indicated their area of expertise (56.3% medical, 41.1% mental health, 2.5% religious service/clergy), and 163 individuals indicated their level of professional education (8.6% technical; 24.5% Bachelor's level; 28.8% Master's level; 38.0% Doctoral level).

This overall sample was automatically randomized by PsychData upon accessing the study, to rate one of the two lists of items obtained in the Prestudy. This randomization process resulted in 80 individuals being assigned to one list (Group 1), and 90 individuals being assigned to the second list (Group 2). Descriptions of the samples can be reviewed in Table 10.

Materials

The study items were the same 259 Prestudy items rated by laypeople in Study 1, with some demographic questions omitted (e.g., marital status, urban vs. rural residence), and the two items on professional training added. All other web survey screens were highly similar to those used in Study 1.

Procedure

As in Study 1, Study 1b participants logged on to the secure website through individual email invitations. As before, participants rated their random subset of items on a 0-10 scale (which translated into scores of 1-11, which are reported here). A brief debriefing screen appeared at the end of the survey, with information on how to contact the researchers if the participants had questions or concerns.

Results

It was decided that as the present project was most focused on the health-related ideas of laypeople (rather than of experts), the 95 Prestudy items which were retained from Study 1 would be used as the standard against which the expert ratings would be compared. Therefore, mean ratings for all 259 Prestudy items were calculated, and used to test differences between the two expert participant groups, but the results reported here

reflect some analyses of how the expert ratings of the 95 Study 1 items differed from layperson ratings. These ratings are provided in **Appendix D**.

Identifying Differences Between Groups in the Randomization Process

To examine differences between the randomized groups, I again ran chi-squared goodness-of-fit tests of the group demographics, professional training, and personal frequency of professional visits; *t*-tests of personal health behaviors and item ratings; and multiple regression tests of the unique influence that the demographic variables and significant health behaviors had on item ratings. These are reported in **Table 9** and **Table 10**.

As reported in Table 9, chi-squared tests revealed that the two groups did not differ from expectation on any demographic variable, area of expertise, level of professional training, and frequency of professional visits related to health. Regarding the various health-related behaviors measured in this study, *t*–tests of means revealed that participants in the two groups only differed on frequency of smoking cigarettes. Specifically, participants in Group 2 reported smoking significantly more frequently than participants in Group 1 (X's of 1.14 vs. 1.61 on a scale of 1-7, $t(132) = -2.23$, $p = .03$). However, the effect size associated with this difference was very small (partial $\varepsilon^2 = .03$). Though was a small difference between groups, I wanted to ensure that differing levels of engagement in this important health behavior did not effect ratings of individual items (so that ratings of items could be safely pooled across the groups). Therefore, I determined to include smoking as a predictor in the multiple regression analysis predicting mean item ratings.

In the multiple regression analysis, all demographic variables, area of expertise, level of training, and professional visits were first dummy-coded, then entered in simultaneously along with smoking to predict mean item ratings. The significant results of this regression equation are reported in the rightmost column of Table 9. As depicted in the table, none of the demographic predictors, nor area of expertise, nor health visits, nor frequency of smoking had any effect on item ratings. However, holding a Master's or Doctoral degree were each significantly associated with lower average item ratings. The effect of training level on item ratings was slightly less for Master's degree holders ($\beta = -2.09$, $p < .05$) than for Doctoral degree holders ($\beta = -2.50$, $p < .05$). Therefore, it appears from this data that overall ratings of the importance of the lay-generated items to expert ideas of health decrease with increasing levels of professional training. A large proportion of the present sample (109 individuals, or 67.8% of the full sample) reported one of these two levels of education, indicating that this effect was likely quite widespread in the final mean ratings. Therefore, interpretation of the ratings themselves should include this caveat.

Associations Between Lay and Expert Importance Ratings, and their Implications

A correlation test of mean layperson and expert ratings of the 95 Study 1 items was performed. Overall ratings of these items were highly and positively correlated ($r = .76$, $p < .001$) despite the general tendency of individuals with higher education to provide lower ratings. However, examining which items would have been included or excluded based on our threshold rating of 8.00 revealed some interesting differences between lay and expert theories. Regarding the 95 items that were retained in Study 1 based on layperson importance ratings, 10 would have been excluded if expert

importance ratings had been used as the standard (at the same 8.00 level). These items were "Does not get sick often or easily" (7.85); "Thinks" (7.90); "Having a sense of purpose in life" (7.84); "Having longevity" (7.31); "Loving people" (7.93); "Having no health problems or illness" (7.58); "Being pain-free" (7.85); "Not being anxious" (7.86); "Being stress-free" (7.27); and "Being energetic" (7.67). As I will further detail later, 5 of these 10 items which would have been discarded based on expert ratings, actually were retained after further analyses for the Lay Theories of Health (LTH) Inventory (detailed in Study 2).

Regarding items that would have been retained for further analysis in Study 2 according to expert importance ratings, the following items would have been included: "Gets preventive checkups" (8.77); "Gets routine medical checkups" (8.52); "Being alert" (8.13); "Able to express emotions and thoughts with friends" (8.07); "Being aware" (8.33); "Being emotionally secure" (8.52); "Being interested in learning about health" (8.44); "Being involved" (8.18); "Being interested" (8.27); "Being self-confident" (8.28); "Not being lazy" (8.22); "Being open-minded" (8.39); "Being proactive" (8.02); "Walks" (8.45); and "Being safe" (8.48). Overall, 100 items would have been retained for further study, had expert ratings been used. It is interesting that experts scored these items higher than laypeople did, given the overall trend towards experts providing lower ratings than laypeople.

Discussion

It appears from the present findings that there are large areas of overlap between lay and expert ideas about health, at least in regard to how important experts see lay-generated and supported items to their ideas about health. On the whole, within the set of

95 Study 1 items, experts and laypeople tended to rate items similarly. However, an interesting finding emerged that having greater levels of training was associated with seeing the lay-generated items, on the whole, as less important to health than laypeople in Study 1 did. Despite this, though, a select set of items were rated more highly by experts than by laypeople, to a level where they would have been advanced to the next stage of the research had the research method been designed to address expert ideas about health primarily. The logical conclusion from this is that experts saw this particular set of items as quite important to health. Some tentative interpretation of themes addressed in these items seems warranted, acknowledging that these comments are speculative and will require more systematic investigation to illuminate.

Two of the items, "Gets preventive checkups" and "Gets routine medical checkups," both seem to mention the practice of maintaining one's health through ongoing contact with the health care establishment (e.g., through regular checkups). A third item, "Being interested in learning about health," also specifically mentions health and health issues. These items seem to address directives or advice that health professionals might give to their patients or clients.

Three of the items, "Being involved," "Not being lazy," and "Being proactive," seem to address a motivational component to health. Were a factor analysis possible in this data set (it is not, due to participants rating random subsets of items rather than the entire item set), it would be interesting to investigate whether these items might load on a factor with the explicitly health-related items mentioned above. That is, one can wonder whether health care professionals not only desire that their patients (clients) keep in

contact with their health care team, and actively seek relevant information or advice, but they also wish their patients (clients) to act on the information provided to them.

Four of the items, "Being alert," "Being aware," "Being interested," and "Being open-minded," seem to address cognitive states of engagement with the external world. Given the high levels of education in this sample, one might wonder whether these were highly-rated due (at least in part) to the personal values of the expert participants regarding intellectual engagement with the larger world. Clearly individuals in this sample had all engaged in specialized, and sometimes grueling, education in order to achieve their own goals. Perhaps these participants were responding to their own implicit ideas about achievement and health – that is, that health involves not only physical and emotional integrity, but also ongoing curiosity and knowledge-seeking in the world. This interpretation actually aligns intuitively with the theorizing of Abraham Maslow, who proposed that human well-being builds in a particular way. That is, the various needs of any individual are arranged hierarchically, such that lower-order needs (such as food, clothing, and shelter) must be met before higher-order needs (such as mental stimulation, self-esteem, positive relationships with others, and eventually reaching one's highest potential, termed *self*-actualization) can be attained (Maslow, 1943).

If it is the case that experts see higher-order needs as just as important to health as other kinds of needs, what does this imply for the clinical encounter? It could mean a number of things. For example, health professionals could, on the whole, feel empathic towards those whose circumstances have not allowed them to achieve higher-order needs. This might translate into taking a caring attitude towards patients (clients), and feeling invested in helping people improve their circumstances. This would certainly be a

positive result. However, other interpretations are possible and less hopeful than this one; for example, it could be that health professionals ally more closely with individuals who have been fortunate enough to attain higher-order needs (e.g., highly educated or high-income individuals), resulting in differential levels and qualities of care for people of differing life circumstances. Some research in this area indicates slight differences in the content and process of family physician visits for less-educated patients, compared to more-educated ones (Fiscella, Goodwin, & Stange, 2002), but more work in this area is needed.

The remaining items do not seem to group together in any meaningful way. "Able to express emotions and thoughts with friends" addresses a social skill, while "Being self-confident" seems to reflect liking and having faith in oneself; "Being emotionally secure" describes an emotional state, while "Walking" and "Being safe" seem to describe health actions. Therefore, it is particularly hard to speculate on why experts might have felt these to be particularly important, and less so than items such as (for example) "Loving people," "Having a sense of purpose in life," and "Being energetic" (all of which did not make the threshold for inclusion). Without further empirical investigation, these questions will have to go unanswered for the immediate future.

Chapter V

Study 2

Study 2 sought to determine the dimensions of health which comprise lay theories, through factor analysis of responses to the items retained from Study 1. The results of this factor analysis became the basis for our new measure of lay theories of health. Initial validation of these factors occurred by comparing scores on this new measure to some of the primary existing measures of well-being. Also, participants were asked to rate the health of five fictional individuals, described in a brief series of profiles. Actual participant ratings of these profiles were correlated with predicted ratings based on the importance ratings provided in Study 1. The purpose of this final stage of this project, therefore, was to determine whether the lay theories measure we created had at least preliminary psychometric support, and whether laypeople actually do use their lay theories in meaningful ways (e.g., to judge the health of others).

Participants

As in Study 1, participants were a sample of young and middle-aged adults accessing an Internet website containing the experimental materials. These participants were invited through email invitations supported by the Study Response Project and PsychData to participate in a 20-minute study of "perceptions of physical and mental states." To ensure consistency with the previous experiments, men and women ages 18-50 were invited to participate. Similar biases could be expected to apply to Study 2 as to Study 1.

In total, 366 individuals accessed the study. Demographic characteristics of the sample are presented in **Table 11.** Thirty-three individuals chose either not to provide information about their chronological age (n = 23), or reported ages above or below our target range (n = 10), so those individuals were eliminated from the sample. This left 333 participants who could be identified as being in the specified age range of interest for this study. Examination of the age distribution of the sample indicated a nearly-uniform distribution, with a slight overrepresentation of individuals aged 24-26 (X = 34.41 years, SD = 9.21 years, range = 18-50). 310 individuals indicated their gender (41.3% males, and 58.7% females). 308 individuals indicated their marital status (32.8% single, 49.0% married, 7.8% divorced, 9.1% in a domestic partnership), educational level (1.3% grade school, 19.2% high school, 30.8% some college, 32.8% college degree, 12.7% graduate degree, 3.2% technical school), yearly household income (18.8% less than $25,000, 34.7% $25,000 to $50,000, 26.3% $50,000 to $75,000, 9.1% $75,000 to $100,000, 11.0% above $100,000), and their religious identification (20.8% Protestant, 2.6% Jewish, 14.9% Roman Catholic, 2.3% Buddhist, 1.9% Muslim, 3.9% Hindu, 8.4% Agnostic/Atheist, 28.9% Other, and 16.2% None). 307 individuals indicated their race (74.9% White, 5.2% Black/African-American, 11.4% Asian/Asian-American, 4.2% Hispanic, 1.3% Multiracial, and 2.9% Other), and their immigrant status (95.4% non-immigrant, 4.6% immigrant; mean years in U.S. of immigrants = 18.2 years). 306 individuals indicated the urban vs. rural characteristics of their lifetime residences (20.1% mostly urban, large cities, 40.3% mostly suburban, 24.7% mostly urban, small cities, 14.9% mostly rural, small towns).

Materials

The website for this experiment consisted of four main sections: one to obtain informed consent for participation, the second to obtain the same demographic information contained in the Prestudy survey, the third to present the study items, along with confidential online data submission instructions, and the fourth to present a brief summary of the research purpose (for debriefing). Captured screen shots of the full lists of items, as they appear on the study website, are provided in **Appendix B**.

Lay theories of health. The 95 retained items from Study 1 were presented, with participants being asked to indicate the degree to which each item describes them on a 1 (*not at all like me*) to 7 (*very much like me*) scale.

Quality of life. The SF-36 Health Survey (SF-36; Ware, Snow, Kosinski, & Gandek, 1993) is a 36-item measure of quality of life. Respondents answer a series of questions with various response sets, ranging from 5 or 6-point Likert-type response scales, to 2 or 3-point scales of agreement. Scoring of the measure results in 8 separate scales of quality of life: physical functioning (degree to which physical activities are limited due to health), role-physical (degree to which work or other daily activities are limited due to health), bodily pain, general health (self-evaluation of health status), vitality (self-evaluation of overall energy level), social functioning (degree to which social activities are limited by physical or emotional functioning), role-emotional (degree to which work or daily activities are limited due to emotional problems), mental health (feelings of nervousness and depression versus feelings of calmness and happiness), and reported health transition (self-evaluation of improvement or degradation in health from the previous year). Ward et al. provided extensive information on reliability and validity studies of the measure; for example, internal consistency was found to be .77 and higher

for all scales in all age groups studied, as well as for all educational levels studied. In our study, we would predict that higher scores on dimensions of health would be associated with higher scores on this quality of life measure.

Optimism. The Life Orientation Test-Revised (LOT-R; Scheier, Carver, & Bridges, 1985) is a 10-item measure of dispositional optimism, or the tendency to have positive outcome expectancies (Sample item: *"I'm always optimistic about my future"*). Three items are keyed in the positive direction, three in the negative direction, and there are four filler items which are intended to obscure the underlying purpose of the measure. Respondents only completed the 6 items explicitly measuring optimism. Respondents are asked to rate their agreement with each item on a 5-point scale, from 0 (*strongly disagree*) to 4 (*strongly agree*). The LOT-R showed adequate internal consistency (α = .76) and test-retest reliability (.79) in its initial development. Its convergent and divergent validity were also adequately demonstrated, as it was found to correlate significantly but not at too high a level with a number of other cognitive and affective measures in the predicted directions. Its external validity was also demonstrated by showing that optimism scores were negatively correlated with self-reported physical symptoms, consistent with the idea that persons greater in optimism experience better health. In our study, then, we would expect that greater optimism scores would be associated with greater multidimensional health.

Positive and negative affect. The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item measure of positive mood (e.g., *"Interested"*) and negative mood (e.g., *"Distressed"*). Respondents are asked to rate the extent to which they feel 10 positive and 10 negative moods across a 5-point Likert-type scale, ranging

from 1 (*very slightly*) to 5 (*extremely*). The PANAS can be presented to assess for affect either over the experimenter's choice of specific time interval (e.g., "over the past week") or in general. Higher scores reflect a greater experience of positive or negative moods over the time period assessed. Internal consistency (Positive Affect: $\alpha = .88$, Negative Affect: $\alpha = .85$) of the PANAS was high in its initial development. Test-retest reliability was lower at briefer assessed time intervals (i.e., .47 for "over the past week") than it was for longer time intervals (i.e., .63 for "over the past year"), but this was consistent with the intention of the scale as a measure of affective experience (rather than pervasive moods). The PANAS was also found to have acceptable external validity, with each scale correlating with other measures of mood and affect in the expected directions. In our study, we would anticipate that greater reported health on a variety of health dimensions would be associated with greater positive and less negative affect.

Social support. The RAND Medical Outcomes Survey Social Support Survey (MOS-SS; Sherbourne & Stewart, 1991) is a 19-item measure of subjective appraisals of the degree to which an individual feels he or she experiences functional social support. The measure was created to assess four dimensions of social support, by asking respondents to indicate how frequently they have access to other individuals to receive emotional/informational support (Sample item: *"Someone to listen to you"*), tangible support (Sample item: *"Someone to help you if you are confined to bed"*), affectionate support (Sample item: *"Someone to show you love and affection"*), and positive social interaction (Sample item: *"Someone to do something enjoyable with"*) on a scale from 1 (*none of the time*) to 5 (*all of the time*). An overall index is also computed by this measure. There is also one item which asks respondents to provide a number indicating how many friends and family

members they have available to them for support. This measure was initially developed for use with chronically-ill populations, but has been used with healthy populations as well (Dole et al., 2004; Wijndaele et al., 2007). In its original development, the overall index and four support scales showed excellent internal reliability (α = .91 and above), and strong test-retest reliability (α = .72 and above), and the four-factor structure was highly supported. However, later research has recommended using an alternative two-factor structure, comprised of socio-emotional (MOS-SE) and tangible (MOS-T) support (Westaway, Seager, Rheeder, & Van Zyl, 2005). This measure is being included in our study for two main reasons: first, we have a general expectation that greater social support appraisal would be predictive of greater multidimensional health, and second, if a dimension of health which involves relationships with others should emerge from our data, scores on the MOS-SS should be particularly predictive of scores on this dimension.

Spirituality. The Daily Spiritual Experiences Survey-Short Form (DSES-S; Underwood, 1999) is a 6-item measure of one's personal perception of the transcendent in life. Respondents indicate their agreement with items (Sample item: *"I find strength and comfort in my religion"*) on a 6-point Likert-type scale, from 1 (*"Many times a day"*) to 6 (*"Never or almost never"*). This is a recently-developed scale for which psychometric data are still being compiled; however, it is the only scale to our knowledge which both attempts to measure personal experience of the spiritual in a way that allows the respondent to define for himself or herself what spirituality itself represents, and has been advanced for use specifically in health-related research. The authors indicate that though the word "God" is used in some items, respondents seem able to connect that word to their own belief systems even if those beliefs do not include the Judeo-Christian God. In

the present study, lower scores on the DSES-S (indicating greater sense of spirituality in daily life) should be associated with higher scores on any spiritual health domain that might emerge from our data.

Profiles. Profiles of five fictional individuals were generated using importance ratings from Study 1. Four of these profiles included lay-generated health information, and one control profile was created which contained no information judged to be related to any items retained from Study 1. Individual items were grouped by importance ratings, and equal numbers of highly-rated, mean-rated, and low-rated items were selected as a general item pool. These items were then distributed across the four health profiles such that the total "value" of each profile was maximally equal (e.g., the overall importance of items included in each profile were leveled across profiles, avoiding a confound of too many highly-important items being placed in one profile). Numbers of positively-framed vs. negatively-framed items, total words, and total sentences were also held constant across all profiles, and they were written to be gender-neutral. The predicted health rating of each profile was determined by varying whether the individual described in each profile possessed, or did not possess, varying numbers of health items. The profiles were also reviewed and judged by an independent group of 7 undergraduate research assistants (all female, mean age = 19.7 years), who rated the profiles for their readability, understandability, ease of judgment, and degree to which the information provided in each was useful in their rating the health of the individual described. All profiles were judged to be highly readable, understandable, and easy to judge. The four health profiles also received higher mean ratings of the degree to which the rater used the information

provided to judge that individual's health, than the non-health-related profile did. The profiles themselves are provided in **Appendix E**.

Procedure

Upon login to the survey website, each participant was first presented with the informed consent screen, and then asked his or her age. The 95 retained items were then presented, followed by the previously-validated wellness instruments. Each participant was then asked to rate each fictional profile for health and unhealthiness, with profiles presented in one of 5 randomized orders. These health ratings were on a 7-point Likert-type scale, from 0 ("not at all healthy" or "not at all unhealthy") to 6 ("extremely healthy" or "extremely unhealthy"). Both the healthiness and unhealthiness of each profile were assessed because of some past findings that the two constructs should be assessed separately, rather than as opposite ends of a single continuum (Millstein & Irwin, 1987). It was hypothesized that profiles which corresponded more closely to the ideal health profile would be rated as healthier by laypeople.

Results

Sample Characteristics

Means, standard deviations, and alpha values for the study measures (other than the lay theories factors, which will be described below) are presented in **Table 12.** These values are presented for both the Study 2 sample ("Within Age Range"), and the study respondents who were eliminated from the sample. Sample differences were not tested due to the vast differences in sample size in the three groups, but the values are presented for visual inspection.

Exploratory Factor Analysis, and Decision to Retain Seven Factor Structure

Exploratory factor analysis was performed on the 95 items retained from Study 1. As recommended by Field (2005), the distributions of all items were first examined. A large majority of the items were nearly-normally distributed; the exceptions were four items which emphasized engagement or nonengagement in specific behaviors (specifically, "does not smoke," "being drug-free," "does not abuse drugs," and "having safe sex"). The phrasing of these items may have encouraged the bimodal responding observed in this sample (that is, the modal response to each question indicated nonuse of substances and engagement in safe sex practices, with a smaller proportion of respondents endorsing the other end of the scale, and very few respondents indicating responses between these poles). All 95 items were then correlated with one another, to determine whether any items were so highly correlated with one another as to skew the factor analysis (e.g., correlations between items of >.90 are often considered too high, with the recommendation being to discard any items which are correlated at this degree). Four of the 95 items were correlated to this degree, and thus were not included in the factor analysis.

The number of factors was left unconstrained in the first exploratory factor analysis, and an oblique (direct oblimin) rotation was applied (to allow factors to correlate with one another). This resulted in 17 factors whose eigenvalues were above 1.00, accounting for 76.4% of the variance in the data set. Examination of the scree plot revealed no obvious cutoff point for the number of factors retained. When the items which comprised the first several factors were examined, no meaningful interpretation of each factor was obvious. Therefore, an exploratory (principal axis) factor analysis with

an orthogonal (varimax) rotation was attempted, again with the number of factors left unconstrained.

Though the analyzable sample size of 224 was markedly smaller than the common recommendation of 10 subjects per variable (necessitating a sample size of 950 in this study), debate is ongoing in the psychometric community regarding whether the necessary sample size varies with several aspects of the data set from which the particular factors which are being extracted (Hogarty, Hines, Kromrey, Ferron, & Mumford, 2005). One often-used assessment of sample size for exploratory factor analysis is the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (recommended to be above .90). This measure was .94 in this sample, indicating sufficient sample size for this extraction. The varimax factor analysis (number of factors unspecified) resulted in 16 factors whose eigenvalues were above 1.00, accounting for 75.3% of the variance in the data set. Examination of the scree plot **(Figure 1)** again revealed no obvious cutoff point for the number of factors retained; Factor I accounted for 35.60% of the variance, Factor II accounted for 7.67% of the variance, Factors III through VII accounted for between 4.2% to 2.2% of the variance, and Factors VIII through XVI accounted for between 1.00% and 2.00% of the variance. With these initial findings, I decided to exclude factors VIII through XVI, as they each accounted for such small proportions of the overall variance in the data set, and seemed less likely than the larger factors to be reliably reproduced in future studies. I then attempted factor constructions of three, four, five, six, and seven factors, to compare the relative interpretability of each construction and to determine which factors should be retained for the final measure.

Findings utilized in comparing the relative worth of the various factor structures are provided in **Appendix G.** This included the communalities of each item after extraction, the factor score coefficients for each item, and the rotated factor loadings. According to Grice (2001), an item should be retained on a factor if its factor score coefficient for that factor is at least 1/3 as large (according to absolute value) as the highest factor score coefficient obtained by any item on that factor. These values for each factor for all factor constructions are shown in parentheses in the findings in Appendix G (e.g., in order for an item to be retained on Factor I under the three-factor structure, that item's factor score coefficient had to exceed .049 on that factor). In most cases, the factor loadings for this subset of retained items would exceed .50 for the corresponding factor (also shown in Appendix G in columns next to each item; this is the most widely-accepted criterion for retention), and in every case, the factor loadings would exceed .40 for that factor (a less conservative, but also often-used criterion for item retention on a factor).

In reviewing the relative merit of retaining three, four, five, six, and seven factors, it became apparent that the same items generally loaded on the first three factors regardless of the inclusion of additional factors. However, under the four-factor structure, no items loaded on Factor IV according to the present criteria. Under the five-factor structure, three items loaded on Factor IV, but just one item loaded on Factor V. Under the six-factor structure, three items loaded on Factor IV, one item loaded on Factor V, and no items loaded on Factor VI. However, the item that loaded on Factor V also loaded nearly equally on Factor I. Under the seven-factor structure, three items loaded on Factor IV, one item loaded on Factor V, no items loaded on Factor VI, and three items

loaded on Factor VII. The one item which loaded on Factor V again loaded nearly equally on Factor I, and thus was retained there rather than identified as a single-item separate factor. When the items retained on each factor under the seven-factor structure were reviewed, they were judged to be interpretable and meaningful; in particular, the items on Factor VII were highly interpretable as involving ideas about rest and sleep. Therefore, the seven-factor structure was retained, resulting in five final dimensions of lay theories of health.

Initial Validation of Lay Theories of Health (LTH) Scales

The proposed lay theories of health (or LTH: Lay Theories of Health Inventory) measure is presented in **Table 13**. Factor I, containing 17 items and accounting for 22.20% of the variance in this data set, was labeled Social-Emotional Health (SEH). Factor II, containing 13 items and accounting for 15.46% of the variance in this data set, was labeled Positive Health Practices (PHP). Factor III, containing 3 items and accounting for 6.92% of the variance in this data set, was labeled Absence of Illness (AI). Factor IV, containing 3 items and accounting for 5.09% of the variance in this data set, was labeled Absence of Stress and Anxiety (ASA). Factor VII, containing 3 items and accounting for 3.04% of the variance in this data set, was labeled Adequate Rest (AR). Together, these subscales account for 52.71% of the variance in this data set.

Table 14 shows the correlations between scores on each item with total (additive) scores for each subscale (one measure of discriminant validity). In every case, each item correlated more highly with the total score of its assigned subscale than with the total score of any other subscale. In order to assess whether a total score (e.g., additive total of all items) for the lay theories of health measure might be useful to propose along with the

specific subscales, I also correlated scores on each item with the proposed total score. Again in every case, correlations between item scores and the proposed total score were higher than between item scores and the subscale scores to which they were not assigned. These correlations were also lower than between the item scores and their assigned subscales. As the correlations between item scores and the total score were fairly high (above .49, with 34 of 39 correlations near or above .60), the total score measure appeared to have initial support. This total score was labeled Multidimensional Health (MDH), an overall measure including all 39 items.

The next stage of the project involved conducting a very high number of correlation tests; therefore, to address the possibility of increased Type 1 error, the *p*–value for significant findings was lowered to .001. Zero-order correlations between the scales of the LTH measure, and the established well-being measures also administered in Study 2, are presented in **Table 15**. Regarding correlations between the LTH scales themselves, all were moderately to highly-correlated with one another. The highest correlations were between LTH: MDH and LTH: SEH ($r = .89$, $p < .001$) between LTH: MDH and LTH: PHP ($r = .86$, $p < .001$) and between LTH: MDH and LTH: ASA ($r = .74$, $p < .001$). The lowest correlations were between LTH: AI and LTH: ASA ($r = .43$, $p < .001$), and LTH: AI and LTH: AR ($r = .40$, $p < .001$). The other 10 pairwise correlations between LTH scales ranged from .49 to .66 (all significant at the .001 level). None of the correlations between subscales (e.g., other than the total score) exceeded .66, which indicates a maximum shared variance between subscales of 44% in this data set.

In examining the tested correlations between the LTH scales and the quality of life (SF-36) scales, significant correlations were all in the expected directions. Of note,

the LTH: MDH was quite highly and negatively correlated with the SF-36 Vitality scale (r = -.71, p < .001, with lower scores on the SF-36: VT indicating greater health on this measure) and highly and positively correlated with the SF-36 Mental Health measure (r = .69, p < .001, with higher scores on the SF-36: MH indicating greater health on this measure). Similarly, the LTH: SEH measure was highly and positively correlated with the SF-36: MH (r = .74, p < .001), the LTH: AI measure was highly and negatively correlated with the SF-36 General Health measure (r = -.73, p < .001, with lower scores on the SF-36: GH indicating greater health on this measure), and the LTH: ASA measure was highly and positively correlated with the SF-36: MH (r = .69, p < .001). Other significant correlations (42 comparisons) between LTH and SF-36 were generally moderate in magnitude, ranging from .19 to -.61. This indicates that on the whole, the constructs measured by the two batteries appear to be consistently related, but not to be fully redundant with one another. Specifically, the shared variance between scales on the two batteries ranged from 3.6% to 55%.

The LTH scales also were found to be associated with the optimism, affect, social support, and spirituality measures administered in Study 2, and all correlations were in the expected directions. The correlations between the LTH and the LOT-R ranged from moderate to high (r's of .36 to .66, all p 's < .001). Therefore, the amount of shared variance between these measures ranged from 13.0% to 44.0%. Regarding the correlations between the LTH and PANAS (PA and NA), correlations ranged from low to very high (magnitude of significant r's ranged from .22 to .81, p 's < .001). Of note, very high positive correlations emerged between the LTH: MDH and LTH: SEH scales on the one hand, and the measure of positive affect (PA) on the other. Specifically, PA was

correlated with the LTH: MDH at .78 ($p < .001$), and with LTH: SEH at .81 ($p < .001$). Therefore, the amount of shared variance between these measures ranged from 4.8% to 66.0%. Regarding the correlations between the LTH and MOS-SS scales, correlations ranged from low to moderate (magnitude of significant *r*'s ranged from .21 to .50, *p* 's < .001). Therefore, the amount of shared variance between these measures ranged from 1.7% to 25.0%. Regarding the correlations between the LTH and DSES-S scales, correlations were moderate (magnitude of *r*'s ranged from -.22 to -.50, all *p* 's < .001; lower scores on the DSES-S indicated greater reported experience of spirituality in daily life). Therefore, the amount of shared variance between these measures ranged from 4.8% to 25.0%. Correlations between the established study measures (other than the LTH scales) are presented in **Table 16** and **Table 17**.

Zero-Order Tests of Association Between LTH Scales and Specific Health-Related Behaviors

Zero-order correlations between the LTH scales, and the various health-related behaviors tested in the Prestudy, Study 1, and the present Study 2, are presented in **Table 18**. Some of these correlations (for example, that between LTH: PHP and Exercising) may be inflated due to particular items on the LTH scales that address these same behaviors. These correlations are indicated in italicized type in Table 16. Again, the acceptable significance level for these analyses was set at .001 (though significance values of <.01 are identified in Table 16 as "marginally significant" for review and consideration for replication in future research). On the whole, higher scores on each of the LTH measures were associated in the more healthful direction with self-reports of each of these health-related behaviors (e.g., individuals scoring higher on LTH: SEH

were more likely to report engaging in exercise; $r = .39$, $p < .001$). However, not all scales were found to be significantly associated with all health behaviors. For example, the LTH: MDH was found to be associated with more health-related behaviors (8 of 10 in this sample) than the LTH: AI scale was (4 of 10 in this sample).

Regarding variance accounted for in each health behavior by each scale of the LTH (excluding the conceptually redundant comparisons), generally small proportions of the variance in health behavior was accounted for by these scales. Specifically, the LTH: MDH accounted for 2.9% of the variance in smoking, 2.6% of the variance in getting medical checkups, and 2.6% of the variance in keeping poor hygiene. The LTH: SEH accounted for 15.2% of the variance in exercising, 4.4% of the variance in getting medical checkups, 1.4% of the variance in drinking alcohol, 11.6% of the variance in sleeping poorly, 9.6% of the variance in managing stress, 6.8% of the variance in controlling one's weight, 3.2% of the variance in using safety measures, 16% of the variance in eating nutritiously, and 3.2% of the variance in keeping poor hygiene. The LTH: PHP accounted for 6.3% of the variance in smoking, 3.6% of the variance in getting medical checkups, 12.3% of the variance in sleeping poorly, 2.6% of the variance in managing stress, and 1.4% of the variance in keeping poor hygiene. The LTH: AI accounted for 12.3% of the variance in exercising, 10.2% of the variance in sleeping poorly, 3.2% of the variance in controlling one's weight, and 10.9% of the variance in eating nutritiously. The LTH: ASA accounted for 10.2% of the variance in exercising, 1.7% of the variance in getting medical checkups, 19.4% in sleeping poorly, 2.9% of the variance in controlling one's weight, 1.7% of the variance in using safety measures, and 11.6% of the variance in eating nutritiously. The LTH: AR accounted for 7.8% of the

variance in exercising, 5.8% of the variance in controlling one's weight, and 14.4% of the variance in eating nutritiously.

Multivariate Tests of Association Between LTH Scales and Health-Related Behaviors: Testing Behaviors Identified as Central to Lay Theories of Health

To test the unique associations between the LTH scales and the assessed health-related behaviors, I conducted a series of multiple regression tests involving the LTH scales, the other well-being measures, and any demographic variables which were found to be significantly associated with the health-related outcomes. **Table 19** depicts the initial simultaneous regression tests performed on the demographic variables, predicting health-related behaviors. Significant demographic predictors were included in later multiple regression tests predicting these behaviors.

Table 20 depicts the results of stepwise multiple regressions predicting the health-related behaviors which were identified in items retained for the LTH measure. These behaviors were tested in order to assess whether the associations between the LTH scales and these behaviors remained even when the other well-being and demographic variables were entered into the regression equations. In all these tests, regressions were performed in three steps. In Step 1, the SF-36 scales were entered. In Step 2, the other well-being and significant demographic variables were entered. In Step 3, the LTH scales were entered.

As depicted in Table 20, three of the SF-36 scales were significantly associated with exercising in Step 1. These three SF-36 scales maintained significance in Step 2, and PA also emerged as a significant predictor. In Step 3, the SF-36 scales did not emerge as significant predictors, PA retained significance, and two LTH scales (LTH:

SEH and LTH: PHP) emerged as significant predictors of exercising. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 23%, a highly significant result ($p < .001$). PA was found to be positively associated with exercising ($\beta = .17$, $p < .05$), LTH: SEH was found to be weakly and negatively associated with exercising ($\beta = -.21$, $p < .05$), and LTH: PHP was found to be highly and positively associated with exercising ($\beta = .74$, $p < .001$).

The regression equations testing controlling one's weight revealed that one of the SF-36 scales was significantly associated with weight control in Step 1. This SF-36 scale maintained significance in Step 2, and two demographic variables (being married, and reporting a religious affiliation of "None") also emerged as significant predictors. In Step 3, the SF-36 scales did not emerge as significant predictors, religion of "None" retained significance, and the LTH: PHP scale emerged as a significant predictor of controlling one's weight. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 35%, a highly significant result ($p < .001$). Religion of "None" was found to be negatively associated with controlling one's weight ($\beta = -.28$, $p < .01$), and LTH: PHP was found to be moderately and positively associated with controlling one's weight ($\beta = .47$, $p < .001$).

Regarding sleeping poorly, one of the SF-36 scales was significantly associated with poor sleep in Step 1. This SF-36 scale maintained significance in Step 2, and one additional SF-36 scale, the LOT-R, and the DSES-S also emerged as significant predictors. Additionally, income also emerged as a significant demographic predictor of poor sleep. In Step 3, the two SF-36 scales and the LOT-R remained significant predictors, and the LTH: SEH and LTH: AR scales emerged as significant predictors of

poor sleep. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 19%, a highly significant result ($p < .001$). The SF-36: PF was found to be positively associated with poor sleep ($\beta = .21$, $p = .001$, with higher scores on the SF-36: PF measure indicating more healthy physical function); the SF-36: GH was found to be positively associated with poor sleep ($\beta = .21$, $p < .05$, with higher scores on the SF-36: GH measure indicating assessments of oneself as less generally healthy); the LOT-R was found to be negatively associated with poor sleep (($\beta = -.17$, $p < .05$); LTH: SEH was found to be weakly and positively associated with poor sleep ($\beta = .25$, $p < .05$) and LTH: AR was found to be highly and negatively associated with poor sleep ($\beta = -.60$, $p < .001$).

One of the SF-36 scales was significantly associated with managing stress in Step 1. This SF-36 scale lost significance in Step 2, PA gained significance, and two demographic variables (reporting a religious affiliation of Hindu or of "None") also emerged as significant predictors. In Step 3, the SF-36 scales did not emerge as significant predictors, PA and religion of "None" retained significance, and being married emerged as a significant predictor. None of the LTH scales emerged as significant predictors of stress management in Step 3. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 3%, a nonsignificant result. PA was found to be positively associated with stress management ($\beta = .34$, $p < .01$), being married was found to be negatively associated with stress management ($\beta = -.17$, $p < .05$), and religion of "None" was found to be negatively associated with stress management ($\beta = -.23$, $p < .05$).

Regarding eating nutritiously, two of the SF-36 scales were significantly associated with nutritious eating in Step 1. These SF-36 scales retained significance in Step 2, and no other variables emerged as significant predictors in this step. In Step 3, one SF-36 scale retained significance, and two of the LTH scales emerged as significant predictors of nutritious eating. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 33%, a very highly significant result ($p < .0001$). SF-36: PF was found to be negatively associated with eating nutritiously ($\beta = -.15$, $p < .05$), LTH: SEH was found to be weakly and negatively associated with eating nutritiously ($\beta = -.22$, $p < .05$), and LTH: PHP was found to be highly and positively associated with eating nutritiously ($\beta = .88$, $p < .001$).

Addressing Confounded LTH: PHP Scale Items in Predicting Selected Health Behaviors

It was possible that similarity between certain items on the LTH: PHP scale, and certain health-related behaviors examined as outcome variables in the regression analyses described above, resulted in inflated results (e.g., the LTH: PHP scale emerging as too strong a predictor of the health-related behaviors tested). Therefore, in order to make a preliminary attempt at addressing this question, I recalculated the LTH: PHP scale three different ways and conducted the analyses again. In the first case, in predicting exercise behavior, I eliminated two items from the LTH: PHP scale: "Being physically active" and "Exercising regularly." In the second case, in predicting controlling one's weight, I eliminated one item from the LTH: PHP scale: "Being of normal weight." In the third case, I eliminated five items from the LTH: PHP scale: "Eating a balanced diet," "Eating good foods, such as fruits and vegetables," "Eating properly, according to a doctor," "Having good eating habits," and "Being nutrition-conscious." I also recalculated the

LTH: MDH (total score) scale utilizing these changes. The results of the stepwise regression analyses that I then conducted with these recalculated variables are presented in **Table 21**. These regressions were run in the same manner as those conducted previously, with the exception of including the recalculated variables rather than the variables including all scale items.

I will discuss only the results of Step 3 of each of these equations (as Steps 1 and 2 are identical to above). In Step 3 of the stepwise regression predicting exercising, one SF-36 scale and PA retained significance, the LTH: PHP scale emerged as a significant predictor of exercising (despite the elimination of exercise-specific items from the scale). The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 18%, a highly significant result ($p < .001$). SF-36: GH was found to be negatively associated with exercising ($\beta = -.17$, $p < .05$), PA was found to be positively associated with exercising ($\beta = .23$, $p < .01$), and LTH: PHP was found to be highly and positively associated with exercising ($\beta = .63$, $p < .001$).

In Step 3 of the stepwise regression predicting controlling one's weight, none of the SF-36 scales retained significance, religion of "None" retained significance, and the LTH: PHP scale emerged as a significant predictor of controlling one's weight (despite the elimination of weight-specific items from the scale). The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 9%, a highly significant result ($p < .001$). Religion of "None" was found to be negatively associated with controlling one's weight ($\beta = -.28$, $p < .01$), and LTH: PHP was found to be moderately and positively associated with controlling one's weight ($\beta = .44$, $p < .001$).

In Step 3 of the stepwise regression predicting eating nutritiously, none of the SF-36 scales retained significance, and the LTH: PHP scale emerged as the only significant predictor of nutritious eating (despite the elimination of eating or diet-specific items from the scale). The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 17%, a highly significant result ($p < .001$). LTH: PHP was found to be highly and positively associated with eating nutritiously ($\beta = .62$, $p < .001$).

Multivariate Tests of Association Between LTH Scales and Health-Related Behaviors: Testing Behaviors Not Identified as Central to Lay Theories of Health

Table 22 depicts the results of stepwise multiple regressions predicting the health-related behaviors which were not identified in items retained for the LTH measure. As above, these behaviors were tested in order to assess whether the associations between the LTH scales and these behaviors remained even when the other well-being and demographic variables were entered into the regression equations. In all these tests, regressions were performed in three steps. In Step 1, the SF-36 scales were entered. In Step 2, the other well-being and significant demographic variables were entered. In Step 3, the LTH scales were entered.

As depicted in Table 22, none of the SF-36 scales were significantly associated with smoking in Step 1. Two SF-36 scales emerged as significant predictors of smoking in Step 2, and DSES-S also emerged as a significant predictor. In Step 3, one SF-36 scale and the DSES-S retained significance, and the LTH: PHP emerged as significant predictors of smoking. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 6%, a significant result ($p < .05$). SF-36: BP was found to be positively associated with smoking ($\beta = .22$, $p < .05$, where higher SF-36: BP scores

indicate greater reported physical pain experience), DSES-S was found to be positively associated with smoking (β = .18, $p < .05$), and LTH: PHP was found to be moderately and negatively associated with smoking (β = -.34, $p < .001$).

Regarding getting medical checkups, one of the SF-36 scales was significantly associated with getting medical checkups in Step 1. This SF-36 scale lost significance in Step 2, and two demographic variables (age, and female gender) emerged as significant predictors. In Step 3, one SF-36 scale emerged as a significant predictor, age and female gender retained significance, and two LTH scales emerged as significant predictors of getting medical checkups. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 9%, a highly significant result ($p < .001$). SF-36: PF was found to be positively associated with getting medical checkups (β = .21, $p < .05$), age (β = .26, $p < .001$) and female gender (β = .21, $p < .01$), were found to be positively associated with getting medical checkups, LTH: AI was found to be moderately and positively associated with getting medical checkups (β = -.28, $p < .01$), and LTH: PHP was found to be moderately and negatively associated with getting medical checkups (β = .36, $p < .001$).

In the next analysis, one of the SF-36 scales was significantly associated with alcohol consumption in Step 1. This SF-36 scale lost significance in Step 2, and reporting a religious affiliation of Hindu emerged as a significant predictor of alcohol consumption. In Step 3, Hindu religion remained the only significant predictor of alcohol consumption; none of the LTH scales emerged as significant predictors. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 2%, a

nonsignificant result. Hindu religion was found to be negatively associated with alcohol consumption ($\beta = -.16$, $p < .05$).

In examining using safety measures (such as seat belts), none of the SF-36 scales was significantly associated with safety practices in Step 1. In Step 2, NA and reporting Buddhist religious affiliation emerged as significant predictors of safety practice. In Step 3, NA and Buddhist religion retained significance, and Roman Catholic religious affiliation and LTH: AI emerged as significant predictors. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 4%, a nonsignificant result. NA was found to be negatively associated with safety practice ($\beta = -.19$, $p < .05$), Buddhist religion was found to be negatively associated with safety practice ($\beta = -.17$, $p < .05$), Roman Catholic religion was found to be negatively associated with safety practice ($\beta = -.23$, $p < .05$), and LTH: AI was found to be weakly and negatively associated with safety practice ($\beta = -.27$, $p < .05$).

In the last of these analyses, one of the SF-36 scales was significantly associated with keeping poor hygiene in Step 1. This SF-36 scale retained significance, and an additional SF-36 scale emerged as a significant predictor of poor hygiene in Step 2, along with the DSES-S and Black/African-American racial group membership. In Step 3, one SF-36 scale retained significance, as did Black/African-American racial group membership. None of the LTH scales emerged as significant predictors of poor hygiene. The addition of the LTH scales in Step 3 resulted in an increase in variance accounted for of 2%, a nonsignificant result. SF-36: PF was found to be negatively associated with poor hygiene ($\beta = -.28$, $p < .01$), and Black/African-American racial group membership was found to be positively associated with poor hygiene ($\beta = .25$, $p < .001$).

Correlations Between Predicted and Actual Profile Ratings Testing Lay Theories Items

Mean healthiness and unhealthiness ratings were calculated for the 5 fictional profiles rated in Study 2. Consistent with previous research indicating that healthiness and unhealthiness should be measured as separate constructs (Millstein & Irwin, 1987), correlation tests of means of each profile indicated that the healthiness and unhealthiness ratings were significantly and negatively correlated with one another (*r*'s ranged from -.59 to -.69, all *p*'s < .001). However, the strength of these associations was not at an extremely high level (e.g., *r* >.80) which could have been interpreted as a reciprocal relationship between the healthiness and unhealthiness ratings. The correlation test of the predicted and actual health ratings of each profile indicated an extremely strong positive association ($r = .99$, $p < .001$). This correlation is depicted in **Figure 2**. A similar test of the profile unhealthiness ratings could not be performed (as the "unimportance" of each of the Prestudy items to lay theories of health were not assessed in Study 1, no predicted unhealthiness ratings could be calculated).

Discussion

The final stage of this project revealed several interesting differences between past findings regarding what comprises lay theories of health, and what content appears to be most important to lay theories of health at the present time. Furthermore, the present results indicate that there may be utility in compiling these ideas (essentially verbatim from lay participant responses) into a measurement instrument whose potential validity appears worthy of continuing assessment. The present study also resulted in various findings regarding specific health behaviors, which beg further discussion in relation to existing knowledge about health-related action.

Creation of the Lay Theories of Health Inventory, and its Correspondence to the Biopsychosocial Model

Factor analysis of the 95 Prestudy items revealed a complex underlying factor structure, with 16 factors achieving eigenvalues after orthogonal rotation of greater than 1. Seven factors with eigenvalues greater than 2 were retained (due to questionable replicability of the remaining factors, which each accounted for very small proportions of the sample variance), five of which were interpretable based upon the content of their corresponding items. These were labeled as (in descending order of percentage variance accounted for) Social-Emotional Health, Positive Health Practices, Absence of Illness, Absence of Stress and Anxiety, and Adequate Rest. A total score, labeled Multidimensional Health, was also proposed. Future studies utilizing confirmatory factor analysis (CFA) will be needed in order to determine whether retaining a multifactorial structure is most appropriate, or whether lay theories of health might be best measured with a single scale containing all items (this will be an important question to address in future research with this measure, given the high correlations between subscales in this study).

What is immediately obvious from reviewing the items corresponding to the five health dimensions is that together, they appear to present a fair representation of Engel's (1977) concept of the biopsychosocial model of health. Quite interesting in relation to his model is the fact that in this study, the "psychosocial" portion of the concept appeared very important to lay theories of health. Items representing psychological concepts (such as being mentally active, having a sense of purpose, being optimistic, and having respect for oneself) and descriptions of social functioning (such as having healthy relationships

with others, loving people, and being socially well-adjusted) not only appeared frequently in responses to open-ended questioning about health, but also were sufficiently and consistently correlated with one another as to emerge as a latent factor of health. However, the "bio" portion of the biopsychosocial model was also represented by an equivalent number of items, as various physical states and behaviors were described and supported by a number of laypeople in various stages of this project. It is also apparent from examining these dimensions of health that the World Health Organizations's description of health as being "not merely the absence of illness" (World Health Organization, 1948) appears to be quite correct in the minds and experience of everyday people.

The complexity of concepts exhibited in this project has not been uncovered in previous studies of lay theories of health; while each of these concepts has emerged in at least one past published study (e.g., Arcury, Quandt, & Bell, 2001; Calnan & Johnson, 1985; Furnham, 1994a, 1994b; Furnham, Akande, & Baguma, 1999; Millstein & Irwin, 1987), they have not yet appeared together, and have not been uncovered through the present bottom-up methodology utilizing fairly large samples. One may wonder about the appropriate way to explain the complexity of content of lay theories of health as examined in this study. As the present study differed in several ways from past efforts to learn how everyday people think about health, the actual reason for the difference must be left to speculation. However, each of these differences might be a contributing factor to the present findings.

Regarding the present methodology, efforts were made to initially recruit a fairly large and demographically varied sample of participants, who might have varying contact

with different sectors of the American health care system, to canvass for their ideas about health. This initial sample, while falling short of the desired level of nationally-representative diversity, was still more varied in terms of age, race, and socioeconomic status than other studies have examined. This sample diversity may have led to greater variety in the initial item pool for later judgment than a less-diverse sample might have generated, or than might have been generated by an expert working in a particular health-related field. While diversity of ideas was most important in the Prestudy, commonality of ideas became most important in the latter stages of the project – therefore, the decreased level of diversity in sampling demographics in Studies 1 and 2 was acceptable for this project. That is, though the results of Studies 1 and 2 are less generalizable than the results of the Prestudy (due to relative sample homogeneity – though the web-based recruitment still resulted in greater geographic and age diversity than is often involved in studies of similar size to the present one), this lessened generalizability is acceptable given the statistical approaches of Studies 1 and 2. Even when seeking commonality of ideas, however, concepts consistent with multiple facets of the biopsychosocial model emerged. This seems to indicate that there is agreement (at least among largely White, middle-class, fairly educated Americans) that the biopsychosocial model is widely accepted in the public as representing health well.

Another difference in this study from previous studies of lay theories of health was the consistent use of lay language to describe health. That is, wherever possible, the actual phrases provided by study participants appeared for judgment in later studies (as recommended by Furnham, 1988). Using lay language may have made items representing multiple dimensions of health more comprehensible to later study

participants, resulting in the retention of concepts which might have been eliminated in past research. It was clear from earlier in this project (Study 1b) that differences do exist between the ideas of laypeople and experts; in fact, of the 10 items that would have been eliminated from the item pool had expert ratings been the deciding factor, 5 of these actually ended up being included on the final layperson-based measure.

As already noted, the present project also utilized a progressive approach to determining dimensions of lay theories of health, differing from previous research in this area. One strength of this approach is that as a large number of laypeople first offered their thoughts "off the top of their heads," and then had those concepts judged and refined by other individuals, the problem of assigning too little or too much importance to any particular item or participant may have been avoided. That is, we can presume that Participant X, who may have voiced 9 medically-related terms and 1 socially-related item in response to open-ended questioning, did not overweight the final item set towards a medical dimension – such a dimension was only able to emerge if sufficient numbers of other participants also supported its accuracy and utility. While some researchers support the use of direct cataloguing of words and parts of speech as indicators of implicit meaning (e.g., Slatcher, Chung, Pennebaker, & Stone, 2007), this approach may risk over- or undervaluing concepts based solely on frequency of usage by each individual (e.g., limited within-person variability). Therefore, in the present project, multiple dimensions of health emerged from the aggregate, which we can believe are not falsely diverse – these dimensions can be seen as (at least initially) fairly representing lay concepts of health.

Lay Theories of Health Cover a Broad Spectrum of Functioning – and Psychological Concepts

Clearly, in reviewing the items which comprise the Lay Theories of Health Inventory (LTH), a broad range of specific behaviors and experiences appear to comprise lay theories of health. In a review of the constructs receiving the most attention in health psychology, Baum & Posluszny (1999) identified stress, diet, exercise, and emotional states as being consistently viewed as strongly related to individual health and illness experience. Each of these was echoed in the final LTH measure, indicating that most laypeople appear to be aware of the strong impact that these factors can have upon health. However, the relative importance of these factors seemed to differ in the minds of laypeople and experts; specifically, health psychology as a field places stronger emphasis on physical states than subjective emotional ones (a reverse pattern from what was found in the present study). Perhaps this is because laypeople are less aware of the complex physiological mechanisms that are activated by stress and emotions than experts are (Baum & Posluszny, 1999), and/or stress and emotions might factor more heavily into how people assess how they "feel" than physical states do (Andersen & Lobel, 1995).

Regarding the Social-Emotional Health scale in particular, a great number of other psychological constructs appear to be included in this factor, many of which have been reliably assessed by other measures (e.g., "Enjoying life" and "Being satisfied" appear to be similar to items on Diener's Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985); "Hopeful" and "Not anxious" correspond to Positive and Negative Affect on Watson, Clark, and Tellegen's (1988) PANAS). Some may see this as a weakness of this measure, particularly because constructs which have been shown in

earlier studies to be distinct from one another, were ultimately classified together in the present factor structure. However, this result could actually have been fully expected, as it has been suggested that lay theories tend to be more descriptive (content-oriented) and less explanatory (process-oriented) than explicit theories (Furnham, 1988). That is, the blending of (presumably) distinct constructs in descriptions of phenomena provided by laypeople, may occur because sets of these constructs might be experienced similarly by laypeople (and not because they can be found to function differently under different circumstances).

In the present case of Social-Emotional Health, the broad commonality may be that all of the items that reflect this latent factor are positive cognitive-emotional experiences. In addition, that particular similarity may be more salient to laypeople than any fine distinctions between the individual experiences which represent that factor. Therefore, the (seemingly mixed) content of the Lay Theories of Health Inventory scales may be a function of how many laypeople do not have reason make fine distinctions between social, emotional, and psychological experiences. This calls into some question whether the approach of many researchers in these areas might (at least to a degree) be thought of as an exercise in "splitting hairs," particularly when laypeople are completing several of the existing inventories of positive experience simultaneously. The present research is hardly sufficient to answer such a question, but it does raise the interesting issue of whether choosing to study concepts which are somewhat broader might actually help researchers better approximate the thought processes of everyday people (if that is the desired goal).

An example of studying a construct with this sort of conceptual breadth was recently conducted by Markus, Ryff, Curhan, and Palmersheim (2004). These researchers took a qualitative approach to the study of what well-being means in the middle years of the lifespan (e.g., ages 40 to 59). They conducted interviews with a selected group of 83 participants in a larger study of well-being (the MIDUS, or Midlife in the United States, national survey). In questioning participants about what well-being means at different times of life, and in different life domains, the authors classified participant responses into several general categories. These were identified as *Relations with Others*, *Health, Family, Enjoyment, Financial Security, Self, Job, Faith, Peace and Satisfaction, Positivity,* and *Not Materialism*. The authors did not explicitly acknowledge the potential empirical problem of measuring each of these various categories in a meaningful way (given that each is complex and measured by numerous psychometric instruments). However, they emphasized that one benefit of conducting broad, open-ended research is to "suggest ways to expand current theories by incorporating newly recognized components of well-being" (p. 315), particularly in regard to constructs which have varying importance to different cultural groups. That is, they recognized the differences between what emerged from their qualitative data, and what had already been included in measures of psychological well-being (e.g., the Scales of Psychological Well-Being; Ryff, 1989; Ryff & Singer, 1996), and gave voice to the possibility that expanding their measurement instruments to reflect how everyday people experience well-being might be a worthy endeavor. In the present project, the issue of adding or changing dimensions of health will be an ongoing effort as well, and (hopefully) will encourage

other researchers to externally validate their instruments through assessing lay theories on various constructs.

Some Psychometric Considerations of the Lay Theories of Health Inventory

Inherent in the approach of the present study is the assertion that lay theories can not only be uncovered and measured by experts, but also that the descriptors that represent those theories in the minds of laypeople can themselves be used to measure the lay theories of other laypeople. While this particular question remains far from being fully answered, there is at least preliminary data in Study 2 to support this approach. This support comes in two forms in this project: first, from the correlation tests of the relationships between each health dimension of the Lay Theories of Health Inventory, and other established well-being measures; and second, from the correlation tests of the relationships between predicted and actual healthiness ratings of profiles of fictional individuals.

In the first case, it appears that the LTH scales relate in predictable ways to other measures of well-being. For example, individuals who reported experiencing greater overall health (on the SF-36) also reported greater multidimensional health on the LTH, as greater endorsement of health on all five of the LTH factors (specifically, greater social-emotional health, engaging in more positive health practices, experiencing less illness and stress/anxiety, and getting better rest). Different scales on the LTH also showed different strengths of association with various other measures of well-being (e.g., relationships between LTH scales and optimism varied from .36 to .66, with the lowest associations between optimism and absence of illness, and the highest associations between optimism and social-emotional health). Findings such as these reveal no severe

deviations from what might be expected, given the interpreted meaning of each LTH factor, and help to support the initial validity of the measure. Such findings also indicate that the items on the Lay Theories of Health Inventory appear to be at least as meaningful to lay respondents as items on other measures are, and that they appear to have initial construct validity relative to their identified factors. At the same time, the shared variance between each dimension of the LTH and each other measure utilized in this survey rarely became so high as to become potentially problematic; that is, the overlap between measures as indicated by shared variance did not exceed 66% (this occurred between Social-Emotional Health from the LTH, and Positive Affect from the PANAS). Most other pairwise analyses of shared variance resulted in much lower values, while still being in the predicted directions. This kind of result is often reported as evidence of discriminant validity between new scales and existing measures of similar constructs.

In the second case of support for the assertion that lay-generated descriptors could be used fruitfully to measure the health of everyday people, Study 2 found a remarkably high positive association between predicted ratings of the health of fictional people (based upon the Study 1 importance rating data) and the actual layperson-provided ratings of those fictional people. Specifically, the more a fictional individual was described as having the attributes of a healthy person (provided in the Prestudy and rated as important in Study 1), the more that person was judged as healthy by a subsequent sample of laypeople. Furthermore, there was a nearly 1-to-1 correspondence in this study between increases in number of healthy attributes, and increases in rated health. This occurrence seems best interpreted as indicating that certain items generated in the Prestudy may be widely agreed-upon as characteristic of healthiness in the minds of

laypeople. This kind of analysis is not often done in studies of various psychological constructs (e.g., generating fictional profiles with varying correspondence to what is measured as ideal by a particular instrument), but has been performed with greater complexity than in the present study (e.g., Sternberg, 1981) and been asserted to be a useful means of validation of everyday descriptions of a construct.

Much future research will be needed to further examine both the reliability and validity of the LTH measure (e.g., the internal consistency of the LTH could not be seen as truly supported by this study, given that items were chosen for each scale based upon their high correlations with one another). Future examinations of the internal consistency, test-retest reliability, and factor structure of the LTH will be needed before this measure can be considered reliable; similarly, the broad approach of the measure necessitates that it be tested alongside a great number of other well-being and illness-focused measures before its validity can be seen as supported. Furthermore, refinements of the measure (or even alternate forms, perhaps) may need to be constructed as more participants from various demographic and cultural groups are studied in regard to their lay theories of health (see, for example, Furnham, Akande, & Baguma, 1999; Williams, 1973). A proposed format and wording for administration of the LTH in future studies is provided in **Appendix F**.

Cultural differences in particular may prove to alter the factor structure of the LTH in interesting ways. One example of such a difference might conceivably be found in studying larger samples of participants of Asian cultural heritage. Such populations have been widely described as more *collectivistic*, or more apt to define the self relative to one's social group membership and participation, than Whites are (Markus &

Kitayama, 1991). Also, Asians have been found to report higher levels of pessimism than Whites report (Chang, 1996a, 1996b). Relative to lay theories, then, a factor analytic study of the lay theories of health of Asian people could result in a dividing of the Social-Emotional Health factor into two separate factors: one possibly reflecting devotion to others and social engagement, and the other reflecting internal cognitive or emotional experience. Though this might at first blush appear counterintuitive, further thought reveals the plausibility of the notion that social engagement and positive emotion could actually be less correlated with one another in an Asian sample than in a mostly-White, Western sample. In the present study, it appears that individuals who saw themselves as engaged with others "automatically" reported more positive emotional experience; however, a more collectivistic (Asian) sample might actually report relatively more negative internal experience with increasing social engagement (due to, perhaps, greater anxiety about disappointing valued others). In addition, the actual content and wording of the items that would withstand the repeated testing of the present approach might be quite different when generated by an Asian sample than in this study; such an occurrence might also be the case with samples of different ages (e.g., Millstein & Irwin, 1987) and educational levels (e.g., Calnan & Johnson, 1985).

Smoking: A Notable Omission from the Lay Theories of Health Inventory

As noted above, the LTH measure appears to be fairly comprehensive in its coverage of a variety of important health behaviors. However, it was surprising to find that "Does not smoke," an item that was rated as quite important to laypeoples' ideas of what it means to be healthy (9.18 on a 1-11 scale), did not emerge on any of the health dimensions uncovered in the Study 2 factor analysis. During the Prestudy, items which

were very similar to this item (e.g., "Being a nonsmoker," "Not smoking," and "Does not smoke cigarettes") appeared dozens of times in each of the five samples. During experimenter ratings of unique items, there was no dispute about combining these various phrasings into a single item, particularly because not a single Prestudy participant described ideas about "occasional" or "moderate" smoking as being characteristic of a healthy person. That is, every one of the many participants who included a mention of smoking stated that total abstinence from smoking is the only degree of usage that can be seen as healthy (unlike with, for example, alcohol usage).

From these initial indicators, it seemed safe to assume that this item would be included on the LTH measure; and yet, it was not. Given overwhelming scientific evidence that smoking is extremely dangerous, both to cigarette users and to those inhaling their secondhand smoke (World Health Organization, 2002, as cited in Vogt, Hall, & Marteau, 2005), this is an unsettling finding. Why would abstaining from smoking not emerge on the LTH measure? The most likely explanation is that the very skewed distribution of responses regarding individual engagement in smoking behavior prevented this item from correlating sufficiently with other item sets to load on any of the identified factors. Specifically, of the 309 individuals in Study 2 who responded to the question of how often they smoke, 193 responded that they "never smoke," and another 39 responded that they smoked as often as "sometimes." Only 67 individuals (21.7% of the sample) indicated that they smoked at the high end of the scale (indicating "frequent" or "very frequent" smoking). However, given that cigarette usage has been found to correlate with reduced engagement in a number of other health-promoting behaviors (Schoenborn & Benson, 1988), it likely that smokers and nonsmokers responded

differently to the rest of the items entering the factor analysis. That is, the smokers may have been more consistently unlikely to engage in the other health behaviors than the nonsmokers were (e.g., engagement in other health behaviors might have been more normally-distributed among nonsmokers than among smokers). Given the significant relationship between higher scores on the LTH-PHP scale and reduced smoking (controlling for multiple other variables), along with the Prestudy and Study 1 data indicating that laypeople do see refraining from smoking as healthy, adding the "does not smoke" item to the Positive Health Practices scale of the LTH should be considered in future research. As studies have found that the major motivator for initiating quitting smoking appears to be personal health concerns (McCaul et al., 2006), this change in the LTH measure may prove valuable.

Potential Predictive Validity of the Lay Theories of Health Inventory

Returning to the general question of whether using lay language to measure lay theories of health is a useful approach, it is telling that in the present study, scales utilizing lay-generated items appeared to be associated with self-reports of a number of specific health behaviors. These findings raise the question of whether the LTH, like many other well-being measures, might actually be used to predict such outcomes. Though true predictive validity can only be shown in a prospective study (and preferably in several replications of a successful prospective study; Kazdin, 2003), there are indications in the present study that further work with the LTH may be fruitful. Participants who reported greater multidimensional health on the LTH, for example, also reported somewhat less smoking, getting more medical checkups, and keeping better personal hygiene than those individuals reporting less multidimensional health (findings

unconfounded by scale content, as items measuring these behaviors did not appear on the final measure). Even when the many other well-being and demographic measures of Study 2 were included into stepwise regression tests predicting these behaviors (and when confounding items were eliminated from the LTH scales, if needed for the sake of analysis), LTH scales often emerged among the group of significant predictors of various health-related behaviors. The true test of the external validity of the LTH measure, however, will be its ability to prospectively predict objectively-measured health outcomes in each of the dimensions of health it identifies. For example, a longitudinal study linking higher scores on the LTH-Positive Health Practices scale (indicating greater engagement in a specific set of health practices) with decreased mortality rates would be strong evidence for the external validity of this scale. As the ability of the LTH measure to predict health-related behavior and health self-appraisal on multiple dimensions was a central goal of the present research, various findings regarding the health behaviors included in this project will be further examined in the General Discussion.

Chapter VI

General Discussion

The main objectives of the research avenues here undertaken were to determine the content and structure of lay theories of health using participant-focused research methods, and to compile the most statistically reliable descriptors of those theories into a viable psychometric measure for use in research and clinical settings. In the *gestalt*, the present project might be evaluated as representing a useful beginning to this new area of research; however, the scope and number of questions to be investigated relating to lay theories of health are far too numerous to address in a single project (Hughner & Kleine, 2004). For if lay theories function as they are theorized to function (e.g., Furnham, 1988; Lim, Plucker, & Im, 2002), then may they represent a "pipeline" through which all health-related information is processed, both into and out of the individual cognitive system. The challenge in this area of work, of course, is grappling with the limits of individual minds to reflect accurately on their own systems (for a review, see Wilson & Dunn, 2004) – this is akin to asking an artist how he or she observes and processes wavelengths of light to reproduce desired colors on the canvas, or inquiring of a jazz percussionist how he or she perceives and anticipates specific sound waves in order to support and mold the pianist's improvisations. We can only know so much about our own mental states and processes. However, this fact has not stopped researchers in all disciplines of psychology from asking important questions of individuals, and by doing

so, uncovering useful answers. Therefore, limited as this mapping of lay theories of health may be, it remains an offering worthy of further examination.

Shifting Emphases on Various Dimensions of Health at Each Stage of the Current Project

One interesting general characteristic of the arc of the present research has been the observed shifts in which specific health dimensions were most heavily emphasized in each study. For example, the findings of the Prestudy appeared to indicate that the ideas of laypeople about health (in general) were most similar to their ideas about physical health (based upon correlating frequencies of occurrence of identified items from open-ended item responses). This emphasis has in fact been assumed by previous researchers investigating lay theories of health. For example (and as already elucidated above), far more research has been conducted in the service of investigating lay theories of mostly physical illnesses (e.g., Antonovsky, 1972; Ben-Sira, 1977; Bishop, 1987; Furham, 1988; Klonoff & Landrine, 1994; Lau & Hartmann, 1983; Leventhal, Meyer, & Nerenz, 1980; Martin et al., 2002; Searle & Murphy, 2000; Skelton & Croyle, 1991) than of investigating lay theories of health (e.g., Andersen & Lobel, 1995; Arcury, Quandt, & Bell, 2001; Bailis, Segall, & Chipperfield, 2003; Calnan, 1987; Millstein & Irwin, 1987).

However, the Prestudy in the present project not only revealed high item correspondence between responses to the "healthy" and "physically healthy" survey questions, but also between the "healthy" and "mentally healthy" survey questions. Indeed, in three of the five Prestudy samples, the strengths of correlation between frequencies of lay-generated items describing health and physical health, and between frequencies of lay-generated items describing health and mental health, were nearly equal

(in the case of the Mental Health group, actually slightly – though not significantly – higher in regard to similarity between health and mental health).

As the project proceeded through its outlined steps, issues pertaining to mental health clearly remained quite important (Study 1) and central to health (Study 2). In fact, items reflecting psychosocial experiences correlated strongly with one another, as a large proportion of the initial variance in the data set could be accounted for by the latent factor represented by these items. Therefore, it could be that social-emotional health is indeed the most accurate overall representation of lay theories of health, with positive health practices (and the other uncovered dimensions) representing lay theories of health less well. Alternatively, the finding that a large portion of the variance in the Study 2 data could be accounted for by examining Social-Emotional Health might be as validly explained by the fact that individual behaviors are often far less internally-consistent than reported attitudes are, particularly when it comes to health behaviors (Taylor, 2002). That is, positive health practices might have emerged as *more* central to lay theories of health, were it the case that people's health-related *behavior* tended to be as internally-consistent as their *belief systems* are. A recent national survey released by the U.S. Centers for Disease Control indicated that nearly 2/3 of adults surveyed indicated believing that their health was "*Excellent or Very Good*." Examining selected health behaviors, however, indicated that this self-appraisal does not necessarily match up to reported behaviors; 20.2% of the sample reported being regular smokers, and 61.6% of the sample reported that they *never* engaged in vigorous leisure-time physical activity lasting at least 10 minutes (Pleis & Lethbridge-Cejku, 2006). Though multifactorial analyses of this data were not reported in this study, these two percentages alone make it

mathematically likely that a very small percentage of people engage regularly in *all* of the health-promoting behaviors identified in the present study. Therefore, it is difficult to determine whether social-emotional health is actually seen by laypeople as the most important dimension of health, or whether that conclusion only emerged from the data as a consequence of significant inconsistencies in the health-promoting qualities of individual health-related behavior.

Regardless of this difficulty in interpretation, it was clear from this study that mental health maintains a significant place in lay theories of health. The inclusion of mental health as a concept central to overall health has not been acknowledged as widely by health professionals and researchers as physical health has (Engel, 1977). This finding serves at least two important purposes for continuing work in the field of lay theories of health. First, it reminds us that mental health is indeed "on the minds" of everyday people when they think about their health experiences. Therefore, health decisions are very likely not influenced only by what is physically optimal, but also by what is mentally/emotionally (and socially, apparently, from other findings in the Prestudy) optimal (Baum & Posluszny, 1999). Second, the findings of the Prestudy advance the recommendation that beginning from the "bottom up," (that is, with basic questioning of individuals from the population of interest) can reveal phenomena beyond the assumption realm of experts. This second observation returns us to the question of who the authority on defining health is; apparently there are cases when such authorities (knowingly or unknowingly) demote the importance of certain experiences, and promote others. The questions which follow from that assertion extend beyond the scope of this project - even beyond the usual purview of psychological study. For example, changes in

public health policy, health insurance parity issues, and issues of political power and inequality (and other such questions which have real consequences for health consumers) begin to become salient when assumptions about who has the authority to define health in the United States and globally are reconsidered.

General Correspondence to Research in Various Disciplines on Lay Theories of Health

Though a number of researchers have used the term "lay theories" to describe their foci of research, the methodologies and findings involved in these endeavors have varied greatly (Lawton, 2003). Psychology, sociology, and medical anthropology have all approached the topic from somewhat different standpoints, and have resulted in varying conclusions which have yet to be adequately bridged. However, the findings from the present project can be compared to general themes which have emerged from recent reviews of interdisciplinary work in the area, particularly in the analysis performed by Hughner and Kleine (2004). These researchers identified 28 articles from the years 1983-2003 in various fields which investigated lay theories of health in largely healthy populations. Several of these studies focused on elderly populations, and several took place in Western Europe; a handful were analytical reviews of other literature in the same area. The authors identified 18 themes which they felt captured the foci of the studies they reviewed. They then classified these themes into 4 categories: definitions of health, explanations for health, external and/or uncontrollable factors which impinge on individual health, and the place health occupies in people's lives.

As the present project examined definitions of health, I will elaborate on these relative to our findings. Hughner and Kleine (2004) first identified the theme of health being defined as the *absence of illness*. This theme was clearly represented in the present

project, as many individuals included variations on the phrase "not sick" in the Prestudy data; ultimately, the concept did indeed persist through each stage of the project to comprise a scale on the LTH. Regarding the meaning of the theme, Hughner and Kleine cite several studies which focus on physical ailments as interfering with health, and thereby proclaim this concept to "mirror the biomedical definition of health [and] the prevalent professional paradigm that laypeople in these studies encountered" (p. 406). However, these authors seemed to have trouble fully reconciling the findings of various studies on this theme, as certain studies they examined emphasized a state of *enjoying* being unimpeded by illnesses (e.g., as when one experiences recovering quickly from minor ailments), while others emphasized a state of *unconcern about, or indifference to, one's physical state,* which indicated health (e.g., as when one does not "feel unhealthy," and therefore is experiencing health).

The present research may have provided some initial clarification of the meaning of this theme, as the Prestudy items which endured validation all could be thought to correspond to the second interpretation of this theme. That is, no mention of experiencing minor ailments, however briefly, sustained through to inclusion on the LTH measure (though such items were present in the Prestudy data, and even were entered into the factor analysis in Study 2). Instead, all indicate that health involves a total absence of illness. This does not preclude the fact that individual judgments of one's own health are an integral part of identifying the self as ill (Bailis, Segall, & Chipperfield, 2003); in fact, this is a more inclusive definition of health, because the authority to define oneself as being free from illness is entirely open to individual interpretation. That is, if the LTH measure (for example) included an item tapping one's ability to recover from "minor

ailments," certain individuals who do not believe any ailments to be "minor" might obtain scores which do not correspond well to their actual theories on health.

A second theme identified in the Hughner and Kleine (2004) article was that health is *being able to carry out daily functions*. This "functional view" of health included experiences such as being able to work, take care of one's family, or simply "getting through the day." From surveying the LTH measure, one might judge that the closest the LTH items seem to come to approximating this idea appears on the Social-Emotional Health scale. Actions such as "loving people," "having healthy relationships with others," and "being engaged in life" imply a functional aspect, but the idea of *being able* to do these things did not appear in the LTH measure. Rather, each of these is identified as a personal characteristic, almost with the implication that one either "has" or "does not have" each.

This finding, interestingly, recalls the work of Dweck and colleagues (e.g., Dweck & Leggett, 1988; Levy & Dweck, 1998) on implicit theories of personal characteristics. That is, the incremental theorist, when considering functional aspects of health, might focus on one's ability to perform various roles given the present context. Therefore, if one is "unable to love people" (for example), then the incremental theorist may consider that a state which can undergo change and improvement with personal efforts in goal pursuit. However, having varying degrees of the quality of "loving people" seems to imply the approach of the entity theorist, and (therefore) little might be able to be done to make oneself more of a "person who loves people."

As the wording of each item was retained from actual participant responses in the Prestudy, and then supported by later participants, it may be that participants in these

samples actually do think of health more as entity theorists than as incremental theorists. Some recent research has found that individuals appear to have little trouble classifying specific health behaviors (such as exercising, flossing one's teeth, and others) into being prototypical of certain personality traits (e.g., responsible vs. adventuresome) (Pease, Brannon, & Pilling, 2006), consistent with entity-type thinking. The unfortunate implication of this is that laypeople may have a tendency to set performance goals for themselves, rather than mastery goals, in attempts to improve their own health. For example, rather than focusing on mastering the ability to jog safely and with good physical form (regardless of distance traveled) to experience themselves as focused on learning to exercise, people may tend to set performance goals of running several miles to prove they are "athletic." This is deeply worrisome, as any perceived failure in athleticism may be ascribed to unchangeable aspects of the self, and result in abandonment of the goal. Research studies on implicit theories have indeed identified this particular issue (Kasimatis, Miller, & Marcussen, 1996; Li, Harrison, & Solmon, 2004; Ommundsen, 2001).

Unfortunately (in this case), the human experience of health or disease is greatly impacted by individual behaviors and choices (Baum & Poslszny, 1999), so abandonment of positive health goals is the last outcome desirable as the U.S. population ages and suffers more frequently from behavior-related illnesses. As health in this study was found to include many social and emotional features as well as physical ones, there is also the possibility that laypeople hold entity theories with regard to their own mental health, an equally troubling idea. One unhappy consequence of this possibility is that

entity theorizing about mental health would be likely to become more deeply cemented as mental health declines (e.g., learned helplessness theory; Seligman, 1975).

There is a possibility, however, of testing the LTH measure such that a greater incremental theory orientation could be addressed. That is, respondents were asked to rate their agreement with how much each item on the scale described them (ranging from *very much like me* to *not at all like me*), which could be argued to be more consistent with entity (vs. incremental) theorizing about lay theories of health. In future studies, the framing of the rating task could be systematically varied to address incremental theorizing about lay theories of health, perhaps by asking people to indicate how "able they currently are to experience or engage in each of the following" (with responses from "*completely able*" to "*completely unable*", for example). In such studies, questions such as whether having entity or incremental theories about health predicts various health outcomes, and whether completing measures framed in particular ways impacts reports of other variables, or engagement in other behaviors (Schneider, 2006) could be usefully addressed.

A third theme identified by Hughner and Kleine (2004) was termed *equilibrium*. This describes health as being "characterized by happiness, relaxation, feeling strong, and having good relations with others…[it] includes one's outlook and state of mind…a positive state of well-being [that is] extremely important in one's life" (p. 407). Proper exercise, healthy diet, adequate rest, and appropriate mental stimulation were also identified as being contained in the equilibrium conceptualization of health. The authors observed that previous research on this conceptualization of lay theories of health

endorsed the importance of maintaining these various factors in a positive balance with one another.

Regarding the present project, the overall content of this conceptualization of lay theories of health appears to map very well onto our findings. It is interesting, as well, that the term "balanced" was produced by multiple individuals in every sample of the Prestudy; and that this term alone did not emerge on any particular scale of the LTH (perhaps due to roughly equivalent correlations with items on all the other scales). "Having a balanced life" was the one item which did receive sufficient importance ratings to enter the factor analysis stage of the project, but it was found to load nearly equally on Factors I and II (at or very near .40 on each factor, a benchmark often used in studies using exploratory factor analysis to include items on a factor).

Though the idea of health as involving a balance of several positive characteristics identified by Hughner and Kleine (2004) is echoed in our study, one unanswered question involves these authors' contention that this view of health is more prevalent among upper socio-economic classes. The authors reviewed sociological research to come to this conclusion, but research methods often used in psychology could also be brought to bear on the issue. As far as the results reported here are concerned, this very important question cannot be addressed, as individuals of White, higher-SES, higher-education backgrounds were overrepresented in the online samples. However, some data from the present project could be examined for preliminary answers to the question. For example, the frequencies of occurrence of the LTH items could be determined for participants from each of the five Prestudy samples, and tested for relationships with their race, income, or education (or some combination of variables representing social class). If frequency of

occurrence of the LTH items appeared more frequently among people reporting minority racial status or higher SES, this would be further validation of the contention that "positive" views of health seem to be associated with upper-SES White culture. This would also reinforce the need to specifically target more diverse populations in future studies of lay theories of health, and being open to altering the LTH to accurately represent those ideas. This would not be simply an academic exercise; rather, it is very important that any meaningful differences in the lay theories of various demographic groups be uncovered. Given many deeply unfortunate examples in the history of American medicine of individuals of minority groups being abused by the medical establishment (e.g., the Tuskegee Experiment), lay theories of health of minority groups may be composed of very different elements than those of majority individuals.

A fourth theme to emerge from the Hughner and Kleine (2004) review was the health was described by laypeople as *freedom*. That is, to be healthy is to be unrestricted, self-directed, autonomous, and ultimately in control of one's own destiny; this has been theorized as a key aspect of psychological well-being (Ryff & Singer, 1996). In the Prestudy, a number of individuals provided responses that seemed to fit with this theme. For example, three participants described health as "being able to do whatever you want," "not having restrictions," and even "being able to eat what you like without worrying about getting sick." However, none of these statements were supported in Study 1 (and therefore were not included in the final LTH measure). Hughner and Kleine (2004) reported that this theme seemed to emerge in the same studies that identified health as a state of equilibrium (and therefore presumably among upper-SES individuals). However, there would seem to be reason to question this speculation on the part of these authors.

For example, previous research on rumination, or the tendency to engage in repetitive thinking about the experience, causes, and consequences of one's own symptoms (Nolen-Hoeksema, 1991), has been found to be more common among individuals who reported a greater need to understand a given situation, who reported that a situation was personally important, and who tended to use other cognitive strategies of analyzing a situation for possible causes and meanings (Watkins, 2004). Thus, it would seem that those individuals to whom issues about health are less comprehensible, and more important, might be more likely to ruminate on their physical or psychological state – that is, seeking to attain or understand what they don't believe they possess, but deeply desire. In considering the possible effects of SES or education on the likelihood to imagine healthiness as freedom, therefore, it seems that those populations who are more likely to experience a wide range of physical and psychological ailments (e.g., lower-SES populations) might actually be more likely to hold idealizing concepts of health. That is, disadvantaged persons might see health as a "magical" state of freedom, where one's worries, pains, and limitations are removed, while individuals of higher SES (such as those in the present study, who experience fewer problems on average) are less focused on this theme. Clearly this is an issue worthy of further investigation. It should also be noted that the idea of autonomy as an indicator of health appears to be a culture-bound notion, endorsed in individualistic cultures but downplayed in collectivistic cultures (Markus & Kitayama, 1991).

The fifth and final theme on the definition of health identified by the Hughner and Kleine (2004) review involved the idea that health represents a form of social control; that is, maintaining one's health becomes a *constraint* upon personal liberty and choice.

For example, individuals espousing this view stated that seeking to better their own health resulted in their feeling dehumanized, or like contemptible" lower animals only seeking self-preservation (p. 409). This interesting and perhaps surprising theme was found in only one sociological study of lay theories of health reviewed by these authors, though, and was expressed by only a subset of that study's participants. Similarly, this theme did not emerge in the present project, neither in the initial Prestudy items, nor (and therefore) in the final measure. However, it is a theme which is receiving scholarly attention by individuals interested in power inequalities or value differentials created by the prevailing Western notion of health, and the possible negative consequences to the individual if this health value is adopted wholesale. For example, a recent conference (held in October 2006) at the University of Michigan was entitled "Against Health: Resisting the Invisible Morality." This conference focused on research and theorizing on the part of many experts in health care delivery and scholarship, to raise important questions about the societal consequences of pushing a specific health care agenda on the general public (according to the online conference program, www.umich.edu/~irwg/againsthealth/).

The concept of health as constraint can also be seen as a possible outcome of bias in the medical establishment; for example, of biased attributions held by physicians about responsibility for illness. In a recent study of psychiatrists at McGill University, for instance, fictional patients who were judged to be suffering due to psychological causes were deemed more responsible and blameworthy for their problems, than patients who were judged to be suffering because of physiological causes (Miresco & Kirmeyer, 2006). Therefore, it is likely that individuals with certain problems have more or less

influence over their own care, and possibly develop feelings of resentment about the process of seeking health - similar to what some research participants described as feeling constrained. Though the lay public may not generally have access to the growing scholarship encouraging similar consideration of this issue, the question of whether the lay theories of certain people include the theme of constraint is worthy of further study.

One interesting recent area of investigation into lay theories of health has involved lay concepts of the influence of genetic inheritance on health and disease. Recent decades have seen enormous gains in scientific knowledge about the human genetic code, from the completion of the Human Genome Project to the identification of genes which appear to be responsible for a wide range of health problems and human behaviors (Johnson, 2007). Given this profusion of knowledge, some researchers have recently asserted the importance of assessing what everyday people know about the role of genetics in health, and (in particular) areas in which their mental models may be flawed (e.g., Henderson & Maguire, 2000; Parrott, Silk, & Condit, 2003). These ideas become particularly important to understand as the public at large is granted increasing access to advanced diagnostic and treatment techniques which may involve genetic testing or counseling (Calnan, Montaner, & Horne, 2005). In short, these studies have shown that lay theories about genetic factors in health are readily accessed in research, when people are questioned specifically about these concepts. Relative to the present research, it is interesting that not a single Prestudy participant provided a response that could be seen as tapping into lay ideas about genetics. In terms of measurement, this led to an absence of any item on the Lay Theories of Health Inventory that referred to genetic history, inheritance, having good genes, etc.; however, a subset of participants in this

study did offer descriptors of healthy people as "lucky," "fortunate," or "not knowing [or appreciating] what they have." These items were later dropped from the item pool due to inadequate support by later samples, but it is possible that some of these participants may have been thinking about genetic inheritance as an important aspect of what makes people "lucky" enough to be healthy. Future investigation into ideas about healthy people as being lucky may be worthwhile, particularly as this concept may map onto past research on internal vs. external health locus of control (Wallston, 1992).

Relative to existing scholarship on what laypeople believe that health means, the present project appears to have touched on multiple themes identified in other studies in this area, utilizing a very different methodological approach than those used previously. The advantages of the present approach over previous methods have included an emphasis on attending to and maintaining the integrity of lay language on ideas about health; quantifiable conclusions about the importance of the diverse themes raised by laypeople in open-ended questioning; repeated testing of these ideas using multiple methods (e.g., frequency analyses, ratings of importance, identification of important latent factors or dimensions, and comparison of these factors to existing constructs in health and well-being research); and the construction of a brief, easy-to-understand self-report instrument that can be utilized in future studies of health concepts and behaviors in multiple settings. While limitations in the present research are numerous (some of which have already been acknowledged, some of which to elaborated below), it is our hope that the accomplishments of the present project will prove to be valuable in future studies of lay theories of health.

Knowledge Here Acquired Regarding Positively Influencing Health Behaviors and Outcomes

While the primary goal of the present project was to assess the content and structure of lay theories of health, and translate those findings into a new psychometric instrument, it should not be ignored that important questions about individual health-related behavior were explored in the process. Each of the specific health-related behaviors here studied has been subject to broad and in-depth empirical investigation; that is, the scientific literature addressing each behavior is so large that it would be impractical to address each of these behaviors individually. However, there exist a number of general cognitive and motivational theories about the process of engagement in health behavior that have been applied to the study of the health-related behaviors assessed in the present project (e.g., the Transtheoretical Model, the Theory of Planned Behavior). Therefore, it seems appropriate to briefly speculate about how this new knowledge of the content of lay theories of health might be productively applied relative to these process theories.

The Social-Cognitive Models and Lay Theories of Health

The commonality between social-cognitive theories of health-related behavior is that emphasis is placed on decisions to initially engage in health behavior change, and to sustain that change over time. The Transtheoretical Model (DiClemente & Prochaska, 1982; Prochaska, 1994), or Stages of Change Model, has been described as the most popular stage model of behavioral self-regulation (Schwarzer, 1999). This model asserts that intentional behavior change involves five discrete stages, and that different types of

cognitions are most salient to the individual at different stages of the process (Prochaska, 1994).

Precontemplation, an initial stage preceding acknowledgement of problems associated with present behavior, is characterized by denial or minimizing of any need to change present behavior, almost regardless of its objective damage to the individual. This can potentially be a very long-lasting stage; however, if sufficient reason to reconsider one's position on his or her own behavior is present, the individual may move to the *Contemplation* stage. This stage is characterized by an acknowledgement of potential or real consequences of one's own behavior. In the contemplation stage, consideration of behavior change begins, but no explicit planning for change occurs. As in precontemplation, contemplation can be maintained for many years without movement to the next stage. If the individual begins formulating a plan for change, however, he or she is described as being in the *Preparation* stage. The planning for behavior change itself actually involves a change in behavior, so this stage is considered the start of the "behavioral element" of the theory (Bulley, Donaghy, Payne, & Mutrie, 2007). The *Action* stage of the Transtheoretical Model involves implementing the behavioral change plan; that is, the individual actually changes his or her behavior in accordance with the desired action. Successful engagement in the behavioral change over time characterizes the *Maintenance* phase. Movement in the "forward" direction through stages can be very arduous, while regression to previous stages is very common, and "spiral" patterns of considering, planning, engaging, and relapse often emerge (Prochaska, DiClemente, Velicer, & Rossi, 1992).

One of the main values of investigating lay theories of health in relation to the Transtheoretical Model (as well as the Theory of Planned Behavior (Ajzen, 1991), and other social-cognitive models of behavior change) may be in providing some clues as to the specific behaviors in which laypeople may self-initiate change. These might be thought of as self-directed, and opposed to behaviors whose change is highly encouraged by medical professionals. Understanding the scope of lay ideas about health-related behavior may broaden the set of behavioral targets of investigations of the Stages of Change Model (for example). Engaging in physical exercise, for example, which emerged as an important behavior in lay theories of health, is one that has already received considerable attention for possible application of the Transtheoretical Model (for a review, see Bulley et al., 2007). This is an area where lay and expert theories about health appear to overlap (see Study 1b, this article), which is a possible explanation for why this behavior has been repeatedly examined by experts. However, less effort has been directed at empirical application of the Transtheoretical Model to social or emotional experiences (Petrocelli, 2002). Specifically, in the psychotherapy arena, the model has been applied to intervening with substance abuse issues, but not to decisions to seek therapy for other kinds of psychological or emotional issues.

In terms of health-related behavior, the utilization of psychotherapies which are directed at improving mental health is most often a matter of individual choice. Mental health in the minds of laypeople appears to include feelings of connectedness to the self and others; a number of insight-oriented, cognitive-behavioral, and multi-person (e.g., couples, family, and group) therapies often seek to address these concerns (Sue, Sue, & Sue, 2005). The present project indicates that this aspect of individual health is an

important factor in overall health, and therefore perhaps worth application of the principles of the Transtheoretical Model; however, the choice to present for therapy to improve this area of health has not been widely studied in regard to the Stages of Change. Perhaps this is due to a somewhat lesser emphasis in expert ideas about health being placed on social or emotional health, as opposed to physical health (evidenced by the particular items that would have been omitted or included based on expert ratings in Study 1b). Theoretically, however, the model could prove useful in this area; it would predict that like other kinds of health-related behavior, people would have differing cognitions about their personal need for therapy, their planning to seek therapy, and their continuing engagement in therapy. Similarly, the recommendations made in therapy for other types of behavior change could possibly be usefully studied in light of the Transtheoretical Model (Petrocelli, 2002), though problems in study methodology and appropriate measurement of the elements of the theory should be addressed (Bridle et al., 2005).

Expanding the Dialogue Between Helping Professionals and Patients/Clients: An Aspirational Goal of Lay Theories of Health Research

A huge research literature has accumulated regarding *doctor-patient communication,* or features of the interpersonal encounter between (usually) physician and patient regarding the patient's health condition and possible interventions (Roter & Hall, 2006). One topic that falls within the realm of doctor-patient communication involves the degree to which patients feel that their questions and opinions influence their medical care, with more positive outcomes tending to result when patients feel heard and taken seriously (Ong, DeHaes, Hoos, & Lammes, 1995; Taylor, 2003). From the present

project, it is clear that everyday people think fairly broadly about their health; in particular, ideas about not being ill constitute just one aspect of everyday health ideas. Is it reasonable to assume, then, that laypeople wish to discuss these multifaceted ideas with their physicians? Or, would it be more accurate to believe that people only present for assistance in order to relieve problems, and are not interested in communicating with their physicians about health enhancement strategies such as those addressed by the present project?

Some interesting recent research indicates that the lay theories of health which include multiple dimensions may in fact be salient to patients during medical encounters, even many which take place in the context of very serious health conditions. Klitzman (2006) recently reported a qualitative study of 50 New York-based physicians (actually, 48 doctors, 1 dentist, and 1 medical student) between the years 1999 and 2002. These professionals had all been involved in caring for individuals with various serious illnesses; the focus of the study, however, was on the fact that all of these professionals had also suffered from serious medical illnesses themselves. Their diagnoses included HIV-positive status, cancer, heart disease, and Hepatitis C, and they had also received extensive medical treatment for their conditions. The major research question of the study was whether these professionals experienced any changes in their opinions about effective doctor-patient communication, as a result of being patients themselves. Though the retrospective nature of the research question raises significant limitations to the study, some of the findings still are worthy of mention.

In particular, when asked about specific ways that medical communication training should be changed to improve the patient's experience of interactions with health

professionals, professionals in this sample consistently mentioned (among other recommendations) that physicians should be more willing to engage their patients in discussion of mental health issues, and be less judgmental of their patients during these interactions. For example, the author described how they "often appeared to want to talk about these areas, and expected [their] doctors to be comfortable doing so. Among these physicians awareness increased, for instance, of the need for sensitivity in discussing mental health problems…One physician made this remark: "The doctor asked, 'How are you?' I said, 'so-so.' It took several visits for me to say, 'actually, I think I'm depressed and need treatment'" (p. 450). It can be inferred from descriptions such as this that medical personnel may be reluctant to inquire about several aspects of psychological health, to the possible detriment of the patient. For example, some research has shown that when people actually present to their physicians for assistance with mental health problems, their current medication status (that is, whether they are taking psychotropic medication or not) may be associated with the physician focusing on the medical vs. social-emotional aspects of their mental health issues (DeCaccavo, Ley, & Reid, 2000).

In addition, professionals in this study expressed a wish for more physicians to discuss preventive health behaviors, and other health practices that may or may not be directly related to the patient's presenting illness. As these professionals widely acknowledged that a lack of time with patients is a major obstacle to communication about multiple aspects of health, a brief self-report measure such as the one developed in the present project might assist patients in sharing information which is important, but too-often not volunteered by patients (and not verbally requested by physicians). Some research has indicated that when such measures are used in clinical settings, patients

experience the medical encounter more positively; that is, they understand the measures, enjoy completing them, and report feeling that they have communicated what they wanted to communicate to their medical treatment team (Jenkinson, 1994). Hopefully, with the present and ongoing development of a layperson-driven measure of quality of life (the LTH), doctor-patient communication will further expand and improve. Again, enough emphasis can hardly be placed on the importance of maintaining a multicultural perspective as this area of research continues.

Limitations of the Present Study, and Implications for Future Research

This project is subject to criticism on a number of grounds. These criticisms can broadly be categorized as addressing the content of the present research, or of addressing the processes used in conducting these studies. Relative to content issues, it should be acknowledged that the knowledge generated in the present project was descriptive in nature. That is, though we now have some empirical data, validated by multiple samples, regarding what comprises lay theories of health, we have little to no knowledge at this time that explains how those theories formed; how they change over time; how they function in the present to influence decision making and other in-the-moment behavior; what future actions they may predict; and how those theories may be influenced to produce positive change. These are all significant questions, which have been repeatedly offered by researchers on lay theories of various phenomena, as reasons for why studying lay theories is worthwhile. Making this all the more difficult is the fact that the methodology utilized in the present project requires the researcher to rely on participants' abilities to introspect, skills which almost certainly vary with a variety of controllable and

uncontrollable factors. Though these are daunting criticisms, we offer some points to consider.

First, regarding our current lack of knowledge about the functioning of lay theories of health under a multiplicity of circumstances, we raise our simple observation that new research on any conjectured phenomenon requires time, thoughtfulness, and commitment to sound science to accomplish appropriate validation. We now appear to have evidence that lay theories of health exist, and can be measured in a manner that is straightforward and understandable to everyday people. Having this initial measurement tool, we argue, will allow for more reliable study of lay theories of health. Further use of this tool allows the kind of broad knowledge-building that can lead to sophisticated investigations of the functioning of lay theories of health; while an interdisciplinary effort to describe lay theories of health has been ongoing for decades, the inconsistency in measurement across these studies has made experimental testing (for example) impossible until the present time.

Regarding the second possible criticism, of the difficulty of relying upon introspection, there is actually less reason to see this as a weakness of the present research than one might initially believe. This is due to at least three reasons. First, it is my anecdotal observation that allowing people to reflect and report their own thoughts about health was a generally positive, sometimes almost therapeutic, experience for most of the Prestudy participants. It is my guess that health is one of the most personal topics that psychologists and other researchers ever seek to investigate. Therefore, research on health which appears open and unintrusive (as opposed to asking multiple specific questions about very personal behaviors and values) may actually lead participants to feel

more positive about the experience of taking part in the research. This positive feeling may itself result in more candid responding, as participants feel that researchers truly value their thoughts and opinions in the service of helping others.

Second, introspection as a scientific method allows the researcher access to ideas that participants can bring into consciousness. Certainly these ideas are important to know about, as there are many times when people make conscious decisions, and therefore call up their relevant mental representations and engage those representations in the decision process. What about the times, however, when actions and decisions occur without conscious engagement of preexisting ideas? The simple answer to this question is that we must know what people report being conscious of, if we are to understand what elements they appear not to be conscious of. Research using implicit association techniques, for example, is fascinating and compelling because people are found to behave in ways which are contrary to their reported opinions or beliefs. Understanding introspective reports of lay theories of health, therefore, may allow future investigations of similar discrepancies (e.g., individuals who report a belief in the importance of engaging in positive health practices, but then fail to engage in those same practices under particular circumstances). Having more knowledge of these discrepancies may allow us to design interventions which will increase correspondence between positive ideas of health, and engagement in positive health behavior (and vice versa for negative ideas and behaviors).

Third, relying on introspection is hardly an uncommon practice in psychological research. For example, research on coping often asks participants to identify a recent stressor; research on expressive writing requires participants to describe a past trauma in

great detail; and so on. Even research questions that require indicating one's level of agreement with a Likert scale involve introspection (one might even argue that the Likert task is more complex, as a kind of "graded" introspection: the individual must not only determine whether they agree or not with the statement, but *how much* they agree as well, and to indicate that meaningfully on an externally-provided scale).

Regarding the process of the research (beyond the introspection question), certainly extending our investigation into multiple studies, using multiple methodologies, is more likely to yield the best data. The most important issue in this and any similar research project is appropriate sampling. Health, to a large degree, appears to vary with individual circumstances. Race, gender, class, geographic location, age, marital status, sexual orientation, disability status, quality of the immediate environment – all of these influence health experiences and goals. It must be our mission, therefore, if we are going to empirically investigate lay theories of health, to ensure that we get access to the appropriate populations at the appropriate times. While all people deserve to thrive in a life where positive social and emotional experiences, engagement in healthful practices, avoidance of illness and stress, and opportunities for restoration are abundant, these ideas mainly come from financially sound, fairly educated adults of White American background. As the world is populated with a great many other kinds of people than that, we must reject any notion of universalism and open-mindedly pursue our questions with many other kinds of people.

Chapter VII

Conclusion

The present project was designed and conducted to describe how everyday people define health. In a Prestudy, samples of laypeople were drawn from five different sites, and responses were compiled and narrowed into a set of distinguishable descriptors. Analysis of the frequencies with which each individual item was produced for each question indicated that "health" seemed to correspond most closely in the minds of laypeople to "physical health." These descriptors were then rated by a second sample of laypeople (recruited over the Internet), whose ratings formed the basis of decisions to further narrow the enormous item pool. They were also rated by health experts (physicians, psychologists, social workers, technical medical workers, and religious-affiliated workers), who were found to have ideas about health which appeared fairly similar to those of laypeople. The set of "important" descriptors were then administered to a final Internet sample, whose responses indicated how much each item resembled them. These responses were then factor analyzed, with a multi-layered decision tree indicating which items should be retained on the determined factors. This set of retained items were used to create the Lay Theories of Health Inventory. This new measure was subjected to some initial validation through comparison to other measures of health, and health-related constructs (such as optimism and affect). The measure appeared to be more strongly associated than most other measures studied in this project, to specific

health-related behaviors. These findings were then discussed in relation to qualitative, interdisciplinary research and theory about lay theories of health, as well as to models of health behavior. Future research should maintain its lay-focused approach, but seek to recruit representative samples to examine, holding open the possibilities of altering, supplementing, or supplanting sections of the new Lay Theories of Health Inventory.

Tables

Table 1

Descriptive Statistics of Full Prestudy Sample, and of Samples Taken from Each Site

Demographic Variable	Full Sample	Internet Group	Medical Group	Community Medical Group	Mental Health Group	College Group
Age:	*X* = 35.54	*X* = 38.18	*X* = 43.06	*X* = 37.19	*X* = 41.00	*X* = 18.92
Gender:						
Male	80 (36.2%)	7 (20.6%)	23 (42.6%)	16 (42.1%)	11 (23.4%)	23 (47.9%)
Female	141 (63.8%)	27 (79.4%)	31 (57.4%)	22 (57.9%)	36 (76.6%)	25 (52.1%)
Race/ethnicity:						
White	176 (81.1%)	28 (87.5%)	44 (81.5%)	27 (73.0%)	45 (95.7%)	32 (68.1%)
Black/African-American	13 (6.0%)	0 (0.0%)	8 (14.8%)	2 (5.4%)	0 (0.0%)	3 (6.4%)
Asian/Asian-American	13 (6.0%)	2 (6.3%)	1 (1.9%)	3 (8.1%)	0 (0.0%)	7 (14.9%)
Hispanic/Latino	4 (1.8%)	0 (0.0%)	0 (0.0%)	1 (2.7%)	1 (2.1%)	2 (4.3%)
Native American/Inuit	3 (1.4%)	1 (3.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.1%)
Multiracial	4 (1.8%)	1 (3.1%)	1 (1.9%)	2 (5.4%)	0 (0.0%)	1 (2.1%)
Other	4 (1.8%)	0 (0.0%)	0 (0.0%)	2 (5.4%)	1 (2.1%)	1 (2.1%)
Immigrant status:						
Immigrant	22 (10.0%)	1 (2.9%)	1 (1.9%)	8 (20.5%)	3 (6.4%)	9 (19.1%)
Non-immigrant	199 (90.0%)	33 (97.1%)	53 (98.1%)	31 (79.5%)	44 (93.6%)	38 (80.9%)
Marital Status:						
Single, never married	98 (44.1%)	10 (29.4%)	15 (27.8%)	14 (35.9%)	12 (25.5%)	47(97.9%)
Married	98 (44.1%)	20 (58.8%)	35 (64.8%)	17 (43.6%)	26 (55.3%)	0 (0.0%)
Domestic partner	4 (1.8%)	1 (2.9%)	0 (0.0%)	1 (2.6%)	1 (2.1%)	1 (2.1%)
Divorced	19 (8.6%)	3 (8.8%)	3 (5.6%)	6 (15.4%)	7 (14.9%)	0 (0.0%)
Separated	1 (.5%)	0 (0.0%)	1 (1.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Widowed	2 (.9%)	0 (0.0%)	0 (0.0%)	1 (2.6%)	1 (2.1%)	0 (0.0%)
Educational Level:						
Grade school	2 (.9%)	0 (0.0%)	2 (3.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
High school	34 (15.3%)	0 (0.0%)	6 (11.1%)	8 (20.5%)	3 (6.4%)	17 (35.4%)
Some college	84 (37.8%)	2 (5.9%)	19 (35.2%)	12 (30.8%)	20 (42.6%)	31 (64.6%)
College degree	54 (24.3%)	7 (20.6%)	20 (37.0%)	14 (35.9%)	13 (27.7%)	0 (0.0%)
Graduate degree	45 (20.3%)	25 (73.5%)	7 (13.0%)	3 (7.7%)	10 (21.3%)	0 (0.0%)
Technical school	3 (1.4%)	0 (0.0%)	0 (0.0%)	2 (5.1%)	1 (2.1%)	0 (0.0%)
Annual Household Income:						
Less than $25,000	47 (23.0%)	3 (9.1%)	10 (19.2%)	21 (60.0%)	10 (24.4%)	3 (7.0%)
$25,000-$50,000	30 (14.7%)	7 (21.2%)	4 (7.7%)	10 (28.6%)	5 (12.2%)	4 (9.3%)
$50,000-$75,000	39 (19.1%)	8 (24.2%)	17 (32.7%)	1 (2.9%)	9 (22.0%)	4 (9.3%)
$75,000-$100,000	36 (17.6%)	6 (18.2%)	12 (23.1%)	1 (2.9%)	10 (24.4%)	7 (16.3%)
More than $100,000	52 (25.5%)	9 (27.3%)	9 (17.3%)	2 (5.7%)	7 (17.1%)	25 (58.1%)
Urban/rural residence:						
Mostly urban, large cities	46 (21.2%)	8 (23.5%)	14 (25.9%)	9 (25.7%)	8 (17.4%)	7 (14.6%)
Mostly suburban	92 (43.3%)	14 (41.2%)	22 (40.7%)	13 (34.3%)	24 (52.2%)	22 (45.8%)
Mostly urban, sm. cities	46 (21.2%)	9 (26.5%)	8 (14.8%)	9 (25.7%)	7 (15.2%)	13 (27.1%)
Mostly rural, small towns	31 (14.3%)	3 (8.8%)	10 (18.5%)	5 (14.3%)	7 (15.2%)	6 (12.5%)
Religious affiliation:						
Protestant	43 (20.6%)	8 (23.5%)	15 (28.3%)	7 (19.4%)	4 (8.7%)	10 (22.2%)
Jewish	14 (6.5%)	7 (20.6%)	1 (1.9%)	0 (0.0%)	3 (6.5%)	3 (6.7%)
Roman Catholic	40 (18.7%)	2 (5.9%)	8 (15.1%)	4 (11.1%)	14 (30.4%)	12 (26.7%)
Buddhist	5 (2.3%)	0 (0.0%)	1 (1.9%)	1 (2.8%)	1 (2.2%)	2 (4.4%)
Muslim	10 (4.7%)	2 (5.9%)	1 (1.9%)	5 (13.9%)	0 (0.0%)	12 (26.7%)
Hindu	7 (3.3%)	6 (17.6%)	0 (0.0%)	1 (2.8%)	0 (0.0%)	2 (4.4%)
Agnostic/Atheist	18 (8.4%)	0 (0.0%)	6 (11.3%)	1 (2.8%)	4 (8.7%)	7 (15.6%)
Other	61 (28.5%)	6 (17.6%)	17 (32.1%)	16 (44.4%)	14 (30.4%)	8 (17.8%)
None	15 (7.0%)	3 (8.8%)	4 (7.5%)	1 (2.8%)	6 (13.0%)	1 (2.2%)

Table 2

Self-Assessed Experiences of Minor and Major Health Problems, and Health-Related Visits, in All Prestudy Samples

Health Variable	Internet Group	Medical Group	Community Medical Group	Mental Health Group	College Group	Group Differences?
$N = 220$	$n = 34$	$N = 55$	$n = 37$	$n = 47$	$n = 48$	ANOVA Tukey's HSD
Minor health problems	$X = 2.41$, $SD = 1.05$	$X = 2.41$, $SD = 1.21$	$X = 2.64$, $SD = 1.38$	$X = 3.13$, $SD = 1.10$	$X = 2.10$, $SD = .91$	
Much less than most people	7 (20.6%)	16 (29.6%)	13 (34.2%)	4 (8.5%)	15 (31.3%)	$F(4, 213) = 5.25$***
Somewhat less than most people	13 (38.2%)	13 (24.1%)	5 (13.2%)	8 (17.0%)	15 (31.3%)	X of Mental Health
About the same as most people	7 (20.6%)	15 (27.8%)	7 (18.4%)	18 (38.3%)	16 (33.3%)	group > X's of all other
Somewhat more than most people	7 (20.6%)	7 (13.0%)	11 (28.9%)	12 (25.5%)	2 (4.2%)	groups ($p < .05$)
Much more than most people	0 (0.0%)	3 (5.6%)	2 (5.3%)	5 (10.6%)	0 (0.0%)	
Major health problems	$X = 2.21$, $SD = 1.25$	$X = 2.17$, $SD = 1.30$	$X = 2.19$, $SD = 1.39$	$X = 2.85$, $SD = 1.35$	$X = 1.75$, $SD = 1.10$	
Much less than most people	12 (35.3%)	24 (45.3%)	20 (52.6%)	10 (21.7%)	29 (60.4%)	$F(4, 211) = 4.30$**
Somewhat less than most people	12 (35.3%)	10 (18.9%)	3 (7.9%)	9 (19.6%)	8 (16.7%)	X of Mental Health
About the same as most people	3 (8.8%)	7 (13.2%)	8 (21.1%)	11 (23.9%)	5 (10.4%)	group > X of College
Somewhat more than most people	5 (14.7%)	10 (18.9%)	4 (10.5%)	10 (21.7%)	6 (12.5%)	group ($p = .001$)
Much more than most people	2 (5.9%)	2 (3.8%)	3 (7.9%)	6 (13.0%)	0 (0.0%)	
Health-related visits	$X = 2.29$, $SD = .87$	$X = 2.38$, $SD = 1.27$	$X = 2.25$, $SD = 1.16$	$X = 3.46$, $SD = 1.41$	$X = 2.29$, $SD = 1.18$	
Less than once a year	6 (17.6%)	18 (34.0%)	14 (36.8%)	2 (4.3%)	15 (31.3%)	$F(4, 212) = 8.05$***
1-2 times per year	15 (44.1%)	11 (20.8%)	7 (18.4%)	15 (32.6%)	14 (29.2%)	X of Mental Health
3-6 times per year	10 (29.4%)	14 (26.4%)	12 (31.6%)	7 (15.2%)	12 (25.0%)	group > X's of all other
6-12 times per year	3 (8.8%)	6 (11.3%)	4 (10.5%)	4 (8.7%)	4 (8.3%)	groups ($p < .001$)
More than 12 times per year	0 (0.0%)	4 (7.5%)	1 (2.6%)	18 (39.1%)	3 (6.3%)	

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Minor health problems were defined as "illnesses of short duration, or injuries which were not life-threatening or profoundly disabling," while major health problems were defined as "illnesses of long duration or a serious nature, or injuries which were life-threatening or profoundly disabling."

Table 3

Descriptive Statistics and Group Comparisons of Health Behaviors Reported by Participants from each Site during the Prestudy

Health Behavior	Internet Group			Medical Group			Community Medical Group			Mental Health Group			College Group			Group Differences?
N = 223	*n*	*X*	*SD*	*n*	*X*	*SD*	*n*	*X*	*SD*	*n*	*X*	*SD*	*n*	*X*	*SD*	ANOVA
Smoking	34	1.47[a]	1.29	54	2.04	1.20	38	2.95[a]	2.51	46	1.96	1.91	48	1.90	1.81	$F(4, 215) = 2.91$*
Exercising	34	4.47	1.24	54	4.76	1.29	38	4.00[b]	1.64	46	4.54	1.71	48	4.96[b]	1.46	$F(4, 215) = 2.50$*
Getting medical checkups	34	4.32	1.24	54	4.31	1.48	38	3.61[c]	1.72	46	4.65[c]	1.43	48	3.65[c]	1.58	$F(4, 215) = 3.85$**
Drinking alcohol	34	3.44	1.46	53	2.87	1.84	38	2.61	1.81	46	2.59	1.50	48	3.50	1.97	$F(4, 214) = 2.74$*
Sleeping poorly	34	3.76	1.46	54	4.28	1.56	37	4.84	1.79	46	4.59	1.72	48	4.50	1.73	$F(4, 214) = 2.16$, *ns*
Managing stress	34	4.47	1.19	53	3.91	1.32	38	3.97	1.53	44	4.45	1.70	48	4.10	1.42	$F(4, 212) = 1.43$, *ns*
Controlling weight	34	4.00	1.28	54	4.06	1.70	38	4.16	1.65	46	3.85	1.63	48	4.10	1.95	$F(4, 215) = .22$, *ns*
Using safety measures	33	6.64	.60	54	6.33	1.30	38	6.24	1.38	46	6.11	1.52	47	6.55	.90	$F(4, 213) = 1.32$, *ns*
Eating nutritiously	33	5.42[d]	.90	54	4.93	1.18	38	4.76	1.38	46	4.67[d]	1.25	48	5.29	1.15	$F(4, 214) = 3.07$*
Keeping poor personal hygiene	32	1.75[e]	1.30	54	1.81[e]	1.44	38	3.21[e]	2.20	45	2.13[e]	1.65	47	2.04[e]	1.43	$F(4, 211) = 5.19$***

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Higher scores indicate more frequent engagement in these health behaviors. Results of Tukey's HSD tests are shown with superscripts. [a]The Community Medical group reported smoking significantly more than the Internet group, $p < .05$. [b]The College group reported exercising significantly more than the Community Medical group, $p < .05$. [c]The Mental Health group reported getting medical checkups significantly more often than the Community Medical and College groups, $p < .05$. [d]The Internet group reported eating nutritiously significantly more than the Mental Health group, $p < .05$. [e]The Community Medical group reported keeping poor personal hygiene significantly more than all four of the other groups, $p < .05$ for the Mental Health and College groups, , $p < .01$ for Internet and Medical groups.

Table 4

Simultaneous Regressions Testing Demographic Variables in Relation to Health Behaviors: Prestudy Full Sample

Health Outcome	Significant Predictors	β	*t* -value	*Sig.*
Minor health problems	Mental Health group	.33	2.37	$p < .05$
	Racial group: Black/Af.-Am.	-.19	-2.40	$p < .05$
	Racial group: Asian/As.-Am.	-.19	-2.24	$p < .05$
Major health problems	Mental Health group	.24	2.34	$p < .05$
	Education: Technical school	-.16	-2.01	$p < .05$
Professional health visits	Internet group	-.28	-2.09	$p < .05$
	Female	.18	2.36	$p < .05$
	Religion: Agnostic/Atheist	-.20	-2.35	$p < .05$
Smoking	Community Medical group	.29	2.25	$p < .05$
	Marital status: Separated	.16	2.08	$p < .05$
Exercising	Community Medical group	-.35	-2.80	$p < .01$
	Female	-.23	-2.88	$p < .01$
	Income: $75,000-$100,000	-.19	-2.02	$p < .05$
	Religion: Other	.20	1.99	$p < .05$
Getting medical checkups	Age	.32	2.87	$p < .05$
	Female	.26	3.46	$p = .001$
	Racial group: Asian/As.-Am.	-.18	-2.29	$p < .05$
	Income: <$25,000	-.33	-3.26	$p = .001$
	Income: $25,000-$50,000	-.18	-2.03	$p < .05$
	Income: $75,000-$100,000	-.21	-2.41	$p < .05$
Drinking alcohol	Age	.24	2.05	$p < .05$
	Marital status: Married	-.33	-2.95	$p < .01$
	Education: Technical school	.15	2.11	$p < .05$
Sleeping poorly	Racial group: Native American	-.18	-2.31	$p < .05$
	Racial group: Multiracial	.17	2.00	$p < .05$
	Education: Grade school	-.15	-1.98	$p < .05$
	Education: College degree	-.23	-2.44	$p < .05$
	Education: Advanced degree	-.24	-2.21	$p < .05$
	Income: $25,000-$50,000	.24	2.50	$p < .05$
	Income: $50,000-$75,000	.20	2.11	$p < .05$
	Religion: Muslim	-.24	-2.41	$p < .05$
Managing stress	Marital status: Domestic partner	-.18	-2.26	$p < .05$
Controlling your weight	Marital status: Married	-.38	-3.35	$p = .001$
	Marital status: Domestic partner	-.20	-2.63	$p < .01$
	Education: Grade school	.15	1.99	$p < .05$
	Education: Technical school	-.17	-2.56	$p < .05$
	Income: <$25,000	-.29	-2.77	$p = .001$
	Income: $25,000-$50,000	-.21	-2.28	$p < .05$
	Income: $50,000-$75,000	-.20	-2.14	$p < .05$
Using safety measures (e.g., wearing a seat belt)	Medical group	-.38	-2.46	$p < .05$
	Community Medical group	-.35	-2.68	$p < .01$
	Mental Health group	-.50	-3.45	$p = .001$
	Age	.30	2.42	$p < .05$
	Racial group: Latino	-.18	-2.09	$p < .05$
	Religion: None	.19	2.09	$p < .05$
Eating nutritiously	Age	.24	2.05	$p < .05$
	Income: <$25,000	-.25	-2.40	$p < .05$
	Income: $50,000-$75,000	-.38	-4.06	$p < .001$
	Income: $75,000-$100,000	-.30	-3.30	$p = .001$
	Religion: Roman Catholic	.24	2.52	$p < .05$
Keeping poor hygiene	Non-immigrant status	-.18	-2.14	$p < .05$
	Income: $25,000-$50,000	.22	2.30	$p < .05$
	Religion: None	.20	2.19	$p < .05$

Note. All demographic variables, including site of data collection (e.g., group) were dummy-coded and entered simultaneously in a series of multiple regressions. The table depicts demographic variables which were found to have unique and significant predictive validity in relation to the identified health behaviors (the dependent variable in each regression).

Table 5

Correlations of Frequencies with which Prestudy Items were Produced by Each Sample, in Response to Each Free-Response Prestudy Item

Type of Health	Prestudy Sample	Health	Physical Health	Mental Health	Social Health	Selected Additional Findings
Physical Health	Internet Group	.70***				
	Medical Group	.77**				
	Community Medical Group	.68***	-			No differences between groups in strength of association between Health and Physical Health
	Mental Health Group	.69***				
	College Group	.70***				
Mental Health	Internet Group	.65***	.36***			
	Medical Group	.48**	.39***			Association between Health and Mental Health less strong in Medical Group than in Mental Health and College Groups
	Community Medical Group	.55***	.36***	-		
	Mental Health Group	.71***	.46***			
	College Group	.68***	.32***			
Social Health	Internet Group	.32***	.06	.53***		
	Medical Group	.19**	.19**	.36***		Associations between Health and Social Health less strong in Medical and Community Medical Groups than in Mental Health and College Groups
	Community Medical Group	.26***	.19**	.48***	-	
	Mental Health Group	.57***	.37***	.67***		
	College Group	.45***	.19**	.54***		
Unhealthy	Internet Group	.24***	.19**	.12	.01	No differences between groups in strength of association between Unhealthiness and other types of Health
	Medical Group	.44***	.19**	.08**	.00	
	Community Medical Group	.44***	.38***	.28***	.08	
	Mental Health Group	.32***	.20***	.28***	.16**	
	College Group	.41***	.27***	.28***	.14*	

Note. *$p < .05$, **$p < .01$, ***$p < .001$. All *N*'s (based on numbers of items, not number of respondents) ranged from 254 to 259. Correlations can broadly be seen as indicating the degree to which respondents in each group viewed each type of health as similar to one another (e.g., correlations indicate the degree to which each item tended to appear in similar frequencies in each group's description of each type of health). For example, if items appeared in similar frequencies in response to the "healthy" and "physically healthy" questions, then general health and physical health would be highly-correlated and interpreted as similar. Fisher's *z* comparisons of correlations in different groups used a significance value of .001, to control Type I error inflation.

Table 6

Study 1 Sample Demographics, in Full Sample and Randomized Groups, and Tests of Sampling Differences

Demographic Variable	Full Sample N = 156	Group 1 n = 80	Group 2 n = 76	χ^2 / *t*-tests[a]	Multiple Regression tests[b]
Age:	*X* = 33.03	*X* = 32.41	*X* = 33.68	*t*(156) = -.85, *ns*	
Gender:					
Male	46 (30.1%)	20 (25.6%)	26 (34.7%)	Group 1: χ^2 = .75, *ns*	
Female	107 (69.9%)	58 (74.4%)	49 (65.3%)	Group 2: χ^2 = .73, *ns*	
Race/ethnicity:					
White	128 (83.7%)	64 (82.1%)	63 (82.9%)	Group 1: χ^2 = 1.34, *ns*	Black/African-American:
Black/African-American	4 (2.6%)	1 (1.3%)	3 (3.9%)		
Asian/Asian-American	8 (5.2%)	5 (6.4%)	3 (3.9%)	Group 2: χ^2 = 1.00, *ns*	β = .22, p < .05
Hispanic/Latino	4 (2.6%)	2 (2.6%)	2 (2.6%)		
Native American/Inuit	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Multiracial	8 (5.2%)	5 (6.4%)	5 (6.6%)		
Other	1 (.7 %)	1 (1.3%)	0 (0.0%)		
Immigrant status:				Group 1: χ^2 = 1.32, *ns*	
Immigrant	11 (7.1%)	3 (3.8%)	8 (10.5%)		
Non-immigrant	144 (92.9%)	76 (96.2%)	68 (89.5%)	Group 2: χ^2 = 1.45, *ns*	
Marital Status:					
Single, never married	76 (49.7%)	37 (48.1%)	39 (51.3%)	Group 1: χ^2 = .76, *ns*	
Married	56 (36.6%)	27 (35.1%)	29 (38.2%)	Group 2: χ^2 = .73, *ns*	
Domestic partner	12 (7.8%)	7 (9.1%)	5 (6.6%)		
Divorced	9 (5.9%)	6 (7.8%)	3 (3.9%)		
Separated	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Widowed	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Sexual orientation:					
Heterosexual	139 (90.3%)	68 (87.2%)	71 (93.4%)	Group 1: χ^2 = 1.58, *ns*	
Homosexual	5 (3.2%)	3 (3.8%)	2 (2.6%)		
Bisexual	8 (5.2%)	6 (7.7%)	2 (2.6%)	Group 2: χ^2 = 1.64, *ns*	
Transgender	1 (.6%)	0 (0.0%)	1 (1.3%)		
Other	1 (.6%)	1 (1.3%)	0 (0.0%)		
Educational Level:					
Grade school	2 (1.3%)	1 (1.3%)	1 (1.3%)	Group 1: χ^2 = 3.67, *ns*	
High school	13 (8.4%)	4 (5.1%)	9 (11.8%)		
Some college	33 (21.4%)	19 (24.4%)	14 (18.4%)	Group 2: χ^2 = 3.96, *ns*	
College degree	59 (38.3%)	25 (32.1%)	34 (44.7%)		
Graduate degree	44 (28.6%)	28 (35.9%)	16 (21.1%)		
Technical school	3 (1.9%)	1 (1.3%)	2 (2.6%)		
Annual Household Income:					
Less than $25,000	31 (20.7%)	18 (23.7%)	13 (17.6%)	Group 1: χ^2 = 3.51, *ns*	
$25,000-$50,000	48 (32.0%)	24 (31.6%)	24 (32.4%)		
$50,000-$75,000	31 (20.7%)	10 (13.2%)	21 (28.4%)	Group 2: χ^2 = 3.57, *ns*	
$75,000-$100,000	19 (12.7%)	10 (13.2%)	9 (12.2%)		
More than $100,000	21 (14.0%)	14 (18.4%)	7 (9.5%)		
Urban/rural residence:					
Mostly urban, large cities	31 (20.1%)	17 (21.8%)	14 (18.4%)	Group 1: χ^2 = .94, *ns*	
Mostly suburban	62 (40.3%)	30 (38.5%)	32 (42.1%)	Group 2: χ^2 = .90, *ns*	
Mostly urban, sm. cities	38 (24.7%)	17 (21.8%)	21 (27.6%)		
Mostly rural, sm. towns	23 (14.9%)	14 (17.9%)	9 (11.8%)		
Religious affiliation:					
Protestant	42 (27.3%)	19 (24.4%)	23 (30.3%)	Group 1: χ^2 = 4.81, *ns*	
Jewish	5 (3.2%)	1 (1.3%)	4 (5.3%)		
Roman Catholic	20 (13.0%)	8 (10.3%)	12 (15.8%)	Group 2: χ^2 = 4.05, *ns*	
Buddhist	4 (2.6%)	2 (2.6%)	2 (2.6%)		
Muslim	2 (1.3%)	2 (2.6%)	0 (0.0%)		
Hindu	2 (1.3%)	1 (1.3%)	1 (1.3%)		
Agnostic/Atheist	16 (10.4%)	9 (11.5%)	7 (9.2%)		
Other	31 (20.1%)	14 (17.9%)	17 (22.4%)		
None	32 (20.8%)	22 (28.2%)	10 (13.2%)		

Note. [a]Chi-squared goodness-of-fit tests used full sample demographic percentages to determine expected values in each group.
[b]Simultaneous multiple regressions testing independent effects of demographic group membership on average item ratings in the full sample (both groups pooled together). Only significant predictors are included.

Table 7

Group Comparisons of Health Behaviors and Experiences, and Mean Item Ratings, in Study 1 Groups 1 and 2

Health Outcome	Group 1	Group 2	*t* –test	Significance
Minor health problems	2.38	2.50	$t(153) = -.69$	*ns*
Major health problems	2.16	2.29	$t(153) = -.66$	*ns*
Health-related visits	2.08	2.46	$t(153) = -2.18$	$p < .05$
Smoking	1.99	2.01	$t(151) = -.09$	*ns*
Exercising	4.86	4.76	$t(152) = .37$	*ns*
Getting medical checkups	3.73	4.22	$t(152) = -1.84$	*ns*
Drinking alcohol	3.54	3.08	$t(152) = 1.67$	*ns*
Sleeping poorly	3.81	3.93	$t(152) = -.47$	*ns*
Managing stress	4.28	4.40	$t(151) = -.55$	*ns*
Controlling weight	4.11	4.20	$t(153) = -.29$	*ns*
Using safety measures	6.31	6.36	$t(151) = -.23$	*ns*
Eating nutritiously	5.21	5.34	$t(152) = -.69$	*ns*
Keeping poor personal hygiene	2.22	2.13	$t(152) = .33$	*ns*
Average item rating*	7.43	7.51	$t(154) = -.32$	*ns*

Note. Mean comparisons indicated that the two groups did not differ significantly on the majority of health-related outcome measures. The only difference detected was that individuals in Group 2 reported significantly more health-related visits than individuals in Group 1; however, this difference represents a very small effect size (partial $\varepsilon^2 = .03$). In light of the overwhelming evidence that the groups did not differ meaningfully from one another, it was determined that the ratings of the groups could be safely pooled. *Indicates mean ratings of all items by all participants for the subset of items rated by individuals in that group. Ratings are on an 11-point scale (0-10).

Table 8

Simultaneous Multiple Regressions Testing Demographic Factors in Relation to Health Outcomes: Study 1 Sample

Health Outcome	Significant Predictors	β	*t* -value	*Sig.*
Minor health problems	Racial group: Black/African-Am.	-.20	-2.17	$p < .05$
	Income: $25,000-$50,000	-.26	-2.19	$p < .05$
	Income: $75,000-$100,000	-.37	-3.11	$p < .01$
	Religion: Hindu	-.21	-2.14	$p < .05$
Major health problems	Age	.31	2.78	$p < .01$
	Income: $50,000-$75,000	-.33	-2.73	$p < .01$
	Income: $75,000-$100,000	-.24	-2.01	$p < .05$
	Education: Technical school			
Professional health visits	Differed between sampling groups: Not tested			
Smoking	Marital status: Domestic Partner	.30	3.11	$p < .01$
	Income: $75,000-$100,000	-.30	-2.49	$p < .05$
	Rural residence	-.37	-3.25	$p < .01$
	Religion: None	.21	2.07	$p < .05$
Exercising	Racial group: Hispanic/Latino	.21	2.30	$p < .05$
	Income: $25,000-$50,000	.33	2.65	$p < .01$
	Income: $50,000-$75,000	.30	2.38	$p < .05$
	Income: $75,000-$100,000	.35	2.80	$p < .01$
	Income: Above $100,000	.43	3.51	$p < .001$
Getting medical checkups	Female	.21	2.36	$p < .05$
	Racial group: Black/African-Am.	.26	2.86	$p < .01$

Health Outcome	Significant Predictors	β	*t* -value	*Sig.*
Drinking alcohol	Suburban residence	-.30	-2.43	$p < .05$
	Religion: Roman Catholic	.20	2.02	$p < .01$
	Religion: Other	.33	3.24	$p < .01$
Sleeping poorly	Age	.25	2.29	$p < .05$
	Racial group: Black/Af.-Am.	.19	2.01	$p < .05$
	Income: $25,000-$50,000	-.25	-2.03	$p < .05$
	Income: $50,000-$75,000	-.26	-2.07	$p < .05$
	Religion: None	.23	2.21	$p < .05$
Managing stress	Age	-.24	-2.18	$p < .05$
	Non-immigrant	-.23	-2.30	$p < .05$
Controlling your weight	Racial group: Black/Af.-Am.	.26	2.61	$p < .01$
Using safety measures (e.g., wearing a seat belt)	Religion: Other	-.27	-2.54	$p < .05$
Eating nutritiously	Female	.20	2.22	$p < .05$
	Income: $25,000-$50,000	.30	2.50	$p < .05$
	Income: $50,000-$75,000	.36	2.96	$p < .01$
	Income: $75,000-$100,000	.26	2.17	$p < .05$
	Religion: Muslim	.28	2.35	$p < .05$
Keeping poor hygiene	Female	-.23	-2.59	$p < .05$
	Religion: Hindu	.36	3.77	$p < .001$

Note. All demographic variables were dummy-coded and entered simultaneously in a series of multiple regressions. The table depicts demographic variables which were found to have unique and significant predictive validity in relation to the identified health behaviors (the dependent variable in each regression). Because individuals in Groups 1 and 2 differed with respect to how often they attended health-related professional visits, this outcome was not tested in this analysis.

Table 9

Study 1b Sample Demographics, in Full Sample and Randomized Groups, and Tests of Sampling Differences

Demographic Variable	Full Sample N = 170	Group 1 n = 80	Group 2 n = 90	χ^2 / *t*-tests[a]	Multiple Regression tests[b]
Age:	*X* = 38.4	*X* = 38.9	*X* = 37.9	*t*(132) = .39, *ns*	
Gender:				Group 1: χ^2 = 1.42, *ns*	
Male	37 (27.6%)	20 (34.5%)	17 (22.4%)		
Female	97 (72.4%)	38 (65.5%)	59 (77.6%)	Group 2: χ^2 = 1.11, *ns*	
Race/ethnicity:					
White	104 (77.6%)	41 (70.7%)	63 (82.9%)	Group 1: χ^2 = 3.00, *ns*	
Black/Af.-American	6 (4.5%)	4 (6.9%)	2 (2.6%)		
Asian/As.-American	12 (9.0%)	6 (10.3%)	6 (7.9%)	Group 2: χ^2 = 2.43, *ns*	
Hispanic/Latino	5 (3.7%)	3 (5.2%)	2 (2.6%)		
Native American/Inuit	1 (0.7%)	0 (0.0%)	1 (1.3%)		
Multiracial	5 (3.7%)	3 (5.2%)	2 (2.6%)		
Other	1 (0.7%)	1 (1.7%)	0 (0.0%)		
Immigrant status:					
Immigrant	10 (7.5%)	6 (10.3%)	4 (5.3%)	Group 1: χ^2 = .67, *ns*	
Non-immigrant	124 (92.5%)	52 (89.7%)	72 (94.7%)	Group 2: χ^2 = .75, *ns*	
Area of expertise:					
Medical	89 (56.3%)	42 (58.3%)	47 (54.7%)	Group 1: χ^2 = .43, *ns*	
Mental Health	65 (41.1%)	29 (40.3%)	36 (41.9%)	Group 2: χ^2 = .69, *ns*	
Religious/Clergy	4 (2.5%)	1 (1.4%)	3 (3.5%)		
Level of professional training:					
Technical	14 (8.6%)	6 (8.2%)	8 (8.9%)	Group 1: χ^2 = 1.88, *ns*	β = -2.09, *p* < .05
Bachelor's level	40 (24.5%)	16 (21.9%)	24 (26.7%)		
Master's level	47 (28.8%)	18 (24.7%)	29 (32.2%)	Group 2: χ^2 = 1.13, *ns*	β = -2.50, *p* < .05
Doctoral level	62 (38.0%)	33 (45.2%)	29 (32.2%)		
Number of professional visits:					
Less than once per year	24 (18.0%)	10 (17.5%)	14 (18.4%)	Group 1: χ^2 = 3.66, *ns*	
1-2 times per year	48 (36.1%)	20 (35.1%)	28 (36.8%)		
3-6 times per year	49 (36.8%)	20 (35.1%)	29 (38.2%)	Group 2: χ^2 = 1.33, *ns*	
6-12 times per year	4 (3.0%)	1 (1.8%)	3 (3.9%)		
> 12 times per year	8 (6.0%)	6 (10.5%)	2 (2.6%)		

Note. [a]Chi-squared goodness-of-fit tests used full sample demographic percentages to determine expected values in each group. [b]Simultaneous multiple regressions testing independent effects of demographic group membership on average item ratings in the full sample (both groups pooled together). Only significant predictors are included.

Table 10

Group Comparisons of Health Behaviors and Mean Item Ratings, in Study 1b Groups 1 and 2

Health Outcome	Group 1	Group 2	*t* –test	Significance
Smoking	1.14	1.61	$t(132) = -2.23$	$p = .03$
Exercising	4.88	4.97	$t(132) = -.36$	*ns*
Getting medical checkups	4.53	4.46	$t(132) = .26$	*ns*
Drinking alcohol	3.17	3.07	$t(132) = .37$	*ns*
Sleeping poorly	3.66	3.67	$t(132) = -.05$	*ns*
Managing stress	5.05	4.86	$t(132) = .86$	*ns*
Controlling weight	4.41	4.54	$t(132) = -.43$	*ns*
Using safety measures	6.66	6.78	$t(151) = -.85$	*ns*
Eating nutritiously	5.79	5.66	$t(152) = .68$	*ns*
Keeping poor personal hygiene	1.90	1.79	$t(152) = .39$	*ns*
Average item rating*	7.59	7.54	$t(159) = .21$	*ns*

Note. Mean comparisons indicated that the two groups did not differ significantly on the majority of health-related outcome measures. The only difference detected was that professionals in Group 1 reported significantly less smoking than individuals in Group 2; however, this difference represents a very small effect size (partial $\varepsilon^2 = .04$). As in Study 1, it was determined that item ratings could be safely pooled across groups; however, smoking was added as a predictor in the simultaneous regression analyses predicting items ratings (Table 9). *Indicates mean ratings of all items by all participants for the subset of items rated by individuals in that group. Ratings are on an 11-point scale (1-11).

Table 11

Demographic Characteristics of Study 2 Sample

Demographic Variable	Within Age Range n = 333	Outside Age Range n = 10	Not Reporting Age n = 23
Age:	*X* = 34.41	*X* = 54.00	-
Gender:			
Male	128 (41.3%)	1 (10.0%)	10 (52.6%)
Female	182 (58.7%)	9 (90.0%)	9 (47.4%)
Race/ethnicity:			
White	230 (74.9%)	10 (100.0%)	15 (78.9%)
Black/African-American	16 (5.2%)	0 (0.0%)	0 (0.0%)
Asian/Asian-American	35 (11.4%)	0 (0.0%)	2 (10.5%)
Hispanic/Latino	13 (4.2%)	0 (0.0%)	2 (2.6%)
Native American/Inuit	0 (0.0%)	0 (0.0%)	0 (0.0%)
Multiracial	4 (1.3%)	0 (0.0%)	0 (0.0%)
Other	9 (2.9%)	0 (0.0%)	2 (10.5%)
Immigrant status:			
Immigrant	14 (4.6%)	0 (0.0%)	0 (0.0%)
Non-immigrant	293 (95.4%)	10 (100.0%)	19 (100.0%)
Marital Status:			
Single, never married	101 (32.8%)	2 (20.0%)	6 (31.6%)
Married	151 (49.0%)	5 (50.0%)	10 (52.6%)
Domestic partner	28 (9.1%)	1 (10.0%)	1 (5.3%)
Divorced	24 (7.8%)	1 (10.0%)	2 (10.5%)
Separated	4 (1.3%)	0 (0.0%)	0 (0.0%)
Widowed	0 (0.0%)	1 (10.0%)	0 (0.0%)
Educational Level:			
Grade school	4 (1.3%)	0 (0.0%)	0 (0.0%)
High school	59 (19.2%)	1 (10.0%)	2 (10.5%)
Some college	95 (30.8%)	6 (60.0%)	6 (31.6%)
College degree	101 (32.8%)	4 (20.0%)	6 (31.6%)
Graduate degree	39 (12.7%)	0 (0.0%)	5 (26.3%)
Technical school	10 (3.2%)	1 (10.0%)	0 (0.0%)
Annual Household Income:			
Less than $25,000	58 (18.8%)	3 (30.0%)	3 (16.7%)
$25,000-$50,000	107 (34.7%)	3 (30.0%)	4 (22.2%)
$50,000-$75,000	81 (26.3%)	3 (30.0%)	4 (22.2%)
$75,000-$100,000	28 (9.1%)	0 (0.0%)	4 (22.2%)
More than $100,000	34 (11.0%)	1 (10.0%)	3 (16.7%)
Urban/rural residence:			
Mostly urban, large cities	73 (23.9%)	0 (0.0%)	10 (52.6%)
Mostly suburban	116 (37.9%)	5 (50.0%)	4 (21.1%)
Mostly urban, smaller cities	71 (23.2%)	2 (20.0%)	3 (1586%)
Mostly rural, small towns	46 (15.0%)	3 (30.0%)	2 (10.5%)
Religious affiliation:			
Protestant	64 (20.8%)	2 (20.0%)	6 (31.6%)
Jewish	8 (2.6%)	0 (0.0%)	0 (0.0%)
Roman Catholic	46 (14.9%)	3 (30.0%)	0 (0.0%)
Buddhist	7 (2.3%)	0 (0.0%)	0 (0.0%)
Muslim	6 (1.9%)	0 (0.0%)	0 (0.0%)
Hindu	12 (3.9%)	0 (0.0%)	0 (0.0%)
Agnostic/Atheist	26 (8.4%)	1 (10.0%)	1 (5.3%)
Other	89 (28.9%)	0 (0.0%)	4 (21.1%)
None	50 (16.2%)	4 (40.0%)	6 (31.6%)

Table 12

Mean Predictor and Health Outcome Scores for Each Subgroup of Study 2 Sample

Variable	Within Age Range n = 333	α	Outside Age Range n = 10	Not Reporting Age n = 23
SF-36: Physical Functioning (PF)	*X* = 24.01, *SD* = 4.00	.91	*X* = 21.60, *SD* = 6.36	*X* = 22.45, *SD* = 5.43
SF-36: Role-Physical (RP)	*X* = 7.13, *SD* = 1.32	.82	*X* = 6.20, *SD* = 1.81	*X* = 7.00, *SD* = 1.53
SF-36: Bodily Pain (BP)	*X* = 4.10, *SD* = 2.02	.86	*X* = 5.50, *SD* = 2.76	*X* = 4.15, *SD* = 2.35
SF-36: General Health (GH)	*X* = 12.23, *SD* = 4.37	.81	*X* = 13.00, *SD* = 5.89	*X* = 10.65, *SD* = 4.84
SF-36: Vitality (VT)	*X* = 11.38, *SD* = 4.34	.82	*X* = 12.89, *SD* = 4.51	*X* = 8.95, *SD* = 3.75
SF-36: Social Function (SF)	*X* = 4.02, *SD* = 2.09	.85	*X* = 4.60, *SD* = 2.07	*X* = 4.20, *SD* = 2.68
SF-36: Role-Emotional (RE)	*X* = 5.22, *SD* = 1.12	.82	*X* = 5.60, *SD* = .84	*X* = 5.40, *SD* = 1.10
SF-36: Mental Health (MH)	*X* = 20.15, *SD* = 5.10	.81	*X* = 21.44, *SD* = 5.57	*X* = 22.10, *SD* = 4.09
LOT-R: Optimism	*X* = 21.08, *SD* = 5.94	.87	*X* = 21.50, *SD* = 7.23	*X* = 22.85, *SD* = 4.69
PANAS: Positive Affect	*X* = 37.61, *SD* = 7.44	.91	*X* = 39.80, *SD* = 6.84	*X* = 40.60, *SD* = 5.17
PANAS: Negative Affect	*X* = 23.65, *SD* = 8.58	.90	*X* = 20.20, *SD* = 8.89	*X* = 20.79, *SD* = 8.72
DSES-S: Spirituality	*X* = 21.29, *SD* = 9.65	.94	*X* = 23.70, *SD* = 8.68	*X* = 22.65, *SD* = 10.10
MOS-SS: Overall Support	*X* = 70.09, *SD* = 25.24	.97	*X* = 56.71, *SD* = 28.39	*X* = 77.54, *SD* = 24.60
MOS-T: Tangible Support	*X* = 70.07, *SD* = 24.78	.92	*X* = 54.64, *SD* = 30.90	*X* = 76.75, *SD* = 27.68
MOS-EI: Emot.-Info. Supp.	*X* = 70.62, *SD* = 26.07	.97	*X* = 57.92, *SD* = 27.62	*X* = 77.90, *SD* = 23.81
Smoking	*X* = 2.61, *SD* = 2.41	*na*	*X* = 4.00, *SD* = 3.16	*X* = 2.95, *SD* = 2.59
Exercising	*X* = 4.40, *SD* = 1.64	*na*	*X* = 3.70, *SD* = 1.77	*X* = 4.53, *SD* = 1.81
Getting medical checkups	*X* = 4.06, *SD* = 1.72	*na*	*X* = 3.80, *SD* = 1.81	*X* = 4.26, *SD* = 1.66
Drinking alcohol	*X* = 3.06, *SD* = 1.84	*na*	*X* = 1.80, *SD* = .92	*X* = 3.32, *SD* = 2.11
Sleeping poorly	*X* = 3.88, *SD* = 1.77	*na*	*X* = 3.80, *SD* = 1.99	*X* = 3.37, *SD* = 1.61
Managing stress	*X* = 4.36, *SD* = 1.49	*na*	*X* = 4.90, *SD* = 1.37	*X* = 4.63, *SD* = 1.50
Controlling your weight	*X* = 4.31, *SD* = .175	*na*	*X* = 3.70, *SD* = 1.70	*X* = 4.11, *SD* = 2.13
Using safety measures	*X* = 6.27, *SD* = 1.26	*na*	*X* = 6.70, *SD* = .48	*X* = 6.53, *SD* = 1.39
Eating nutritiously	*X* = 4.96, *SD* = 1.41	*na*	*X* = 4.70, *SD* = 1.77	*X* = 5.16, *SD* = 1.68
Keeping poor personal hygiene	*X* = 2.16, *SD* = 1.72	*na*	*X* = 1.40, *SD* = .97	*X* = 2.56, *SD* = 2.38

Table 13

Factor Structure of Proposed Lay Theories of Health Inventory (LTH), with Factor Loadings (Loadings >.50 in Bold)

Scale (Factor: Eigenvalue, % Variance)	Items	I	II	III	IV	V	VI	VII
Social-Emotional Health	Enjoying life	**.78**	.14	.19	.14	-.07	.03	-.10
(Factor I: 35.60, 22.20%)	Being engaged in life	**.76**	.23	.20	.06	.04	.09	.02
	Feeling good	**.70**	.22	.40	.24	-.02	-.03	.10
	Having healthy relationships with others	**.73**	.18	.15	.08	.06	.19	.08
	Being happy	**.82**	.15	.17	.21	.03	.04	.14
	Having a sense of purpose	**.70**	.35	.02	.06	.13	.08	.10
	Being hopeful	**.80**	.21	.02	.09	.03	.02	.19
	Having laughter	**.73**	.05	.08	.06	.09	.02	-.04
	Loving people	**.67**	.14	-.02	-.11	-.06	.24	-.05
	Being socially well-adjusted	**.71**	.21	.15	.15	.27	.07	.07
	Being mentally active	**.58**	.25	.08	.02	**.56**	.11	.02
	Being positive	**.82**	.19	.07	.27	-.02	.02	.07
	Having a great attitude	**.82**	.16	.13	.28	.11	.04	.03
	Being satisfied	**.74**	.22	.17	.12	-.08	.09	.09
	Having self-love	**.75**	.27	.05	.16	.09	-.11	.18
	Being optimistic	**.78**	.19	.10	.27	-.07	.07	.04
	Having respect for oneself	**.72**	.24	.08	.08	.23	-.06	.21
Positive Health Practices	Eating a balanced diet	.11	**.71**	.02	.25	-.05	.30	.22
(Factor II: 6.98, 15.46%)	Being of normal weight	.06	**.62**	.13	-.11	.21	-.17	.24
	Eating good foods, such as fruits and vegetables	.21	**.64**	-.04	.21	-.06	.31	-.08
	Eating properly, according to a doctor	.22	**.73**	.05	.18	.06	.25	.05
	Being fit	.28	**.80**	.26	.02	.06	-.11	.03
	Having good eating habits	.28	**.75**	.16	.19	.07	.20	.18
	Being health-conscious	.30	**.67**	.07	.14	.15	.24	.26
	Being in good shape	.30	**.75**	.30	.09	.10	-.18	.06
	Having an active lifestyle	.43	**.67**	.24	.14	.06	-.08	-.10
	Being physically active	.36	**.77**	.20	.06	.06	-.12	-.07
	Being nutrition-conscious	.26	**.72**	.13	.12	.07	.25	.25
	Exercising regularly	.22	**.76**	.13	.10	.03	-.14	-.04
	Being physically fit	.21	**.80**	.31	.07	.10	-.14	.05
Absence of Illness	Being free from illness	.14	.15	**.83**	.12	.12	.08	.10
(Factor III: 3.82, 6.92%)	Having no health problems or illness	.14	.27	**.84**	.06	-.02	.02	.04
	Being well	.44	.32	**.68**	.12	.05	.03	.04
Absence of Stress and Anxiety	Not anxious	.43	.06	.25	**.56**	.15	.02	.09
(Factor IV: 3.27, 5.09%)	Not stressed	.54	.19	.08	**.63**	.14	-.07	.06
	Stress-free	.41	.28	.18	**.66**	-.06	-.06	.22
Adequate Rest	Getting enough rest	.25	.27	.20	.22	.10	-.09	**.70**
(Factor VII: 2.01, 3.04%)	Sleeping well	.31	.28	.31	.20	-.07	-.12	**.64**
	Getting 6-8 hours of sleep each night	.26	.23	.16	.13	.12	-.07	**.69**

Note. $N = 224$. "Being mentally active" loaded at >.50 on both Factor I and Factor V; as it correlated highly with the other items of Factor I, it was included on that scale rather than identified as a separate single-item scale. No items were found to load at a level of >.50 on Factor VI; however, this factor was found to have an eigenvalue of 2.38, accounting for 2.62% of the sample variance.

Table 14

Correlations Between Items and Scales (Assigned Scales in Boldface)

Scale	Items	MDH	SEH	PHP	AI	ASA	AR
Social-Emotional Health (SEH)	Enjoying life	**.70**	**.80**	.44	.43	.51	.42
17 items	Being engaged in life	**.69**	**.74**	.48	.43	.47	.37
	Feeling good	**.78**	**.80**	.53	.60	.62	.48
	Having healthy relationships with others	**.67**	**.77**	.43	.38	.49	.37
	Being happy	**.76**	**.87**	.47	.46	.63	.48
	Having a sense of purpose	**.75**	**.81**	.58	.40	.46	.40
	Being hopeful	**.72**	**.84**	.44	.36	.49	.41
	Having laughter	**.58**	**.74**	.32	.33	.44	.28
	Loving people	**.52**	**.66**	.34	.25	.30	.20
	Being socially well-adjusted	**.72**	**.79**	.48	.42	.59	.41
	Being mentally active	**.60**	**.68**	.43	.36	.41	.33
	Being positive	**.76**	**.87**	.47	.42	.66	.40
	Having a great attitude	**.75**	**.88**	.45	.43	.63	.38
	Being satisfied	**.73**	**.83**	.48	.46	.56	.40
	Having self-love	**.76**	**.83**	.52	.36	.59	.48
	Being optimistic	**.73**	**.83**	.47	.38	.62	.41
	Having respect for oneself	**.71**	**.77**	.48	.37	.50	.44
Positive Health Practices (PHP)	Eating a balanced diet	**.59**	.34	**.75**	.29	.35	.37
13 items	Being of normal weight	**.49**	.25	**.67**	.29	.26	.41
	Eating good foods, such as fruits and vegetables	**.58**	.40	**.69**	.30	.34	.28
	Eating properly, according to a doctor	**.65**	.42	**.80**	.33	.40	.32
	Being fit	**.75**	.49	**.88**	.45	.45	.43
	Having good eating habits	**.77**	.52	**.87**	.43	.49	.46
	Being health-conscious	**.74**	.56	**.79**	.42	.42	.47
	Being in good shape	**.76**	.52	**.86**	.47	.50	.46
	Having an active lifestyle	**.77**	.61	**.80**	.48	.51	.38
	Being physically active	**.75**	.53	**.84**	.43	.45	.38
	Being nutrition-conscious	**.73**	.51	**.83**	.39	.44	.49
	Exercising regularly	**.67**	.43	**.81**	.36	.41	.37
	Being physically fit	**.74**	.47	**.88**	.50	.45	.46
Absence of Illness (AI)	Being free from illness	**.49**	.36	.36	**.91**	.33	.35
3 items	Having no health problems or illness	**.51**	.37	.42	**.93**	.34	.33
	Being well	**.73**	.65	.56	**.85**	.51	.42
Absence of Stress and Anxiety (ASA)	Not anxious	**.57**	.53	.36	.41	**.84**	.32
3 items	Not stressed	**.69**	.65	.48	.32	**.90**	.46
	Stress-free	**.69**	.55	.54	.40	**.90**	.53
Adequate Rest (AR)	Getting enough rest	**.59**	.42	.46	.34	.48	**.92**
3 items	Sleeping well	**.65**	.48	.53	.45	.49	**.90**
	Getting 6-8 hours of sleep each night	**.56**	.43	.42	.32	.41	**.90**

Note. *n*'s ranged from 274 to 327 for these correlations. All correlations were highly significant ($p < .001$). MDH = Multidimensional Health Scale (additive combination of all items).

Table 15

Zero-Order Correlations Between Proposed Lay Theories of Health Scales, and Other Study Measures

	LTH: MDH	LTH: SEH	LTH: PHP	LTH: AI	LTH: ASA	LTH: AR
LTH: SEH	.89*					
LTH: PHP	.86*	.57*				
LTH: AI	.62*	.50*	.49*			
LTH: ASA	.74*	.66*	.52*	.43*		
LTH: AR	.65*	.49*	.51*	.40*	.50*	
SF-36: PF	.22*	.12	.26*	.41*	.05	.13
SF-36: RP	.26*	.20*	.19*	.45*	.14	.18
SF-36: BP	-.38*	-.26*	-.32*	-.56*	-.28*	-.35*
SF-36: GH	-.58*	-.43*	-.54*	-.73*	-.36*	-.37*
SF-36: VT	-.71*	-.60*	-.58*	-.51*	-.61*	-.55*
SF-36: SF	-.43*	-.42*	-.30*	-.40*	-.39*	-.28*
SF-36: RE	.29*	.33*	.15	.25*	.34*	.25*
SF-36: MH	.69*	.74*	.42*	.44*	.69*	.44*
LOT-R	.61*	.66*	.41*	.36*	.54*	.37*
PA	.78*	.81*	.60*	.42*	.56*	.42*
NA	-.31*	-.39*	-.15	-.22*	-.46*	-.22*
MOS-SS	.38*	.49*	.24*	.23*	.25*	.14
MOS-EI	.38*	.50*	.23*	.23*	.25*	.13
MOS-T	.34*	.43*	.22*	.21*	.24*	.15
DSES-S	-.49*	-.50*	-.34*	-.22*	-.35*	-.25*

Note. *$p < .001$. *n*'s ranged from 256-315 for these pairwise comparisons. LTH: Lay Theories of Health Measure; MDH: Multidimensional Health; SEH: Social-Emotional Health; PHP: Positive Health Practices; AI: Absence of Illness; ASA: Absence of Stress/Anxiety; AR: Adequate Rest; SF-36: RAND Medical Outcome Study SF-36; PF: Physical Functioning; RP: Role-Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Functioning; RE: Role-Emotional; MH: Mental Health; LOT-R: Life Orientation Test-Revised; PA: Positive Affect; NA: Negative Affect; MOS-SS: Medical Outcome Study Overall Support; MOS-SE: Medical Outcome Study Emotional-Informational Support; MOS-T: Medical Outcome Study Tangible Support; DSES-S: Daily Spiritual Experiences Survey-Short Form.

Table 16

Zero-Order Correlations Between Widely-Used Quality of Life Measure (SF-36) and Other Study Measures

	SF-36: PF	SF-36: RP	SF-36: BP	SF-36: GH	SF-36: VT	SF-36: SF	SF-36: RE	SF-36: MH
SF-36: RP	.54*							
SF-36: BP	-.48*	-.67*						
SF-36: GH	-.42*	-.45*	.56*					
SF-36: VT	-.27*	-.43*	.49*	.56*				
SF-36: SF	-.37*	-.62*	.55*	.45*	.60*			
SF-36: RE	.18	.43*	-.36	.25*	-.45*	-.55*		
SF-36: MH	.14	.27*	-.39*	-.45*	-.66*	-.57*	.52*	
LOT-R	.12	.18	-.22*	-.38*	-.52*	-.35*	.29*	.65*
PA	.06	.15	-.19*	-.39*	-.58*	-.33*	.26*	.59*
NA	-.11	-.17	.21*	.26*	.38*	.42*	-.32*	-.63*
MOS-SS	.17	.16	-.13	-.24*	-.27*	-.24*	.21*	.42*
MOS-EI	.15	.16	-.13	-.24*	-.28*	-.24*	.21*	.42*
MOS-T	.19*	.14	-.12	-.22*	-.22*	-.22*	.19*	.37*
DSES-S	.02	.04	.01	.25*	.31*	.08	-.07	-.34*

Note. *$p < .001$. *n*'s ranged from 290-312 for these pairwise comparisons. SF-36: RAND Medical Outcome Study SF-36; PF: Physical Functioning; RP: Role-Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Functioning; RE: Role-Emotional; MH: Mental Health; LOT-R: Life Orientation Test-Revised; PA: Positive Affect; NA: Negative Affect; MOS-SS: Medical Outcome Study Overall Support; MOS-SE: Medical Outcome Study Emotional-Informational Support; MOS-T: Medical Outcome Study Tangible Support; DSES-S: Daily Spiritual Experiences Survey-Short Form.

Table 17
Remaining Zero-Order Correlations Between Other Study Measures

	LOT-R	PA	NA	MOS-SS	MOS-EI	MOS-T
PA	.56*					
NA	-.49*	-.26				
MOS-SS	.43*	.37	-.32*			
MOS-EI	.43*	.38	-.32*	-.98*		
MOS-T	.38*	.32	-.30*	-.94*	.86*	
DSES-S	-.49*	-.46*	.21*	-.22*	-.21*	-.22*

Note. *$p < .001$. *n*'s ranged from 288-311 for these pairwise comparisons. LOT-R: Life Orientation Test-Revised; PA: Positive Affect; NA: Negative Affect; MOS-SS: Medical Outcome Study Overall Support; MOS-SE: Medical Outcome Study Emotional-Informational Support; MOS-T: Medical Outcome Study Tangible Support; DSES-S: Daily Spiritual Experiences Survey-Short Form.

Table 18

Zero-Order Correlations Between Proposed Lay Theories of Health Measure, and Health-Related Behaviors

	Smoking	Exercising	Getting medical checkups	Drinking alcohol	Sleeping poorly	Managing stress	Controlling your weight	Using safety measures	Eating nutritiously	Keeping poor hygiene
LTH: MDH	-.17**	*.59***	.16	-.10	*-.46***	*.26***	*.40***	.12	*.62***	-.16**
LTH: SEH	-.08	.39***	.21***	-.12	-.34***	.31***	.26***	.18**	.40***	-.18**
LTH: PHP	-.25***	*.73***	.19***	-.06	-.35***	.16**	*.47***	.08	*.76***	-.12
LTH: AI	-.09	.35***	-.11	.06	-.32***	.03	.18**	.06	.33***	-.05
LTH: ASA	-.10	.32***	.13	-.04	-.44***	*.16***	.17**	.13	.34***	-.10
LTH: AR	-.07	.28***	.06	-.09	*-.67***	.10	.24**	.01	.38***	-.07

Note. **Marginally significant findings ($p < .01$); ***$p < .001$. *n*'s ranged from 263-307 for these pairwise comparisons. LTH: Lay Theories of Health Measure; MDH: Multidimensional Health; SEH: Social-Emotional Health; PHP: Positive Health Practices; AI: Absence of Illness; ASA: Absence of Stress/Anxiety; AR: Adequate Rest. Italicized values indicate possible inflation of association due to high similarity between LTH subscale items, and the health behaviors assessed in Study 2.

Table 19

Simultaneous Multiple Regressions Testing Demographic Factors in Relation to Health-Related Behaviors: Study 2 Sample

Health Outcome	Significant Predictors	β	*t* -value	*Sig.*	**Health Outcome**	Significant Predictors	β	*t* -value	*Sig.*
Smoking	Marital status: Divorced	.15	2.14	$p < .01$	**Managing stress**	Marital status: Married	-.16	-1.98	$p < .05$
						Income: Above $100,000	.19	2.41	$p < .05$
						Religion: Hindu	-.17	-2.26	$p < .05$
						Religion: None	-.23	-3.12	$p < .01$
Exercising	Racial group: Black/Af.-Am.	.13	2.06	$p < .05$	**Controlling your weight**	Religion: None	-.24	-3.25	$p < .001$
Getting medical checkups	Age	.17	2.69	$p < .01$	**Using safety measures (e.g., wearing a seat belt)**	Education: High School	.41	1.97	$p < .05$
	Female	.22	3.82	$p < .001$		Education: Some College	.67	2.77	$p < .01$
	Racial group: Black/Af.-Am.	.13	2.33	$p < .05$		Education: College	.62	2.56	$p < .05$
	Rural	.14	1.99	$p < .05$		Education: Advanced Degree	.51	2.77	$p < .01$
	Religion: Agnostic	-.16	-2.36	$p < .05$		Education: Technical School	.24	2.35	$p < .05$
						Religion: Buddhist	-.21	-3.20	$p < .01$
Drinking alcohol	Age	-.19	-2.93	$p < .01$	**Eating nutritiously**	Female	.15	2.43	$p < .05$
	Female	-.12	-1.98	$p < .05$		Education: Advanced Degree	.37	1.97	$p < .05$
	Religion: Roman Catholic	.15	2.10	$p < .05$		Religion: Agnostic	-.15	-2.08	$p < .05$
						Religion: Other	-.19	-2.26	$p < .05$
Sleeping poorly	Income: $25,000-$50,000	-.17	-2.04	$p < .05$	**Keeping poor hygiene**	Racial group: Black/Af-Am.	.13	2.02	$p < .05$
	Income: Above $100,000	-.18	-2.36	$p < .05$		Income: $25,000-$50,000	-.20	-2.31	$p < .05$
	Religion: Hindu	-.18	-2.43	$p < .05$		Income: $50,000-$75,000	-.25	-2.75	$p < .01$

Note. All demographic variables were dummy-coded and entered simultaneously in a series of multiple regressions. The table depicts demographic variables which were found to have unique and significant predictive validity in relation to the identified health behaviors (the dependent variable in each regression).

Table 20

Stepwise Regressions Predicting Behaviors Identified as Central to Lay Theories of Health

Health Outcome	Step	Significant Predictors	β	*t* -value	*Sig.*	R^2	Effect size (f^2)	Change in R^2	*F* change	*Sig.*
Exercising	1	SF-36: General Health	-.31	-3.96	$p < .001$	.31	.45	.31	12.17	$p < .001$
n = 221		SF-36: Vitality	-.33	-3.76	$p < .001$					
		SF-36: Role-Emotional	-.16	-2.16	$p < .05$					
	2	SF-36: General Health	-.23	-2.97	$p < .01$	.41	.69	.09	2.84	$p < .01$
		SF-36: Vitality	-.19	-2.14	$p < .05$					
		SF-36: Role-Emotional	-.15	-2.13	$p < .05$					
		Positive Affect	.32	3.94	$p < .001$					
	3	Positive Affect	.17	2.14	$p < .05$	.64	1.78	.23	24.83	$p < .001$
		LTH: Social-Emotional Health	-.21	-2.01	$p < .05$					
		LTH: Positive Health Practices	.74	10.83	$p < .001$					
Controlling your weight	1	SF-36: Vitality	-.32	-3.29	$p = .001$	.13	.15	.13	4.02	$p < .001$
n = 221	2	SF-36: Vitality	-.26	-2.36	$p < .05$	.25	.33	.12	1.35	*ns*
		Marital status: Married	-.17	-2.08	$p < .05$					
		Religion: None	-.31	-3.25	$p = .001$					
	3	Religion: None	-.28	-3.08	$p < .01$	.35	.54	.10	5.71	$p < .001$
		LTH: Positive Health Practices	.47	4.83	$p < .001$					
Sleeping poorly	1	SF-36: Physical Functioning	.26	3.31	$p = .001$	.33	.49	.33	13.14	$p < .001$
n = 221	2	SF-36: Physical Functioning	.25	3.31	$p < .001$	.42	.72	.09	1.88	$p < .05$
		SF-36: Vitality	.35	3.70	$p < .001$					
		Optimism	-.24	-2.80	$p < .01$					
		Daily Spiritual Experiences	-.17	-2.06	$p < .05$					
		Income: $25,000-$50,000	-.12	-2.11	$p < .05$					
	3	SF-36: Physical Functioning	.21	3.33	$p = .001$	.61	1.56	.19	19.22	$p < .001$
		SF-36: General Health	.21	2.57	$p < .05$					
		Optimism	-.17	-2.36	$p < .05$					
		LTH: Social-Emotional Health	.25	2.20	$p < .05$					
		LTH: Adequate Rest	-.60	-9.35	$p < .001$					
Managing stress	1	SF-36: Mental Health	.43	4.48	$p < .001$	.14	.16	.14	4.19	$p < .001$
n = 222	2	Positive Affect	.29	2.94	$p < .01$	.26	.35	.13	1.53	*ns*
		Religion: Hindu	-.14	-1.98	$p = .05$					
		Religion: None	-.20	-2.08	$p < .05$					
	3	Positive Affect	.34	2.82	$p < .01$	.29	.41	.03	1.54	*ns*
		Marital status: Married	-.17	-2.08	$p < .05$					
		Religion: None	-.23	-2.37	$p < .05$					
Eating nutritiously	1	SF-36: General Health	-.27	-3.34	$p = .001$	.27	.37	.27	9.57	$p < .001$
n = 221		SF-36: Vitality	-.33	-3.66	$p < .001$					
	2	SF-36: General Health	-.24	-2.85	$p < .01$	.33	.49	.07	1.22	*ns*
		SF-36: Vitality	-.28	-2.78	$p < .01$					
	3	SF-36: Physical Functioning	-.15	-2.52	$p < .05$	.66	1.94	.33	37.00	$p < .001$
		LTH: Social-Emotional Health	-.22	-2.04	$p < .05$					
		LTH: Positive Health Practices	.88	12.98	$p < .001$					

Note. All SF-36 subscales were entered in Step 1; Positive Affect, Negative Affect, Optimism, Daily Spiritual Experiences, and significant demographic predictors were entered in Step 2; and all LTH subscales were entered in Step 3.

Table 21

Stepwise Regressions Predicting Behaviors Identified as Central to Lay Theories of Health, Eliminating Content-Similar LTH: PHP Items

Health Outcome	Step	Significant Predictors	β	*t* - value	*Sig.*	Model R^2	Effect size (f^2)	Change in R^2	*F* change	*Sig.*
Exercising	1	SF-36: General Health	-.31	-3.96	$p < .001$	.31	.45	.31	12.17	$p < .001$
n = 221		SF-36: Vitality	-.33	-3.76	$p < .001$					
		SF-36: Role-Emotional	-.16	-2.16	$p < .05$					
	2	SF-36: General Health	-.23	-2.97	$p < .01$	.41	.69	.09	2.84	$p < .01$
		SF-36: Vitality	-.19	-2.14	$p < .05$					
		SF-36: Role-Emotional	-.15	-2.13	$p < .05$					
		Positive Affect	.32	3.94	$p < .001$					
	3	SF-36: General Health	-.17	-1.99	$p < .05$	.58	1.38	.18	16.40	$p < .001$
		Positive Affect	.23	2.70	$p < .01$					
		LTH: Positive Health Practices	.63	8.72	$p < .001$					
Controlling your weight	1	SF-36: Vitality	-.32	-3.29	$p = .001$	.13	.15	.13	4.02	$p < .001$
n = 221										
	2	SF-36: Vitality	-.26	-2.36	$p < .05$	.25	.33	.12	1.35	*ns*
		Marital status: Married	-.17	-2.08	$p < .05$					
		Religion: None	-.31	-3.25	$p = .001$					
	3	Religion: None	-.28	-3.04	$p < .01$	.34	.52	.09	4.92	$p < .001$
		LTH: Positive Health Practices	.44	4.41	$p < .001$					
Eating nutritiously	1	SF-36: General Health	-.27	-3.34	$p = .001$	.27	.37	.27	9.57	$p < .001$
n = 232		SF-36: Vitality	-.33	-3.66	$p < .001$					
	2	SF-36: General Health	-.24	-2.85	$p < .01$	.32	.47	.05	1.22	*ns*
		SF-36: Vitality	-.28	-2.78	$p < .01$					
	3	LTH: Positive Health Practices	.62	7.73	$p < .001$	.49	.96	.17	14.22	$p < .001$

Note. All SF-36 subscales were entered in Step 1; Positive Affect, Negative Affect, Optimism, Daily Spiritual Experiences, and significant demographic predictors were entered in Step 2; and all LTH subscales were entered in Step 3.

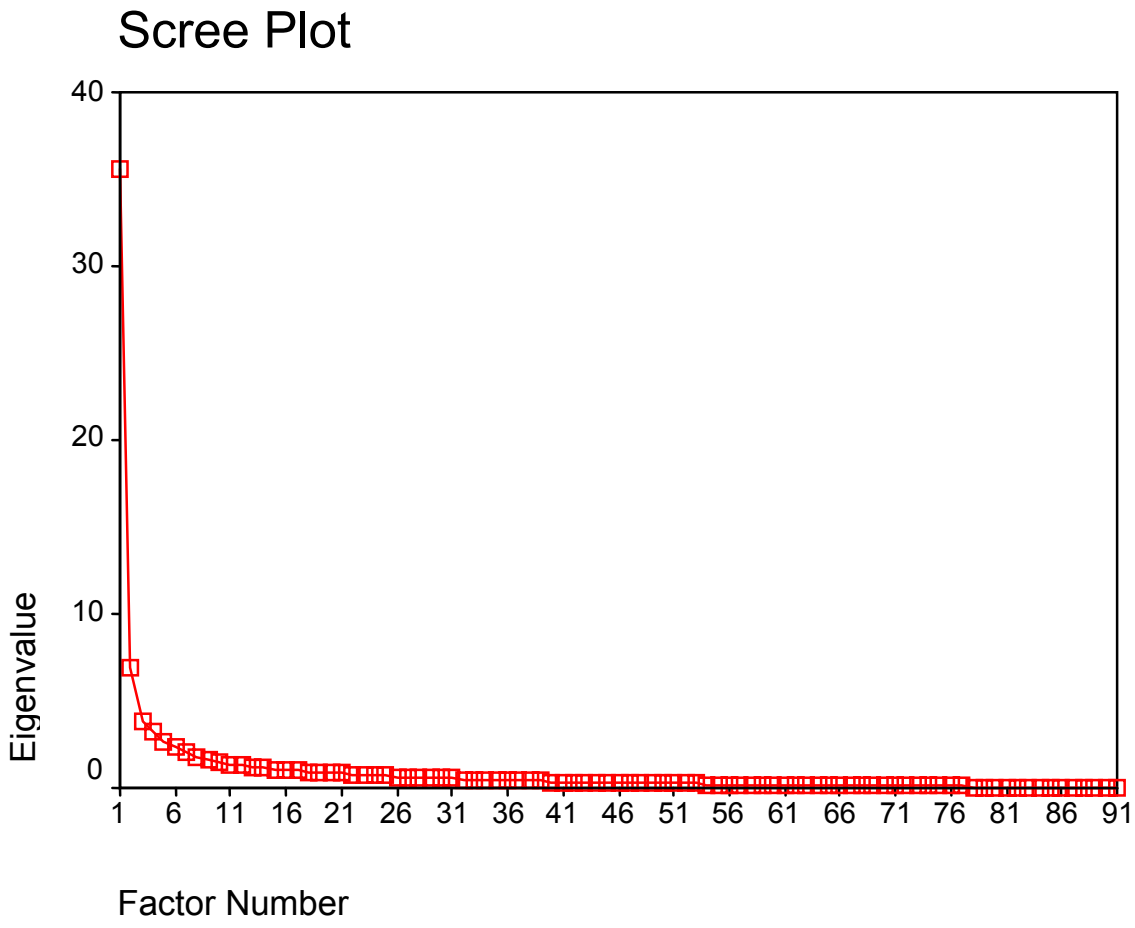
Table 22

Stepwise Regressions Predicting Health-Related Behaviors Not Identified as Central to Lay Theories of Health

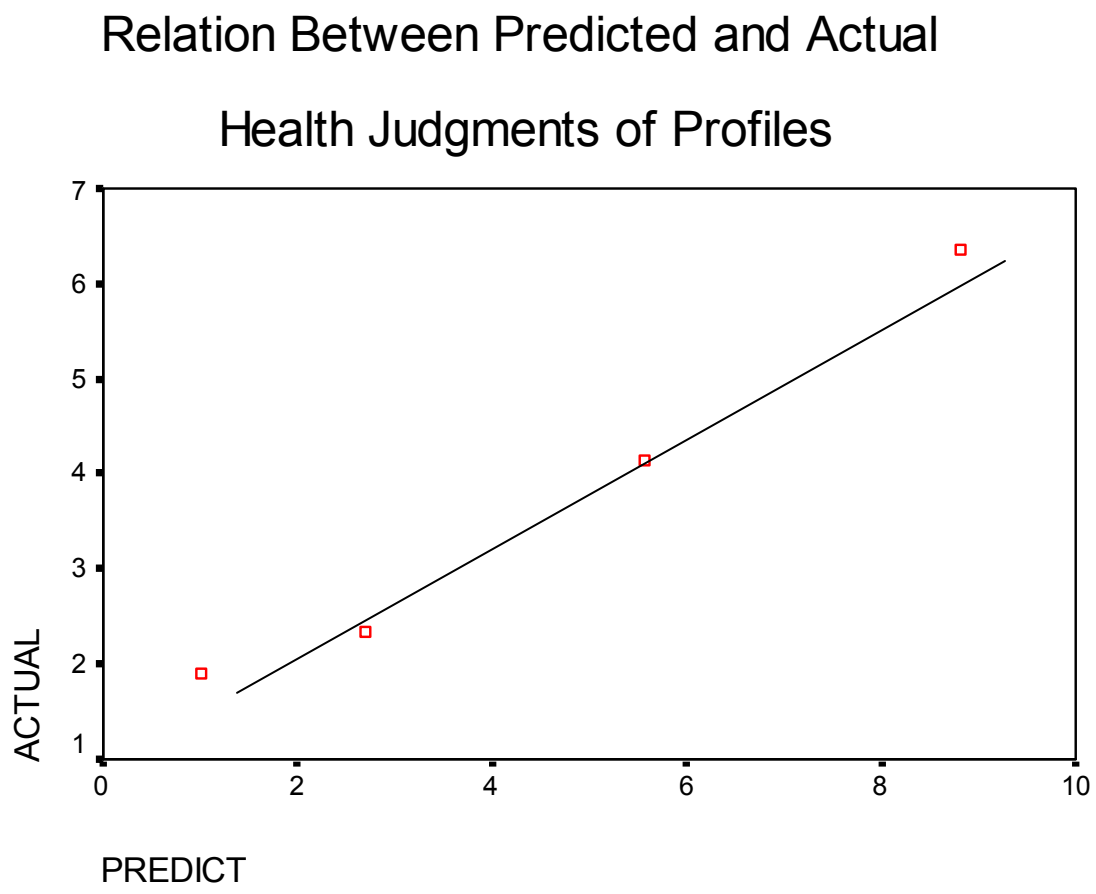
Health Outcome	Step	Significant Predictors	β	*t* -value	*Sig.*	Model R^2	Effect size (f^2)	Change in R^2	*F* change	*Sig.*
Smoking	1	No significant predictors				.06	.06	.06	1.83	*ns*
n = 222	2	SF-36: Bodily Pain	.24	2.33	$p < .05$	.14	.16	.08	1.78	*ns*
		SF-36: Vitality	-.24	-2.21	$p < .05$					
		Daily Spiritual Experiences	.19	2.30	$p < .05$					
	3	SF-36: Bodily Pain	.22	2.17	$p < .05$	.20	.25	.06	3.06	$p < .05$
		Daily Spiritual Experiences	.18	2.14	$p < .05$					
		LTH: Positive Health Practices	-.34	-3.42	$p < .001$					
Getting medical checkups	1	SF-36: Mental Health	.23	2.33	$p < .05$	.08	.09	.08	2.38	$p < .05$
n = 221	2	Age	.24	3.17	$p < .01$	.29	.41	.20	2.23	$p = .001$
		Female	.19	2.82	$p < .01$					
	3	SF-36: Social Functioning	.21	2.15	$p < .05$	.37	.59	.09	5.03	$p < .001$
		Age	.26	3.52	$p < .001$					
		Female	.21	3.09	$p < .01$					
		LTH: Absence of Illness	-.28	-2.65	$p < .01$					
		LTH: Positive Health Practices	.36	3.66	$p < .001$					
Drinking alcohol	1	SF-36: Physical Functioning	.18	2.07	$p < .05$	.05	.05	.05	1.47	*ns*
n = 222	2	Religion: Hindu	-.14	-1.98	$p < .05$	.20	.25	.14	2.19	$p < .01$
	3	Religion: Hindu	-.16	-2.15	$p < .05$	.21	.27	.02	.81	*ns*
Using safety measures	1	No significant predictors				.05	.05	.05	1.35	*ns*
n = 221	2	Negative Affect	-.20	-2.10	$p < .05$	.20	.25	.15	1.89	$p < .05$
		Religion: Buddhist	-.17	-2.32	$p < .05$					
	3	Negative Affect	-.19	-2.03	$p < .05$	.24	.32	.04	2.06	*ns*
		Religion: Buddhist	-.17	-2.33	$p < .05$					
		Religion: Roman Catholic	-.18	-2.08	$p < .05$					
		LTH: Absence of Illness	-.27	-2.33	$p < .05$					
Keeping poor personal hygiene	1	SF-36: Physical Functioning	-.31	-3.69	$p < .001$	.08	.09	.08	2.39	$p < .05$
n = 221	2	SF-36: Physical Functioning	-.29	-3.39	$p < .001$	.22	.28	.14	2.29	$p < .01$
		SF-36: Role-Emotional	-.18	-2.06	$p < .05$					
		Daily Spiritual Experiences	.19	2.33	$p < .05$					
		Racial group: Black/African-Am.	.23	3.52	$p = .001$					
	3	SF-36: Physical Functioning	-.28	-3.21	$p < .01$	.24	.32	.02	1.17	*ns*
		Racial group: Black/African-Am.	.25	3.72	$p < .001$					

Note. All SF-36 subscales were entered in Step 1; Positive Affect, Negative Affect, Optimism, Daily Spiritual Experiences, and significant demographic predictors were entered in Step 2; and all LTH subscales were entered in Step 3.

Figures



Note. Scree plot resulting from exploratory factor analysis (varimax rotation) of the 95 Study 1 items.



Note. The correlation here depicted between predicted profile ratings (horizontal axis), and actual profile ratings (vertical axis) from Study 2, was extremely high ($r = .99$, $p < .001$). This can be seen as evidence that the Prestudy items which were judged most important to health are indeed utilized by laypeople to judge the health of others.

Appendices

Appendix A
Prestudy Survey

Thank you for participating in our survey. We are investigating the ideas adults have about health. Please answer the following questions thoroughly, thoughtfully, and as honestly as possible. Your responses will be kept completely confidential.

1. Think of a very healthy person. What ten words or phrases would you use to describe that person? (These can be stated in terms of having or being something, or *not* having or being something.)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

2. Think of your idea of an unhealthy person. What ten words or phrases would you use to describe that person? (These can be the same or different from the answers to Questions 1, 2, 3, and 4.)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

3. Think of a very physically healthy person. What ten words or phrases would you use to describe that person? (These can be the same or different from the answers to Question 1.)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

4. Think of a very mentally healthy person. What ten words or phrases would you use to describe that person? (These can be the same or different from the answers to Questions 1 and 3.)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

5. Think of a person who has very healthy social relationships. What ten words or phrases would you use to describe that person? (These can be the same or different from the answers to Questions 1, 3, and 4.)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

In the space below, please write a short paragraph elaborating on your ideas about what it means to be healthy.

_____

_____

_____

_____

_____

_____

_____

_____

As the last part of the survey, please answer the following questions about yourself.

7. Age:_____years 8. Gender: _____Male _____Female

9. Race/ethnicity:

_____White _____Hispanic/Latino

_____Black/African-American _____Native American/Inuit

_____Asian/Asian-American/Pacific Islander _____Multiracial (indicate groups)

_____Other

10. Are you an immigrant to the United States? _____yes _____no

11. If yes, how many years have you resided in the U.S.? _____years

12. Marital status:

_____Single, never married _____Domestic partner

_____Married _____Separated

_____Divorced _____Widowed

13. Educational Level (last level completed):

_____Grade school _____ College degree

_____High school _____ Advanced degree (Master's

_____Some college or doctoral)

_____Technical school

14. Annual household income (total of all income earning members of your primary residence):

_____Less than $25,000 _____$75,000-$100,000

_____$25,000-$50,000 _____ Above $100,000

_____$50,000-$75,000

15. Considering the places where you have lived in your lifetime, would you describe them as being:

_____Mostly urban, larger cities _____Mostly urban, smaller cities

_____Mostly suburban _____Mostly rural, small towns

16. How would you describe your religious affiliation?

_____Protestant _____Roman Catholic

_____Jewish _____Muslim

_____Buddhist _____Hindu

_____Agnostic/Atheist _____Other

_____None

17. Compared to other people your age, how many minor health problems (e.g., illnesses of short duration, injuries which were not life-threatening or profoundly disabling) have you faced?

_____Much less than most people _____ Somewhat more than most people

_____Somewhat less than most people _____Much more than most people

_____About the same as most people

18. Compared to other people your age, how many major health problems (e.g., illnesses of long duration or a serious nature, injuries which were life-threatening or profoundly disabling) have you faced?

_____Much less than most people _____ Somewhat more than most people

_____Somewhat less than most people _____Much more than most people

_____About the same as most people

20. How often do you visit a professional for any problems related to your health?

_____Less than once a year _____6-12 times per year

_____1-2 times per year _____ More than 12 times per year

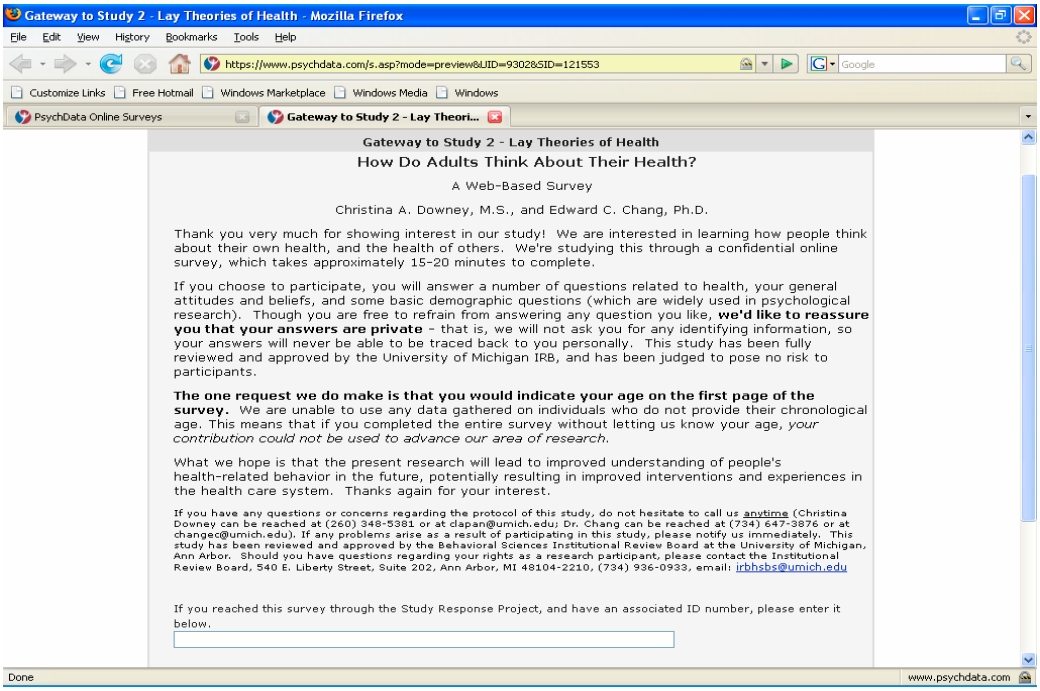
_____3-6 times per year

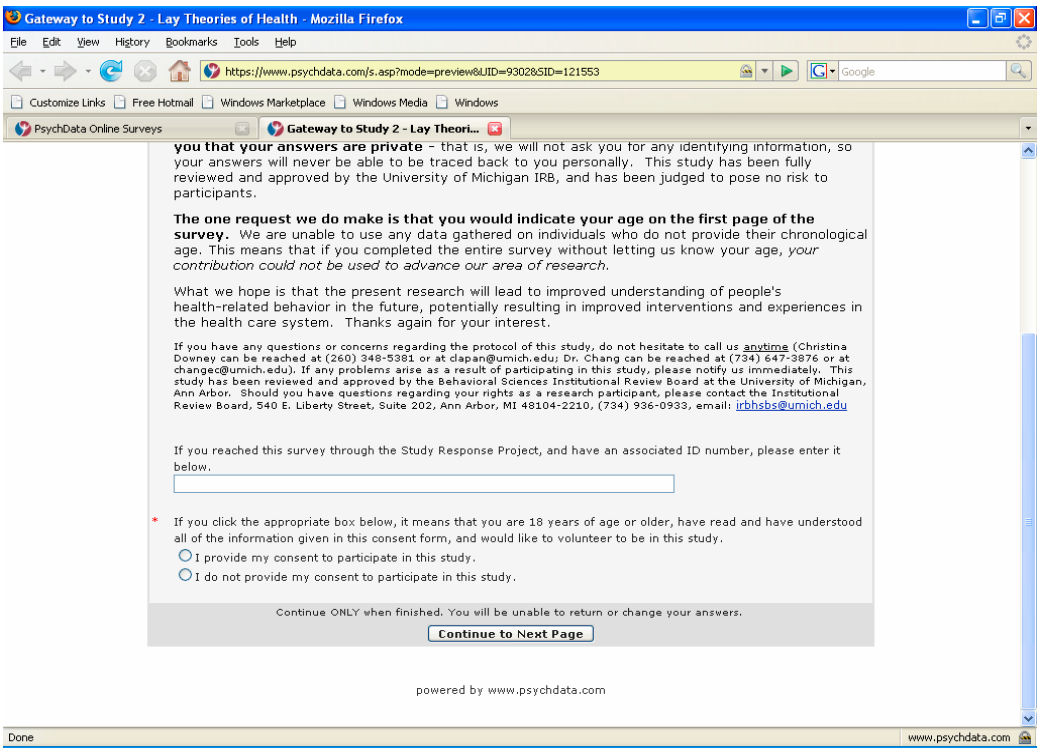
21. How frequently do you engage in each of the following behaviors? (circle the number that most closely represents your behavior):

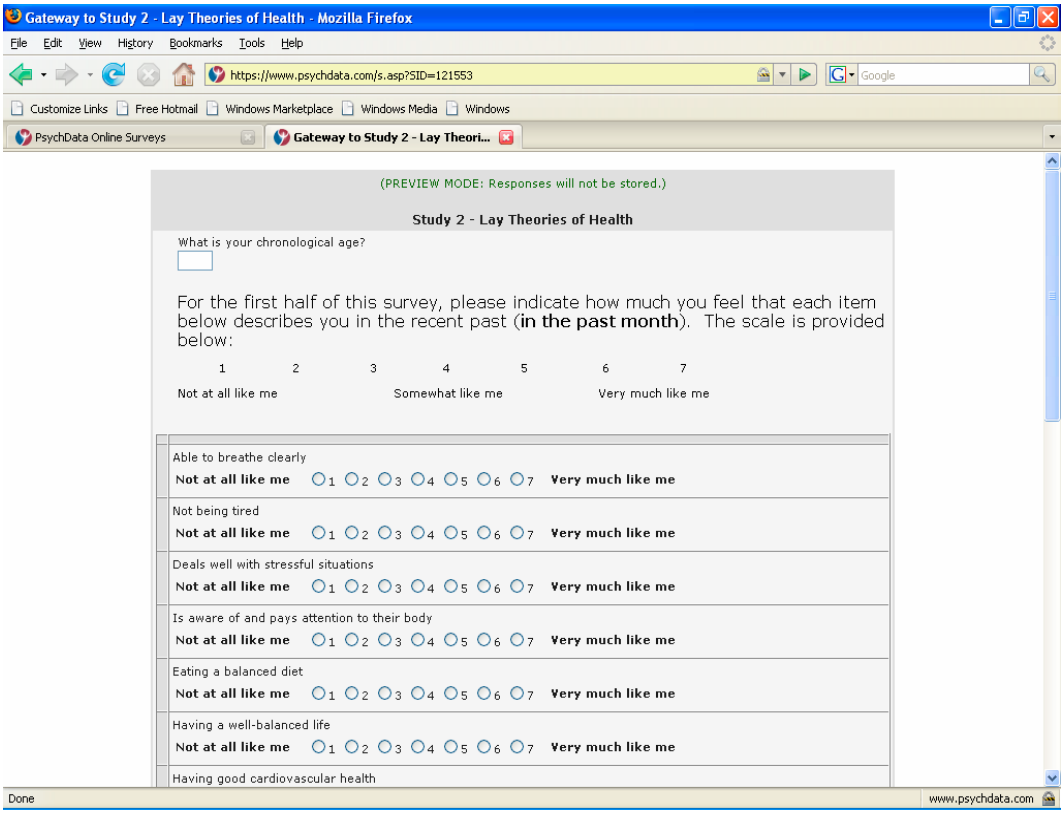
	Never			Sometimes			Very Frequently
Smoking	1	2	3	4	5	6	7
Exercising	1	2	3	4	5	6	7
Getting medical checkups	1	2	3	4	5	6	7
Drinking alcohol	1	2	3	4	5	6	7
Sleeping poorly	1	2	3	4	5	6	7
Managing stress	1	2	3	4	5	6	7
Controlling your weight	1	2	3	4	5	6	7
Using safety measures (i.e., wearing a seat belt)	1	2	3	4	5	6	7
Eating nutritiously	1	2	3	4	5	6	7
Keeping poor personal hygiene	1	2	3	4	5	6	7

Appendix B

Captured Screen Shots of All Items Rated in Study 2



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Study 2 - Lay Theories of Health
What is your chronological age?
For the first half of this survey, please indicate how much you feel that each item below describes you in the recent past (in the past month). The scale is provided below:
1 2 3 4 5 6 7
Not at all like me
Somewhat like me
Very much like me
Able to breathe clearly
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being tired
Not at all like me 1 2 3 4 5 6 7 Very much like me
Deals well with stressful situations
Not at all like me 1 2 3 4 5 6 7 Very much like me
Is aware of and pays attention to their body
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating a balanced diet
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a well-balanced life
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good cardiovascular health
Done
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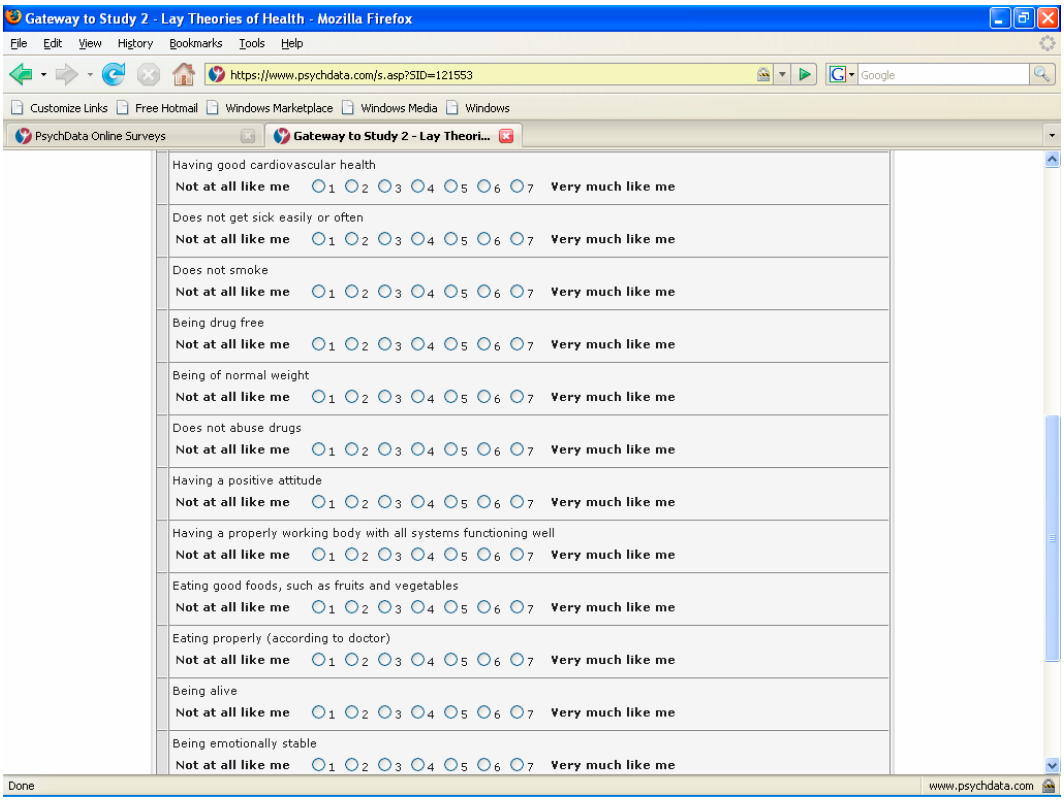
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Gateway to Study 2 - Lay Theori...
Having good cardiovascular health
Not at all like me 1 2 3 4 5 6 7 Very much like me
Does not get sick easily or often
Not at all like me 1 2 3 4 5 6 7 Very much like me
Does not smoke
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being drug free
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being of normal weight
Not at all like me 1 2 3 4 5 6 7 Very much like me
Does not abuse drugs
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a positive attitude
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a properly working body with all systems functioning well
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating good foods, such as fruits and vegetables
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating properly (according to doctor)
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being alive
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being emotionally stable
Not at all like me 1 2 3 4 5 6 7 Very much like me
Done
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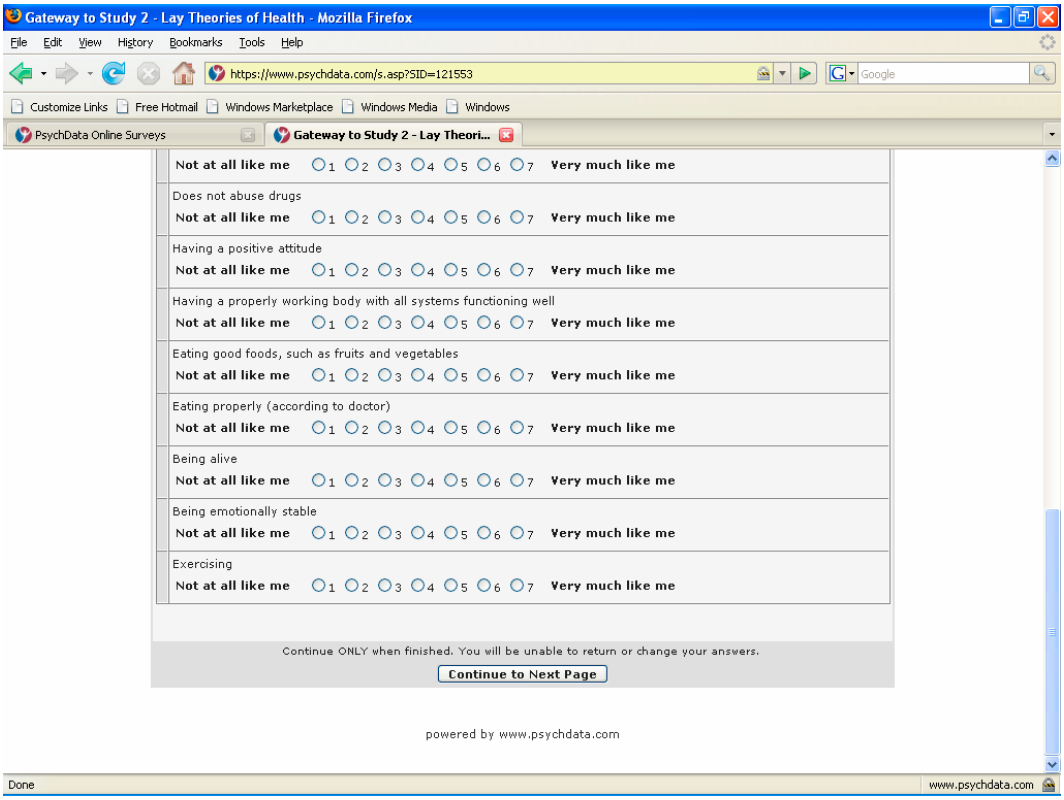
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Not at all like me 1 2 3 4 5 6 7 Very much like me
Does not abuse drugs
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a positive attitude
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a properly working body with all systems functioning well
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating good foods, such as fruits and vegetables
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating properly (according to doctor)
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being alive
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being emotionally stable
Not at all like me 1 2 3 4 5 6 7 Very much like me
Exercising
Not at all like me 1 2 3 4 5 6 7 Very much like me
Continue ONLY when finished. You will be unable to return or change your answers.
Continue to Next Page
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Done
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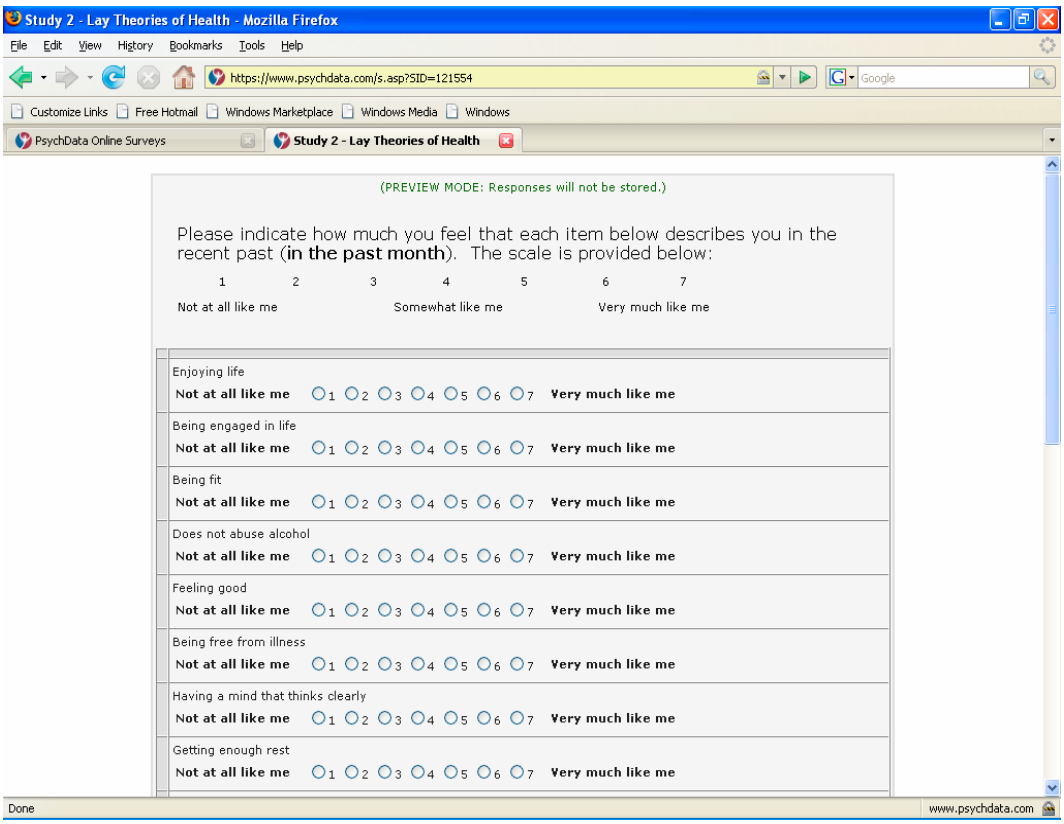
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Study 2 - Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
Please indicate how much you feel that each item below describes you in the recent past (in the past month). The scale is provided below:
1 2 3 4 5 6 7
Not at all like me
Somewhat like me
Very much like me
Enjoying life
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being engaged in life
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being fit
Not at all like me 1 2 3 4 5 6 7 Very much like me
Does not abuse alcohol
Not at all like me 1 2 3 4 5 6 7 Very much like me
Feeling good
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being free from illness
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a mind that thinks clearly
Not at all like me 1 2 3 4 5 6 7 Very much like me
Getting enough rest
Not at all like me 1 2 3 4 5 6 7 Very much like me
Done
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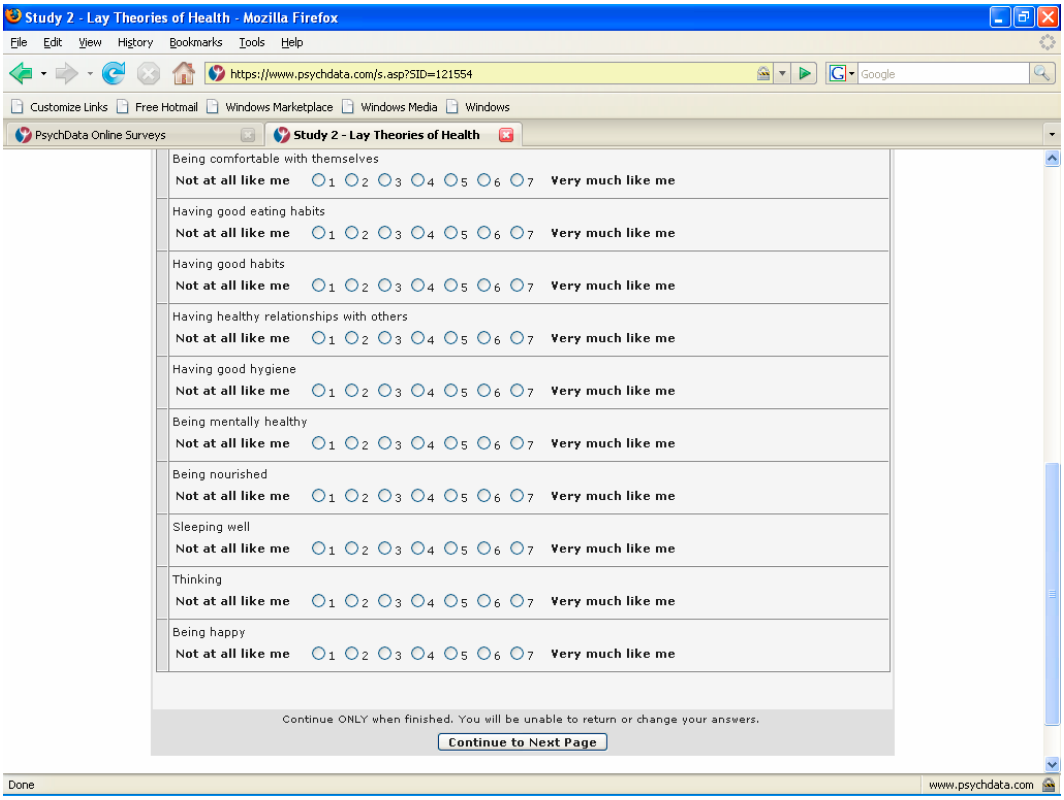
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Being comfortable with themselves
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good eating habits
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good habits
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having healthy relationships with others
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good hygiene
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being mentally healthy
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being nourished
Not at all like me 1 2 3 4 5 6 7 Very much like me
Sleeping well
Not at all like me 1 2 3 4 5 6 7 Very much like me
Thinking
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being happy
Not at all like me 1 2 3 4 5 6 7 Very much like me
Continue ONLY when finished. You will be unable to return or change your answers.
Continue to Next Page
Done
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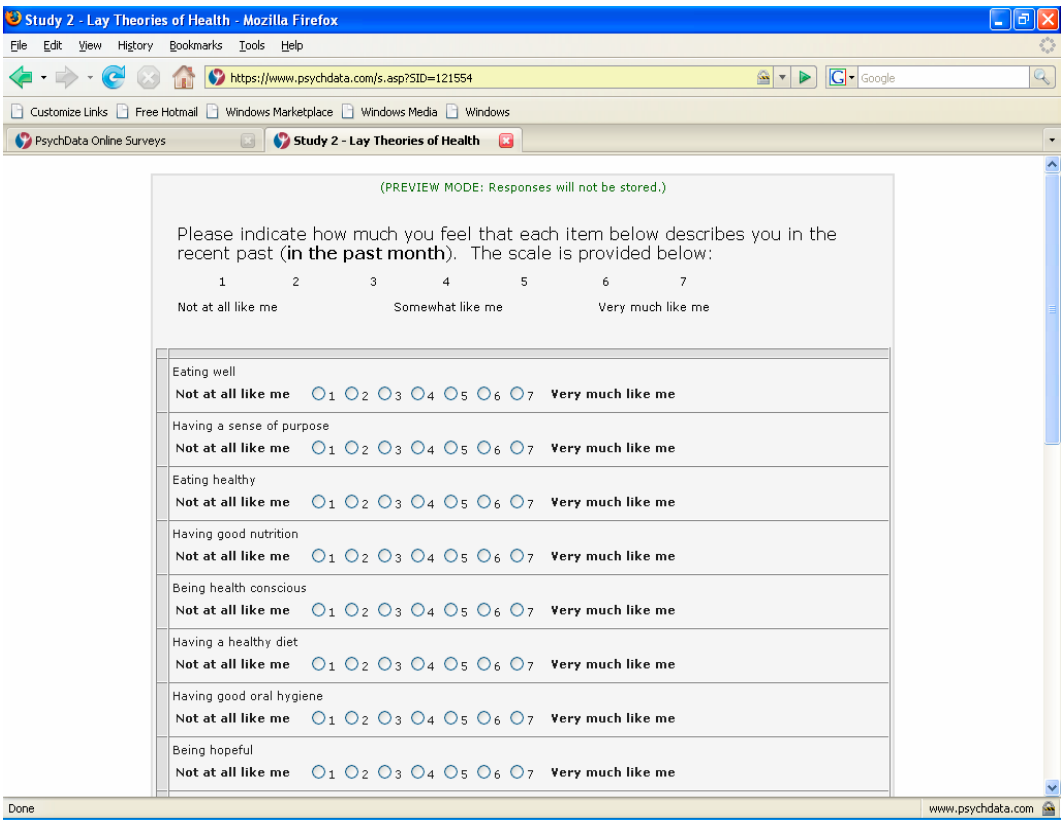
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Study 2 - Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
Please indicate how much you feel that each item below describes you in the recent past (in the past month). The scale is provided below:
1 2 3 4 5 6 7
Not at all like me
Somewhat like me
Very much like me
Eating well
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a sense of purpose
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating healthy
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good nutrition
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being health conscious
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a healthy diet
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having good oral hygiene
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being hopeful
Not at all like me 1 2 3 4 5 6 7 Very much like me
Done
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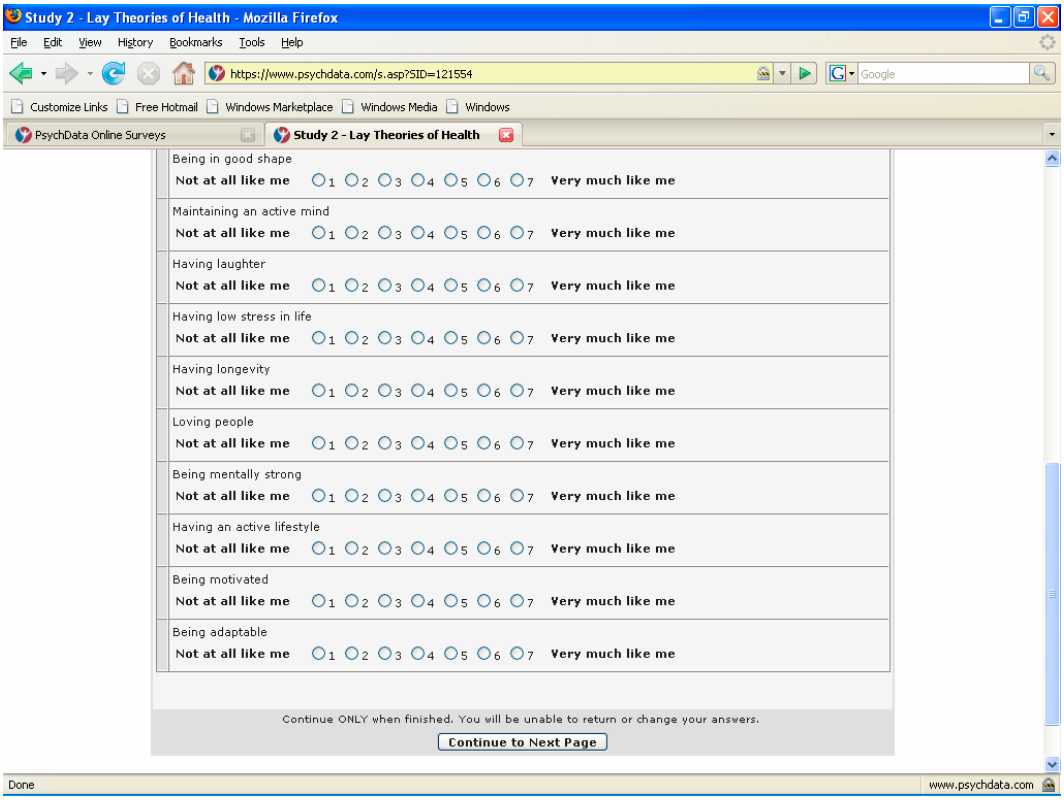
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Being in good shape
Not at all like me 1 2 3 4 5 6 7 Very much like me
Maintaining an active mind
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having laughter
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having low stress in life
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having longevity
Not at all like me 1 2 3 4 5 6 7 Very much like me
Loving people
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being mentally strong
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having an active lifestyle
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being motivated
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being adaptable
Not at all like me 1 2 3 4 5 6 7 Very much like me
Continue ONLY when finished. You will be unable to return or change your answers.
Continue to Next Page
Done
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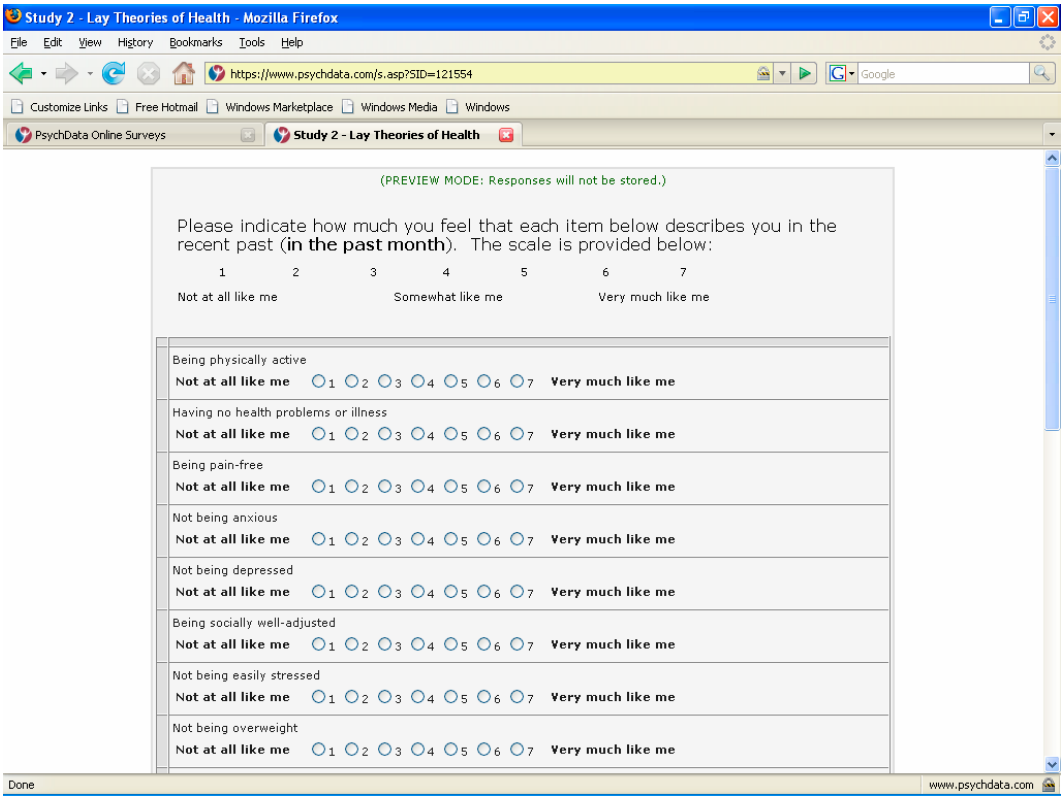
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Study 2 - Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
Please indicate how much you feel that each item below describes you in the recent past (in the past month). The scale is provided below:
1 2 3 4 5 6 7
Not at all like me
Somewhat like me
Very much like me
Being physically active
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having no health problems or illness
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being pain-free
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being anxious
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being depressed
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being socially well-adjusted
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being easily stressed
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being overweight
Not at all like me 1 2 3 4 5 6 7 Very much like me
Done
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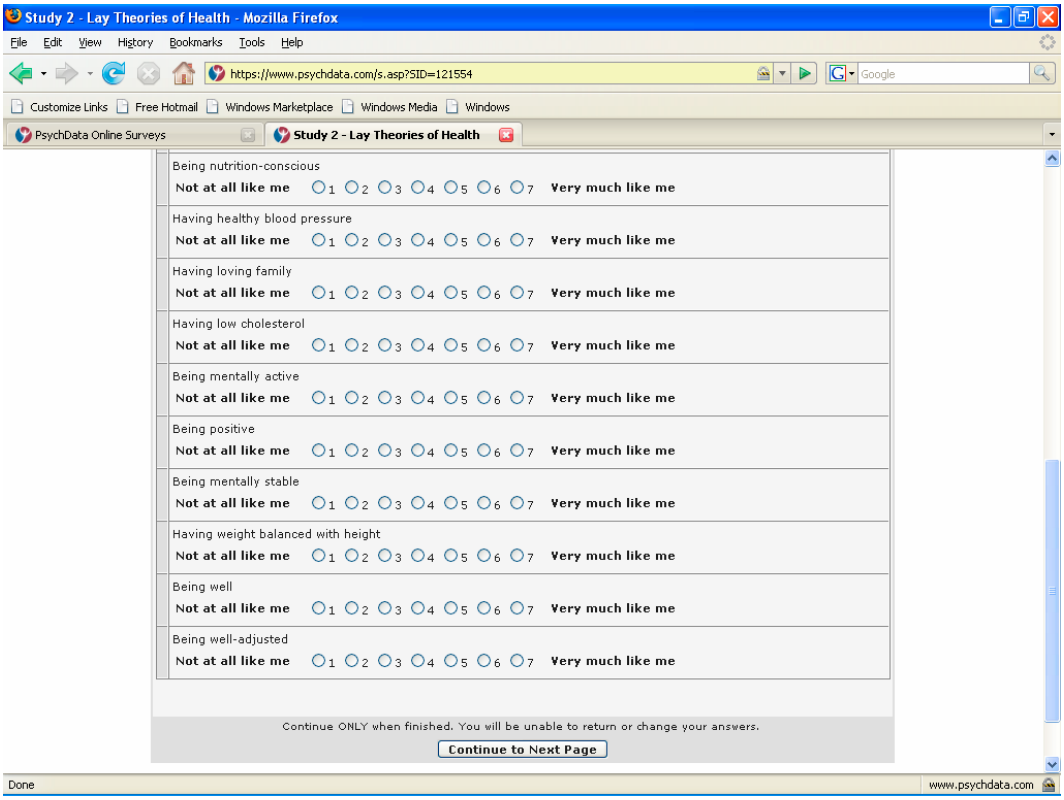
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Study 2 - Lay Theories of Health
Being nutrition-conscious
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having healthy blood pressure
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having loving family
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having low cholesterol
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being mentally active
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being positive
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being mentally stable
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having weight balanced with height
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being well
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being well-adjusted
Not at all like me 1 2 3 4 5 6 7 Very much like me
Continue ONLY when finished. You will be unable to return or change your answers.
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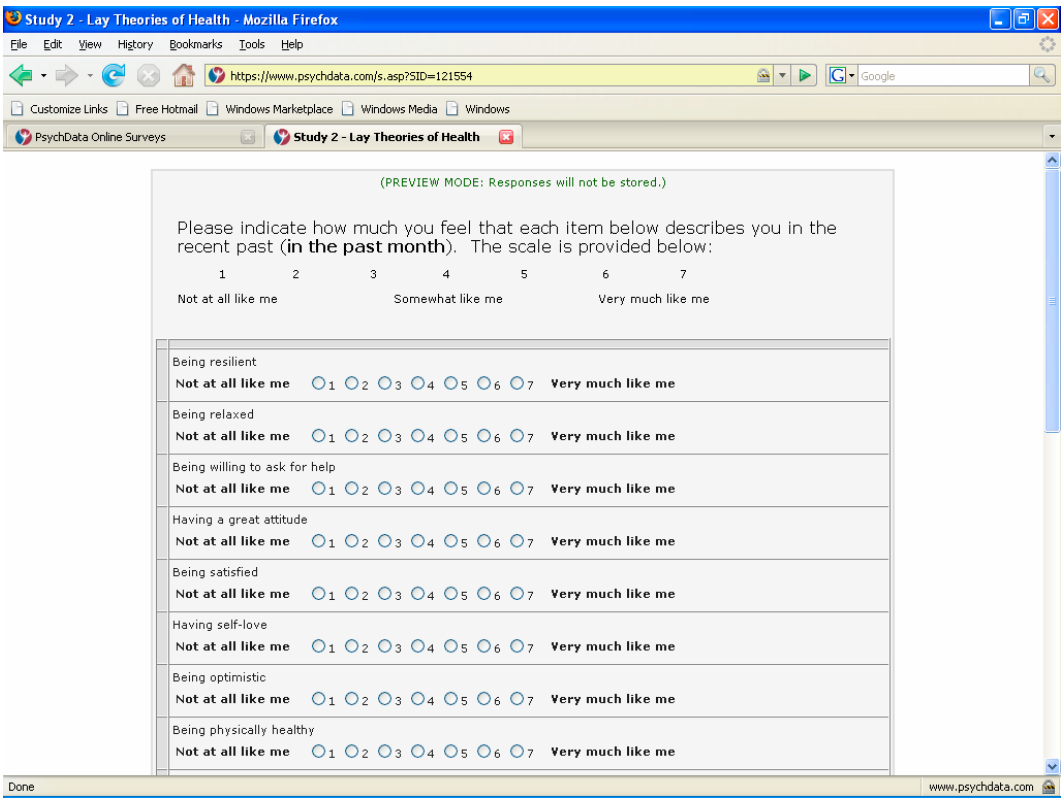
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Please indicate how much you feel that each item below describes you in the recent past (in the past month). The scale is provided below:
1 2 3 4 5 6 7
Not at all like me Somewhat like me Very much like me
Being resilient
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being relaxed
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being willing to ask for help
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having a great attitude
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being satisfied
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having self-love
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being optimistic
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being physically healthy
Not at all like me 1 2 3 4 5 6 7 Very much like me
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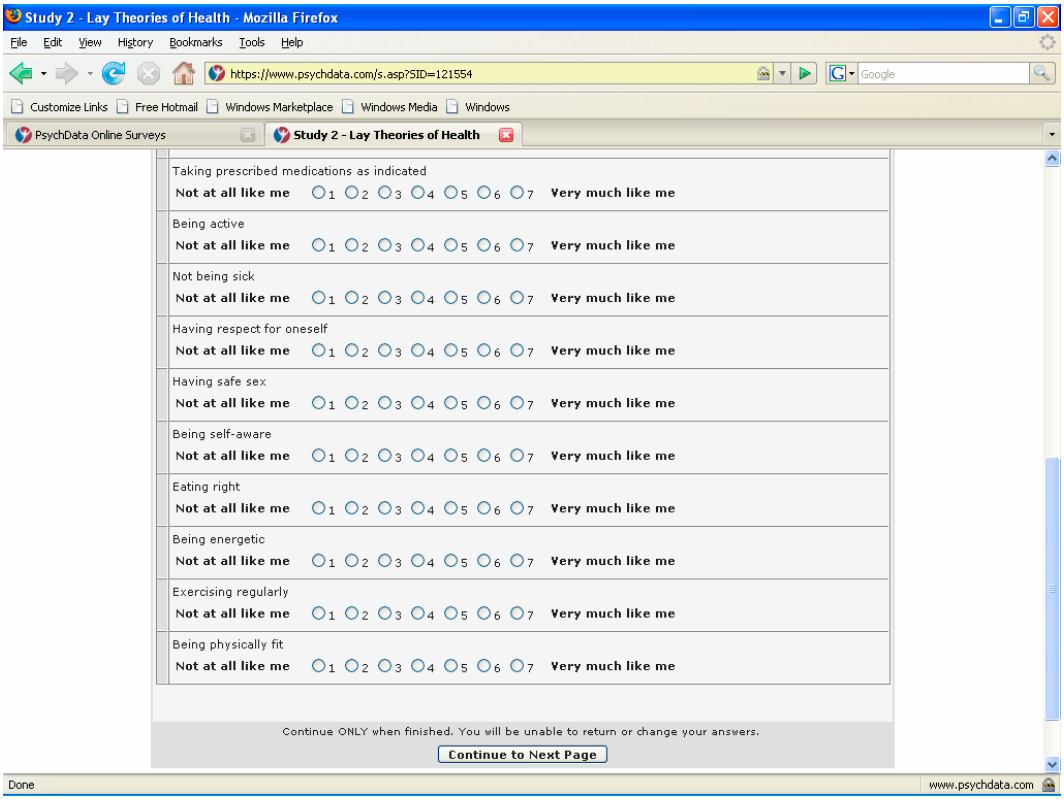
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Taking prescribed medications as indicated
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being active
Not at all like me 1 2 3 4 5 6 7 Very much like me
Not being sick
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having respect for oneself
Not at all like me 1 2 3 4 5 6 7 Very much like me
Having safe sex
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being self-aware
Not at all like me 1 2 3 4 5 6 7 Very much like me
Eating right
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being energetic
Not at all like me 1 2 3 4 5 6 7 Very much like me
Exercising regularly
Not at all like me 1 2 3 4 5 6 7 Very much like me
Being physically fit
Not at all like me 1 2 3 4 5 6 7 Very much like me
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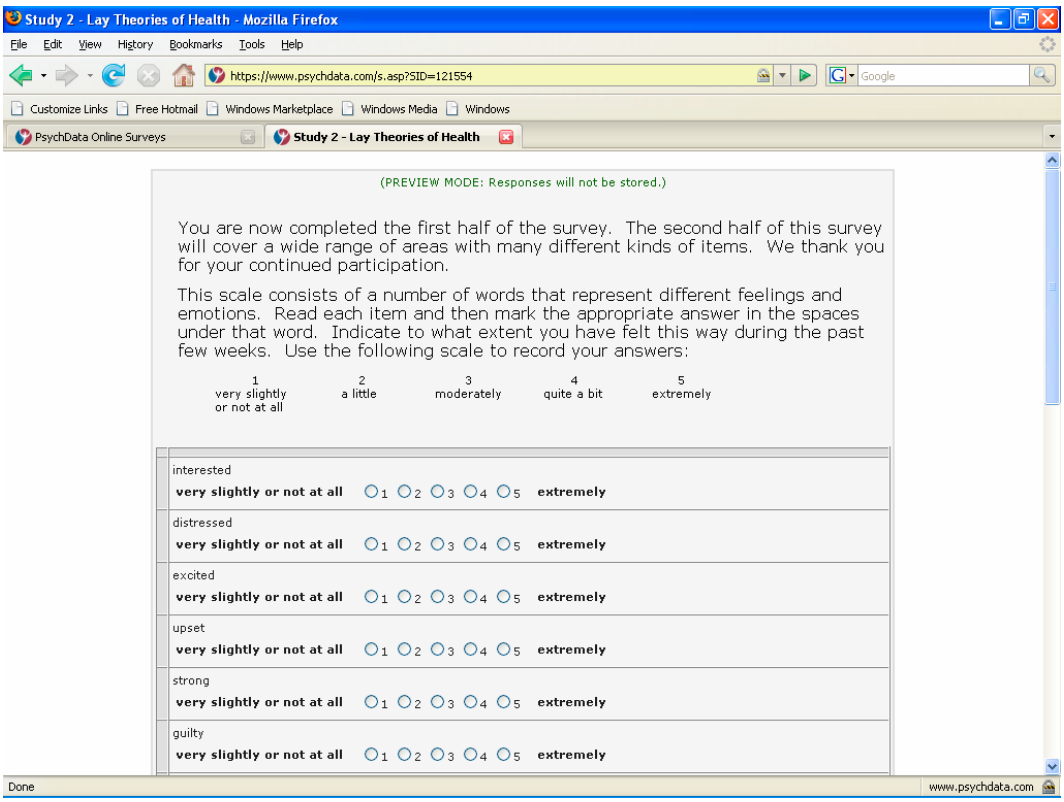
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You are now completed the first half of the survey. The second half of this survey will cover a wide range of areas with many different kinds of items. We thank you for your continued participation.
This scale consists of a number of words that represent different feelings and emotions. Read each item and then mark the appropriate answer in the spaces under that word. Indicate to what extent you have felt this way during the past few weeks. Use the following scale to record your answers:
1 very slightly or not at all
2 a little
3 moderately
4 quite a bit
5 extremely
interested
very slightly or not at all 1 2 3 4 5 extremely
distressed
very slightly or not at all 1 2 3 4 5 extremely
excited
very slightly or not at all 1 2 3 4 5 extremely
upset
very slightly or not at all 1 2 3 4 5 extremely
strong
very slightly or not at all 1 2 3 4 5 extremely
guilty
very slightly or not at all 1 2 3 4 5 extremely
Done
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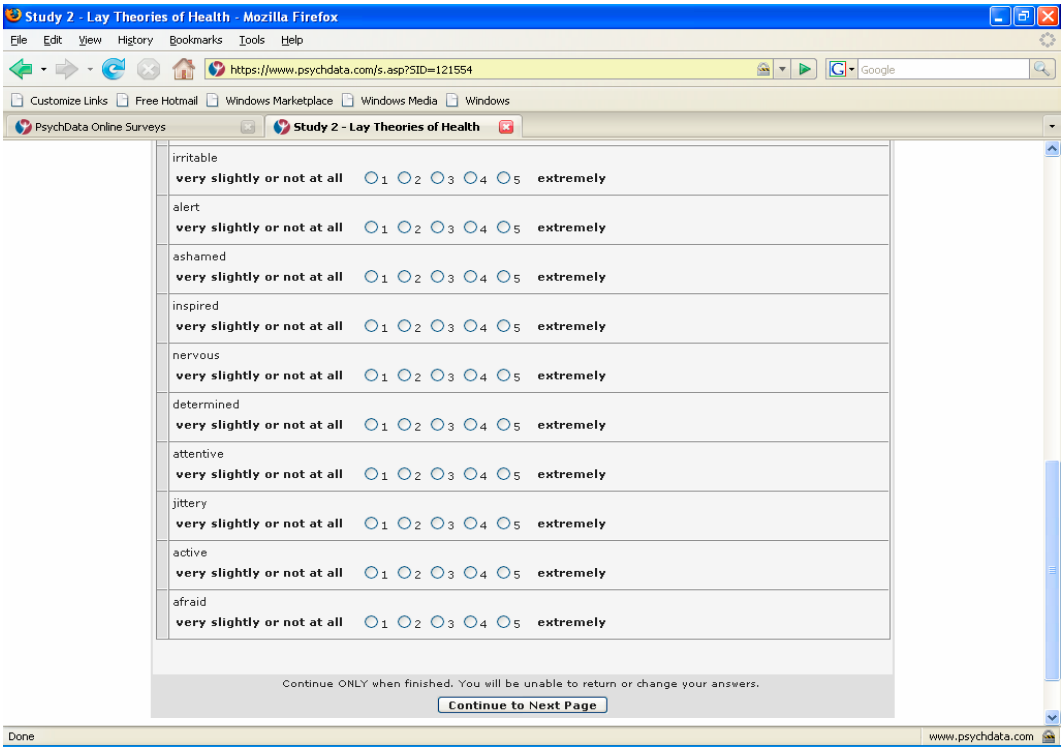
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irritable
very slightly or not at all 1 2 3 4 5 extremely
alert
very slightly or not at all 1 2 3 4 5 extremely
ashamed
very slightly or not at all 1 2 3 4 5 extremely
inspired
very slightly or not at all 1 2 3 4 5 extremely
nervous
very slightly or not at all 1 2 3 4 5 extremely
determined
very slightly or not at all 1 2 3 4 5 extremely
attentive
very slightly or not at all 1 2 3 4 5 extremely
jittery
very slightly or not at all 1 2 3 4 5 extremely
active
very slightly or not at all 1 2 3 4 5 extremely
afraid
very slightly or not at all 1 2 3 4 5 extremely
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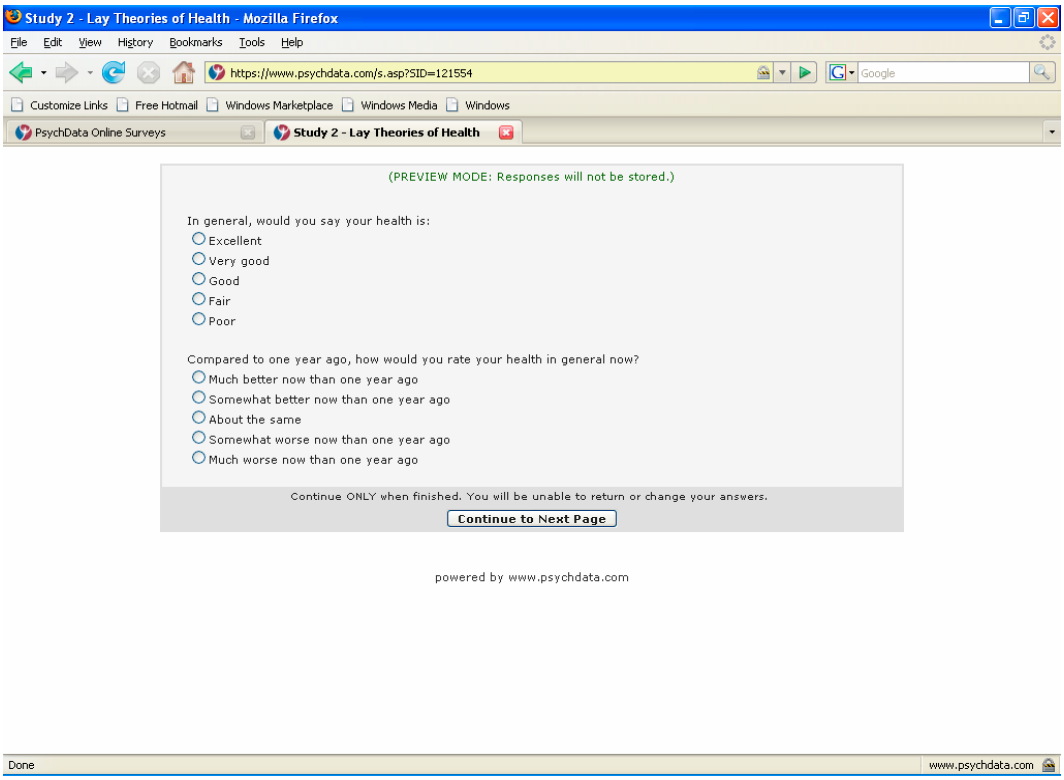
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In general, would you say your health is:
Excellent
Very good
Good
Fair
Poor
Compared to one year ago, how would you rate your health in general now?
Much better now than one year ago
Somewhat better now than one year ago
About the same
Somewhat worse now than one year ago
Much worse now than one year ago
Continue ONLY when finished. You will be unable to return or change your answers.
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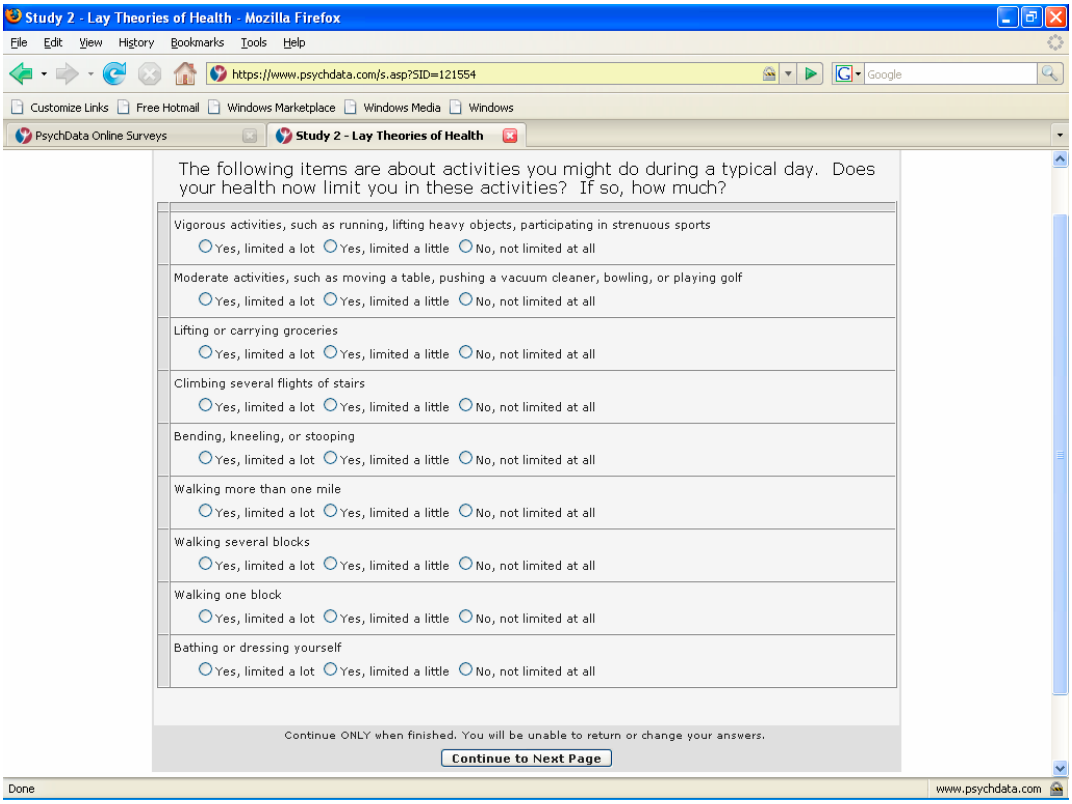
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The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports
Yes, limited a lot Yes, limited a little No, not limited at all
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
Yes, limited a lot Yes, limited a little No, not limited at all
Lifting or carrying groceries
Yes, limited a lot Yes, limited a little No, not limited at all
Climbing several flights of stairs
Yes, limited a lot Yes, limited a little No, not limited at all
Bending, kneeling, or stooping
Yes, limited a lot Yes, limited a little No, not limited at all
Walking more than one mile
Yes, limited a lot Yes, limited a little No, not limited at all
Walking several blocks
Yes, limited a lot Yes, limited a little No, not limited at all
Walking one block
Yes, limited a lot Yes, limited a little No, not limited at all
Bathing or dressing yourself
Yes, limited a lot Yes, limited a little No, not limited at all
Continue ONLY when finished. You will be unable to return or change your answers.
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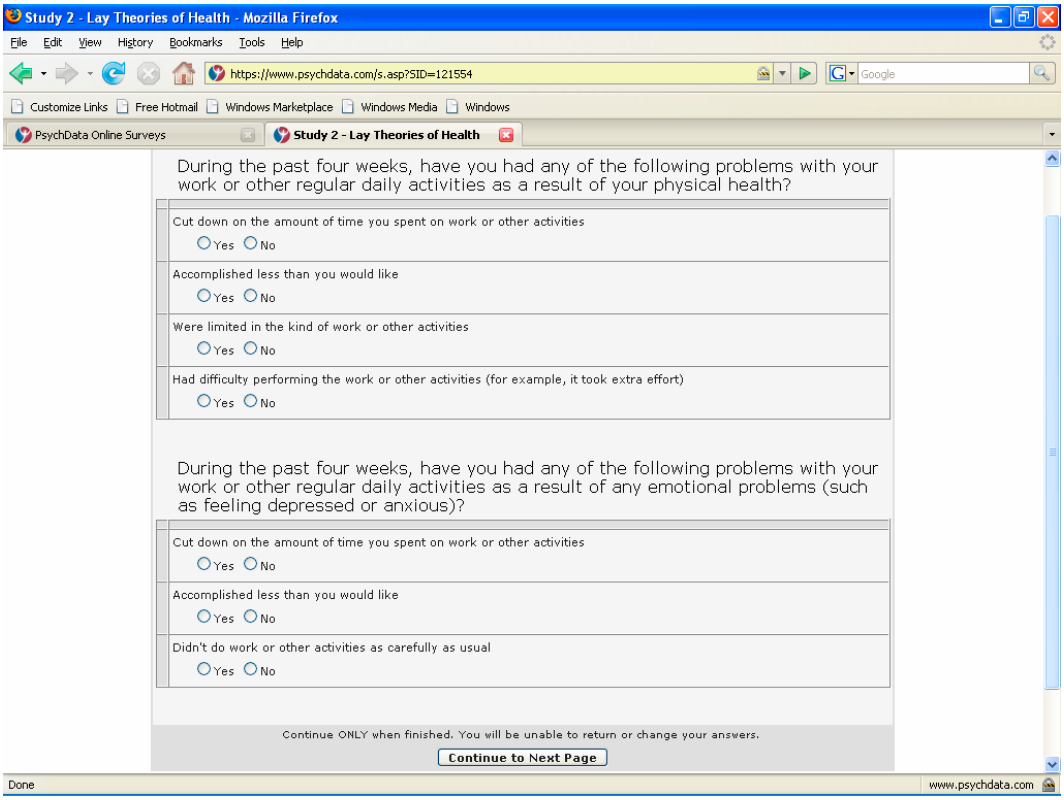
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During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?
Cut down on the amount of time you spent on work or other activities
Yes No
Accomplished less than you would like
Yes No
Were limited in the kind of work or other activities
Yes No
Had difficulty performing the work or other activities (for example, it took extra effort)
Yes No
During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?
Cut down on the amount of time you spent on work or other activities
Yes No
Accomplished less than you would like
Yes No
Didn't do work or other activities as carefully as usual
Yes No
Continue ONLY when finished. You will be unable to return or change your answers.
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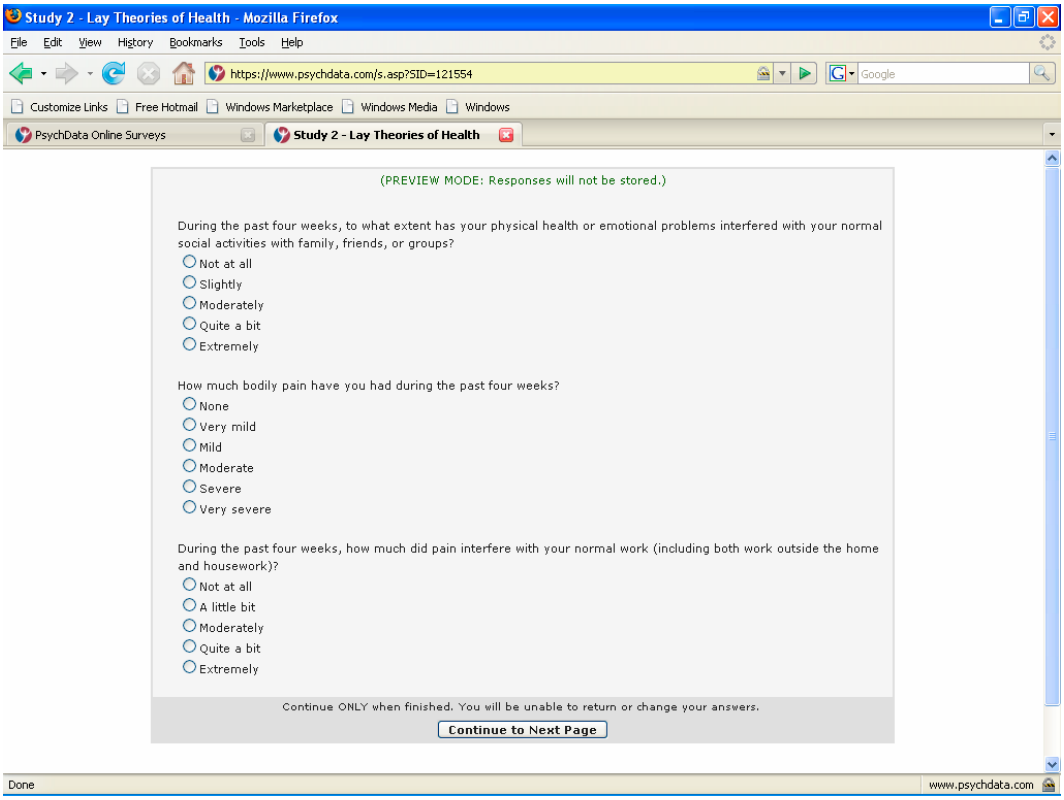
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During the past four weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, or groups?
Not at all
Slightly
Moderately
Quite a bit
Extremely
How much bodily pain have you had during the past four weeks?
None
Very mild
Mild
Moderate
Severe
Very severe
During the past four weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?
Not at all
A little bit
Moderately
Quite a bit
Extremely
Continue ONLY when finished. You will be unable to return or change your answers.
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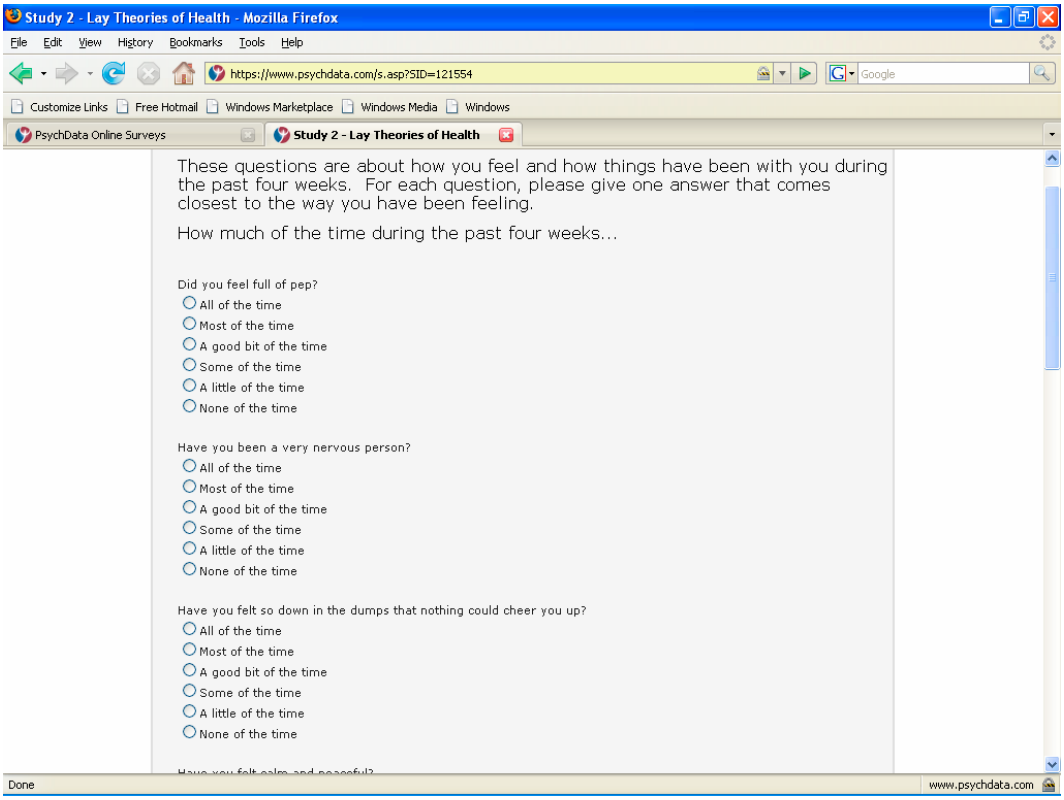
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These questions are about how you feel and how things have been with you during the past four weeks. For each question, please give one answer that comes closest to the way you have been feeling.
How much of the time during the past four weeks...
Did you feel full of pep?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Have you been a very nervous person?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Have you felt so down in the dumps that nothing could cheer you up?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Done
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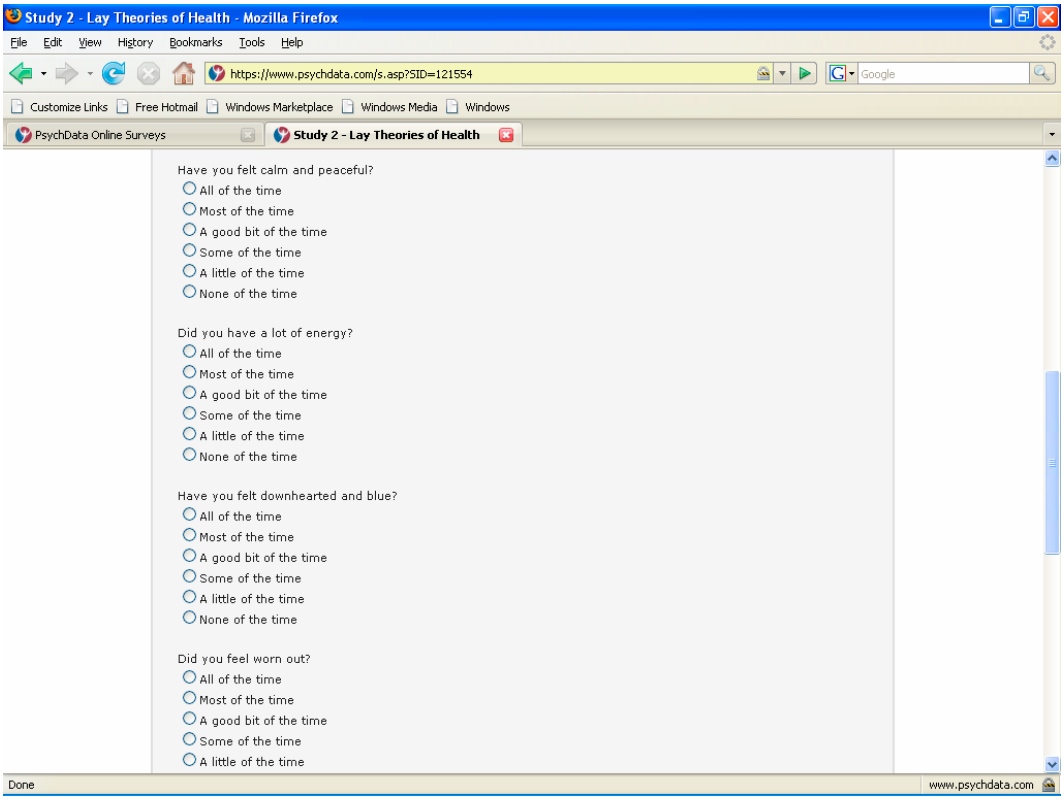
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Have you felt calm and peaceful?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Did you have a lot of energy?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Have you felt downhearted and blue?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Did you feel worn out?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
Done
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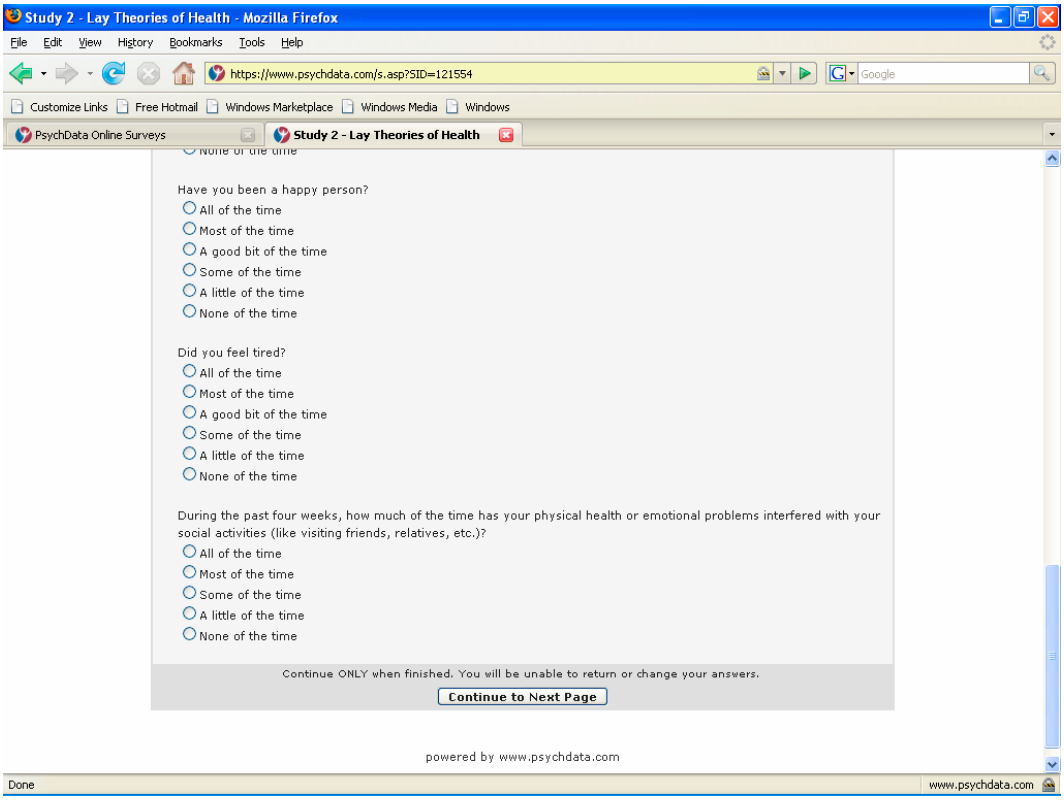
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Have you been a happy person?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
Did you feel tired?
All of the time
Most of the time
A good bit of the time
Some of the time
A little of the time
None of the time
During the past four weeks, how much of the time has your physical health or emotional problems 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
Continue ONLY when finished. You will be unable to return or change your answers.
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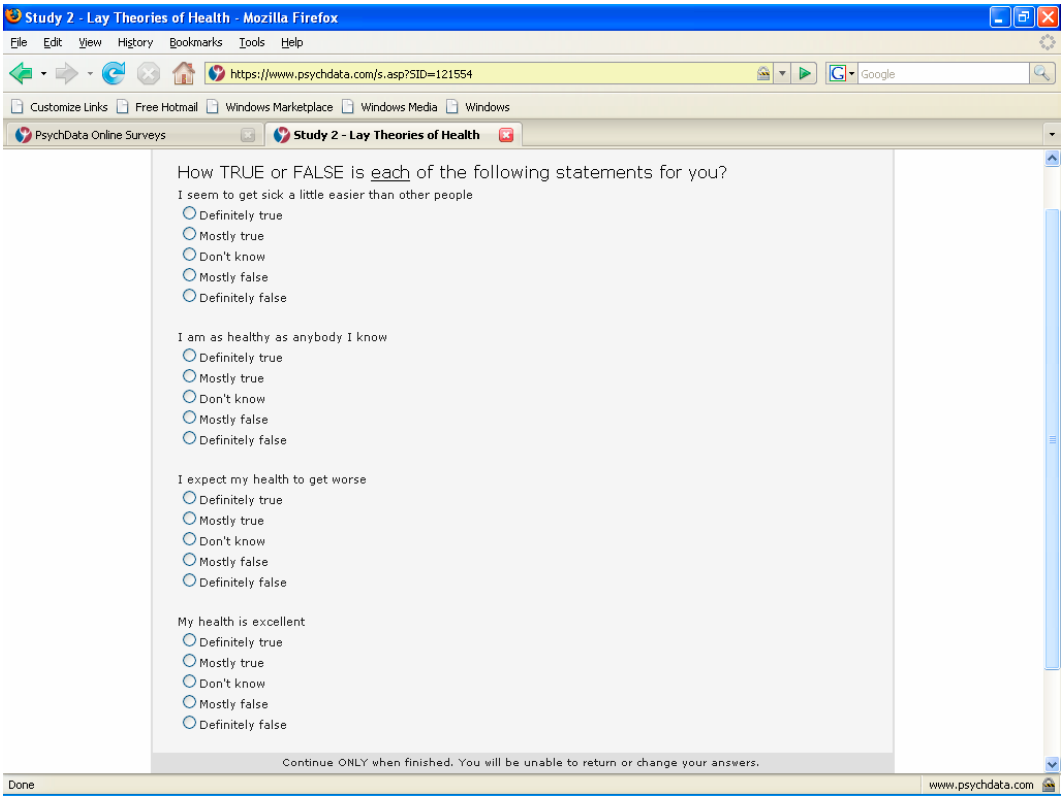
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How TRUE or FALSE is each of the following statements for you?
I seem to get sick a little easier than other people
Definitely true
Mostly true
Don't know
Mostly false
Definitely false
I am as healthy as anybody I know
Definitely true
Mostly true
Don't know
Mostly false
Definitely false
I expect my health to get worse
Definitely true
Mostly true
Don't know
Mostly false
Definitely false
My health is excellent
Definitely true
Mostly true
Don't know
Mostly false
Definitely false
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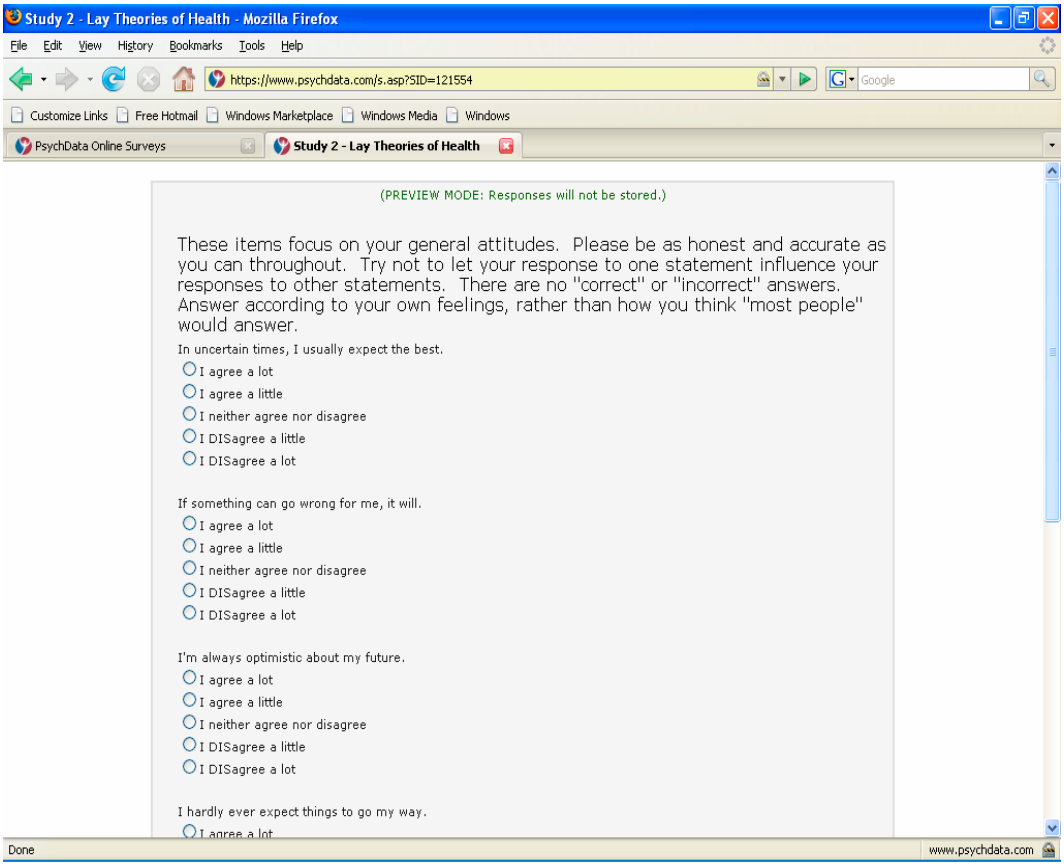
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These items focus on your general attitudes. Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.
In uncertain times, I usually expect the best.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
If something can go wrong for me, it will.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
I'm always optimistic about my future.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
I hardly ever expect things to go my way.
I agree a lot
Done
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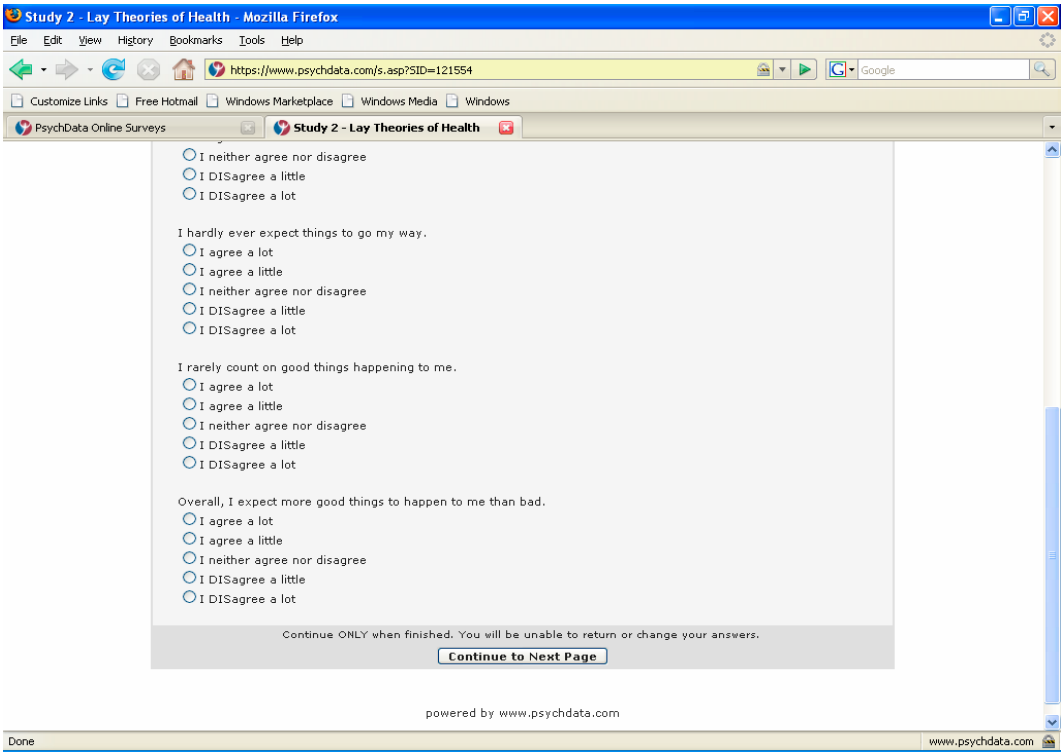
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I neither agree nor disagree
I DISagree a little
I DISagree a lot
I hardly ever expect things to go my way.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
I rarely count on good things happening to me.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
Overall, I expect more good things to happen to me than bad.
I agree a lot
I agree a little
I neither agree nor disagree
I DISagree a little
I DISagree a lot
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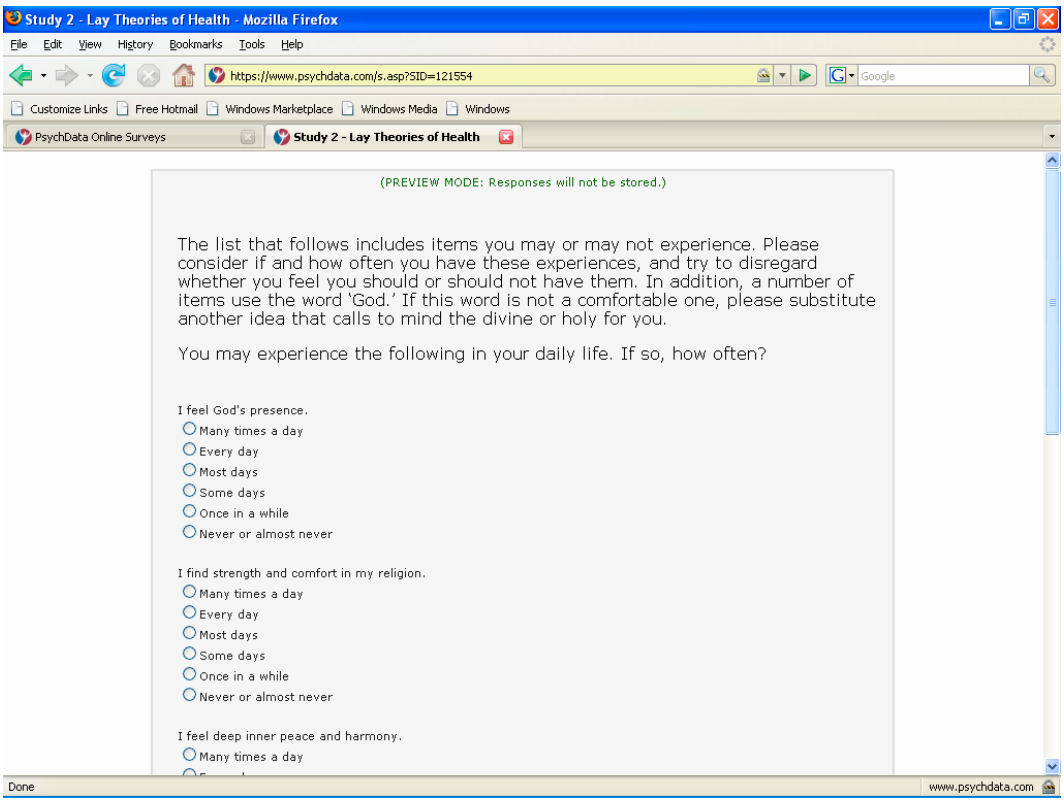
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The list that follows includes items you may or may not experience. Please consider if and how often you have these experiences, and try to disregard whether you feel you should or should not have them. In addition, a number of items use the word 'God.' If this word is not a comfortable one, please substitute another idea that calls to mind the divine or holy for you.
You may experience the following in your daily life. If so, how often?
I feel God's presence.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I find strength and comfort in my religion.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I feel deep inner peace and harmony.
Many times a day
Done
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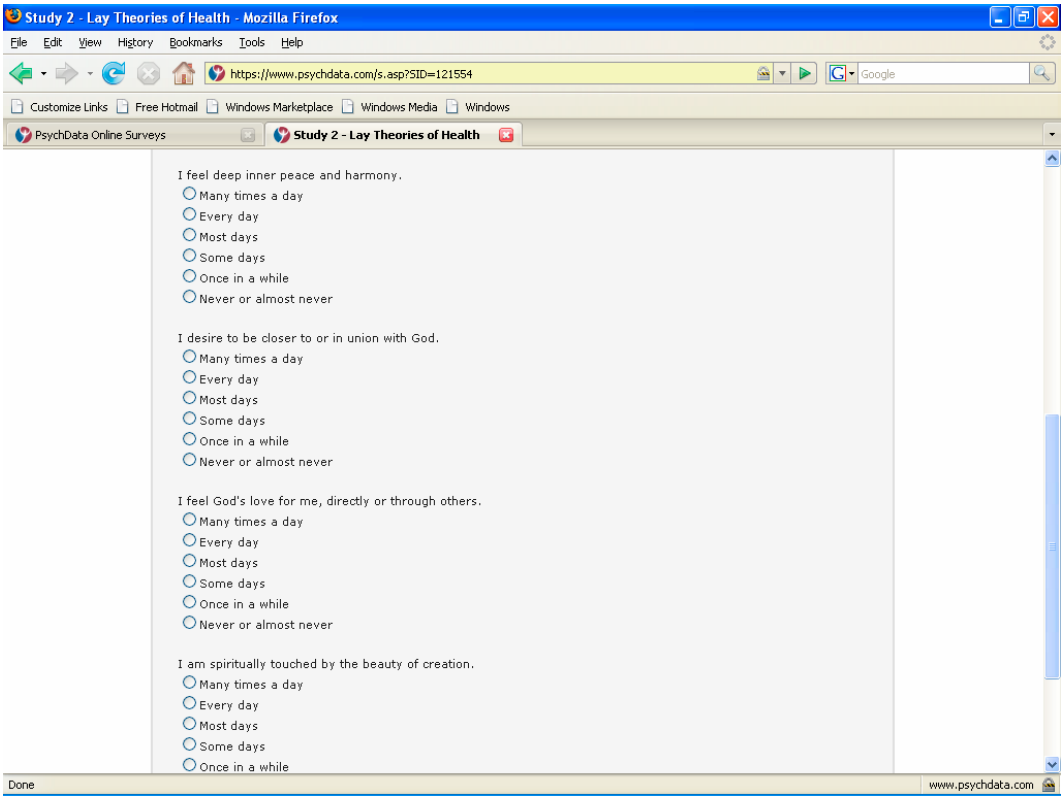
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I feel deep inner peace and harmony.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I desire to be closer to or in union with God.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I feel God's love for me, directly or through others.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I am spiritually touched by the beauty of creation.
Many times a day
Every day
Most days
Some days
Once in a while
Done
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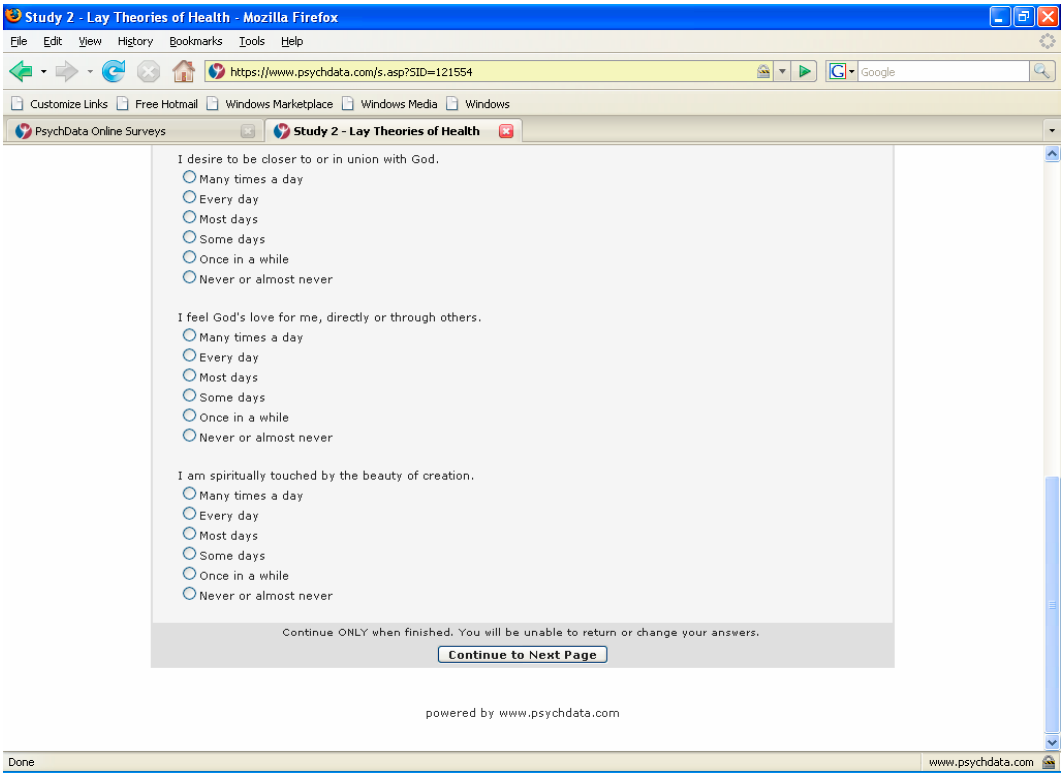
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I desire to be closer to or in union with God.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I feel God's love for me, directly or through others.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
I am spiritually touched by the beauty of creation.
Many times a day
Every day
Most days
Some days
Once in a while
Never or almost never
Continue ONLY when finished. You will be unable to return or change your answers.
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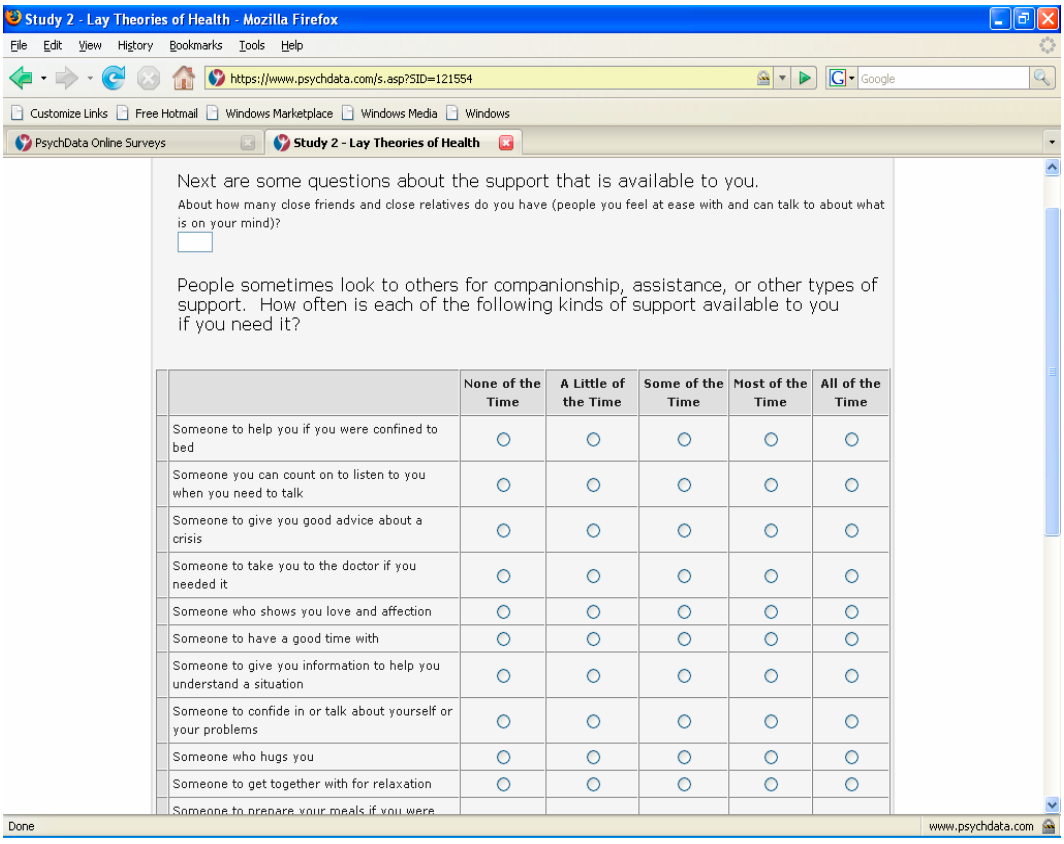
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Next are some questions about the support that is available to you.
About how many close friends and close relatives do you have (people you feel at ease with and can talk to about what is on your mind)?
People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?
None of the Time
A Little of the Time
Some of the Time
Most of the Time
All of the Time
Someone to help you if you were confined to bed
Someone you can count on to listen to you when you need to talk
Someone to give you good advice about a crisis
Someone to take you to the doctor if you needed it
Someone who shows you love and affection
Someone to have a good time with
Someone to give you information to help you understand a situation
Someone to confide in or talk about yourself or your problems
Someone who hugs you
Someone to get together with for relaxation
Done
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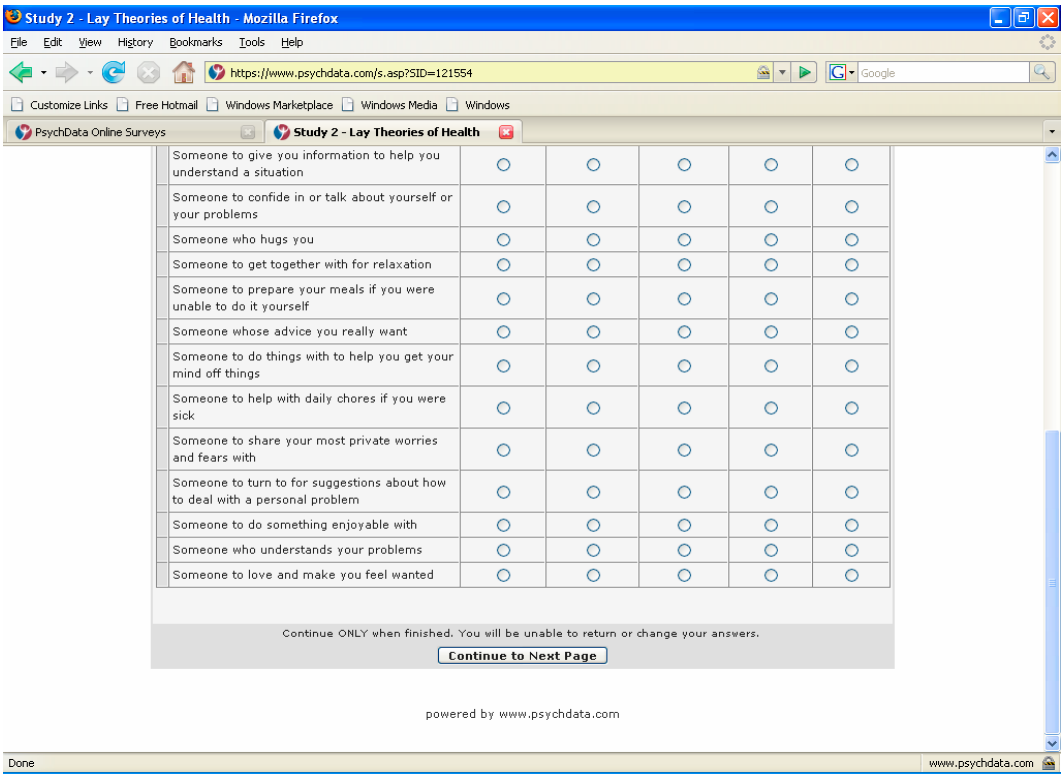
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Someone to give you information to help you understand a situation
Someone to confide in or talk about yourself or your problems
Someone who hugs you
Someone to get together with for relaxation
Someone to prepare your meals if you were unable to do it yourself
Someone whose advice you really want
Someone to do things with to help you get your mind off things
Someone to help with daily chores if you were sick
Someone to share your most private worries and fears with
Someone to turn to for suggestions about how to deal with a personal problem
Someone to do something enjoyable with
Someone who understands your problems
Someone to love and make you feel wanted
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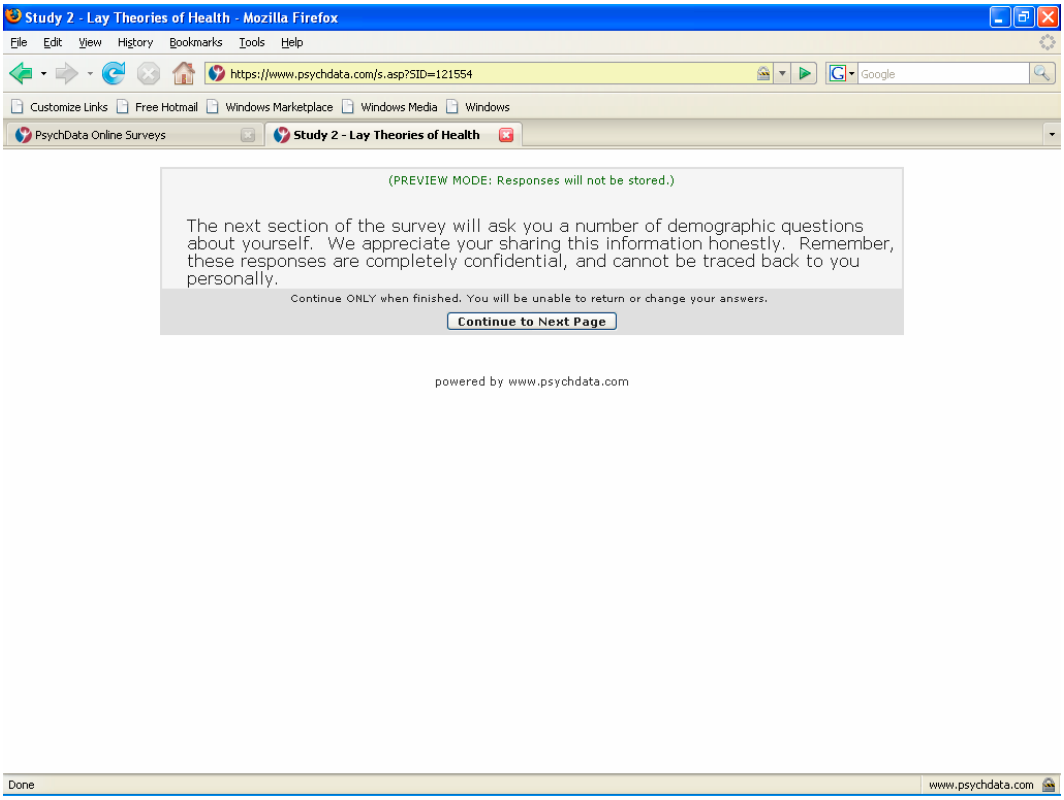
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(PREVIEW MODE: Responses will not be stored.)
The next section of the survey will ask you a number of demographic questions about yourself. We appreciate your sharing this information honestly. Remember, these responses are completely confidential, and cannot be traced back to you personally.
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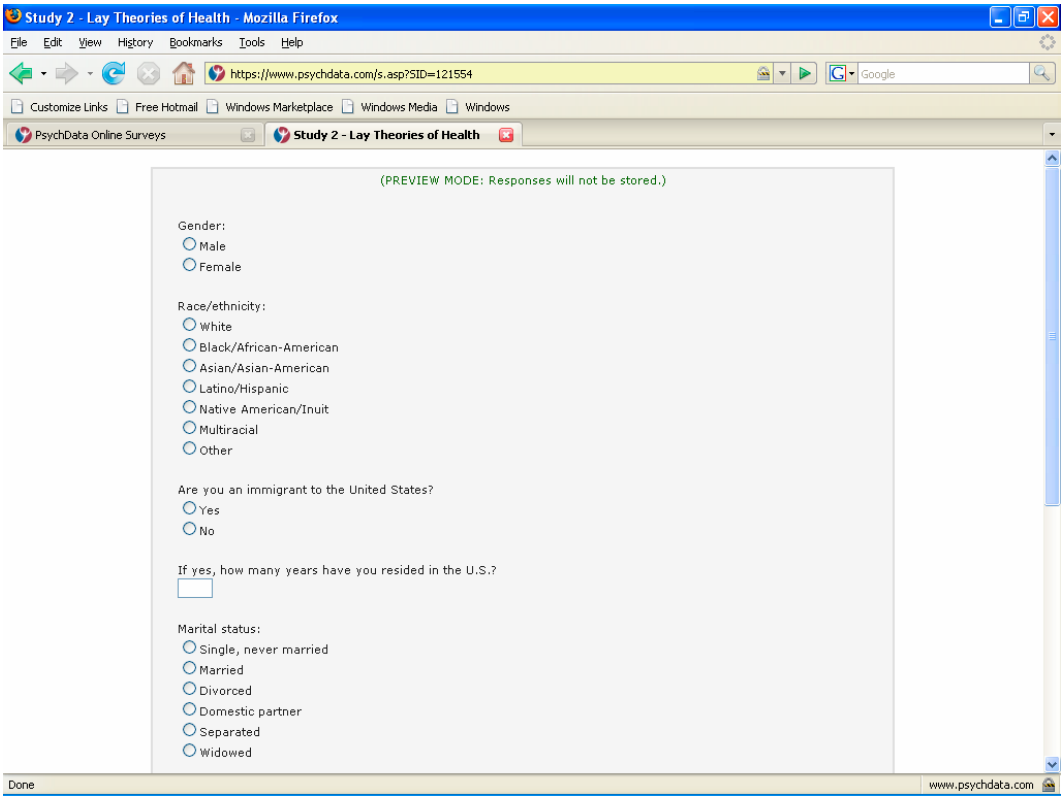
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(PREVIEW MODE: Responses will not be stored.)
Gender:
Male
Female
Race/ethnicity:
White
Black/African-American
Asian/Asian-American
Latino/Hispanic
Native American/Inuit
Multiracial
Other
Are you an immigrant to the United States?
Yes
No
If yes, how many years have you resided in the U.S.?
Marital status:
Single, never married
Married
Divorced
Domestic partner
Separated
Widowed
Done
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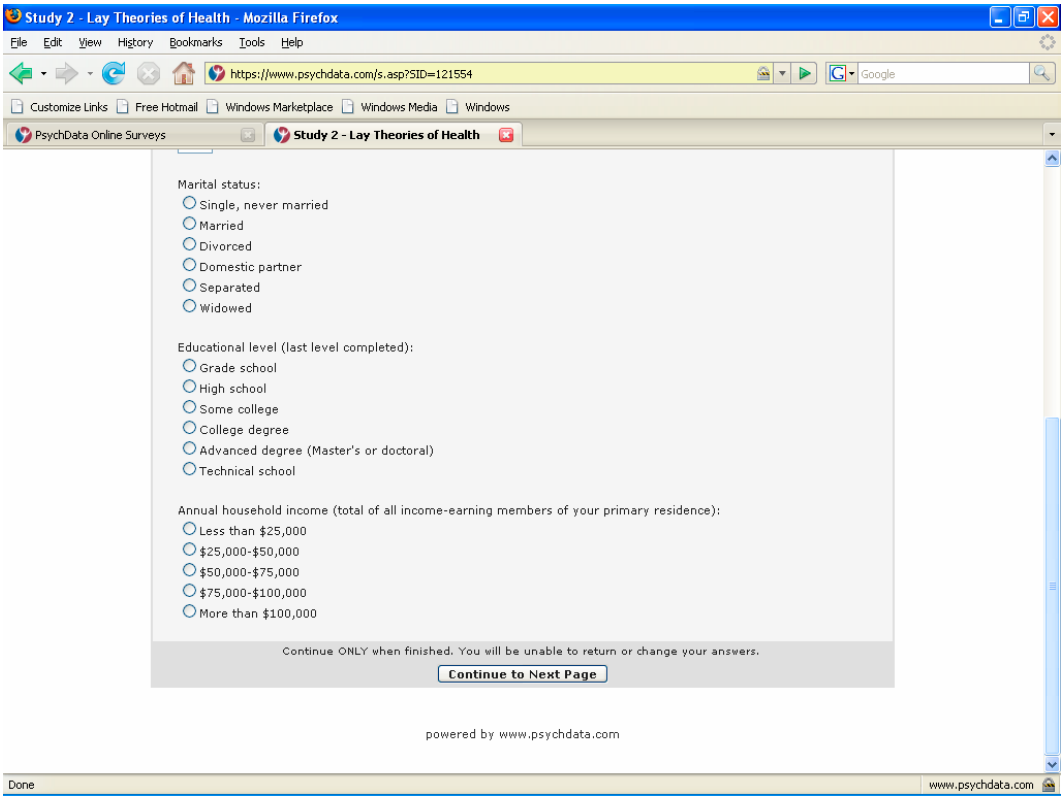
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Study 2 - Lay Theories of Health
Marital status:
Single, never married
Married
Divorced
Domestic partner
Separated
Widowed
Educational level (last level completed):
Grade school
High school
Some college
College degree
Advanced degree (Master's or doctoral)
Technical school
Annual household income (total of all income-earning members of your primary residence):
Less than $25,000
$25,000-$50,000
$50,000-$75,000
$75,000-$100,000
More than $100,000
Continue ONLY when finished. You will be unable to return or change your answers.
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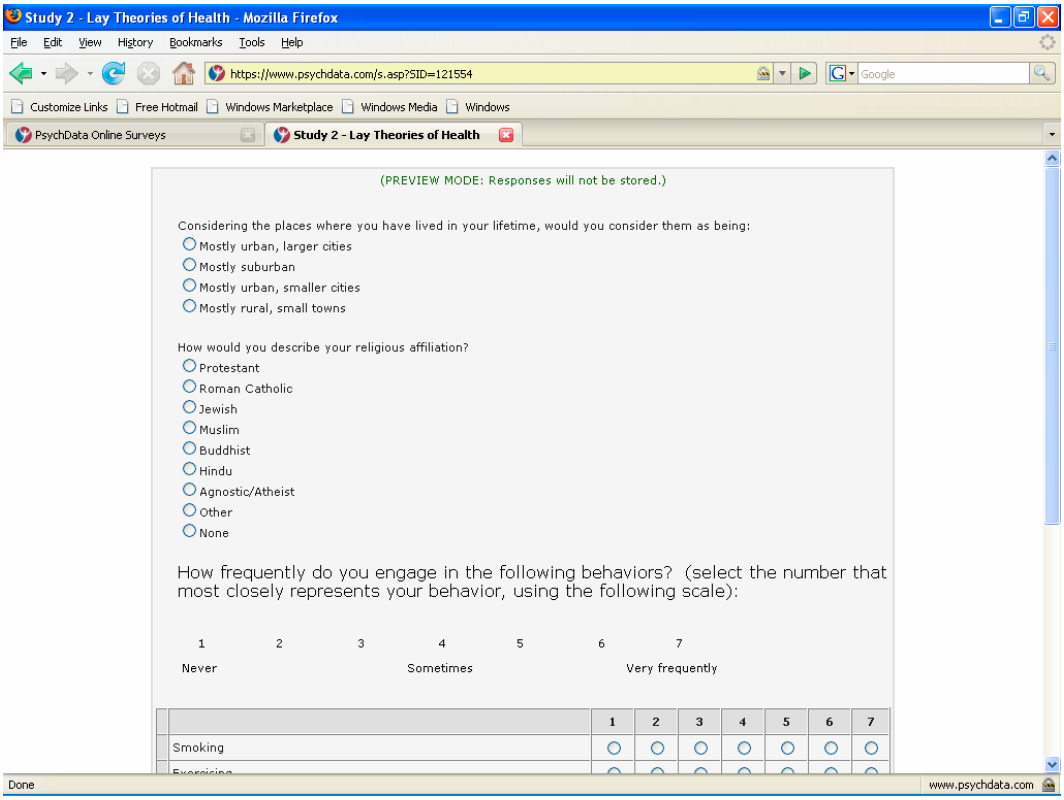
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Study 2 - Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
Considering the places where you have lived in your lifetime, would you consider them as being:
Mostly urban, larger cities
Mostly suburban
Mostly urban, smaller cities
Mostly rural, small towns
How would you describe your religious affiliation?
Protestant
Roman Catholic
Jewish
Muslim
Buddhist
Hindu
Agnostic/Atheist
Other
None
How frequently do you engage in the following behaviors? (select the number that most closely represents your behavior, using the following scale):
1 2 3 4 5 6 7
Never Sometimes Very frequently
1 2 3 4 5 6 7
Smoking
Done
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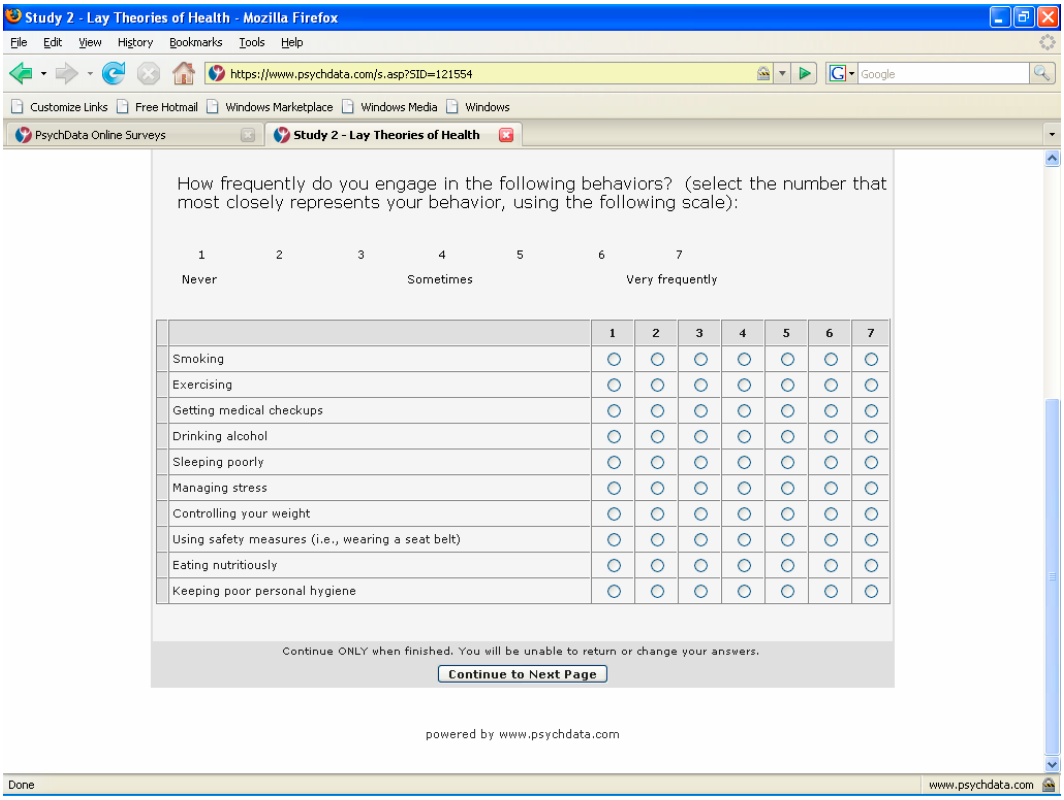
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Study 2 - Lay Theories of Health
How frequently do you engage in the following behaviors? (select the number that most closely represents your behavior, using the following scale):
1 2 3 4 5 6 7
Never
Sometimes
Very frequently
Smoking
Exercising
Getting medical checkups
Drinking alcohol
Sleeping poorly
Managing stress
Controlling your weight
Using safety measures (i.e., wearing a seat belt)
Eating nutritiously
Keeping poor personal hygiene
Continue ONLY when finished. You will be unable to return or change your answers.
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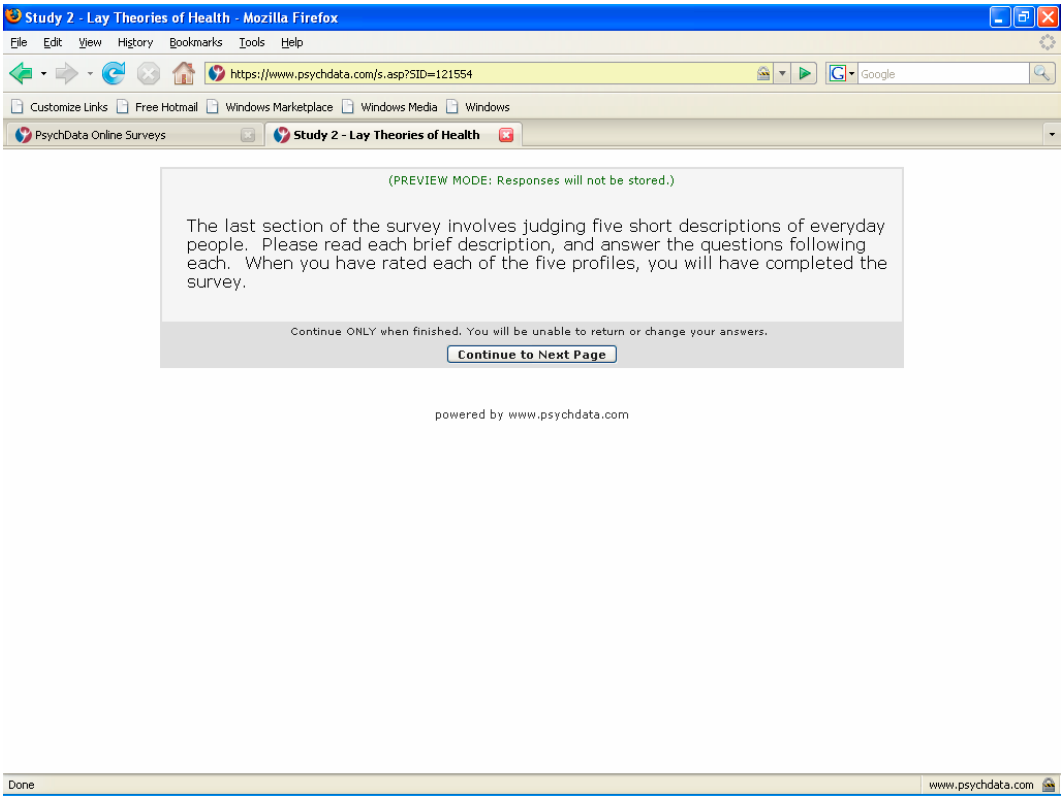
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Study 2 - Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
The last section of the survey involves judging five short descriptions of everyday people. Please read each brief description, and answer the questions following each. When you have rated each of the five profiles, you will have completed the survey.
Continue ONLY when finished. You will be unable to return or change your answers.
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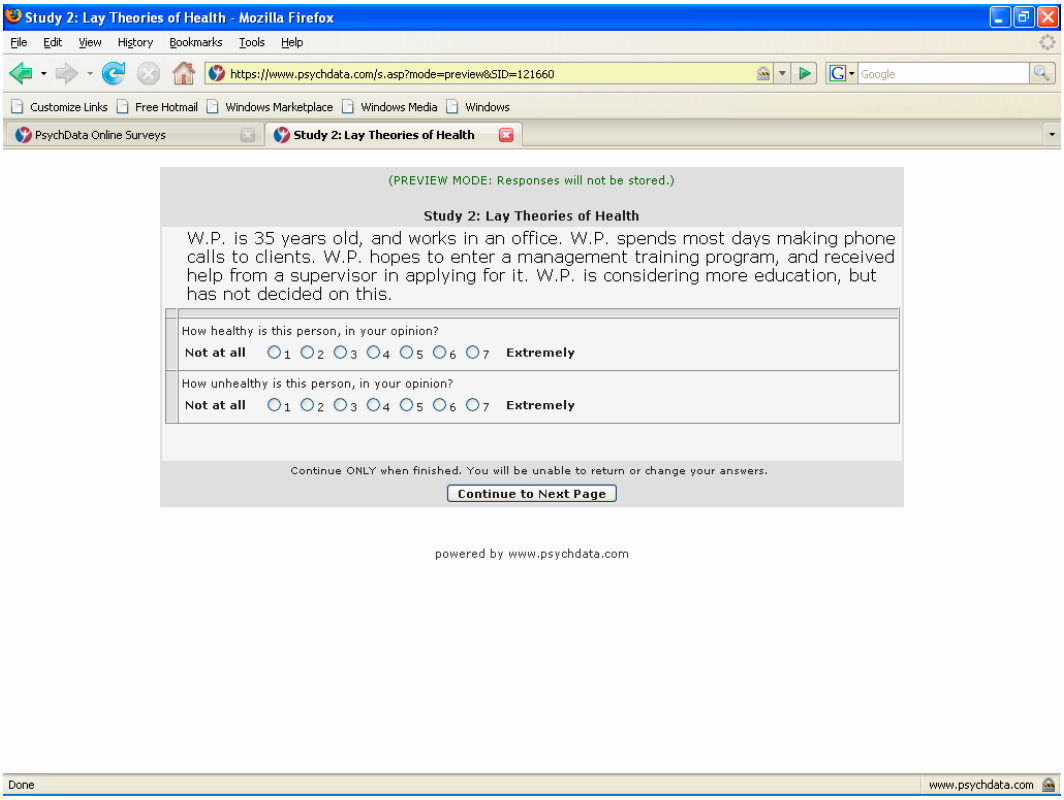
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Study 2: Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
Study 2: Lay Theories of Health
W.P. is 35 years old, and works in an office. W.P. spends most days making phone calls to clients. W.P. hopes to enter a management training program, and received help from a supervisor in applying for it. W.P. is considering more education, but has not decided on this.
How healthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
How unhealthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
Continue ONLY when finished. You will be unable to return or change your answers.
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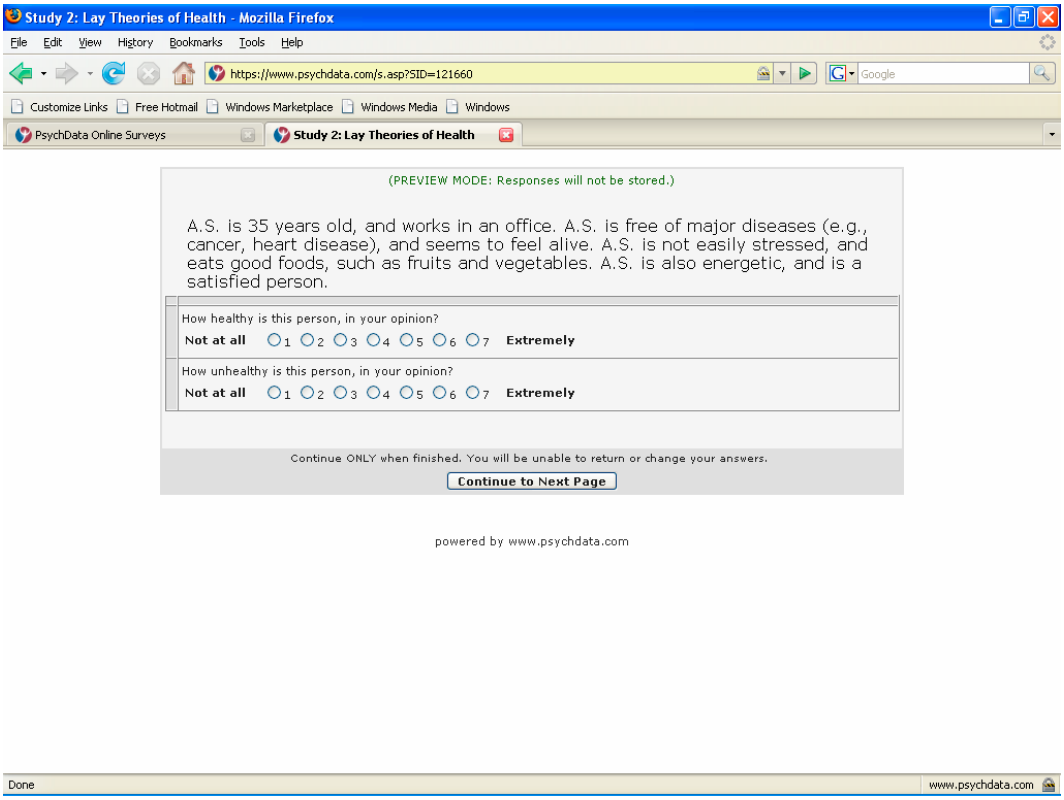
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PsychData Online Surveys
Study 2: Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
A.S. is 35 years old, and works in an office. A.S. is free of major diseases (e.g., cancer, heart disease), and seems to feel alive. A.S. is not easily stressed, and eats good foods, such as fruits and vegetables. A.S. is also energetic, and is a satisfied person.
How healthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
How unhealthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
Continue ONLY when finished. You will be unable to return or change your answers.
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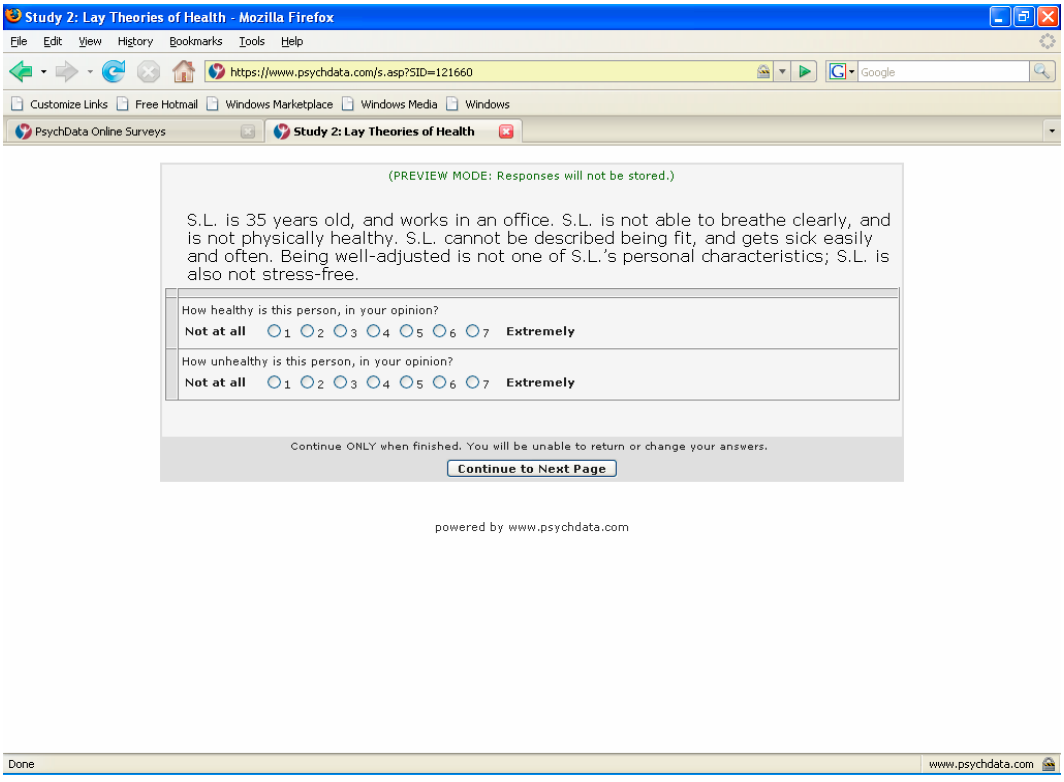
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Study 2: Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
S.L. is 35 years old, and works in an office. S.L. is not able to breathe clearly, and is not physically healthy. S.L. cannot be described being fit, and gets sick easily and often. Being well-adjusted is not one of S.L.'s personal characteristics; S.L. is also not stress-free.
How healthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
How unhealthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
Continue ONLY when finished. You will be unable to return or change your answers.
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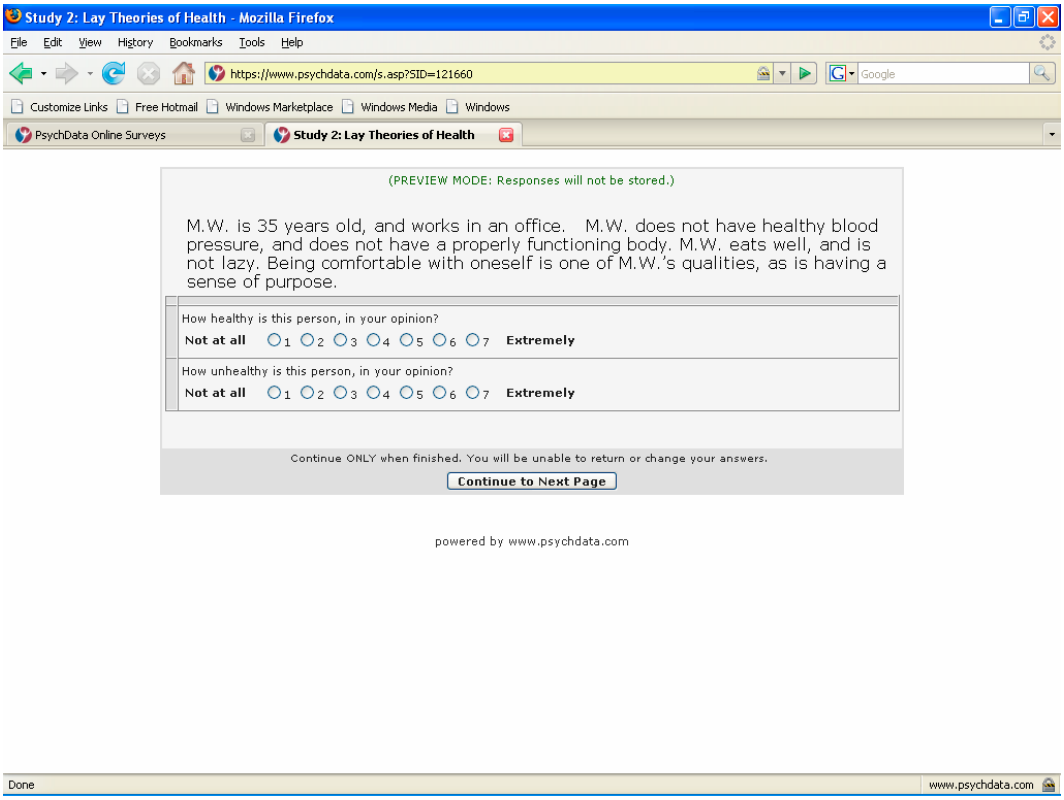
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PsychData Online Surveys
Study 2: Lay Theories of Health
(PREVIEW MODE: Responses will not be stored.)
M.W. is 35 years old, and works in an office. M.W. does not have healthy blood pressure, and does not have a properly functioning body. M.W. eats well, and is not lazy. Being comfortable with oneself is one of M.W.'s qualities, as is having a sense of purpose.
How healthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
How unhealthy is this person, in your opinion?
Not at all 1 2 3 4 5 6 7 Extremely
Continue ONLY when finished. You will be unable to return or change your answers.
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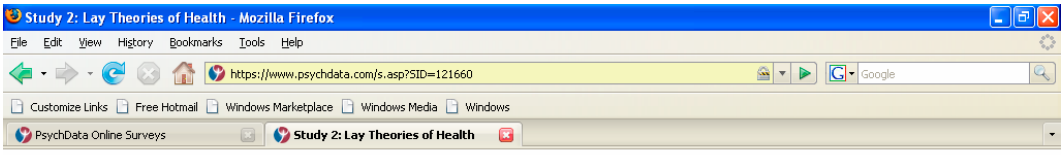

(PREVIEW MODE: Responses will not be stored.)

G.B. is 35 years old, and works in an office. G.B. abuses drugs, and does not get six to eight hours of sleep each night. G.B. does not have good eating habits, and is not self-aware. Having weight balanced with height describes G.B.'s build; G.B. also loves people.

How healthy is this person, in your opinion?

Not at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Extremely**

How unhealthy is this person, in your opinion?

Not at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Extremely**

Continue ONLY when finished. You will be unable to return or change your answers.

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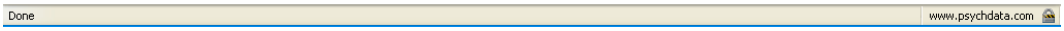

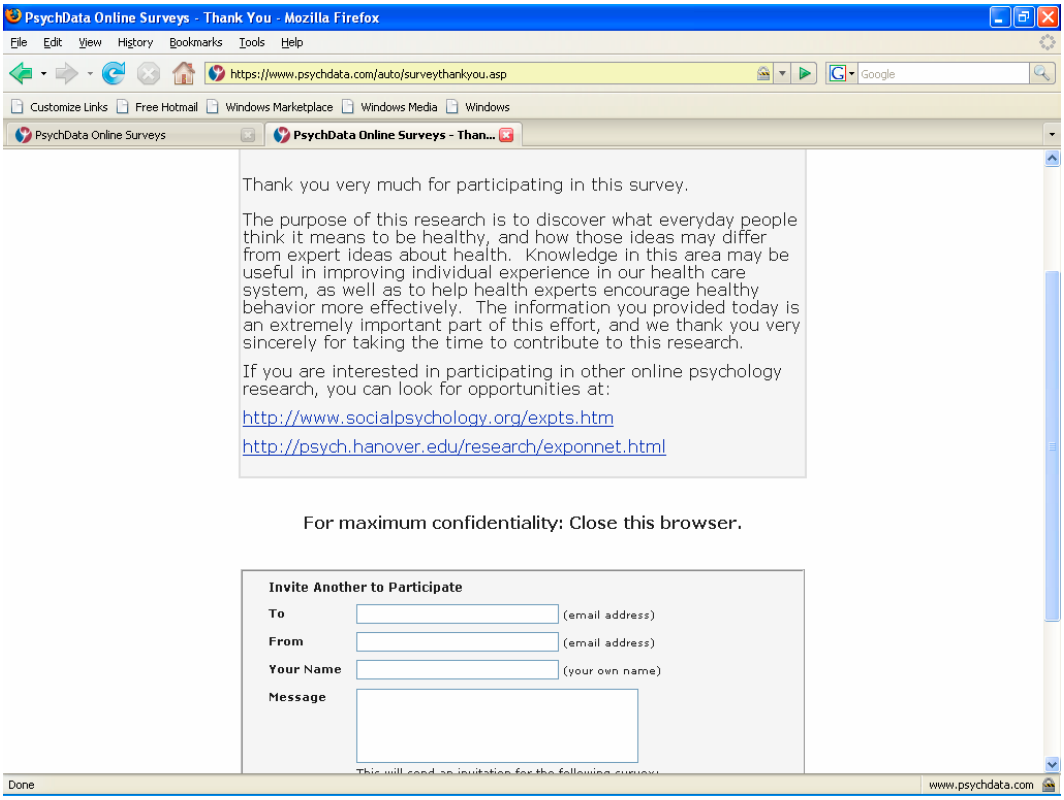

Thank you very much for participating in this survey.

The purpose of this research is to discover what everyday people think it means to be healthy, and how those ideas may differ from expert ideas about health. Knowledge in this area may be useful in improving individual experience in our health care system, as well as to help health experts encourage healthy behavior more effectively. The information you provided today is an extremely important part of this effort, and we thank you very sincerely for taking the time to contribute to this research.

If you are interested in participating in other online psychology research, you can look for opportunities at:

http://www.socialpsychology.org/expts.htm

http://psych.hanover.edu/research/exponnet.html

For maximum confidentiality: Close this browser.

Invite Another to Participate

To (email address)

From (email address)

Your Name (your own name)

Message

Appendix C

Items Retained from Study 1 (95 items in total):

Item	Average rating
1. Able to breathe clearly	10.38
2. Not being tired	8.73
3. Deals well with stressful situations	8.29
4. Is aware of and pays attention to their body	8.50
5. Eating a balanced diet	8.90
6. Having a well balanced life	8.88
7. Having good cardiovascular health	9.34
8. Does not get sick easily or often	8.56
9. Does not smoke	9.18
10. Being drug free	8.81
11. Being of normal weight	8.25
12. Does not abuse drugs	9.59
13. Having a positive attitude	8.27
14. Having a properly working body with all systems functioning well	9.52
15. Eating good foods, such as fruits and vegetables	8.67
16. Eating properly (according to doctor)	8.15
17. Being alive	9.89
18. Being emotionally stable	8.15
19. Exercising	8.74
20. Enjoying life	8.57
21. Being engaged in life	8.33
22. Being fit	8.58
23. Does not abuse alcohol	9.27
24. Feeling good	8.57
25. Being free from illness	8.99
26. Having a mind that thinks clearly	8.32
27. Getting enough rest	9.08
28. Being free of major disease (cancer, heart disease)	9.59

29. Being comfortable with themselves	8.00
30. Having good eating habits	8.62
31. Having good habits	8.11
32. Having healthy relationships with others	8.37
33. Having good hygiene	8.56
34. Being mentally healthy	9.26
35. Being nourished	9.17
36. Sleeping well	9.23
37. Thinking	8.20
38. Being happy	8.53
39. Eating well	8.69
40. Having a sense of purpose	8.01
41. Eating healthy	8.71
42. Having good nutrition	8.79
43. Being health conscious	8.10
44. Having a healthy diet	8.77
45. Having good oral hygiene	8.68
46. Being hopeful	8.97
47. Being self-controlled	8.41
48. Being in good shape	8.99
49. Maintaining an active mind	9.29
50. Having laughter	9.33
51. Having low stress in life	9.07
52. Having longevity	8.36
53. Loving people	8.10
54. Being mentally strong	8.87
55. Having an active lifestyle	8.84
56. Being motivated	8.55
57. Being adaptable	8.42
58. Being physically active	9.13
59. Having no health problems or illness	8.03
60. Being pain-free	8.13

61. Not being anxious	8.22
62. Not being depressed	9.03
63. Being socially well-adjusted	8.21
64. Not being easily stressed	8.71
65. Not being overweight	8.42
66. Getting 6-8 hours of sleep each night	8.99
67. Being nutrition-conscious	8.29
68. Having healthy blood pressure	8.90
69. Having loving family	8.26
70. Having low cholesterol	8.80
71. Being mentally active	9.28
72. Being positive	9.07
73. Being mentally stable	9.00
74. Having weight balanced with height	8.07
75. Being well	9.21
76. Being well-adjusted	8.07
77. Being resilient	8.55
78. Being relaxed	8.29
79. Being willing to ask for help	8.34
80. Having a great attitude	8.29
81. Being satisfied	8.03
82. Having self-love	8.33
83. Being optimistic	8.16
84. Being physically healthy	9.42
85. Being stress-free	8.07
86. Taking prescribed medications as indicated	8.24
87. Being active	8.91
88. Not being sick	8.92
89. Having respect for oneself	8.97
90. Having safe sex	8.96
91. Being self-aware	8.57
92. Eating right	8.62

93. Being energetic	8.03
94. Exercising regularly	8.48
95. Being physically fit	8.48

Appendix D

Items Retained from Study 1 (95 items in total), with Expert Ratings Included:

Item	Layperson rating	Expert Rating
1. Able to breathe clearly	10.38	10.36
2. Not being tired	8.73	8.83
3. Deals well with stressful situations	8.29	8.70
4. Is aware of and pays attention to their body	8.50	8.91
5. Eating a balanced diet	8.90	9.07
6. Having a well balanced life	8.88	9.10
7. Having good cardiovascular health	9.34	9.59
8. Does not get sick easily or often	**8.56**	**7.85**
9. Does not smoke	9.18	9.76
10. Being drug free	8.81	9.09
11. Being of normal weight	8.25	8.52
12. Does not abuse drugs	9.59	9.77
13. Having a positive attitude	8.27	8.39
14. Having a properly working body with all systems functioning well	9.52	9.55
15. Eating good foods, such as fruits and vegetables	8.67	9.15
16. Eating properly (according to doctor)	8.15	8.67
17. Being alive	9.89	9.85
18. Being emotionally stable	8.15	8.33
19. Exercising	8.74	9.07
20. Enjoying life	8.57	8.72
21. Being engaged in life	8.33	8.33
22. Being fit	8.58	8.46
23. Does not abuse alcohol	9.27	9.48
24. Feeling good	8.57	8.92
25. Being free from illness	8.99	8.91
26. Having a mind that thinks clearly	8.32	8.66
27. Getting enough rest	9.08	8.98
28. Being free of major disease (cancer, heart disease)	9.59	9.63
29. Being comfortable with themselves	8.00	8.27

30. Having good eating habits	8.62	8.79
31. Having good habits	8.11	8.26
32. Having healthy relationships with others	8.37	8.50
33. Having good hygiene	8.56	8.60
34. Being mentally healthy	9.26	9.48
35. Being nourished	9.17	9.02
36. Sleeping well	9.23	9.08
37. Thinking	**8.20**	**7.90**
38. Being happy	8.53	8.45
39. Eating well	8.69	8.86
40. Having a sense of purpose *	**8.01**	**7.84**
41. Eating healthy	8.71	8.83
42. Having good nutrition	8.79	9.18
43. Being health conscious	8.10	8.40
44. Having a healthy diet	8.77	8.90
45. Having good oral hygiene	8.68	9.11
46. Being hopeful	8.97	9.14
47. Being self-controlled	8.41	9.02
48. Being in good shape	8.99	9.49
49. Maintaining an active mind	9.29	9.83
50. Having laughter	9.33	9.03
51. Having low stress in life	9.07	8.02
52. Having longevity	**8.36**	**7.31**
53. Loving people*	**8.10**	**7.93**
54. Being mentally strong	8.87	8.76
55. Having an active lifestyle	8.84	9.10
56. Being motivated	8.55	9.02
57. Being adaptable	8.42	8.86
58. Being physically active	9.13	9.60
59. Having no health problems or illness*	**8.03**	**7.58**
60. Being pain-free	**8.13**	**7.85**
61. Not being anxious*	**8.22**	**7.86**
62. Not being depressed	9.03	8.88
63. Being socially well-adjusted	8.21	8.50
64. Not being easily stressed	8.71	8.48

65. Not being overweight	8.42	8.71
66. Getting 6-8 hours of sleep each night	8.99	9.44
67. Being nutrition-conscious	8.29	9.68
68. Having healthy blood pressure	8.90	10.53
69. Having loving family	8.26	9.24
70. Having low cholesterol	8.80	9.05
71. Being mentally active	9.28	9.82
72. Being positive	9.07	9.06
73. Being mentally stable	9.00	9.15
74. Having weight balanced with height	8.07	8.80
75. Being well	9.21	9.34
76. Being well-adjusted	8.07	8.58
77. Being resilient	8.55	8.46
78. Being relaxed	8.29	8.14
79. Being willing to ask for help	8.34	8.12
80. Having a great attitude	8.29	8.26
81. Being satisfied	8.03	8.12
82. Having self-love	8.33	8.54
83. Being optimistic	8.16	8.40
84. Being physically healthy	9.42	9.96
85. Being stress-free*	**8.07**	**7.27**
86. Taking prescribed medications as indicated	8.24	9.36
87. Being active	8.91	9.59
88. Not being sick	8.92	8.40
89. Having respect for oneself	8.97	9.32
90. Having safe sex	8.96	9.43
91. Being self-aware	8.57	8.71
92. Eating right	8.62	8.85
93. Being energetic	**8.03**	**7.67**
94. Exercising regularly	8.48	8.71
95. Being physically fit	8.48	8.51

Appendix E

Study 2 Profiles

Profile 1:

A.S. is 35 years old, and works in an office. A.S. is free of major diseases (e.g., cancer, heart disease), and seems to feel alive. A.S. is not easily stressed, and eats good foods, such as fruits and vegetables. A.S. is also energetic, and is a satisfied person.

-Has 2 highly-rated health characteristics, 2 mean-rated health characteristics, and 2 low-rated health characteristics
-Has 5 positively-framed and 1 negatively-framed item
-Mean value of items (if had them all) = 8.82
-Predicted health score (given what profile has/doesn't have; 1-11 scale) = 8.82
-48 words in 4 sentences

Profile 2:

M.W. is 35 years old, and works in an office. M.W. does not have healthy blood pressure, and does not have a properly functioning body. M.W. eats well, and is not lazy. Being comfortable with oneself is one of M.W.'s qualities, as is having a sense of purpose.

-Has 2 mean-rated health characteristics, and 2 low-rated health characteristics; does not have 2 high-rated health characteristics
-Has 5 positively-framed and 1 negatively-framed item
-Mean value of items (if had them all) = 8.80
-Predicted health score = 5.57
-48 words in 4 sentences

Profile 3:

G.B. is 35 years old, and works in an office. G.B. abuses drugs, and does not get six to eight hours of sleep each night. G.B. does not have good eating habits, and is not self-aware. Having weight balanced with height describes G.B.'s build; G.B. also loves people.

-Has 2 low-rated health characteristics; does not have 2 high-rated health characteristics, nor 2 mean-rated health characteristics
-Has 5 positively-framed and 1 negatively-framed item
-Mean value of items (if had them all) = 8.82
-Predicted health score = 2.69
-48 words in 4 sentences

Profile 4:

S.L. is 35 years old, and works in an office. S.L. is not able to breathe clearly, and is not physically healthy. S.L. cannot be described being fit, and gets sick easily and often. Being well-adjusted is not one of S.L.'s personal characteristics; S.L. is also not stress-free.

-Has no high, mean, or low rated health characteristics
-Has 5 positively-framed and 1 negatively-framed item
-Mean value of items (if had them all) = 8.85
-Predicted health score = 1.00
-48 words in 4 sentences

Profile 5:

W.P. is 35 years old, and works in an office. W.P. spends most days making phone calls to clients. W.P. hopes to enter a management training program, and received help from a supervisor in applying for it. W.P. is considering more education, but has not decided on this.

-Only connection to full pool of health items (all 800+) is statement that this person works (though no references to working or employment made the cut to the top 95 items in Study 1, and working is a constant in all 5 profiles)
-Control profile, no predicted health score
-48 words in 4 sentences

Appendix F

Lay Theories of Health Inventory

The following questions address a number of different experiences and behaviors. Please indicate how well each item describes you on the following scale:

1	2	3	4	5	6	7
Not at all like me		A bit like me	Somewhat like me	Like me		Very much like me

_____1. Having a great attitude
_____2. Being free from illness
_____3. Eating a balanced diet
_____4. Being optimistic
_____5. Being fit
_____6. Being mentally active
_____7. Loving people
_____8. Not being anxious
_____9. Sleeping well
_____10. Having laughter
_____11. Being hopeful
_____12. Being engaged in life
_____13. Exercising regularly
_____14. Feeling good
_____15. Not being stressed
_____16. Being well
_____17. Having good eating habits
_____18. Having an active lifestyle
_____19. Eating good foods, such as fruits and vegetables
_____20. Being physically active
_____21. Being in good shape
_____22. Having no health problems or illness
_____23. Stress-free
_____24. Enjoying life
_____25. Getting enough rest
_____26. Being happy
_____27. Being health-conscious
_____28. Being physically fit
_____29. Getting 6-8 hours of sleep each night
_____30. Having healthy relationships with others
_____31. Being nutrition-conscious
_____32. Being socially well-adjusted
_____33. Being of normal weight
_____34. Being satisfied
_____35. Eating properly, according to a doctor
_____36. Having a sense of purpose
_____37. Being positive
_____38. Having self-love
_____39. Having respect for oneself

Appendix G

Factor Loadings, All Items, Several Alternative Factor Structures

I. Three Factor Structure

Items loading at >.50 on a given factor, and having factor score coefficients with absolute value of greater than identified values (in parentheses) on that factor, in boldface

Item	Communality	I	II	III
		(.049)	(.056)	(.111)
1. Able to breathe clearly	.17	.11	.24	.31
2. Not being tired	.26	.26	.31	.32
3. Deals well with stressful situations	.29	.47	.17	.18
4. Is aware of and pays attention to their body	.27	.12	.50	.04
5. Eating a balanced diet	.54	.17	.70	.13
6. Having a well balanced life	.47	.42	.47	.27
7. Having good cardiovascular health	.45	.15	.61	.22
8. Does not get sick easily or often	.51	.12	.17	.68
9. Does not smoke	.01	.05	.10	.04
10. Being drug free	.01	.06	.02	.09
11. Being of normal weight	**.44**	.03	**.65**	.13
12. Does not abuse drugs	.06	.08	-.10	-.08
13. Having a positive attitude	.63	.73	.23	.22
14. Having a properly working body with all systems functioning well	.54	.15	.41	.59
15. Eating good foods, such as fruits and vegetables	**.46**	.25	**.63**	-.04
16. Eating properly (according to doctor)	**.62**	.26	**.73**	.11
17. Being alive	.25	.45	.17	.13
18. Being emotionally stable	.59	.69	.17	.29
19. Exercising	.48	.16	.67	.09
20. Enjoying life	.63	.73	.16	.25
21. Being engaged in life	**.62**	**.71**	.26	.21
22. Being fit	**.75**	.21	**.79**	.28
23. Does not abuse alcohol	.05	.20	-.08	-.04
24. Feeling good	.74	.67	.23	.48
25. Being free from illness	**.70**	.12	.18	**.81**
26. Having a mind that thinks clearly	.47	.55	.20	.36
27. Getting enough rest	.33	.32	.34	.34
28. Being free of major disease (cancer,				

heart disease)	.20	-.04	.15	.42
29. Being comfortable with themselves	.55	.58	.36	.27
30. Having good eating habits	**.75**	.31	**.78**	.23
31. Having good habits	.57	.44	.57	.24
32. Having healthy relationships with others	.60	.72	.22	.18
33. Having good hygiene	.28	.42	.32	.08
34. Being mentally healthy	.57	.68	.17	.27
35. Being nourished	.46	.55	.38	.13
36. Sleeping well	.42	.34	.34	.43
37. Thinking	.25	.41	.27	.05
38. Being happy	**.76**	**.82**	.17	.26
39. Eating well	.59	.35	.65	.20
40. Having a sense of purpose	**.63**	**.69**	.39	.06
41. Eating healthy - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)				
42. Having good nutrition - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)				
43. Being health conscious	**.66**	.35	**.72**	.13
44. Having a healthy diet - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)				
45. Having good oral hygiene	.18	.36	.22	-.03
46. Being hopeful	**.66**	**.77**	.24	.09
47. Being self-controlled	.38	.53	.29	.12
48. Being in good shape	**.73**	.24	**.75**	.34
49. Maintaining an active mind	.45	.60	.29	.04
50. Having laughter	.49	.69	-.08	.08
51. Having low stress in life	.40	.49	.18	.36
52. Having longevity	.61	.61	.34	.36
53. Loving people	.39	.60	.17	-.04
54. Being mentally strong	.58	.73	.21	.11
55. Having an active lifestyle	.58	.38	.65	.27
56. Being motivated	.65	.66	.39	.18
57. Being adaptable	.62	.60	.26	.12
58. Being physically active	**.70**	.29	**.75**	.22
59. Having no health problems or illness	**.74**	.05	.28	**.81**
60. Being pain-free	.56	.13	.29	.68
61. Not being anxious	.46	.55	.06	.40
62. Not being depressed	**.60**	**.67**	.25	.31

63. Being socially well-adjusted	**.66**	**.74**	.26	.19
64. Not being easily stressed	.55	.67	.18	.28
65. Not being overweight	.44	.07	.59	.28
66. Getting 6-8 hours of sleep each night	.27	.31	.31	.28
67. Being nutrition-conscious	**.68**	.29	**.75**	.19
68. Having healthy blood pressure	.31	.19	.45	.17
69. Having loving family	.20	.43	.10	.05
70. Having low cholesterol	.21	.16	.41	.19
71. Being mentally active	**.52**	**.64**	.33	.02
72. Being positive	**.75**	**.82**	.20	.18
73. Being mentally stable	**.61**	**.73**	.18	.22
74. Having weight balanced with height	.50	.11	.67	.19
75. Being well	**.72**	.38	.34	**.68**
76. Being well-adjusted	**.75**	**.75**	.29	.32
77. Being resilient	.40	.57	.26	.12
78. Being relaxed	.57	.63	.16	.39
79. Being willing to ask for help	.29	.53	.12	.04
80. Having a great attitude	**.79**	**.84**	.18	.22
81. Being satisfied	.60	.70	.23	.24
82. Having self-love	**.65**	**.73**	.29	.15
83. Being optimistic	**.67**	**.77**	.19	.21
84. Being physically healthy	.72	.20	.69	.46
85. Being stress-free	.50	.51	.26	.41
86. Taking prescribed medications as indicated	.08	.22	.17	-.09
87. Being active	.66	.36	.67	.29
88. Not being sick	.63	.11	.20	.76
89. Having respect for oneself	.63	.73	.29	.14
90. Having safe sex	.11	.27	.16	.10
91. Being self-aware	.38	.27	.32	.08
92. Eating right - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)				
93. Being energetic	.71	.57	.49	.38
94. Exercising regularly	.60	.18	.74	.17
95. Being physically fit	**.78**	.16	**.80**	.34

II. Four Factor Structure

Items loading at >.50 on a given factor, and having factor score coefficients with absolute value of greater than identified values (in parentheses) on that factor, in boldface

Item	Communality	I	II	III	IV

		(.043)	(.057)	(.129)	(.076)
1. Able to breathe clearly	.19	.12	.23	.31	.13
2. Not being tired	.31	.32	.32	.27	-.19
3. Deals well with stressful situations	.30	.51	.17	.12	-.07
4. Is aware of and pays attention to their body	.28	.11	.50	.03	.12
5. Eating a balanced diet	.54	.18	.70	.11	.08
6. Having a well balanced life	.47	.45	.46	.22	.05
7. Having good cardiovascular health	.50	.15	.60	.22	.25
8. Does not get sick easily or often	.53	.17	.17	.68	.10
9. Does not smoke	.08	.02	.08	.07	.26
10. Being drug free	.25	.04	-.01	.15	.48
11. Being of normal weight	**.47**	.07	**.67**	.10	-.11
12. Does not abuse drugs	.25	.09	-.04	.05	.49
13. Having a positive attitude	.63	.74	.22	.15	.12
14. Having a properly working body with all systems functioning well	.55	.20	.41	.58	.08
15. Eating good foods, such as fruits and vegetables	**.47**	.25	**.62**	.03	.16
16. Eating properly (according to doctor)	.63	.26	.72	.09	.17
17. Being alive	.30	.43	.15	.14	.28
18. Being emotionally stable	.60	.73	.17	.22	-.02
19. Exercising	.48	.17	.67	.07	.02
20. Enjoying life	**.63**	**.75**	.17	.22	-.02
21. Being engaged in life	**.63**	**.71**	.24	.16	.19
22. Being fit	.76	.26	.80	.24	-.02
23. Does not abuse alcohol	.20	.15	-.11	-.01	.40
24. Feeling good	**.74**	**.72**	.23	.41	.01
25. Being free from illness	**.75**	.17	.18	**.82**	.14
26. Having a mind that thinks clearly	.47	.57	.20	.31	.09
27. Getting enough rest	.43	.39	.36	.27	-.27
28. Being free of major disease (cancer, heart disease)	.34	.03	.13	.47	.33
29. Being comfortable with themselves	.56	.62	.36	.20	-.02
30. Having good eating habits	**.75**	.33	**.77**	.19	.11
31. Having good habits	.61	.44	.55	.22	.27
32. Having healthy relationships with others	.62	.71	.20	.13	.24
33. Having good hygiene	.36	.38	.30	.07	.36
34. Being mentally healthy	.57	.70	.16	.21	.09
35. Being nourished	.47	.54	.36	.09	.20
36. Sleeping well	.51	.42	.36	.37	-.27

37. Thinking	.25	.41	.26	.02	.09
38. Being happy	**.76**	**.84**	.16	.18	.06
39. Eating well	.59	.37	.64	.17	.12
40. Having a sense of purpose	**.62**	**.68**	.37	-.02	.14
41. Eating healthy - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)					
42. Having good nutrition - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)					
43. Being health conscious	**.66**	.36	**.71**	.10	.14
44. Having a healthy diet - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)					
45. Having good oral hygiene	.20	.33	.20	.02	.23
46. Being hopeful	**.67**	**.78**	.23	.01	.04
47. Being self-controlled	.40	.52	.27	.09	.22
48. Being in good shape	**.76**	.30	**.76**	.28	-.10
49. Maintaining an active mind	.46	.58	.27	-.09	.22
50. Having laughter	.49	.68	.06	.03	.15
51. Having low stress in life	.47	.56	.19	.29	-.21
52. Having longevity	.63	.62	.33	.31	.19
53. Loving people	.44	.56	.14	-.06	.31
54. Being mentally strong	**.58**	**.73**	.20	.05	.07
55. Having an active lifestyle	.65	.42	.65	.22	.03
56. Being motivated	.62	.68	.38	.12	.08
57. Being adaptable	.43	.60	.24	.07	.12
58. Being physically active	**.71**	.33	**.75**	.18	-.06
59. Having no health problems or illness	**.77**	.12	.28	**.82**	.10
60. Being pain-free	.56	.20	.30	.66	-.03
61. Not being anxious	.47	.59	.06	.33	-.06
62. Not being depressed	**.61**	**.71**	.25	.23	-.02
63. Being socially well-adjusted	**.66**	**.75**	.25	.13	.16
64. Not being easily stressed	**.63**	**.72**	.19	.19	-.18
65. Not being overweight	.49	.14	.66	.09	-.15
66. Getting 6-8 hours of sleep each night	.34	.38	.33	.22	-.23
67. Being nutrition-conscious	**.68**	.30	**.74**	.16	.14
68. Having healthy blood pressure	.35	.18	.48	.16	.24
69. Having loving family	.24	.40	.08	.05	.26
70. Having low cholesterol	.24	.15	.40	.14	.21
71. Being mentally active	**.55**	**.61**	.31	-.06	.28

72. Being positive	**.76**	**.84**	.19	.10	.02
73. Being mentally stable	**.61**	**.75**	.18	.14	.03
74. Having weight balanced with height	.54	.16	.69	.14	-.14
75. Being well	**.74**	.43	.34	**.66**	.13
76. Being well-adjusted	**.76**	**.76**	.27	.26	.18
77. Being resilient	.40	.57	.25	.07	.10
78. Being relaxed	**.61**	**.69**	.16	.31	-.14
79. Being willing to ask for help	.29	.53	.11	-.06	.08
80. Having a great attitude	**.79**	**.86**	.17	.14	.08
81. Being satisfied	.60	.71	.22	.18	.11
82. Having self-love	**.69**	**.77**	.29	.06	-.07
83. Being optimistic	**.68**	**.79**	.18	.14	.05
84. Being physically healthy	.73	.24	.69	.43	.10
85. Being stress-free	**.61**	**.60**	.27	.33	-.27
86. Taking prescribed medications as indicated	.11	.19	.15	-.09	.20
87. Being active	.67	.40	.67	.24	-.03
88. Not being sick	.64	.17	.21	.75	.06
89. Having respect for oneself	**.65**	**.75**	.29	.06	.12
90. Having safe sex	.24	.23	.14	.12	.40
91. Being self-aware	.43	.49	.30	.06	.32
92. Eating right - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)					
93. Being energetic	.73	.63	.49	.30	-.06
94. Exercising regularly	**.62**	.22	**.75**	.13	-.08
95. Being physically fit	**.80**	.21	**.81**	.30	-.07

III. Five Factor Structure

Items loading at >.50 on a given factor, and having factor score coefficients with absolute value of greater than identified values (in parentheses) on that factor, in boldface

Item	Communality	I	II	III	IV	V
		(.050)	(.048)	(.131)	(.136)	(.071)
1. Able to breathe clearly	.22	.07	.22	.27	.22	.23
2. Not being tired	.34	.21	.30	.18	.41	-.06
3. Deals well with stressful situations	.33	.41	.14	.05	.38	.03
4. Is aware of and pays attention to their body	.32	.08	.48	-.01	.17	.23
5. Eating a balanced diet	**.69**	.09	**.68**	.05	.36	.29
6. Having a well balanced life	.51	.37	.44	.15	.36	.16
7. Having good cardiovascular health	.51	.15	.59	.21	.10	.29
8. Does not get sick easily or often	.55	.10	.15	.64	.29	.17
9. Does not smoke	.08	.05	.07	.08	-.05	.26
10. Being drug free	.26	.05	-.02	.17	-.10	.47
11. Being of normal weight	**.49**	.09	**.67**	.12	.02	-.15
12. Does not abuse drugs	**.36**	.01	-.07	.03	.09	**.60**
13. Having a positive attitude	.64	.69	.19	.12	.30	.14
14. Having a properly working body with all systems functioning well	.58	.21	.41	.60	.09	.02
15. Eating good foods, such as fruits and vegetables	**.55**	.19	**.60**	-.04	.26	.30
16. Eating properly (according to doctor)	**.66**	.23	**.70**	.05	.20	.27
17. Being alive	.31	.47	.13	.18	-.10	.20
18. Being emotionally stable	.63	.62	.13	.14	.44	.07
19. Exercising	.50	.21	.67	.09	.02	-.03
20. Enjoying life	.64	.75	.13	.20	.18	-.06
21. Being engaged in life	**.66**	**.75**	.22	.20	.07	.07
22. Being fit	**.79**	.29	**.80**	.26	.05	-.09
23. Does not abuse alcohol	.27	.14	-.13	-.03	.04	.48
24. Feeling good	**.75**	**.68**	.21	.40	.28	-.04
25. Being free from illness	**.75**	.15	.16	**.82**	.17	.11
26. Having a mind that thinks clearly	.48	.51	.17	.27	.33	.14
27. Getting enough rest	**.47**	.25	.34	.17	**.50**	-.12
28. Being free of major disease (cancer, heart disease)	.36	.10	.13	.52	-.12	.22

29. Being comfortable with themselves	.56	.59	.34	.19	.25	-.04
30. Having good eating habits	**.56**	.28	**.75**	.14	.28	.21
31. Having good habits	.78	.40	.52	.18	.25	.35
32. Having healthy relationships with others	**.63**	**.73**	.18	.15	.12	.17
33. Having good hygiene	.37	.44	.28	.12	-.06	.28
34. Being mentally healthy	.57	.65	.13	.19	.28	.10
35. Being nourished	.48	.51	.34	.07	.22	.24
36. Sleeping well	.52	.30	.34	.28	.47	-.15
37. Thinking	.25	.41	.25	.02	.09	.07
38. Being happy	**.77**	**.81**	.14	.17	.27	.02
39. Eating well	.67	.29	.62	.09	.36	.27
40. Having a sense of purpose	.64	.70	.35	.02	.10	.07
41. Eating healthy - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)						
42. Having good nutrition - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)						
43. Being health conscious	**.70**	.32	**.69**	.05	.26	.25
44. Having a healthy diet - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)						
45. Having good oral hygiene	.20	.35	.19	.03	.03	.20
46. Being hopeful	**.68**	**.77**	.21	.02	.18	-.18
47. Being self-controlled	.41	.51	.25	.08	.15	.22
48. Being in good shape	**.79**	.30	**.76**	.30	.12	-.15
49. Maintaining an active mind	.47	.62	.25	-.04	.07	.13
50. Having laughter	**.55**	**.73**	.05	.09	-.17	-.06
51. Having low stress in life	.61	.37	.15	.15	.65	.03
52. Having longevity	.63	.61	.30	.31	.21	.17
53. Loving people	.45	.61	.30	.31	.21	.17
54. Being mentally strong	.58	.70	.17	.04	.23	.06
55. Having an active lifestyle	.64	.44	.64	.25	.09	-.05
56. Being motivated	.64	.68	.36	.13	.15	.02
57. Being adaptable	.44	.61	.23	.08	.11	.06
58. Being physically active	**.74**	.36	**.75**	.21	.04	-.08
59. Having no health problems or illness	**.80**	.12	.27	**.84**	.11	.03
60. Being pain-free	.57	.17	.29	.64	.21	-.04
61. Not being anxious	.52	.47	.03	.24	.48	.06
62. Not being depressed	.62	.63	.22	.18	.36	.16
63. Being socially well-adjusted	**.67**	**.75**	.22	.15	.15	.09

64. Not being easily stressed	**.68**	.58	.15	.08	**.56**	-.04
65. Not being overweight	.50	.14	.66	.10	.07	-.18
66. Getting 6-8 hours of sleep each night	.36	.26	.31	.13	.41	-.11
67. Being nutrition-conscious	**.72**	.26	**.72**	.11	.25	.24
68. Having healthy blood pressure	.35	.19	.47	.16	.06	.26
69. Having loving family	.25	.46	.07	.06	-.09	.15
70. Having low cholesterol	.24	.19	.47	.16	.06	.26
71. Being mentally active	.57	.46	.29	-.04	-.03	.17
72. Being positive	**.76**	**.80**	.17	.08	.29	.17
73. Being mentally stable	.61	.70	.15	.11	.31	.05
74. Having weight balanced with height	.57	.18	.69	.16	.04	-.20
75. Being well	**.77**	.43	.32	**.68**	.15	.05
76. Being well-adjusted	**.76**	**.75**	.25	.26	.21	.13
77. Being resilient	.41	.54	.23	.05	.22	.12
78. Being relaxed	.67	.54	.13	.20	.56	.08
79. Being willing to ask for help	.30	.53	.10	.08	.08	.03
80. Having a great attitude	**.79**	**.83**	.14	.14	.26	.04
81. Being satisfied	.60	.70	.20	.18	.18	.05
82. Having self-love	**.70**	**.74**	.27	.06	.23	-.12
83. Being optimistic	**.68**	**.75**	.15	.12	.28	.04
84. Being physically healthy	.76	.28	.68	.47	.05	.02
85. Being stress-free	**.74**	.40	.23	.18	**.70**	-.06
86. Taking prescribed medications as indicated	.13	.18	.14	-.10	.07	.25
87. Being active	.71	.42	.67	.27	.08	-.08
88. Not being sick	.64	.12	.20	.72	.24	.08
89. Having respect for oneself	.67	.75	.27	.08	.16	-.06
90. Having safe sex	.24	.29	.12	.16	-.07	.34
91. Being self-aware	.43	.53	.28	.09	.03	.26
92. Eating right - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)						
93. Being energetic	.73	.58	.47	.28	.30	-.06
94. Exercising regularly	**.64**	.23	**.74**	.13	.09	-.10
95. Being physically fit	**.82**	.22	**.81**	.31	.10	-.11

IV. Six Factor Structure

Items loading at >.50 on a given factor, and having factor score coefficients with absolute value of greater than identified values (in parentheses) on that factor, in boldface

Item	Communality	I	II	III	IV	V	VI
	(.048)	(.050)	(.146)	(.130)	(.132)	(.068)	
1. Able to breathe clearly	.23	.05	.21	.28	.22	.11	.21
2. Not being tired	.35	.22	.31	.18	.40	-.06	-.05
3. Deals well with stressful situations	.36	.38	.13	.06	.38	.21	.01
4. Is aware of and pays attention to their body	.33	.05	.47	.02	.17	.16	.21
5. Eating a balanced diet	**.71**	.09	**.71**	.08	.35	-,02	.29
6. Having a well balanced life	.52	.38	.45	.15	.35	-.08	.17
7. Having good cardiovascular health	.51	. 15	.59	.22	.09	.05	.28
8. Does not get sick easily or often	.55	.10	.15	.64	.28	.02	.16
9. Does not smoke	.10	.06	.09	.08	-.05	-.08	.27
10. Being drug free	.26	.04	-.02	.17	-.10	.62	.46
11. Being of normal weight	**.53**	.05	**.64**	.13	.01	.25	-.20
12. Does not abuse drugs	.36	-.07	-.06	.04	.01	.08	.59
13. Having a positive attitude	.69	.72	.22	.11	.29	-.08	.17
14. Having a properly working body with all systems functioning well	.59	.23	.41	.60	.07	-.05	.01
15. Eating good foods, such as fruits and vegetables	**.60**	.20	**.63**	-.05	.24	-.06	.32
16. Eating properly (according to doctor)	.67	.23	.72	.05	.19	.04	.26
17. Being alive	.31	.46	.13	.18	-.01	.10	.20
18. Being emotionally stable	.63	.61	.14	.14	.44	.13	.06
19. Exercising	.51	.22	.68	.09	-.01	-.01	-.03
20. Enjoying life	**.70**	**.77**	.15	.18	.16	-.08	.02
21. Being engaged in life	**.68**	**.76**	.24	.19	.06	.07	.09
22. Being fit	**.80**	.29	**.80**	.26	.04	.04	-.10
23. Does not abuse alcohol	.27	.13	-.12	-.03	.04	.06	.48
24. Feeling good	**.77**	**.70**	.22	.39	.27	-.04	-.03
25. Being free from illness	**.78**	.14	.15	**.83**	.16	.12	.09
26. Having a mind that thinks clearly	.57	.46	.14	.29	.34	.37	.10
27. Getting enough rest	**.51**	.22	.32	.18	**.51**	.22	-.15
28. Being free of major disease (cancer, heart disease)	.37	.08	.12	.53	-.12	.11	.20
29. Being comfortable with themselves	.57	.56	.33	.19	.25	.22	-.06
30. Having good eating habits	**.78**	.27	**.76**	.15	.26	.09	.20
31. Having good habits	.65	.38	.52	.19	.24	.16	.33
32. Having healthy relationships with							

others	**.64**	**.73**	.19	.14	.11	.05	.18
33. Having good hygiene	.36	.42	.28	.12	-.06	.14	.27
34. Being mentally healthy	.59	.62	.12	.20	.28	.27	.08
35. Being nourished	.50	.48	.32	.08	.22	.26	.21
36. Sleeping well	.55	.28	.32	.29	.48	.18	-.18
37. Thinking	.40	.34	.20	.04	.11	.48	.02
38. Being happy	**.78**	**.82**	.15	.16	.26	.02	.04
39. Eating well	.68	.28	.63	.10	.35	.08	.26
40. Having a sense of purpose	**.64**	**.69**	.36	.02	.10	.12	.07
41. Eating healthy - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)							
42. Having good nutrition - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)							
43. Being health conscious	**.70**	.29	**.68**	.06	.25	.18	.22
44. Having a healthy diet - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)							
45. Having good oral hygiene	.21	.35	.20	.03	.03	.04	.21
46. Being hopeful	**.69**	**.78**	.22	.10	.18	.04	-.03
47. Being self-controlled	.43	.47	.24	.09	.16	.27	.20
48. Being in good shape	**.79**	.30	**.75**	.30	.11	.08	-.17
49. Maintaining an active mind	.58	.56	.21	-.03	.01	.47	.09
50. Having laughter	**.55**	**.74**	.05	.08	-.02	.05	.09
51. Having low stress in life	.64	.40	.18	.14	.65	-.12	.02
52. Having longevity	.63	.61	.31	.30	.20	.06	.17
53. Loving people	.51	.65	.16	-.02	-.08	-.08	.23
54. Being mentally strong	.67	.65	.14	.05	.24	.42	.02
55. Having an active lifestyle	.70	.45	.65	.24	.07	.06	-.04
56. Being motivated	.66	.70	.37	.12	.14	.29	.04
57. Being adaptable	.47	.57	.21	.09	.11	.29	.04
58. Being physically active	**.76**	.37	**.76**	.20	.03	.02	-.09
59. Having no health problems or illness	**.80**	.13	.27	**.83**	.09	-.02	.02
60. Being pain-free	.57	.17	.28	.65	.20	.07	-.06
61. Not being anxious	.52	.46	.03	.25	.48	.10	.06
62. Not being depressed	.62	.63	.23	.18	.36	.08	.02
63. Being socially well-adjusted	**.68**	**.72**	.21	.15	.15	.25	.07
64. Not being easily stressed	**.68**	.57	.16	.08	**.56**	.10	-.04
65. Not being overweight	.56	.10	.63	.11	.07	.29	-.23
66. Getting 6-8 hours of sleep each night	.41	.23	28	.15	.42	.24	-.14
67. Being nutrition-conscious	**.72**	.24	**.73**	.12	.24	.10	.23
68. Having healthy blood pressure	.43	.13	.44	.19	.07	.37	.21
69. Having loving family	.25	.45	.07	.05	-.08	.12	.15
70. Having low cholesterol	.29	.14	.36	.18	.01	.29	.15
71. Being mentally active	**.72**	**.60**	.25	.01	-.03	**.53**	.12
72. Being positive	**.79**	**.82**	.19	.07	.28	-.03	.03

73. Being mentally stable	.66	.65	.13	.12	.32	.32	.02
74. Having weight balanced with height	**.64**	.14	**.66**	.18	.04	.30	-.25
75. Being well	**.77**	.44	.32	**.67**	.13	.02	.05
76. Being well-adjusted	.77	.72	.24	.27	.21	.25	.11
77. Being resilient	.44	.50	.21	.06	.23	.30	.09
78. Being relaxed	.67	.54	.13	.20	.56	.08	.08
79. Being willing to ask for help	.30	.53	.10	.03	.08	.08	.03
80. Having a great attitude	**.79**	**.83**	.15	.13	.25	.07	.05
81. Being satisfied	.66	.73	.23	.17	.16	-.09	.08
82. Having self-love	**.70**	**.74**	.28	.05	.22	.09	-.12
83. Being optimistic	**.74**	**.78**	.18	.10	.27	-.10	.08
84. Being physically healthy	.77	.29	.69	.46	.03	-.01	.02
85. Being stress-free	**.75**	.42	.26	.17	**.69**	-.07	-.05
86. Taking prescribed medications as indicated	.15	.19	.16	-.11	.06	-.05	.27
87. Being active	.73	.44	.68	.26	.06	-.04	-.07
88. Not being sick	.63	.13	.20	.72	.23	.10	.07
89. Having respect for oneself	.68	.72	.25	.10	.03	.31	.23
90. Having safe sex	.24	.28	.13	.16	-.07	.05	.34
91. Being self-aware	.46	.48	.26	.10	.03	-.09	-.05
92. Eating right - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)	.74						
93. Being energetic	.74	.59	.48	.27	.29	-.09	-.05
94. Exercising regularly	**.65**	.23	**.75**	.13	.07	-.06	-.11
95. Being physically fit	**.82**	.22	**.80**	.31	.09	.08	-.13

IV. Seven Factor Structure

Items loading at >.50 on a given factor, and having factor score coefficients with absolute value of greater than identified values (in parentheses) on that factor, in boldface

Item	Communality	I	II	III	IV	V	VI	VII
	(.037)	(.041)	(.144)	(.133)	(.136)	(.073)	(.172)	
1. Able to breathe clearly	.24	.04	.23	.28	.24	.13	.19	.01
2. Not being tired	.35	.23	.31	.19	.32	-.08	-.05	.22
3. Deals well with stressful situations	.44	.34	.16	.05	.47	.26	-.03	-.01
4. Is aware of and pays attention to their body	.33	.05	.47	.06	.11	.15	.21	.15
5. Eating a balanced diet	**.71**	.11	**.71**	.02	.25	-.05	.30	.22
6. Having a well balanced life	.53	.39	.45	.16	.26	-.03	.18	.23
7. Having good cardiovascular health	.52	.14	.61	.22	.10	.08	.26	-.03
8. Does not get sick easily or often	.54	.10	.16	.64	.26	.02	.15	.09
9. Does not smoke	.10	.06	.62	.13	-.03	-.05	.26	-.07
10. Being drug free	.26	.02	-.05	.17	-.08	.11	.44	-.18
11. Being of normal weight	**.55**	.06	**.62**	.13	-.11	.21	-.17	.24
12. Does not abuse drugs	.35	-.01	-.05	.05	.04	.09	.58	-.04
13. Having a positive attitude	.70	.72	.23	.11	.26	-.07	.31	.08
14. Having a properly working body with all systems functioning well	.59	.24	.41	.60	.02	-.04	.01	.07
15. Eating good foods, such as fruits and vegetables	**.60**	.21	**.64**	-.04	.21	-.06	.31	.08
16. Eating properly (according to doctor)	**.68**	.22	**.73**	.05	.18	.06	.25	.05
17. Being alive	.34	.43	.15	.18	.10	.17	.16	-.18
18. Being emotionally stable	.63	.60	.15	.15	.43	.14	.06	.15
19. Exercising	.54	.20	.69	.09	.03	.04	-.06	-.10
20. Enjoying life	**.70**	**.78**	.15	.19	.14	-.07	.03	.07
21. Being engaged in life	**.68**	**.76**	.23	.20	.06	.04	.09	.02
22. Being fit	**.80**	.28	**.80**	.26	.02	.06	-.11	.03
23. Does not abuse alcohol	.27	.13	-.12	-.02	.04	.06	.48	.01
24. Feeling good	**.77**	**.70**	.22	.40	.24	-.02	-.03	.10
25. Being free from illness	.78	.14	.15	.83	.12	.12	.08	.10
26. Having a mind that thinks clearly	.58	.43	.15	.29	.33	.38	.09	.14

27. Getting enough rest	**.73**	.25	.27	.20	.22	.10	.09	**.70**
28. Being free of major disease (cancer, heart disease)	.37	.08	.11	.53	-.13	.12	.20	-.03
29. Being comfortable with themselves	.59	.57	.32	.20	.15	.20	-.04	.25
30. Having good eating habits	**.78**	.28	**.75**	.16	.19	.07	.20	.18
31. Having good habits	.65	.38	.53	.20	.22	.17	.32	.10
32. Having healthy relationships with others	**.65**	**.73**	.18	.15	.08	.06	.19	.08
33. Having good hygiene	.37	.43	.27	.13	-.08	.15	.27	.03
34. Being mentally healthy	.64	.58	.14	.19	.36	.33	.04	-.03
35. Being nourished	.50	.47	.32	.08	.18	.26	.22	.14
36. Sleeping well	**.73**	.31	.28	.31	.20	.07	-.12	**.64**
37. Thinking	.40	.34	.19	.04	.04	.46	.03	.21
38. Being happy	**.79**	**.82**	.15	.17	.21	.03	.04	.14
39. Eating well	.68	.29	.62	.11	.25	.05	.27	.23
40. Having a sense of purpose	**.64**	**.70**	.35	.02	.06	.13	.08	.10
41. Eating healthy - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)								
42. Having good nutrition - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)								
43. Being health conscious	**.71**	.30	**.67**	.07	.14	.15	.24	.26
44. Having a healthy diet - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)								
45. Having good oral hygiene	.21	.36	.19	.03	.04	.04	.21	.04
46. Being hopeful	**.72**	**.80**	.21	.02	.09	.03	.02	.19
47. Being self-controlled	.46	.45	.26	.09	.22	.32	.17	-.04
48. Being in good shape	**.80**	.30	**.75**	.30	.09	.10	-.18	.06
49. Maintaining an active mind	.58	.54	.21	-.03	.07	.49	.09	.07
50. Having laughter	**.55**	**.73**	.06	.08	.06	.09	.02	-.04
51. Having low stress in life	.64	.39	.20	.15	.60	-.12	.02	.23
52. Having longevity	.63	.60	.32	.31	.20	.09	.16	.05
53. Loving people	.54	.67	.37	.12	.11	.02	.03	.08
54. Being mentally strong	**.70**	**.62**	.15	.04	.29	.46	-.08	.04
55. Having an active lifestyle	**.74**	.43	**.67**	.24	.14	.06	-.08	-.10
56. Being motivated	.66	.70	.37	.12	.11	.02	.03	.08
57. Being adaptable	.48	.55	.21	.09	.15	.32	.02	.02
58. Being physically active	**.79**	.36	**.77**	.20	.06	.06	-.12	-.07

59. Having no health problems or illness	**.80**	.14	.27	**.84**	.06	-.02	.02	.04
60. Being pain-free	.59	.17	.27	.65	.10	.04	-.05	.21
61. Not being anxious	**.59**	.43	.06	.25	**.56**	.15	.02	.21
62. Not being depressed	.62	.62	.24	.18	.35	.10	.08	.11
63. Being socially well-adjusted	.69	.71	.21	.15	.15	.27	.07	.07
64. Not being easily stressed	**.76**	.54	.19	.08	**.63**	.14	-.07	.06
65. Not being overweight	.76	.11	.61	.11	-.04	.25	-.21	.23
66. Getting 6-8 hours of sleep each night	**.66**	.26	.23	.16	.13	.12	-.07	**.69**
67. Being nutrition-conscious	**.73**	.26	**.72**	.13	.12	.07	.25	.25
68. Having healthy blood pressure	.43	.12	.44	.19	.02	.36	.22	.12
69. Having loving family	.26	.45	.06	.06	-.09	.13	.16	.05
70. Having low cholesterol	.31	.11	.37	.17	.06	.33	.12	-.06
71. Being mentally active	**.72**	**.58**	.25	.08	.02	**.56**	.11	.02
72. Being positive	**.79**	**.82**	.19	.07	.27	-.02	.02	.07
73. Being mentally stable	.68	.62	.14	.12	.36	.36	-.03	.06
74. Having weight balanced with height	.65	.14	.64	.18	-.08	.26	-.23	.24
75. Being well	**.77**	.44	.32	**.68**	.12	.05	.03	.04
76. Being well-adjusted	.77	.71	.24	.27	.22	.28	.10	.07
77. Being resilient	.45	.48	.22	.06	.24	.32	.08	.07
78. Being relaxed	.67	.53	.15	.20	.54	.09	-.08	.19
79. Being willing to ask for help	.31	.53	.09	.07	.05	.08	.04	.09
80. Having a great attitude	**.80**	**.82**	.16	.13	.28	.11	.04	.03
81. Being satisfied	**.67**	**.74**	.22	.17	.12	-.08	.08	.08
82. Having self-love	**.71**	**.75**	.27	.05	.16	.09	-.11	.18
83. Being optimistic	**.74**	**.78**	.19	.10	.27	-.07	.07	.04
84. Being physically healthy	.77	.29	.69	.47	.01	.01	.06	.01
85. Being stress-free	**.77**	.41	.28	.18	**.66**	-.07	-.06	.22
86. Taking prescribed medications as indicated	.20	.22	.14	-.10	-.03	-.09	.30	.14
87. Being active	.76	.43	.69	.26	.10	.01	-.11	-.08
88. Not being sick	.63	.13	.20	.72	.20	.08	.07	.09
89. Having respect for oneself	**.69**	**.72**	.24	.08	.08	.23	-.06	.21
90. Having safe sex	.32	.31	.11	.17	-.17	.02	.38	.12
91. Being self-aware	.47	.48	.24	.10	-.02	.31	.24	.13

92. Eating right - ELIMINATED from factor analysis (due to high correlation (>.90) with several other items)								
93. Being energetic	.74	.59	.49	.27	.26	.09	-.06	.11
94. Exercising regularly	**.68**	.22	**.76**	.13	.10	.03	-.14	-.04
95. Being physically fit	**.83**	.21	**.80**	.31	.07	.10	-.14	.05

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