The Development of New Scales for Assessing Health Belief Model Constructs in Adulthood

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The present investigation reports on the reliability and validity of several scales derived from the Health Belief Model (HBM). Both their internal consistency and their ability to predict self-reported sport and physical activity participation among younger and older adults are examined. As an exploratory endeavor, new, internally consistent scales were developed to assess several HBM factors. Results of age-group comparisons as well as comparisons across levels of diversity in several types of self-reported physical activity suggest that the newly developed measures differentiate between individuals on the basis of age and degrees of diversity in activity.

Key Words: activity, exercise, aging

One factor that seems to be critical to a healthy lifestyle among older adults is physical activity or exercise. The physical and emotional benefits of exercise have been documented (Dishman, 1988a; Shephard, 1987), and the decision to initiate and maintain regular activity is influenced by the expectation as well as the attainment of these benefits (Dishman, 1988b). In this light, beliefs concerning the benefits and potential costs of regular exercise behavior may change with increasing age (Carter, Elward, Malmgren, Martin, & Larson, 1991; Dishman, Sallis, & Orenstein, 1985; King, Taylor, Haskell, & DeBusk, 1989).

Indeed, with increased age, factors such as impaired health, physical disabilities, isolation from others due to poor health, retirement, living on a fixed income, having caregiving responsibilities, or depression may undermine older persons' motivation to remain physically active (see Hayslip & Panek, 1993). Such factors may likewise interfere with the initiation of regular exercise that might lead to enhanced well-being or improved cognitive or physiological functioning (see Abourezk, 1989; Berger & Hecht, 1989; Blumenthal et al., 1991; Emery, Hauck, & Blumenthal, 1992; Hird & Williams, 1989). Dishman (1988a) argued that age is an...
important consideration that researchers need to recognize when studying health beliefs, attitudes, and behaviors. Similarly, Roberts, Maddux, and Wright (1984) pointed out that developmental (age) differences impact individuals’ abilities to understand health issues and to assume personal responsibility for their health. Yet, while research has indicated a reduction in physical activity level and intensity with increased age (Gordon, Gaitz, & Scott, 1976; Rudman, 1986), this disengagement from active exercise among older adults may not be due to age-related physiological changes alone (Spreitzer & Snyder, 1983).

There appears to be a need to determine the meaning of exercise as an experience in itself, one that may be age-related. An interactionalist perspective is needed that emphasizes the complex interplay of characteristics of the person and the situation in which he or she is placed. For example, personal investment theory (Maehr, 1984; Maehr & Braskamp, 1986) emphasizes that the subjective perception of the meaning of a situation is the critical determinant of one’s personal investment of resources into the situation. In essence, this theory would argue that older adults may be motivated to participate (or not participate) in physical activity for different reasons than younger adults based on the subjective meaning of the situation to them.

Dishman et al. (1985) categorized the aspects of regular exercise and physical activity into (a) characteristics of the person and his or her lifestyle habits (e.g., demographic factors, past or present health-related knowledge, perceived health, costs/benefits), (b) characteristics of environments (e.g., spouse support, perceived available time, access to facilities), and (c) characteristics of the activity itself (e.g., perceived intensity, perceived exertion, perceived discomfort). One model that incorporates many of these factors to predict exercise participation and adherence is the Health Belief Model (HBM) (Becker, 1974; Janz & Becker, 1984; Rosenstock, 1966, 1974).

The HBM is one of several motivational theories (see, e.g., McAuley & Courneya, 1993; Weinstein, 1993, for reviews) which assume that anticipation of negative health outcomes and the desire to avoid these outcomes or reduce their impact create motivation for self-protection. The HBM (Becker & Maiman, 1975; Knapp, 1988; Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1988) states that one’s readiness to undertake a health regimen such as exercise depends upon the following: (a) at least moderate motivation to make health issues salient (e.g., concern about health or illness, willingness to accept direction); (b) an evaluation of the illness threat (e.g., perceived vulnerability or susceptibility to serious health problems, or existence of current serious health problems); (c) a belief that the potential or existing problem is preventable or controllable (i.e., that exercise might yield physical and psychological remedial or preventative benefits) and a feeling of competence to implement the necessary change; (d) a belief that participation in an exercise program will reduce the threat of illness; and (e) the presence of cues that trigger or elicit action, making the individual aware of his or her feelings about the need to improve his or her health. Such cues might be internal (e.g., perception of bodily states) or external (e.g., interpersonal interactions or health propaganda). Various other influences modify or enhance compliance, including demographic factors (e.g., age, sex, ethnicity), structural factors (e.g., cost, complexity, knowledge about disease), attitudes (e.g., satisfaction with an exercise regimen), interaction factors (e.g., mutuality of expectations and agreement between professional
A great deal of research has accumulated concerning the utility of HBM constructs such as perceived benefits of exercise, perceptions of vulnerability to disease, perceived barriers to regular exercise involvement, cues to action, and perceived control over health outcomes, as they relate to compliance with medical regimens and exercise adherence (see, e.g., Becker, Nathanson, Drachman, & Kirscht, 1977; Larson, Olsen, Cole, & Shortell, 1979; Noland & Feldman, 1985; Olson & Zanna, 1982; Oldridge & Streiner, 1990; Rundall & Wheeler, 1979; Slenker, Price, Roberts, & Jurs, 1984). However, little of this work applies to middle-aged or elderly persons, whose ability to engage in vigorous physical activity may be limited and for whom exercise might need to be redefined to incorporate less strenuous forms of physical activity (see Berger & Hecht, 1989; Berger & Owen, 1989; Gordon et al., 1976).

While much research has focused on self-efficacy as both a determinant and a consequence of exercise behavior (see, e.g., McAuley, 1992; McAuley & Courneya, 1993; McAuley, Lox, & Duncan, 1993), knowledge about the determinants of physical activity within the HBM has been primarily restricted to younger and middle-aged adults (see Sallis & Hovell, 1990). Sharpe and Connell’s (1992) investigation, however, found that among employees aged 50 to 69 who participated in a university-supported health promotion program, those who believed they could initiate or continue a vigorous exercise program also felt that vigorous exercise would result in desirable health benefits. Moreover, those who saw few barriers to regular exercise were more likely to express an intention to exercise regularly during the subsequent 6 months. Emery and Blumenthal (1990a) found that health enhancement was the most common reason given for continued exercise (1 year later) in an aerobic exercise program for older adults aged 60 to 83. Howze, DiGilio, Bennett, and Smith (1986) reported that individuals with high attendance rates (M age = 63) in an exercise program had more favorable expectations of the benefits of exercise and perceived fewer barriers to future exercising than those with low attendance rates. Andersson and Stanich (1992) found that over a third of older persons reported cues to action that led to both positive and negative behaviors. While Walker, Pender, Frank-Stromborg, and Sechrist (1990) found that the perceived benefits of barriers to exercise, one’s definition of health, gender, preferred level of exertion, and health locus of control accounted for nearly 35% of the variance in exercise in middle-aged and older adults.

With the exception of several studies by Champion (1987, 1988, 1994) and others (Lashley, 1987; Lauver & Angerame, 1988; Rutledge, 1987) exploring the development of scales derived from the HBM specific to breast cancer self-examination among middle-aged and elderly women, psychometric studies examining the HBM model from a developmental perspective are largely absent. Consequently, the purpose of the present study was to report on the development of scales to assess internal consistency and validity of components of the Health Belief Model, specifically their internal consistency and validity in examining the extent to which younger and older adults similarly (a) perceive susceptibility to risk of disease and/or aging, (b) anticipate positive benefits of regular exercise, (c) perceive barriers to exercise, (d) perceive health behavior to be under their own control, (e) identify significant others who might influence or support exercise or related health
habits, and (f) identify cues to action (i.e., factors precipitating an awareness of the need for regular exercise).

A secondary purpose of the present study was to examine the ability of the scales to predict self-reported physical activity. It was hypothesized that both younger and older adults would be more likely to report greater levels of activity if they (a) perceived themselves to be more susceptible to aging-related health problems, (b) associated more benefits with physical activity, (c) identified fewer barriers to participation in physical activity, (d) saw health behavior to be under their own control rather than dependent upon external factors, (e) perceived greater support from significant others regarding exercise and health habits, and (f) were more susceptible to cues to action.

Method

SUBJECTS AND PROCEDURES

Data were collected from 144 volunteers. Eighty-six younger adults (M age 21.5 years, SD 2.4, range 19–31; 56 females and 30 males) and 58 community-residing older adults (M age 71.8 years, SD 6.4, range 60–91; 38 females and 20 males) participated in the study. The younger adult sample included full-time students (N = 51, 59%), students who worked part-time or full-time (N = 12, 14%), and individuals who were not currently in college who worked either full-time or part-time (N = 23, 27%). With respect to current census data (U.S. Bureau of the Census, 1993), which indicate that 13% of adults aged 18–34 do not possess a high school education, 35% have graduated from high school, and 23% have some college but have not completed their degrees, the present sample is overrepresented regarding full-time and part-time college students and underrepresented regarding individuals who have not attended college. Yet, the present sample of younger adults included both working and nonworking individuals, and the variable years of education was unrelated to reported activity in the young adult sample (r = -.04, NS).

The older adult sample included community-residing individuals, none of whom indicated that they were enrolled in college courses. While 4 individuals reported active involvement in volunteer work, the remainder reported that they were retired and not working either full-time or part-time. Twenty-one (36%) either had failed to complete high school or had graduated from high school, while 15 (27%) had some college, and 22 (37%) had college degrees. With respect to census figures for persons 65 years and older (U.S. Bureau of the Census, 1993), which indicate that 12% have a high school education, 15% have some college, and 13% have college degrees, the present sample of older adults is somewhat positively biased with respect to level of education. In the older adult sample, however, level of education was also unrelated to reported activity (r = -.03, NS).

The positive bias with respect to level of education is typical of most volunteer samples in the adult development and aging literature (see Baltes, 1968) as well as in the aging and exercise literature (Berger & Hecht, 1989). Due to this systematic volunteering bias, generalization of our findings to less well educated, nonworking younger persons as well as to less well educated, less healthy older individuals should be made with caution.
As most elderly persons are female (Hayslip & Panek, 1993), it is understandable that more women comprised the elderly sample. The young adult sample was matched so that each sample would be comparable regarding the proportion of males and females. Recruitment of all volunteers was through local media advertising, promotional fliers, direct mailing, and announcements to local fitness clubs as well as aging organizations and senior citizen centers in a major metropolitan area of the Southwest. Informed consent was obtained, and as appropriate, persons were told they would receive either extra credit or a $10 payment for completing a short questionnaire regarding their opinions about regular exercise. Questionnaires required approximately 45 min to complete.

MEASURES

Measures to assess HBM constructs (see the appendix for a complete list of scales) were developed from an examination of the available literature on aging and physical activity. These measures assessed the following HBM components:

**Perceived Susceptibility to Serious Health Problems.** Sixteen diseases or negatively perceived health problems including depression, heart attack, arthritis, obesity, and stroke were identified. Each item consisted of a statement requiring the respondent to rate his or her degree of agreement regarding risk on a 5-point Likert-type scale ranging from 1 = somewhat low risk to 5 = extremely high risk.

**Expected Benefits of Exercise.** Thirteen potentially positive outcomes associated with physical activity/exercise were developed, including such items as losing weight, feeling better psychologically, getting stronger, being with friends/being social, and release of tension. Each item required the respondent to rate his or her degree of agreement concerning each benefit of physical activity on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree.

**Barriers to Exercise.** Seventeen reasons for not exercising were developed, including not having enough time, inconvenience, injury, cost, and bad weather. Each item required the respondent to rate his or her degree of agreement concerning major reasons for not exercising on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree.

**Significant Others in Support of Exercise.** Eleven potential sources of inspiration or support regarding exercise including spouse, parents, children, physician, co-workers, and instructors were identified. Each item required the respondent to rate the extent to which he or she was influenced by, or sought advice, support, and approval from, various sources of support, using a 5-point Likert-type scale ranging from 1 = not influenced to 5 = extremely influenced.

**Cues to Action.** Twelve potential factors were identified that might bring about an awareness of the need to exercise. Such factors included a doctor’s recommendation, advice from friends, shortness of breath, newspaper/magazine articles, and the availability of an exercise program. They were assessed on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree.

In addition to these newly developed scales, several other established scales were utilized. They were considered secondary in their ability to reflect HBM constructs.

**Multidimensional Health Locus of Control Scale.** The Multidimensional Health Locus of Control Scale (Form A; Wallston, Wallston, & DeVellis, 1978; Wallston,
Wallston, Kaplan, & Maides, 1976) is an 18-item questionnaire that assesses individuals’ expectancies about control over their health on three dimensions: internal, powerful others, and chance. Though not specific to exercise, the Health Locus of Control (LOC) Scale was felt to indirectly index individuals’ concerns about health issues influencing the extent to which one would value exercise as an activity that is health promoting (see Rosenstock et al., 1988). The Internality scale measures the extent to which one believes one’s own behavior determines health, while the Chance and Powerful Others scales reflect the degree to which one believes health is determined by unpredictable factors (i.e., luck or fate) or by the actions of others (i.e., health care professionals), respectively. This instrument contains six items for each subscale, and each item consists of a statement requiring the respondent to rate his or her degree of agreement on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The scale has been used with a variety of populations, with alpha coefficients ranging from .67 to .77 (Wallston et al., 1978). In this sample, correlations between the Health LOC subscales ranged from .01 to -.26, suggesting they were independent of one another and thus assessed distinct dimensions of health-related expectations of control.

Aging Opinion Survey. The Aging Opinion Survey (Scale Two; Kafer, Rakowski, Lachman, & Hickey, 1980) is a 15-item questionnaire reflecting anxiety, uneasiness, fear, or dread concerning one’s aging, and consequently it might be considered to be an indirect indicator of one’s sense of vulnerability to aging-related losses interfering with activity. The instrument requires the respondent to rate his or her degree of agreement on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The scale has an alpha reliability coefficient of .65 (Kafer et al., 1980).

Health History. Each individual’s health was assessed in several ways. Respondents were first asked to evaluate their relative health on a 3-point scale, comparing their health with that 5 years earlier (better, about the same, or worse). In addition, using a Likert scale, individuals also indicated the extent to which they had been ill in the past year (3-point rating scale from less than twice to more than 6 times). We also computed a generic measure of subjective physical wellness; we listed 10 symptoms or problems (e.g., shortness of breath, chest pains, being overweight, high blood cholesterol, frequent or severe headaches, kidney or heart problems), and each respondent indicated whether he or she had experienced them. LaRue, Bank, Jarvik, and Hetland (1979) found that self-reports of health not only predicted survival among older persons but also substantially covaried with physicians’ evaluations of health. While frequency of illness and subjective wellness were interrelated (r = .33, p < .05), as were comparative health and frequency of illness (r = .28, p < .05), comparative health and subjective wellness were independent (r = .03).

There were no differences across age groups (p > .05) for any of the measures of health, and the age groups were similarly educated (p > .05). Thus, the samples were comparably constituted regarding gender and were similarly healthy and equally highly educated (see Table 1).

Activity. Respondents also indicated the number of months and days per week (frequency) as well as minutes per day (duration) they had spent participating in 20 specific physical activities, in addition to an “other” category (where specific activities were listed exclusive of the above 20), during the previous 12 months. The
activities listed included individual activities such as jogging, weight training, walking, and golf as well as group activities such as softball, baseball, basketball, and soccer. The eventual measure of activity utilized was the number of activities
the individual participated in at least once during the previous year (Brown & Frankel, 1993). This measure of activity was used because we felt that it would be more likely for an individual to accurately recall at least one instance of participation in a number of activities during the previous year than to reliably recall the exact number of minutes per day, days per week, and months per year for a given activity. In addition, there is an established precedent for the use of self-reported activity/exercise behavior in the aging literature (Brooks, 1994; Brown & Finkel, 1993; McAuley, Lox, & Duncan, 1993) and, indeed, several investigators have found objective, physiological markers of exercise to in fact substantially covary with self-reports of exercise behavior (Boyette, Sharon, & Archea, 1994; Emery & Blumenthal, 1990a, 1990b; Hauck, Emery, & Blumenthal, 1992).

While the absolute number of physical activities served as a measure of self-reported activity in this sample, difficulties in ascertaining the exact extent (quantity) of physical activity for many individuals suggest that these self-report data might better reflect the diversity of physical activity, independent of its quantity, frequency, or intensity. Consequently, for purposes of this study, higher self-
reported activity was operationally defined to reflect greater diversity of activity.

As noted, self-reported activity was operationalized via frequency counts of those physical activities each respondent indicated as having participated in at least once during the previous 12 months. These activities were subsequently organized as sport related (e.g., skiing, tennis, golf, soccer, bowling, volleyball, football, baseball), fitness related (e.g., jumping rope, walking for fitness/conditioning, sit-ups, stretching, jogging, leg lifts, swimming for fitness/conditioning, weight training), and pleasure related (e.g., walking for pleasure/recreation, swimming for pleasure/recreation, horseback riding, dancing). Interscorer agreement between the first and fourth authors concerning identification of these categories of self-reported activity exceeded 90% in each case. In addition, an overall measure of self-reported activity was created via the sum of the sport-related, fitness-related, and pleasure-related activities. Correlations among the three types of activity ranged from .11 to .30, suggesting that they were substantially independent of one another. For the measures of overall activity, $F(1,132) = 18.48, p < .01$, sport-related activity, $F(1, 132) = 34.67, p < .01$, pleasure-related activity, $F(1, 132) = 18.87, p < .01$, and fitness-related activity, $F(1, 132) = 10.10, p < .01$, age differences were substantial, wherein in each case, young adults reported more diverse activity than did older adults (see Table 1). Such findings replicate those of other studies (Glamser & Hayslip, 1985; Gordon et al., 1976; Rudman, 1986).

Results

RELIABILITY AND VALIDITY OF HBM SCALES

Internal consistency estimates for the new HBM scales in both the younger and older samples were quite good. With two exceptions (see below) all exceeded .80, which is the minimum level recommended for applied purposes (Nunnally, 1978). The coefficient alphas for the five HBM scales for the younger and older samples, respectively, were as follows: Susceptibility to Health Problems = .88 and .92, Benefits of Exercise = .90 and .87, Barriers to Exercise = .81 and .79, Social Support From Others = .77 and .85, and Cues to Action = .87 and .88. For the entire sample, scale reliabilities were as follows: Susceptibility to Health Problems = .90, Benefits of Exercise = .89, Barriers to Exercise = .80, Social Support From Others = .80, and Cues to Action = .87.

In addition, the internal consistency estimates in the present samples for the established scales were generally higher than previously reported. For the Multidimensional Health Locus of Control Scale, the coefficient alphas for each subscale, for the younger and older samples, respectively, were as follows: Internality = .84 and .85, Chance = .71 and .80, and Powerful Others = .81 and .74. For the Aging Opinion Survey, the coefficient alphas for the younger and older samples, respectively, were .73 and .71.

To assess the validity of the HBM scales, one-way MANOVAs were conducted to explore the extent to which these scales could differentiate between younger and older adults as well as the extent to which the scales could differentiate between individuals who reported varying degrees of physical activity.

A one-way MANOVA (by age groups) of the measures of susceptibility to health problems, barriers to and benefits of exercise, cues to action, support from others, health locus of control, and anxiety about aging (see Table 1) suggested that
for the variables as a set, there were reliable age differences, multivariate $F(8, 133) = 9.14, p < .001$. At the univariate level of analysis, significant age effects were found for (a) barriers to exercise, $F(1, 140) = 17.82, p < .01$, wherein older persons perceived fewer barriers to exercise; (b) cues to action, $F(1, 140) = 4.03, p < .05$, wherein older persons reported fewer cues to exercise; (c) support from others for exercise, $F(1, 140) = 12.97, p < .001$, wherein older persons reported less social support; and (d) anxiety about aging, $F(1, 140) = 19.65, p < .001$, wherein older persons were less anxious about growing older. In addition, age differences in susceptibility to health difficulties approached statistical significance, $F(1, 140) = 2.97, p < .09$, wherein such vulnerability tended to be greater for older adults. Perceived benefits of exercise and health locus of control did not differentiate persons by age.

For purposes of comparing individuals on the basis of levels of diversity of self-reported activity, levels of diversity of sport-related, pleasure-related, and fitness-related activity were created; that is, individuals were categorized into “higher” (two or more reported activities over the past year) and “lower” (one or less reported activity over the past year) levels of diversity of participation. In each case, approximately 40% of the sample were placed above the cutoff, while the remainder fell below the cutoff. A similar breakdown by levels of diversity of overall self-reported activity (two or less versus three or more over the past year) was created.

A one-way MANOVA by levels of diversity of fitness-related activity for the above variables suggested that for the measures as a set, fitness-related differences in such scores did indeed exist, multivariate $F(8, 140) = 2.67, p < .01$ (see Table 2). At the univariate level, persons who reported having participated in more diverse fitness-related activity in the past year were found to perceive greater benefits of such activity, $F(1, 147) = 4.06, p < .05$, to report more cues to action, $F(1, 147) = 8.25, p < .01$, and to report greater support from others regarding engaging in exercise, $F(1, 147) = 9.55, p < .01$. However, regardless of the diversity of self-reported fitness-related activity, persons perceived similar impediments to exercise, felt equally susceptible to health risks, were equally anxious about aging, and felt equally in control of their health ($p > .05$).

When a similar analysis was carried out regarding levels of diversity of sport-related activities, the overall multivariate effect was significant, $F(8, 140) = 2.94, p < .01$. Persons who reported more diverse sport-related activity perceived greater barriers to such activity, $F(1, 147) = 4.30, p < .05$, more cues to action, $F(1, 147) = 6.82, p < .01$, and more support from others for exercise, $F(1, 147) = 14.12, p < .01$, and they were more anxious about aging, $F(1, 147) = 6.44, p < .01$. Additionally, those reporting greater diversity of sport-related activity tended to report more benefits of exercise, $F(1, 147) = 2.80, p < .09$, but felt equally vulnerable to health difficulties and equally in control of their health.

For pleasure-related activity, the multivariate effects were statistically significant, $F(8, 140) = 2.74, p < .01$. At the univariate level, persons reporting more diverse pleasure-related activity perceived more barriers to exercise, $F(1, 147) = 6.19, p < .01$, reported more support from others for exercise, $F(1, 147) = 13.01, p < .01$, and had greater chance health LOC scores, $F(1, 147) = 4.19, p < .05$. Across levels of diversity of pleasure-related activity, benefits of exercise, cues to action, vulnerability, internal, powerful others, health LOC, and anxiety about aging scores
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were similar. For overall self-reported activity, the multivariate effect across levels of diversity of such activity was not statistically significant and, consequently, no univariate analyses were carried out.

Discussion

The present study explored the development of scales assessing perceptions of factors influencing physical activity in younger and older adults as derived from the Health Belief Model. Almost without exception, scale alpha coefficients met or exceeded .80, suggesting that the newly developed measures possess adequate internal consistency. Regarding each scale’s validity, both comparisons across age and across levels of diversity of self-reported activity irrespective of age suggested that the HBM scales could differentiate individuals along these dimensions.

Results showed that younger and older adults perceive some aspects of the HBM differently and other aspects similarly. The younger subjects were more anxious about aging (e.g., more anxious about the future as one ages, frightened at the thought of outliving one’s spouse), perceived more barriers to exercise (e.g., cost, lack of time, interference with work), felt somewhat less vulnerable to health difficulties \( p < .09 \), had access to more social support influencing their exercise and health habits (e.g., parents, siblings, friends), and were more strongly motivated by cues (e.g., TV advertisements) to be active.

Beyond their ability to differentiate younger and older persons, what might these findings tell us about aging and exercise? Older and younger persons similarly perceived the benefits of exercise, yet older persons reported less diverse activity and fewer barriers to exercise, felt less susceptible to cues to action, and perceived less support from others for exercise. Additionally, older persons were less anxious about aging and yet felt somewhat more vulnerable to age-related health difficulties.

One might predict, via the HBM, that if older persons (relative to younger adults) indeed felt more vulnerable to age-related health difficulties, they might also perceive the benefits of exercise to be greater, feel more support from others, be more sensitive to cues to action, report fewer barriers to exercise, and consequently report more (diverse) activity. Yet in this study, while older adults felt less anxious about growing older, they felt only somewhat \( p < .09 \) more vulnerable to health-related difficulties and were no more likely (relative to younger adults) to see exercise as beneficial. In addition, older adults in this study reported less support from others regarding their exercise and health habits. This may suggest that, at least in this sample of older adults, the motivation to select exercise as a means by which to cope with real or perceived health difficulties is relatively weak.

Older persons reported less diverse activity than did younger adults in this study, despite the fact that they were equally healthy and independent, community-residing individuals. There are several possible explanations for this limited range of physical activity in the older sample. First, there may be a cohort effect concerning differing expectations about health and physical activity. Although today’s generation of younger adults associate intense physical activity with being “healthy,” for older adults, being healthy may be better defined in terms of mobility, positive feelings about oneself, or freedom from injuries, illness, or aches and pains. Indeed, more passive activities may be considered the norm for healthy older adults (Gordon et al., 1976). For older adults, having the ability to drive, attend social
functions, or work around the house may represent healthy daily activities to a greater extent than running, softball, basketball, skiing, or weight training. For example, in this study, older persons identified numerous “other” activities they participated in during the previous year such as gardening, mowing the lawn, stretching, cleaning the apartment, or horseback riding. Yet, even when such activities were incorporated into this study’s definition of activity, older adults were still less diverse in their activity than their younger counterparts.

With respect to the relationship between diversity of physical activity and the HBM, our findings suggest that the HBM scales can differentiate between individuals, irrespective of age, on the basis of self-reported levels of diversity of sport-related, pleasure-related, and fitness-related activity, but not overall activity. This indicates that with respect to their relationship to several HBM constructs, distinctions between domain-specific types of self-reported activity are necessary.

Especially for fitness-related and sport-related activity, cues to action, benefits of activity, and support from others all related to levels of participation as predicted by the HBM. However, we also found that while persons who reported more sport-related and pleasure-related activity perceived more benefits associated with exercise, felt more support from others for exercise, and/or reported themselves to be more influenced by cues to initiate activity/exercise, they also reported more barriers to exercise. This might suggest that barriers to such activity can be overcome. Interestingly, the variable barriers to exercise was independent of levels of diversity in fitness-related activity. As with the age-related findings, these results might challenge the role of perceived barriers to exercise in accounting for activity/exercise initiation and maintenance, as predicted by the Health Belief Model.

Despite their potential for future research, our newly developed scales may need several modifications. Although possessing sufficient internal consistency (alpha = .87 for the combined sample), the Cues to Action scale nevertheless seemed to be biased in favor of external cues. That is, 8 of the 12 items referred to external influences such as advice from others, illness of others, doctor’s recommendation, and advertisements on TV. In comparison, the four items that appear to tap internal perceptions are difficulty in climbing stairs, not fitting into clothes comfortably, difficulty in doing daily chores, and shortness of breath. In future work, greater relative emphasis might be placed on internally driven cues to action. Additionally, more exercise-specific measures of perceived control might be more revealing (see McAuley et al., 1993), since generalized health LOC did not differentiate persons on the basis of age or, with a single exception, with regard to diversity of activity. In this regard, the moderate internal consistency for this measure must be seen as a contributing factor in its lack of sensitivity to age or diversity of activity effects, though the measure assessing anxiety about aging was nevertheless sensitive to age and activity diversity, despite its modest internal consistency.

Several substantive research directions are also suggested by the results of the present investigation. First, future work might include a qualitative assessment of activity, independent of self-reported activity as assessed in this study, as well as physiological assessments of exercise. That is, we might ask older adults what constitutes meaningful physical activity, what factors would make them more active, what they perceive to be the benefits of and barriers to such activity, and what specific cues influence their decision to participate in activities that they value. Such work may be crucial to the accurate prediction of exercise adherence, especially for
older persons, whose subjective beliefs about and self-definition of activity may differ from those of younger persons (see Berger & Hecht, 1989; Berger & Owen, 1989).

Second, future work must take into account cohort effects, since socialization processes and the internalization of beliefs and values consistently change as longevity and consciousness about factors that lead to longer, healthier lives also change. That is, existing belief systems as well as resulting behavioral patterns that determine what constitutes being “healthy” or being “active” for each generation of older adults should be explored. At any given time about 40% of Americans do not exercise and another 40% are active at levels probably too low and infrequent for fitness and health gains (Stephens, Jacobs, & White, 1985). Moreover, of those individuals who begin a supervised exercise program, about 50% drop out of the program within 6 months to 1 year (Dishman, 1988~). Thus, a cohort-specific lack of commitment to regular exercise may influence the ability of the HBM to predict activity and exercise adherence with equal strength in younger and older age cohorts. Especially promising might be research with older persons who report vulnerability to aging-related illness and decline, with an emphasis on factors that promote gains in fitness and health with regular exercise. The importance of work with sedentary older persons reflects the positively biased nature of older adult participants in aging and exercise research (Berger & Hecht, 1989).

Third, and especially related to our findings, more emphasis needs to be placed on the social context influencing the behavioral patterns of older adults. The influence of retirement communities, social organizations, country clubs, and other such group-oriented living and sporting organizations needs to be assessed when examining the reasons why older adults become or stay active. If these influences are substantial, health educators need to foster their development and encourage individuals to join such groups or move, if possible, into retirement communities, as opposed to influencing solitary (potential) exercisers living in the community at large.

References


Roberts, C.C., Maddux, J.E., & Wright, L. (1984). Developmental perspectives in behavioral...


Appendix: Scales Assessing Health Belief Model Constructs

Barriers to Exercise

A major reason why I do not exercise is

| a. Not enough time | b. Inconvenience | c. Lack of transportation | d. Injury | e. Poor physical conditioning | f. Exercise is boring | g. Lack of facilities |

...
h. Cost
i. Exercise interferes with work
j. Exercise interferes with social/family activities
k. Lack of motivation
l. Disapproval by others
m. Too tired
n. Too lazy
o. Illness
p. Limiting health reason
q. Bad weather

Benefits to Exercise
A major benefit of physical activity for me is
a. Losing weight
b. Feeling better psychologically
c. Getting stronger
d. Increasing range of motion
e. Increasing physical conditioning
f. Improved mental alertness
g. Reduce risk of heart attack
h. Lower blood pressure
i. Be with friends/social
j. Improved health
k. Feeling younger
l. Sense of accomplishment
m. Release of tension

Cues to Action
A major reason for getting me to start an exercise program is
a. Doctor’s recommendation
g. Illness of family member
b. Advertisement on television
h. Illness of friends
c. Difficulty in climbing stairs
i. Newspaper/magazine article
d. Not fitting comfortably into clothing
j. Difficulty in doing daily chores
e. Advice from friends
k. Shortness of breath
f. Advice from family
l. Availability of exercise program

Susceptibility to Health Problems
To what extent do you feel that you are personally at risk to develop or experience each of the following?
a. Depression
i. Dementia
b. Osteoporosis
j. Inactivity
c. Obesity
k. Arthritis
d. High blood pressure
l. Stiffness and soreness
e. Heart attack
m. Cancer
f. Stroke
n. Diabetes
g. Memory loss
o. Lack of strength
h. Bouts of anxiety
p. Being overweight

Support From Others for Exercise
To what extent are you influenced by or do you seek advice, support, and approval from the following person(s) regarding your exercise and health habits?
a. My spouse
g. My counselor
b. My parents
h. My friends
c. My brothers or sisters
i. My co-workers
d. My children
j. My instructors
e. My physician
k. My grandchildren
f. My pastor

Note: All items are answered along a 5-point Likert continuum (see text).