

The *Process* of Adult Exercise Adherence: Self-Perceptions and Competence

Diane E. Whaley
University of Virginia

Agnes F. Schrider
Nelson Physical Therapy

What constitutes an *effective* exercise program for older adults remains elusive. For example, little is known regarding the role of current and future-oriented self-perceptions. Nineteen physically active male and female adults ($M = 68.9$ years) were interviewed, and assessments of functional ability (Rikli & Jones, 1999) and possible selves (Markus & Nurius, 1986) were given at baseline and 10 weeks. Hoped-for selves centered on remaining healthy and independent, while feared selves focused on avoiding dependence and negative health outcomes. Exercise was facilitated through the expertise and guidance of the staff and the positive outcomes exercisers perceived. Results support Markus, Cross, and Wurf's (1990) model of effective performance. Intervention strategies that can help exercisers identify and develop possible selves that promote sustained exercise behavior will be discussed.

In a position statement by the American College of Sports Medicine regarding exercise and physical activity for older adults (Mazzeo et al., 1998), the authors state that, "it is imperative to determine the extent and mechanisms by which exercise and physical activity can improve health, functional capacity, quality of life, and independence in this population" (p. 992). Although understanding the outcomes associated with exercise is a worthwhile endeavor, understanding the *process* that leads to actual exercise participation and adherence behavior is critical for the development of successful interventions. Clearly, knowledge of benefits is necessary but often not sufficient to result in exercise participation. In addition,

Diane E. Whaley is with the Department of Human Services at the University of Virginia, Charlottesville, VA 22904. E-mail: dew6d@Virginia.edu. Agnes F. Schrider is with Nelson Physical Therapy, Afton, VA 22920. E-mail: agnes@nelsonphysicaltherapy.com.

longer-term adherence to exercise programs remains an area of major concern for practitioners. An understanding of the cognitions individuals have of themselves and their exercise behavior, as well as the situational factors that influence these cognitions, is important for designing effective interventions.

Self-related constructs have been implicated in behavior (Fox, 2000; Stein & Markus, 1996). In particular, a thorough understanding of the self is critical for understanding adult development and aging (Baltes & Baltes, 1990; Cross & Markus, 1991). How we view ourselves and our abilities strongly influence our choice of activity, how much effort we exert toward that activity, and how persistent we are at a given task (Eccles & Wigfield, 2002; Harter, 1978, 1985, 1986; Ruvolo & Markus, 1992). For example, perceptions of physical competence influence the activities in which children participate (Weiss & Ferrer-Caja, 2002) and can determine whether or not adult women pursue exercise classes (Mulqueen, 1992). Stein and Markus (1996) describe the role self-perceptions play in behavior change and resistance to change. They believe that individuals who choose not to exercise, even though they have been ordered to do so by their physician, are not acting out against that prescription, but instead behaving in ways consistent of the view they have of themselves. Thus, understanding these conceptions is the first step toward designing interventions capable of changing or adapting the self in ways consistent with persistent exercise behavior.

One aspect of the self-system particularly relevant to the study of behavior is self-schema. Described by Markus (1977) as a knowledge structure based on past and present experience, self-schema is considered intimately linked to the “development, maintenance, and breakdown of competence” (Markus, Cross, & Wurf, 1990, p. 205). In the physical domain, Kendzierski (1988, 1990) showed how the presence of a schema for exercise not only facilitated exercise behavior but led to the development of strategies to make exercise behavior more likely. In addition, Whaley and Ebbeck (2002) showed how schemas of older adult exercisers are influenced by societal beliefs. Older exercisers were reticent to adopt a schema as “exerciser,” given the prevailing stereotypes of exercisers as younger, fitter, or stronger than they. They opted instead to describe themselves with terms such as “physically inclined” or “active person.” Regardless, their identities appeared to play a role in their exercise adherence. Cross and Markus (1994) argue that actual competence in a particular domain requires the combination of some level of ability plus an appropriate self-schema for that behavior. Thus, individuals may have a level of ability to exercise, but if they do not have an associated schema as “an exerciser,” they are likely to view themselves as inadequate or incompetent.

How we view ourselves includes not only past experiences and current reality, but future hopes and expectations as well (Markus & Nurius, 1986). These future-oriented self-conceptions, known as possible selves, represent the link between thoughts about oneself and motivated behavior. Possible selves can be positive, hoped-for selves (independent older adult) or feared, to be avoided selves (dependent on others). Both hoped-for and feared selves have been shown to influence physical activity behavior (Whaley, 2003), although some evidence suggests that hoped-for selves may be more important with regard to health-related behaviors (Hooker & Kaus, 1994). Cross and Markus (1991) describe how possible selves influence behavior by serving as a standard of comparison for evaluating one’s current self. For example, an individual who hopes to be independent into older adulthood may be more highly motivated to “keep moving” as a way of achieving that possible

self. If that person is currently inactive, the discrepancy between what she hopes to be and what she currently is should spur some change in behavior. These changes are facilitated by the presence of a variety of self-regulatory strategies (Cross & Markus, 1991). Typical self-regulatory strategies include attaching importance to the possible self, creating specific action plans for that self, or developing self-efficacy for the behavior in question. Once these strategies are in place, these selves are hypothesized to be both dynamic and stable in nature (Cross & Markus, 1991; Markus & Nurius, 1986). In the first longitudinal study of possible selves, Frazier, Hooker, Johnson, and Kaus (2000) found that hoped-for and feared selves remained relatively stable over a 5-year period, with changes generally indicating increases in complexity and depth of the possible self. In response to the need to further examine the emergence and maintenance of possible selves, a goal of this study is to examine changes in exercise-related selves over time.

All of the self-related variables described above are integral to Markus et al.'s (1990) model of effective performance, shown in Figure 1, adapted specifically for physical activity behavior (Whaley, 2004). The model proposes that individuals with the physical ability to exercise, who have formed a self-schema for physical activity, will in turn develop future-oriented conceptions of themselves consistent with that schema. According to Markus et al., possible selves allow the individual to see what it “feels like” to be competent in a particular domain. However, possible selves are not in and of themselves sufficient for behavior. As implied by the box titled, “organization and energization of action,” self-regulatory strategies are necessary to turn a possible self into effective behavior. These self-regulatory strategies can be behavioral (e.g., using goal setting as a way to organize action) or cognitive (e.g., developing confidence in one’s ability to achieve a possible self). In turn, this process impacts and is impacted by one’s perceptions of physical competence. This construct is central to many motivational theories (e.g., Fox, 1997; Harter, 1999; Sonstroem, 1982), although it is far less discussed with regard

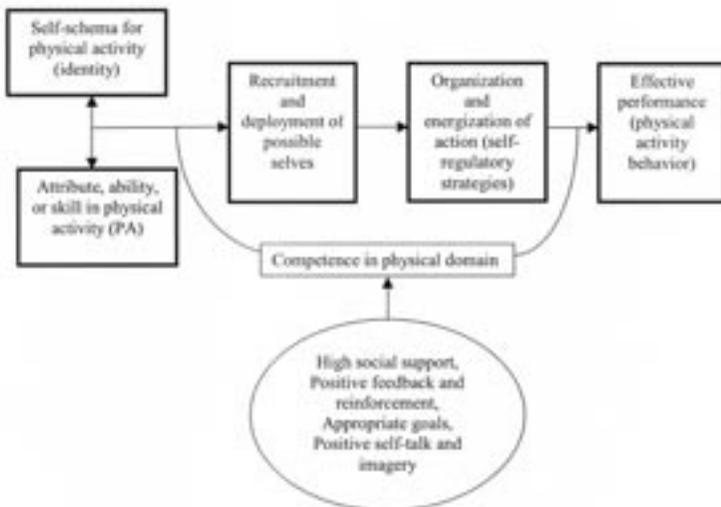


Figure 1—Markus, Cross, and Wurf’s (1990) model of effective performance, adapted to the physical domain.

to exercise than it is within the sport context (see Biddle & Mutrie, 2001). Finally, in the oval at the bottom of the model are a variety of strategies that can influence one's perceptions of competence. For example, research in the sport domain has consistently implicated the importance of feedback, reinforcement, and social support from significant others on perceptions of competence (Babkes & Weiss, 1999; Rose, Larkin, & Berger, 1994; see Weiss & Ferrer-Caja, 2002 for an extensive review of this topic).

In sum, this model integrates cognitions, goals, and self-regulatory strategies, and provides a structure for examining the mechanisms by which the process is driven. In order to understand motivated behavior, a variety of theorists (e.g., Eccles & Wigfield, 2002; Schunk & Zimmerman, 1994) have recommended that researchers assess the interactions between self-perceptions, goals, and cognitions. The goal of this study was to begin this process by examining a group of exercisers who might be considered "at risk" for inactivity but instead were regular adherers. If we can better understand what qualities of a program help to enhance perceptions of and actual competence, as well as the self-perceptions and goals of those individuals, we will be better equipped to plan interventions intended to enable older adults to become and remain active. Specifically, we examined the following questions:

1. What are the self-reported current and future selves of older exercisers related to physical activity, and do these selves change over time?
2. What factors are evident in the exercise environment that might contribute to the formation and elaboration of possible selves and competence?

Given that few studies have examined the topic of self-perceptions in older adult exercisers (see Fox, 2000), both hypothesis-generating (qualitative) and hypothesis-testing (quantitative) methods (Auerbach & Silverstein, 2003) were employed to examine factors related to physical activity participation, perceptions of competence, and actual (functional ability) physical competence. Quantitative measures were used to assess possible selves and functional ability, testing whether these factors changed over time. Qualitative methods (interviews) were used to question participants regarding their experiences in the exercise setting, in an effort to better understand the links between possible selves and exercise participation.

Method

Participants and Setting

Nineteen older adults between 60 and 79 years of age (9 males; $M = 69$ years) participated in the study. They were predominantly married, White, and well educated (most frequent category of educational attainment was college degree). They had been members in the fitness center an average of 11 months, exercising an average of 2 times per week. Body fat (bioelectric impedance) measures indicated the participants were in the "poor" category ($M_{\text{males}} = 29\%$, $M_{\text{females}} = 39\%$), and the majority self-reported suffering from multiple chronic conditions (e.g., arthritis, heart disease, cancer). All participants were members at one of two fitness centers associated with the same physical therapy business. The fitness centers were in rural areas and were relatively small (each having approximately 50 members) and

catered to older adults living nearby. Although some members had transitioned to exercise directly from physical therapy, others joined independent of any physical therapy. In the exercise setting, there was typically a physical therapist on hand to answer questions. One clinic had a full-time activity director with considerable experience working with older adult exercisers. At the other clinic, the physical therapist also directed activities at the center.

Measures

Possible Selves. The possible selves questionnaire (PSQ; Cross & Markus, 1991) was used to assess current selves and future hoped for and feared selves directly related to their exercise behavior. Respondents are asked to list all of their hoped-for selves associated with their participation in the fitness context. Examples are provided for what is and what is not a possible self (e.g., to be a writer is a possible self; to write books is not a possible self). From this list, the next page asks the respondent to choose the self most important to their exercise participation and to describe why this self is important. This process is then repeated for feared selves and current selves. The instrument was completed at baseline and at 10 weeks. The PSQ has been used in both health and exercise contexts (e.g., Hooker & Kaus, 1992, 1994; Whaley, 2003) and appears to adequately assess adults' future oriented selves.

Functional Assessment. The Fullerton Functional Fitness Test (Rikli & Jones, 1999) was administered at baseline and 10 weeks. This test battery includes activities believed to be most closely associated with independent functioning: upper and lower body strength and flexibility, aerobic endurance, and agility/dynamic balance. Rikli and Jones showed test-retest reliability as well as content, criterion, and construct validity in community dwelling older adults. The following activities are included: 30-second chair stand, arm curl, chair sit-and-reach, back scratch, 2-min step-in-place (alternative to the 6-min walk), and 8 foot up and go (for details, see Rikli & Jones, 1999). Scores for each activity can be measured over time for intra-individual change or individual scores may be compared to age group norms.

Semistructured Interview. In order to examine the factors related to self-perceptions and exercise behavior, semistructured interviews were conducted with each participant. Questions centered on reasons for joining the fitness facility, reasons for continued participation, and reasons why they might discontinue their participation. Interviews were recorded and transcribed verbatim.

Procedure

After receiving permission from the Institutional Review Board, notices at two fitness centers were posted informing members of the study and asking for their participation. All current members were eligible to participate. Volunteers read and signed an informed consent and scheduled the physical assessment. All members had already been cleared medically to participate in an exercise program. Physical therapists or their trained associate conducted the physical assessments. After the assessment was completed, a staff person contacted the lead author, who then scheduled a time for the interview and initial questionnaire administration. Generally, the interview was conducted within one week of the fitness assessment. The lead author conducted all interviews and distributed the first round of questionnaires. At approximately 10 weeks past this date, fitness center staff contacted the

participants. The physical therapist or associate conducted the second physical assessment and administered the possible selves' instrument. Thus, the order of testing was physical assessment (pre), individual interview, possible selves (pre), physical assessment (post), and possible selves (post).

Data Analyses

In order to examine the possible selves data, the questionnaires were coded using the procedure first utilized by Cross and Markus (1991) and adapted to the physical activity domain by Whaley (2003). This involved coding each most-important possible self (hoped-for, feared, and current) into one of 5 categories: health (medical issues and concerns), physical (dealing primarily with activity levels), body image (weight and attractiveness), independence-dependence (issues associated with incapacitation or requiring care), and personal (including possible selves that did not fit into the above categories). The lead author, who has used the system in previous studies, coded all questionnaires. Frequencies for each category of hoped-for, feared, and current selves (in percentage of total responses) were then examined across time. Results of the functional assessments were compared at time 1 and time 2 by gender using paired *t*-tests.

With regard to the qualitative data, member checks were conducted so respondents had the opportunity to add or comment on their original transcripts. Analyses of the transcripts followed procedures described by Auerbach and Silverstein (2003). Starting with the relevant text (i.e., text directly related to specific research concerns), the coauthors independently compiled lists of responses (i.e., raw data themes) for each question, then compared these lists and began to group like-issues together, looking for commonalities (e.g., repeating ideas). Similar repeating ideas are then grouped as themes, and further distinctions are made at the level of sub-themes. This inductive analysis of the interview data continued until we had 100% agreement of the themes that best represented reasons participants joined, stayed with, and discontinued their program. In addition to member checks, verification procedures included extensive review of the transcripts and triangulation of data (qualitative interview data with questionnaire and functional data).

Results

Possible Selves Questionnaire

Participants' possible selves were coded into five categories. Examples from the data for each of these categories can be found in Table 1. At baseline (time 1), hoped-for selves included 3 categories: physical ("being stronger and more mobile"), health ("being a non-aching person in the morning"), and independence ("be an independent person"). Hoped-for selves related to physical issues were predominant (43% of responses), followed by health and independence at 28.5% each. Feared selves were dominated by the dependence category (67%; "becoming unable to care for myself and to live independently"), followed by health-related selves (27%; "getting osteoporosis"). One individual reported "no fears." With regard to current selves, participants were more variable. Responses included 5 relatively evenly represented categories (physical, body image, personal, independence, and health). Selves included such positive statements as, "I am a very active person (but) a little overweight" (physical/body image) and "I am a capable

person” (personal), as well as less positive but still hopeful statements such as, “I would like to stay as strong as I am and build up my immune system” (health). Table 2 lists the categories of possible selves reported by the respondents and the percentage each category represented.

Table 1 Examples of the Participant’s Possible Selves by Category

	Hoped-for self	Feared self	Current self
Health-related	“To be disease-free in future”	“To suffer a stroke”	“I am a fairly healthy person.”
Body- image	“To lose weight”	“To become grossly overweight”	“I am over-weight”
Physical	“To gain body strength”	“To become completely inactive”	“Continuing my exercise regime”
Personal	“Continue to be a good friend to many”	“Becoming a less social person”	“Happy with my life”
Dependence/ Independence	“Retain my independence”	“Unable to care for myself”	“Capable of taking care of myself”

At time 2, some changes were evident in the content of hoped-for, feared, and current selves (see Table 2). For hoped-for selves, the category of health increased to 40% of responses. Hoped-for selves related to physical condition declined (20%), and a new category of body image-related selves emerged (“to lose weight”; “to have a smaller stomach”; 11%). The fear of becoming dependent also became less prevalent at time 2, decreasing to 44% of the responses. Health- and physical-related fears were still evident, each accounting for 20%. Notably, 2 individuals claimed to have “no feared selves.” Finally, current selves remained fairly consistent over time, with health and physical selves accounting for 75% of responses, but selves related to body image disappeared.

Functional Assessments

In order to have an objective measure of change in physical function, functional measures were assessed and compared across time using paired *t*-tests. Table 3 lists the means and standard deviations for upper and lower body strength and flexibility, endurance and dynamic balance at Time 1 and Time 2. Beginning values were within national norms for this age group (Rikli & Jones, 2001). For women, upper and lower body strength increased significantly over time, while for males, upper body strength improved significantly over time ($p < .008$; Bonferonni adjustment used because of multiple comparisons). As a measure of actual fitness competence, these findings indicate that the exercise program resulted in modest gains in functional ability over this 10-week period.

Table 2 Percentage of Possible Selves by Category Across Time

	Hoped-for selves		Feared selves		Current selves	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Health	29	40	27	22	14	37.5
Physical	43	20	6.5	22	29	37.5
Indep/Dep	29	10	60	44	14	12.5
Body image	0	20	0	0	21.5	12.5
Personal	0	10	0	0	21	0
None	0	0	6.5	11	0	0

Table 3 Functional Assessment Values (Mean/SD) by Time and Gender

	Men			Women		
	Time 1	Time 2	% change	Time 1	Time 2	% change
Lower body strength	12.7/3.2	14.5/3.3	14.2	11.3/2.9	13.7/3.9*	21.2
Upper body strength	13.0/3.3	19.8/5.8*	52.0	13.1/3.9	17.6/4.5*	34.3
Lower body flexibility	-4.2/4.0	-4.8/4.3	14.3	.93/3.4	1.1/2.2	18.3
Upper body flexibility	-6.8/9.1	-8.2/10.1	20.6	1.6/1.2	2.0/1.2	25.0
Aerobic endurance	76.5/29	70.3/43	-8.1	62.6/19.3	65.0/10.2	3.8
Dynamic Balance	5.6/1.5	4.5/.66	-19.6	5.9/1.1	5.4/1.6	-8.5

Note. * $p < .008$ (Bonferroni correction = $.05/6$)

Interview Data

The first issue of interest was the reasons why the participants joined this program relative to other choices available to them. Individuals cited multiple reasons, which were best represented by 3 themes: personal health and fitness, spouse encouraged him/her to join, and perceived qualities of the program. The health and fitness category included two subthemes: individuals who transitioned from physical therapy directly into their exercise program (6/19 participants) and individuals who joined for reasons related to maintaining health or physical function (9/19). For example, a male participant offered, “my body seems to be in pretty good shape, except I’m overweight, but my endurance and wind isn’t . . . so by working out, I can do things.” Another husband and wife joined for their specific health issues: “[my wife] was having a blood pressure problem, and I was having a cholesterol problem; we were both getting fat and sloppy so we said ok.” Spousal encouragement was the second theme, cited by 6 participants. Some people joined together (“my wife was a patient [in physical therapy], so when they opened the fitness program we both joined”), while for others one spouse joined and the other followed (“My wife joined after her physical therapy . . . so, when I needed a place to go and start, I just knocked on this door”). As evidenced by these quotes, it was typical for women to join first, followed by their husbands.

The third theme of reasons for joining dealt with qualities of the program itself, cited by 18/19 participants. This theme included practical issues such as convenience to the home (“It was logical, since it’s a lot closer”) and cost (“I figured well, I can afford that”), as well as issues related to the structure of the program. For example, for some members, the program simply met their needs (“I can do all the exercises that I was doing [at the hospital], so I can continue that and expand”) or believed they needed the individualized structure the program offered (“I wouldn’t have done it [exercise] on my own;” “I don’t have a lot of self-discipline, and here I figured somebody, you know, checks you out”). Interestingly, staffing caused some to choose this facility over another newer, more modern gym only a few doors down. The following quote exemplifies this thinking: “I can’t judge the competence of the people next door except for the fact that they were recruited by newspaper ads, with little training. I can look on the wall in there and see credentials of the people.”

Motivation to continue in the program could be categorized into three primary themes: the positive health-related outcomes participants perceived from their exercise (cited by all 19 participants); the support, expertise, and guidance of the staff (cited by 11/19); and the social support/influence of fellow exercisers (7/19). Increased perceptions of physical and health-related outcomes included two subthemes: improving health/feeling better and increasing function. For some, the health-related motive was dramatic: “Staying alive. So, my primary motivation is to keep my strength up and my cardiac condition such that I don’t have another one [heart attack].” For others, health outcomes involved the ability to decrease medications: “I stay off a lot of medicine. If I don’t exercise or whatever, then the bp starts going up and I need to start taking more medicine.” Perceptions of increased physical function are illustrated in the following quotes: “I can pick up my canoe and throw it on top of the car now, so there’s progress;” “My endurance is probably better.” These quotes relate to changes the individuals perceived since they had joined the fitness program.

The staff played a considerable role in the continued motivation and participation of the members and included the subthemes of presence of trained personnel (10/19) and supportive atmosphere (9/19). Some participants focused on the issue of guidance (“one of the things my friend told me is that they watch you very carefully—it’s small enough, you’re not a number, and they watch you”), while others spoke specifically of the supportive atmosphere (“it’s just so friendly—I mean, it’s like a big family here!”). In this case, the individual was referring to the staff. The third theme also related to a social component, but in this case the support was from fellow exercisers. For example, one respondent offered, “And I really enjoy the fellowship here . . . there are times when I’d rather not come, but we get to talking, so that’s neat.” Another exerciser spoke of the general social environment: “We like the group of people, mostly 60+, and, well, we just stay here.”

With regard to the third major question, “What would cause you to discontinue your participation in this program,” the participants often had a difficult time coming up with a reason. They remarked: “I have no reason to expect that such a thing would happen” and “Everybody is very nice—I can’t imagine that.” Those that did come up with a reason tended to focus on health issues (“If I break a leg, or something like that, but that’s about it. Medical issues, otherwise, I’m in for the long haul”). It appeared, based on the responses, that these individuals were quite committed to staying with the program.

Discussion

The purpose of this study was to examine the current and future-oriented selves specific to the physical domain in older adult exercisers and to relate these selves to their reasons for participation in an exercise program. The results indicated that older adults held well-developed possible selves related to their exercise behavior, and these selves continued to evolve over time. The perceived health benefits recognized by participants, along with the perceived expertise of the staff facilitated adherence, which in turn appeared to contribute to feelings of competence in the exercise setting. Gains in actual physical competence were realized as well, evidenced by positive changes in functional assessments over a 10-week period. This is notable given the moderate intensity of the exercise programs and relatively short duration between measurements. These findings will be discussed as they relate to Markus et al.’s model of competent performance and the implications the model may have in the design of effective physical activity interventions.

With regard to the possible selves reported by the participants, it was no surprise that hoped-for and feared selves focused on physical ability, health, and independence. These are concerns central to the thinking of older adults. Maintaining good health, avoiding ill health, or ameliorating existing health conditions are often cited as primary reasons older adults engage in physical activity (e.g., Ashford, Biddle, & Goudas, 1993; O’Brien Cousins, 2001). It appears from these older adults that creating plans for avoiding a feared self (e.g., becoming dependent on others) can be a strong motivator. However, in terms of intervention strategies, it is probably preferable to focus on attaining positive outcomes rather than avoiding negative ones (Hooker & Kaus, 1992; Ruvolo & Markus, 1992), although more research in the physical domain is needed. For the exercise leader or fitness trainer, making explicit the link between health-related possible selves and exercise behavior should increase commitment to the exercise program.

Stein and Markus (1996) believe that well-conceived and complex possible selves are most conducive to behavior. This suggests that possible selves should be dynamic over time, an issue evident in this study. For example, the emergence of selves related to body image after a few months of activity might reflect a new, more specific goal for the individual's exercise behavior. Whereas at the start of the exercise program, the possible self was to "get healthier"; with mastery experiences comes a new feeling of confidence that results in the exerciser setting new, more specific selves with associated action plans. Fears of dependence also declined over time, again perhaps owing to gains in strength and perceived health status. For these exercisers, becoming and remaining active provides a way to decrease the discrepancy between a valued possible self ("a healthy, independent, older adult") and a current self ("fairly healthy person").

The emergence of body image related selves is also somewhat alarming. Although body image and other indices of physical appearance continues to be an important aspect of the self into a through adulthood (Harter, 1990), an exclusive focus on weight-related goals could thwart exercise participation. For example, Sears and Stanton (2001) found that exercise dropouts were predicted by expectancies for fitness and weight. That is, individuals who over-estimated the weight they would lose were more likely to drop out than those who did not have those expectations, even when they were given objective information that was contrary to their predictions. This has important implications for the practitioner. If an individual has specific weight-related possible selves to the exclusion of other health-related goals and these goals are not attained, the individual may be likely to drop out. In this case, the fitness professional would be wise to encourage the development of selves and associated goals congruent with increased health and function that are achievable and measurable, such as increasing physical function or decreasing blood pressure.

From the interview data, it was clear that what motivated individuals to continue their exercise program was the positive health benefits they perceived from their workouts and the encouragement and expertise they perceived from the staff at the facility. These factors are consistent with Markus et al.'s (1990) model, which focuses on the role of competence in effective performance. In fact, across many theories of motivation, perceptions of competence play a leading role in motivated behavior. In the case of exercisers, these perceptions can be influenced by a variety of sources, including feedback from significant others ("[the exercise instructor] is always willing to help you with anything to make you feel better"), self-comparison or improvement ("I just feel stronger now") and speed or ease of learning ("at first I was intimidated with the machines, but I can do it now"; Harter, 1978, 1990). All of these sources seem to be operating here, and the recruitment and deployment of possible selves influence these competence perceptions. Markus et al. maintain that "felt competence" (i.e., perceived competence) is intimately related to actual competence. Competence beliefs, they argue, "can actually create competence by selectively directing attention, efforts, and energies toward the desired action, and away from inconsistent or contradictory thoughts, feelings, and actions" (p. 213). Future research should examine what specific sources of competence information are most valuable for adult and older adult exercisers, and how exercise leaders or exercise psychologists can enhance these sources of competence. In the meantime, a practical implication is to provide exercisers with multiple sources of competence information, such as providing specific, positive feedback to all participants and

encouraging the individual to use self-comparison and mastery experiences as a way of measuring improvement.

Actual physical competence, measured by gains in functional ability over time, was also evidenced. Women experienced statistically significant gains in upper and lower body strength and men experiencing gains in upper body strength. According to established norms for the Fullerton Senior Fitness Test (Rikli & Jones, 1999, 2001), the men and women in this study were at the lower end of the normal range of scores for their age groups in both lower and upper body strength, so gains were likely to be seen with only minimal physical training. Again these findings have practical implications for the fitness professional. For example, an individual who identifies a possible self of “me as independent” may be motivated to continue or increase strength training if the connection is made between gains in strength and ability to remain independent. Anecdotally, one participant noted at the second functional test administration that she “would not have tried so hard the first time” if she had realized her scores were going to be compared over time. For this individual (who had undergone 2 knee replacements but still considered herself to be quite active), self-comparison did not seem to be a good source of competence information. However, she did compare herself to others her age to show how she was “better off” than many, thus preserving her positive self-image. Being familiar with the sources of information an individual uses to assess his or her competence can be incorporated into feedback in order to maximize positive perceptions in the exerciser.

Of particular interest are the *perceptions* the participants had of their functional ability. Recall that one of the principal reasons participants cited for remaining motivated was gains they experienced as a result of their exercise: “I can pick up my canoe”; “my endurance is probably better.” These statements indicate that participants *perceived* increases in their health and physical function. Although most participants did show significant increases in upper body strength, there was no change in aerobic endurance. Although perceptions of ability may not accurately reflect actual ability, these perceptions drive behavior. This phenomenon has been seen in children (Hatfield, Vaccaro, & Benedict, 1985) where children believed they were gaining in strength, even though objective indicators did not support it. In older adults, research has shown how exercisers often believe that exercise is improving their memory, although functional scores do not support this perception (Emery & Blumenthal, 1991). Lachman (1991) believes that restructuring older adults’ beliefs about controlling memory is the best way to increase memory. In the same way, perhaps helping older exercisers believe they can increase their endurance is the first step toward gaining control over actual improvements in endurance. It is now established that psychological benefits of exercise (e.g., decreased state anxiety) can occur with just one bout of physical activity (Petruzello, Landers, Hatfield, Kubitz, & Salazar, 1991), while health and fitness gains take some time to accrue. Using this information, practitioners would be well advised to focus on the psychological benefits of exercise and use those gains to instill a sense of commitment that will result in adherence to the exercise program, which will then lead to the health benefits desired.

Importantly, this program did not rely on expensive equipment or shiny facilities to attract and retain members. A few treadmills, exercise bikes, elastic bands, and hand weights constituted most of the equipment available to the members. It was not the “ambiance” of the facility that attracted and retained these

participants, but the perceived expertise, friendliness of the staff, and feeling of safety that motivated them to join and to stay. Although the program was one of individual exercise, there was ample opportunity for members to get to know each other and the staff and to feel like they were “a part of a family.” Consistent with Markus et al.’s (1990) model of effective performance as well as self efficacy theory (Bandura, 1997), these individuals had opportunities to develop competence in the exercise domain through their interactions with others (vicarious experiences) and personal experiences (mastery). This increased physical competence can facilitate the development and elaboration of possible selves that motivate the individual to change a current self. For example, one participant wrote that a current self was a “weak senior citizen.” By perceiving gains in actual and/or perceived strength, this individual moves closer to her possible self of a “physically independent senior” and thus is likely to sustain her strength training program.

What are the take-home messages for those who work with older adults in exercise settings? For one, there is clearly a place for exercise-related cognitive interventions that include attention to possible selves. The model presented here starts with the premise that individuals must have the necessary skills *and* a self-schema for a behavior in order to initiate action. This implies that increasing self-efficacy may be necessary but not sufficient to sustain behavior over time (Cross & Markus, 1994; Purdie & McCrindle, 2002). It is equally important for a previously sedentary person to see exercise as an integral part of his or her self-concept if that behavior is to be maintained. People who begin an exercise program are likely to have a schema related to exercise, if not an exercise-specific schema. That is, self-schemas are not just about a personality attribute but also about social roles and areas of interest or skill (Stein & Markus, 1996). The issue then is not one of *creating* a schema as much as it is helping the individual to uncover an existing or related schema. For example, one might have a highly elaborated and important schema as a grandparent or dedicated friend. The link that must be made is to see how physical activity can be an integral part of that existing schema (e.g., having the energy to remain active with one’s grandchildren or to be able to travel with friends). From there, cognitive interventions incorporating methods like goal setting or imagery can be employed to help individuals develop and refine possible selves related to that behavior, along with the necessary strategies and plans (self-regulatory skills) needed to make those selves a reality. The attention to self-perceptions is likely to help an individual adhere to an exercise program over time, since the activity is now a part of the individual’s identity.

Ruvolo and Markus (1992) showed how imagery manipulations could be used to increase the accessibility of possible selves, and in turn use those possible selves to increase effort and persistence on a task. Methods like imagery are well known to researchers and practitioners in sport and exercise psychology, but using them in order to target self-perceptions (rather than the behavior directly) represents a new perspective. With regard to the *process* of exercise adherence, this attention to a potential mechanism underlying behavior change is a step toward understanding that process more completely.

A limitation of the study was the small sample size and the relatively high education level of the participants. Although the findings are not generalizable beyond a similar sample of older adult exercisers, they do provide a basis for future research. There is also a clear need to determine if possible selves are viewed similarly across race, ethnicity, or socioeconomic status. For example, it may be that

older individuals with less education do not as easily see the connection between physical activity and health and well-being in the future. These questions remain to be answered in future research examining this model.

In summary, the results of this investigation point to the importance of including self-perceptions in interventions designed to promote exercise participation and adherence. The findings also highlight how hoped-for selves can be used to supplement and possibly improve on existing psychological methods employed in the exercise context. That is, by combining future-oriented selves with goal setting or imagery, the individual is likely to feel more committed to their goals and to more vividly imagine their exercise behavior because that behavior has attained personal relevance. In turn, that relevance should translate into adherence to the exercise program.

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