

Intrinsic Motivation and Exercise Adherence

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Two prospective studies tested the hypothesis that intrinsic motives for physical activities facilitate long-term adherence. In Study 1, participants in two physical activity classes, Tae Kwon Do and Aerobics (N = 40), were compared in their motives for participating using the Motivation for Physical Activity Measure (MPAM; Frederick & Ryan, 1993). Participation motives were also used to predict adherence. Results showed that Tae Kwon Do participants were higher in enjoyment and competence motives and lower in body-related motives than those in aerobics. They also showed better adherence. Further analyses revealed that group differences in adherence were mediated by enjoyment motives. Body-focused motives were unrelated to adherence. In Study 2, subjects joining a nautilus center (N=155) rated their initial motives on a revised Motivation for Physical Activity Measure (MPAM-R). They also rated workout length, challenge, and enjoyment after each exercise session. Results revealed that adherence was associated with motives focused on enjoyment, competence, and social interaction, but not with motives focused on fitness or appearance. Post-workout ratings of enjoyment also predicted adherence. Discussion focuses on the importance of intrinsic motivation for exercise adherence.

KEY WORDS: Adherence, Exercise, Intrinsic motivation, Self-determination theory.

Although the links between regular physical exercise and health are well documented (e.g., Leon, Connett, Jacobs et al., 1987; Paffenbarger, Hyde, Wing et al., 1986), many people are either sedentary or too infrequently active

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to accrue health benefits (Dubbett, 1992; Caspersen, Christenson, & Pollard, 1986). Thus a major practical issue in health promotion concerns how to facilitate adherence to regular exercise (Dishman, Sallis & Orenstein, 1985). A number of investigators have shown that, even among individuals who start physical activity programs, adherence is typically quite low (Biddle & Fox, 1989). In some research, the attrition rate has been well over 50 per cent within the first 6 months (Dishman, 1982). Although frequently studied, this attrition phenomenon is not yet fully understood (Duncan & McAuley, 1993).

In this paper we explore one aspect of the exercise adherence issue: How different motives for initiating a physical activity relate to sustained participation. Specifically, we examine how the initial motivational focus of exercise participants predicts their subsequent attendance and adherence in two prospective studies.

Motivation and Exercise

An important distinction concerning motivation in exercise and sport is that between intrinsic and extrinsic motives for participation (Gill, Gross, & Huddleston, 1983; Ryan, Vallerand, & Deci, 1984). Intrinsically motivated behaviors are those performed for the satisfaction one gains from engaging in the activity itself. According to most theorists the primary satisfactions associated with intrinsically motivated actions are experiences of competence and interest/enjoyment (Deci & Ryan, 1985; Pelletier, Fortier, Vallerand, et al., 1995; Reeve & Deci, 1996; Csikszentmihalyi & Rathunde, 1993; Koestner & McClelland, 1990). Thus, for the purposes of the current studies we considered individuals whose participation was motivated mainly by *competence* (the desire to engage challenges and exercise and expand skills) and *enjoyment* (desire to have fun, pursue interests, be stimulated) as primarily having an intrinsic focus. By contrast, extrinsically motivated behaviors are those that are performed in order to obtain rewards or outcomes that are separate from the behavior itself. In the current studies we considered exercisers who have *body-related* motives (desires to improve appearance or fitness) as primarily extrinsically focused, since their goals concern outcomes extrinsic to the activity *per se* (*).

(*)The defining feature of extrinsically motivated activity is its instrumental nature, and it is important to note that there is nothing inherently negative about extrinsic motives or about being extrinsically motivated. Extrinsic motives can be highly volitional (as when one pursues a personally valued goal), or highly externally driven (as when one does an activity to gain approval or avoid punishment). That is, extrinsic motives vary greatly in the degree of autonomy attending them (Ryan & Connell, 1989; Vallerand & Reid, 1990). Whereas extrin-

Undoubtedly, most sport and exercise participants are activated by both intrinsic and extrinsic motives, but may differ in the relative salience of these different foci. Additionally, some physical activities may be more conducive to intrinsic versus extrinsic motivation. Frederick and Ryan (1993) used the intrinsic versus extrinsic motivation distinction to examine individual differences in initial motivational foci for physical activities, and demonstrated that different types of physical activities may attract people with different types of motivation. They surveyed 376 adults concerning their primary physical activities and classified those activities into *individual sports*, such as tennis and sailing, and *exercise/fitness activities*, such as running, aerobics, and nautilus. Using the Motivation for Physical Activities Measure (MPAM), these investigators then examined differences between exercise and sport activities on three types of motives: *enjoyment*, *competence*, and *body-related*. The enjoyment and competence motives were considered to be primarily instances of intrinsic motivation insofar as these motives are focused on inherent aspects of the activity (i.e., interest value, desire for challenge, exercise of skills) whereas body-related motivation was considered to be an extrinsic focus, as it concerned improved image and fitness, outcomes that are independent of the activity per se. Results indicated that enjoyment and competence motives were greater for the sports participants, whereas body-related motives were higher for exercise/fitness participants. Interestingly, even among exercisers, body-related motives were negatively correlated with hours per week of participation and length of workouts. By contrast, enjoyment and competence motives were positively associated with hours per week of participation, perceived competence, and overall satisfaction with the activity. Frederick and Ryan suggested that, to the extent that one exercises for intrinsic reasons, one is more likely to feel energized, confident, and satisfied in one's activity, whereas extrinsic, body-related reasons may not facilitate these results.

Other researchers have further suggested that, regardless of one's initial motive for exercising, intrinsic motivation is critical for adherence. For example, Brawley and Vallerand (1984) argued that many individuals participate in fitness programs for external reasons such as losing weight or feeling more attractive. Yet they further speculated that these extrinsic reasons for participa-

sically motivated action can be either self- or nonself-determined, intrinsically motivated action is invariably self-determined (deCharms, 1968). And unlike extrinsically motivated behaviors, intrinsically motivated actions are not dependent upon the attainment of extrinsic outcomes for their maintenance (Deci & Ryan, 1985). Because there are functional differences that are expected to follow from a differential emphasis on intrinsic versus extrinsic motivation, we focused in the current studies primarily on the distinction between intrinsic and extrinsic motivation per se, rather than the relative autonomy of participation.

tion may be related to poor adherence rates insofar as extrinsically focused individuals may derive less enjoyment from the activity itself. Wankel (1993) similarly views intrinsic motivation as a key factor in exercise adherence, suggesting that spontaneous enjoyment of an activity leads to increased persistence and to reduced stress and positive psychological feelings. In addition, he added that social motives, although extrinsic to the activity, may contribute to adherence because social interaction can add to one's enjoyment in participating, and enjoyment is critical to adherence (a point we shall consider in Study 2). Perrin (1979) found that, whereas participants in physical activity programs reported health benefits as their reason for initiation, long-term participants reported enjoyment as their principal reason for continuing. Conversely, Boothby, Tungatt, and Townsend (1981) found lack of enjoyment to be a primary reason for withdrawing from physical activity programs.

In the current project we conducted two prospective studies of participation motives and attendance/adherence. On the basis of prior findings concerning intrinsic and extrinsic motives, we hypothesized that: a) exercisers would report extrinsic, body-related motives as their most important reasons for participation; b) body-related motives would not, on average, facilitate adherence; and c) greater intrinsic reasons for participating, specifically enjoyment or competence interests, would positively predict adherence. It should be noted that in both studies our focus was only on initial motives as predictors of adherence, and we made no assumption that such motives are stable. It is, indeed, quite likely that participants can change in motivational focus as they continue in an activity. However, we did expect that initial participation motives would represent an important, if partial, influence on adherence. We further expected that, regardless of initial motives, participants who experienced greater enjoyment once undertaking a physical activity would be more likely to adhere.

Study 1

In Study 1 we followed participants joining one of two physical activity classes, Aerobics and Tae Kwon Do, at the beginning of the academic year in a college setting. These two classes were both voluntary, non-credit classes which participants could attend up to several times a week. The similar structure for participation facilitated the consideration and comparison of these two quite different physical activities with regard to adherence.

To date there is little by way of a comparative sport and exercise psychology, that is, an understanding of how various sport and exercise activities differ in terms of the motives, experiences, and outcomes that accompany them

(Frederick & Ryan, 1993; Morris, Clayton, Power & Han Jin-Song, 1995). Nonetheless, we hypothesized that participants in aerobics and Tae Kwon Do would differ on variables related to their reasons for undertaking the activity, with Aerobics participants, on average, being more focused than their Tae Kwon Do counterparts on *body-related motives*, and Tae Kwon Do participants rating *enjoyment-* and *competence-related motives* more highly than aerobics participants. These speculative hypotheses were derived from the observation that aerobics is a vigorous physical activity that is often claimed by proponents to result in improved body shape, muscle tone, and weight loss (Jasnosi, Holmes, Solomon, & Aguiar, 1981). While Tae Kwon Do can also produce physical benefits such as improved coordination and strength, the typical benefits cited for Tae Kwon Do and other martial arts activities are psychological, for example, improved attentional focus, mental well-being, and increased energy or vitality (Seitz, Olsen, Locke, & Quam, 1990). In addition, Tae Kwon Do is a skill-oriented activity which may draw participants high in competence-oriented motives. Morris and Han Jin-Song (1991), for example, found that competence and skill improvement were salient motives for Tai Chi participants, a physical activity with many commonalities to Tae Kwon Do.

For our purposes the comparison between Tae Kwon Do and aerobics was less important than how initial motives would relate to adherence across both activities. We predicted, in line with the reasoning presented earlier, that participants in either aerobics or Tae Kwon Do who were higher in body-related motives would be less likely to attend classes and more likely to drop out than those for whom body-related motives were less salient. In contrast, participants who rated competence and enjoyment motives highly would be more likely to attend and adhere than those who were less strongly motivated by enjoyment or competence interests.

Because we expected Tae Kwon Do and aerobics participants to differ in initial motives, we predicted greater drop out from aerobics than Tae Kwon Do. We further predicted that these differences would be accounted for by differences in initial motives, such that when differences in participation motives are statistically controlled, differences in drop out as a function of activity type would no longer be significant.

METHOD

Participants

Participants were 40 university students and employees who signed up for one of two physical activity programs. Both programs were voluntary, non-credit offerings. The mean age

of participants was 21 (range 18 to 24), and there were no age differences between the groups. The 24 Tae Kwon Do participants consisted of 16 men and 8 women, whereas the 16 aerobics participants were women.

Measures

Motivation for Physical Activities Measure (MPAM; Frederick & Ryan, 1993). This device contains 23 items tapping reasons for engaging in sport or exercise activities. Reasons for participating are rated on 7-point Likert scales, which form three factor-analytically based subscales: a 10-item *body-related* factor (e.g., because I want to improve my body shape); a 7-item *competence* factor (e.g., because I want to improve existing skills); and a 6-item *enjoyment* («intrinsic») factor (e.g., because I enjoy this activity). Frederick and Ryan (1993) provided evidence for both reliability and validity of these factors, showing a clear three factor structure to the scale items, internal consistency (alphas above .87 for each subscale) and differential relations with both choice of sport/exercise activities and associated outcomes. In addition the scale has been used in several other published studies (e.g., Frederick & Morrison, 1996; Frederick, Morrison, & Manning, 1996).

Dropout and Attendance Variables. Two indices related to adherence were formed. The primary issue is that of program adherence, and thus the major dependent variable is that of dropout. Participants were considered as dropouts if they did not attend any classes during the first three weeks of the study. Of the 40 participants in the study, 16 became dropouts by this definition. A secondary index of persistence is *attendance*, representing the total number of hours attended during the 10-week course of the study. Aerobics participants had 10 hours per week in which classes were offered that they could attend, whereas Tae Kwon Do participants were offered a maximum of 6 hours per week. Because of the differential opportunity to attend as a function of activity type (in this case favoring aerobics participants), this attendance variable provides, at best, a secondary index of persistence.

Procedures

At the beginning of their respective programs participants were asked to complete a survey containing questions concerning demographics, background, and initial motives. They were also familiarized with a logbook procedure in which they were to record their attendance at each class throughout the semester. As an incentive, participants were entered into a lottery in which 5 participants received \$20 on the basis of a random drawing at the end of the study.

RESULTS

Preliminary Analyses

There were no significant effects of sex on MPAM variables or on attendance or dropout within the co-ed Tae Kwon Do Class, and thus analyses collapse across sex. Correlations between MPAM subscales were also examined. Competence and enjoyment motives were highly correlated ($r = .74, p < .001$) in this sample. Body-related motives were significantly associated with competence ($r = .42$), but not with enjoyment motives ($r = -.18, ns$).

Primary Analyses

It was hypothesized that aerobics and Tae Kwon Do participants would differ in their motives for engaging in their respective activities as measured by the MPAM. To examine this, a one-way MANOVA compared participants in the two activities on the three motive dimensions. Results revealed an overall effect for activity type, $F(3,36) = 19.24, p < .001$. Follow-up univariate F-tests revealed significant differences on all three dimensions, with aerobics participants higher in body-related motives than their Tae Kwon Do counterparts, $F(1,38) = 11.54, p < .002$, and Tae Kwon Do participants higher on competence, $F(1,38) = 38.88, p < .001$, and enjoyment, $F(1,38) = 31.09, p < .001$, motives.

The hypothesis that initial motivational focus would predict attendance and adherence across activities was initially examined by correlating motive scores with attendance and dropout status. Both competence (r 's = .45 and -.36, both $p < .03$) and enjoyment (r 's = .52 and -.43, both $p < .01$) motives were significantly correlated with attendance and dropout, respectively, but there were no relations of body-related motives to these outcomes (r 's = -.16 and -.01, both ns). To further test these hypotheses, we regressed the relevant dependent variables simultaneously onto the three MPAM subscale scores. The overall models were significant for both attendance, $F(3,36) = 6.09, p < .001, R^2 = .34$, and dropout, $F(3,36) = 4.09, p < .02, R^2 = .25$. In each of these models, only the enjoyment motive emerged as a significant predictor, being significantly associated with both higher attendance (Beta = .55, $p < .02$) and lower dropout (Beta = .46, $p < .05$). The absence of unique effects for competence in this multivariate analysis is clearly due to its shared variance with enjoyment motives.

Differences between Tae Kwon Do and Aerobics participants in terms of adherence and attendance were also hypothesized, but expected to be a function of motivational differences. Results revealed that activity type was a significant predictor of both dropout and attendance. Tae Kwon Do participants were less likely to drop out, $F(1,38) = 6.21, p < .05$, and attended more total hours, $F(1,38) = 18.55, p < .001$, than those in aerobics.

To examine the hypotheses that these group differences could be a function of motivation variables, a two-step hierarchical regression procedure was employed. In this procedure, the dependent variable (e.g., attendance) was regressed first onto an MPAM score, followed by a dummy code for activity type (Tae Kwon Do vs. Aerobics). Insofar as a motive score accounts for the relations between activity type and dropout (or attendance) then this second step in the regression should be nonsignificant. Because body-related motives were unrelated to adherence in zero-order correlations, only competence and enjoyment motives were examined in this procedure. Results revealed support for the idea that competence and enjoyment motives account for the relations between activity type and adherence outcomes. Specifically, when competence was entered at step 1, it was significantly associated with dropout, $F(1,38) = 5.72, p < .05$, rendering the variance attributable to activity type (entered at step 2) nonsignificant, $F(2,37) = 1.23, ns$. Enjoyment was also significant at step 1, $F(1,38) = 12.11, p < .01$, whereas activity type, entered at step 2 was nonsignificant, $F(2,37) = 0.18, ns$. However, for attendance, even after controlling for the effects of motivation, variance due to activity type remained. Thus, competence motives significantly predicted attendance at step 1, $F(1,38) = 9.72, p < .01$, and activity type predicted attendance at step 2, $F(2,37) = 7.11, p < .02$. Similarly, for enjoyment the motive score was significant at step 1, $F(1,38) = 18.97, p < .001$, and activity type remained marginally significant at step 2, $F(2,37) = 3.84, p < .06$.

Although hypotheses regarding the mediation of the relations between activity type and adherence or attendance by motivational variables were not specified a priori, the significant

relations between both activity type and enjoyment and competence motives to these outcomes raises the question of whether such mediation exists. Baron and Kenny (1986) suggest testing for mediation through the following series of regressions: a) regression of the potential mediator (MPAM subscale score) on the independent variable (activity type); b) regression of the dependent variable (dropout, attendance) onto the independent variable (activity type); and c) regression of the dependent variable (dropout, attendance) onto both the potential mediator (motive score) and independent variable (activity type). If the relationship between the independent variable (activity type) and the dependent variable (adherence) weakens or becomes nonsignificant on this last regression while the relationship between the mediator and the dependent variable remains significant, then mediation is in evidence. These procedures were applied to both competence and enjoyment as previous analyses revealed that both were potential candidates as mediators. Results revealed that the enjoyment motive mediated between activity type and adherence outcomes. Specifically, activity type was no longer significantly predictive of either attendance ($Beta = .33$, ns) or dropout ($Beta = -.08$, ns) when enjoyment was in the equation at step c above. Competence did not meet the criteria for mediation.

BRIEF DISCUSSION

Results of Study 1 suggested that initial motives for participating in a physical activity were differentially associated with adherence and attendance. Specifically, competence and enjoyment motives were predictive of greater adherence and attendance to one's chosen activity. By contrast body-related motivations, which Frederick and Ryan (1993) conceptualized as largely an extrinsic focus, were not significantly associated with greater adherence.

An aspect of Study 1 was the comparison between Tae Kwon Do and aerobics participants. It was found that Tae Kwon Do participation was more highly associated with competence and enjoyment motives and less highly associated with body-related motives than was participation at aerobics. As stated earlier, these activity-type differences have interest insofar as motivational research begins to explore how different types of sport or exercise have differential appeal depending upon one's goals or motives.

Further analyses explored whether activity-type differences in adherence could be accounted for by the motivational differences between these groups. Results supported this idea, suggesting that when differences in competence or enjoyment motives were controlled, group differences in dropout were insignificant. Subsequent analyses further revealed that enjoyment motivation mediated the relationship between activity type and adherence and attendance.

While the results of this study supported our general hypotheses, the study had several limitations. First, it was based on a small sample. Second,

the version of the MPAM (Frederick & Ryan, 1993) used in study 1 assessed only three broad motives--competence, enjoyment, and body-related. Other motives that may potentially influence attendance and adherence were thus not considered. In Study 2, therefore, we expanded the list of participation motives assessed. Finally, study 1 focused only on adherence-related outcomes, and included no measures of participants' experience in the activity. In Study 2 we obtained measures of perceived challenge and enjoyment following each exercise session, in order to relate them to differences in initial motives. In sum, Study 2 extended our prospective examination of the relations between initial motives and adherence by using a new activity, a larger sample, a more differentiated assessment of motives, and process ratings of the exercise experience.

Study 2

Frederick and Ryan (1993) previously presented evidence that competence, enjoyment, and body-related motives differentially relate to sport and exercise activities, and Study 1 suggested that they also differentially relate to adherence and attendance. However, body-related motives represent a rather broad, and somewhat undifferentiated variable. The MPAM, used both in Frederick and Ryan (1993) and in Study 1, included both appearance- and health-related items together on a single body-related factor. Similarly, Morris et al.'s (1995) study of participation motives used an extended version of Gill et al.'s (1983) PMQ and identified a similar health/fitness factor that included both appearance and fitness concerns.

Although fitness and appearance goals share the characteristics of being both body-focused (concerned with physical outcomes) and extrinsic (concerned with goals that are not activity-inherent), we felt that they may, nonetheless, have had different significance for participants. Some evidence for this comes from research by Kasser and Ryan (1996), who examined the functional significance of various life aspirations. They found in factor analytic studies of life goal ratings that appearance-related goals tended to load with more extrinsic aspirations such as desires for money and fame, whereas health/fitness aspirations were more closely aligned with intrinsic goals such as affiliation, self-acceptance, and generativity. Accordingly, in scale-development work on the MPAM subsequent to Study 1, efforts were made to write items that better differentiated appearance and fitness goals for participation. Results of preliminary studies showed that appearance and fitness motives could be represented on separate factors. In Study 2 we examined the

associations of these new factors with attendance and adherence. However, because both are extrinsic foci, we expected neither to be significantly positively associated with adherence.

Another type of initial motive that was not assessed in study 1 was a social motivation for exercise. Clearly, one of the benefits of sport and exercise activities is that they can (but do not always) bring one into social interactions. The opportunity for social contact can be an added feature of such activities and may be one goal of participation. This social motive for participation was noted by Wankel (1993) as a potential contributor to exercise enjoyment, and therefore to attendance and adherence. Some empirical evidence for the potential contribution of social motives to adherence comes from Spink and Carron (1992), who reported lesser absenteeism among women exercisers who were high in attraction to social aspects of an exercise program. The role of social motives was therefore examined in Study 2. Although social motives are extrinsic to exercise per se, we followed Wankel's hypothesis that, because social interaction may yield enjoyment in the context of the activity, social motives should be positively related to both session ratings of enjoyment, as well as attendance and adherence.

Another aspect of the current investigation was the examination of how experiences of enjoyment and challenge as one initiates a program of physical exercise relate both to initial motives and to adherence. In Study 2, therefore, we asked participants to rate after each workout: a) the length of their workout; b) their enjoyment; and c) their experience of challenge. The latter two ratings were expected to tap into intrinsic motivational experiences in activity participation. We specifically hypothesized that initial motives for enjoyment and competence would predict workout enjoyment. We also expected that participants who rated sessions as more enjoyable would evidence greater attendance and adherence.

In sum, the purpose of Study 2 was to provide a prospective examination of the relations between three factors: initial reasons for exercise, ongoing responses to exercise (especially enjoyment), and attendance/adherence. Reasons for exercise were examined using a revised Motivation for Physical Activities Measure (MPAM-R) consisting of five categories of reasons for activity engagement: *fitness, appearance, competence, enjoyment, and social*. Experiences during exercise were assessed by questions that accompanied an «exercise log» in which participants rated the duration, enjoyment, and challenge of each workout session they attended.

Specifically, we predicted that factor analyses would support our preliminary psychometric studies by showing that participants can differentiate these five categories of initial reasons. We further expected that enjoyment

and competence motives would positively predict mean session ratings of enjoyment and challenge, attendance, and greater adherence. By contrast, neither of the body-related motives of fitness or appearance enhancement was expected to predict adherence. In addition, regardless of initial motives, we expected that those individuals who rated workouts as more enjoyable would be more likely to adhere. We further expected that social motives would be associated with both greater workout enjoyment and greater adherence. Finally, we expected to replicate the sex differences that Frederick and Ryan (1993) found among exercisers: Namely, men would be higher on competence motives, whereas women would be higher on body-related motives.

METHOD

Participants

For a month-long period (August 25 to September 30), new registrants at a university fitness center (i.e., those requesting a new, first-time membership) were asked to participate in a study focusing on people's attitudes and perceptions regarding exercise. Very few eligible registrants ($N < 6$) declined, resulting in a sample of 155 participants (89 females, 66 males) with a mean age of 19.5 years ($SD = 3.0$), and an age range of 17 to 39.

Procedure

Upon agreeing to participate, registrants were given a consent form to sign and a survey packet containing the MPAM. Study participants paid the same «up front» membership fees as nonparticipants, namely \$30 for 4 months (1 semester) or \$75 for 12 months. All members were required to sign in and out, and from these records attendance data was obtained. In addition, study participants were oriented to a procedure for completing a brief questionnaire after each workout session on forms that accompanied the sign out records.

Measures

Motivation for Physical Activities Measure-Revised (MPAM-R). The MPAM-R is a revision of the MPAM (Frederick & Ryan, 1993) and was developed on the basis of pilot testings of items on samples at two universities. These two pilot studies involved both factor analytic and construct studies. On the basis of these data, 30 items were selected that loaded on factors tapping five general motives for activity participation: *enjoyment* (7 items), *competence* (7 items), *appearance* (6 items), *fitness* (5 items), and *social* (5 items), each rated on 7-point Likert scales.

Post-workout ratings. Participants signed out after each workout, recorded the length of their workout (in minutes), and rated their degree of enjoyment and challenge on a 7-point Likert scale (1 = low, 7 = high). Average *length*, average *enjoyment*, and average *challenge* are defined as the mean of these respective ratings across all days attended.

RESULTS

Preliminary Analyses

Factor analysis (varimax rotation) of MPAM-R items in the current sample yielded the expected five-factor solution with all items loading on their appropriate factors. However, unlike our pilot sample analyses, two items from the enjoyment scale crossloaded on the competence factor in this sample. Factor loadings on the primary factors, as well as relevant cross-loadings and factor eigenvalues, appear in Table I. The five factors together accounted for

TABLE I
Factor Loadings of Items from Motivation for Physical Activities Measure-Revised (Study 2; n=155)*.

Abbreviated Item	E	A	S	F	C
<i>Enjoyment</i>					
makes me happy	.68				
because its fun	.79				
like the excitement of participation	.52				.51
because I enjoy this activity	.80				
like to do this activity	.85				
because it's interesting	.49				.56
because the activity is stimulating	.63				
<i>Appearance</i>					
to define muscles, look better		.74			
to improve my appearance		.87			
to lose weight, look better		.70			
to be attractive to others		.85			
feel unattractive if I don't (r)		.72			
to improve my body shape		.71			
<i>Social</i>					
to be with others in activity			.70		
want to be with my friends			.80		
to meet new people			.63		
my friends want me to			.64		
enjoy spending time with others doing this			.71		
<i>Fitness/Health</i>					
to improve cardiovascular fitness				.69	
to maintain strength, live healthy				.80	
to have more energy				.83	
maintain physical health, well-being				.62	
want to be physically fit				.53	
<i>Competence/Challenge</i>					
like physical challenges					.65
to get better at activity					.74
to keep up current skill level					.72
to obtain new skills					.62
like activities that are challenging					.77
to improve existing skills					.82
like the challenge					.75
<i>Eigenvalues</i>	10.67	4.00	2.52	1.73	1.39

Note. (A) = attractiveness; (F) = fitness; (C) = competence; (E) = enjoyment; (S) = social.
*Complete scale format and instructions can be obtained from Christina M. Frederick, Ph.D., Department of Psychology, Southern Utah University, Cedar City, Utah 84720.

66% of the variance. Variables were formed using the mean of the items representing enjoyment, competence, social, fitness, and appearance motives. The alphas for these subscales in this sample were .92, .91, .83, .78, and .88 respectively.

Gender effects on motive ratings were assessed using MANOVA. Results revealed a significant overall effect, $F(5,149) = 4.01, p < .01$. Univariate follow-ups, presented in Table II, revealed that females were significantly more likely than males to exercise for reasons pertaining to appearance and fitness. Both males and females, however, reported the same order of means for the five variables: fitness, appearance, competence, interest/enjoyment, social. Sex differences on session ratings were also examined. Males reported longer workouts, but there were no sex differences for enjoyment or challenge ratings. In additional analyses we examined for sex differences on adherence indices (see below), and interactions between sex and MPAM-R scores in the prediction of adherence. Results of these analyses were not significant and, accordingly, subsequent analyses collapse across sex.

Primary Analyses

To examine the relations between participation motives and attendance, correlations were run between MPAM-R scores and the sum of sessions attended. Note that this analysis does not consider when subjects attended; for example, a person who attended everyday for two weeks and then dropped out would have a score equivalent to someone who attended regularly throughout the study period once or twice a week. Results revealed that higher scores on four of the five motives were associated with greater attendance. Specifically, attendance was significantly correlated with motives for competence ($r = .26, p < .001$), enjoyment ($r = .19, p < .02$), social interaction ($r = .21, p < .01$), and fitness ($r = .17, p < .05$), but not with the initial motive of appearance improvement ($r = .05, n.s.$). A multiple regression analysis was also accomplished in which the attendance sum was regressed onto all 5 MPAM subscale scores simultaneously. The overall model was significant, $F(5,150) = 2.26, p < .05$. However, due to shared variances, competence motivation was the only variable within the model that approached significance at the univariate level, $F(1,154) = 3.60, p < .06$.

TABLE II
Gender Effects for Motivation for Physical Activities Measure Revised (MPAM-R) Subscales and Post-Workout Ratings (Study 2).

Measure	Males (n= 66)	Females (n= 89)	F(1,153) value
MPAM-R			
Competence	5.04	4.81	1.14
Appearance	5.16	5.66	12.96**
Fitness	5.74	6.24	17.74**
Enjoyment	4.59	4.75	0.48
Social	4.01	4.26	1.68
Post-Workout Ratings			
Average length (min.)	58.42	46.96	13.00**
Average challenge	5.04	5.10	0.03
Average enjoyment	5.04	5.03	0.00

* $p < .05$.

To differentiate participants who were «adhering» to nautilus from those who were not, two different indices were examined. First, we formed a group consisting of all participants who attended nautilus at least once during the first three weeks of the 10-week study period. The number of participants adhering by this definition was 33. A second operational definition of adherence was based on the frequency of attendance at nautilus over all 10 weeks. This classification captured all participants whose attendance ratio was greater than or equal to .20 (indicating that these participants attended at least once every five days of the study period). The number of participants meeting this latter definition of adherence was 35, and these 35 participants included all 33 of those who met the first adherence criterion. Because this second operational definition of adherence is slightly more inclusive it is used in all further analyses.

To examine what motives differentiate high adherers from low adherers a MANOVA was run using all five MPAM-R dimensions as dependent variables. The overall MANOVA only approached significance, $F(6,148) = 2.48, p < .06$, reflecting the inclusion of variables predicted to be unrelated to the adherence measure. Univariate follow-up comparisons, presented in Table III reveal that, as expected, the MPAM-R variables significantly predicting adherence were enjoyment, competence, and social motives; and, as predicted, the two variables that did not significantly predict adherence were the body-related foci of fitness and appearance. In short, those participants who evidenced greater adherence to exercise had significantly higher initial ratings of enjoyment, competence, and social motives.

TABLE III
Contrasts Between Exercise Adherers and Nonadherers on Their Initial Participation Motives (MPAM-R) and Post-Workout Ratings (Study 2).

	Adherers (n = 35)	Nonadherers (n = 120)	F(1,153) values
MPAM-R			
Competence	5.48	4.73	9.02**
Appearance	5.56	5.43	0.68
Fitness	6.25	5.98	3.21
Enjoyment	5.25	4.48	9.34**
Social	4.50	4.05	4.01*
Post-Workout Ratings			
Length (min.)	55.73	49.47	5.26*
Challenge	5.60	4.87	3.76+
Enjoyment	5.49	4.86	10.55**

+ $p < .06$

* $p < .05$

** $p < .01$.

Table IV shows relations between MPAM-R dimensions and post-workout ratings. Both competence and enjoyment motives were associated with a longer average length of workouts, whereas fitness motives were positively related to the average degree of challenge experienced. All five MPAM-R dimensions were positively correlated with average workout enjoyment.

Examination of post-workout «process» ratings indicated that, as predicted, mean enjoyment was positively associated with attendance ($r = .28, p < .001$). Mean session length was

TABLE IV
Correlations Between Initial Participation Motives (MPAM-R) and Post-Workout Ratings (Study 2).

	Average Post-Workout Ratings		
	Length	Challenge	Enjoyment
MPAM-R			
Competence	.25**	.04	.39**
Appearance	-.08	.11	.20
Fitness	.08	.18*	.27**
Enjoyment	.23*	-.06	.43**
Social	.01	-.07	.25**

* $p < .05$

** $p < .01$.

also significantly related to attendance ($r = .20, p < .02$), whereas challenge ratings only approached a significant relation ($r = .16, p < .06$). Relations between adherence status and workout ratings were examined using one-way ANOVAs, the results of which appear in Table III. The findings were similar to those obtained for attendance, showing that enjoyment and session length were both significantly higher for high versus low adherers, whereas the challenge rating only approached significance ($p < .06$) in the same direction.

Discussion

Exercise is a natural activity in humans. Indeed, it has been widely held that humans are intrinsically motivated to exercise their capacities, both physical and mental (White, 1959; Ryan, 1993, 1995). However, in modern cultures which are quite sedentary, and in which natural opportunities for physical exercise are not always readily available, exercise has increasingly become a programmed activity. Rather than being a spontaneous behavior done for fun and challenge, exercise is thus often accomplished for extrinsic reasons such as improved fitness or appearance. An important question thus becomes whether such extrinsic motives can sustain exercise activity over time. We have suggested that, despite the fact that people primarily cite extrinsic reasons for exercising, intrinsic motivation remains a critical factor in sustained physical activity. Specifically, in these studies we hypothesized and found that, although extrinsic motives concerning body-related outcomes were highly rated as reasons for initiating physical activity programs, adherence was more reliably a function of differences in motives concerning enjoyment and competence, foci which are definitionally of a more intrinsic motivational nature (Ryan et al., 1984; Koestner & McClelland, 1990; Pelletier et al., 1995).

The implications of these findings for those interested in promoting regular exercise are manifold. They suggest that body-related motives are not, on average, sufficient to sustain regular exercise regimens, and thus should not be made the most salient justification for engaging in exercise. Instead, the focus of exercise promotion may be better placed on the inherent enjoyment associated with physical activity and/or the growth of competencies that exercise promotes. Furthermore, since session enjoyment predicts attendance and adherence, making exercise or physical activities more intrinsically motivating (i.e., fun, personally challenging) might be a viable route to enhancing persistence. There is a great deal of existing literature pointing to ways in which intrinsic motivation can be enhanced that is applicable to exercise (Deci & Ryan, 1985; Frederick & Ryan, 1995).

Women may be particularly prone to extrinsic orientations for exercise. Similar to the results found by Frederick and Ryan (1993), and Morris et al. (1995), females starting a nautilus program (Study 2) reported exercising more for appearance- and fitness-related motives than males. Such findings are consistent with prior studies showing that women tend to be more concerned than men with body image and appearance. For example, Mintz and Bek (1986) found that college women were significantly less satisfied with their bodies than men. Similarly, Pliner, Chaiken, and Flett (1990) concluded that women aged 10 to 79 were significantly more concerned about weight and physical appearance than men. The fact that women express these body-related concerns may be due to greater societal emphasis on body appearance for women (Matlin, 1993). Nonetheless, although women rated appearance and fitness motives more highly than men, both men and women nautilus users rated appearance and fitness as their most important reasons for engaging in exercise. This finding accords with those of Frederick and Ryan (1993) who found that the reasons underlying exercise activities were, across gender, more extrinsic and body-focused in their orientation compared to sport-related activities. This pattern was also reflected in Study 1 results, suggesting that aerobics participants were more motivated by body-related concerns than those in Tae Kwon Do.

In Study 2 we differentiated between two specific types of body-motives, namely fitness and appearance goals. Factor analyses supported this differentiation, and, although neither was significantly predictive of adherence outcomes, fitness motives were positively correlated with attendance, whereas the appearance focus was not. It is possible that fitness – the sense of being strong, healthy and able – is a motive that is more readily associated with the intrinsic aspects of exercise activity per se, thus facilitating greater participation. In addition, there may be other functional differences associated with

these differing body-related foci that were not studied herein. Future research may benefit from continuing to operationally separate these two distinct body-related motives.

The fact that body-related motives were not significantly associated with adherence should not be taken to mean that fitness or appearance concerns cannot lead to sustained exercise. The nonsignificant relation between body-related variables and adherence, indeed, suggests that some body-focused exercisers are adhering while others fail to persist, summing to a noneffect. We believe that it is probable that when one is extrinsically focused, one's adherence may be highly dependent upon perceived positive outcomes related to one's goal (Deci & Ryan, 1985). It thus may be that exercisers who were body-oriented, but who did not see immediate gains in appearance or fitness, did not continue. The factors that differentiate extrinsically oriented adherers from nonadherers warrant further study, particularly since body-related motives are typically the most highly endorsed reasons for exercising (e.g., Frederick & Ryan, 1993; Morris et al., 1995).

Study 2 afforded an examination of how initial motives related to participants' experiences in exercise sessions. It was found that participants with higher competence and enjoyment motives reported longer workouts than participants lower on these motives, a finding that is congruent with the association of these variables with greater adherence. Additionally, participants who were more highly motivated by fitness goals reported undertaking more challenging workouts. This suggests that those who are strongly fitness oriented may exert more effort when they attend to exercise. Finally, higher scores on all motive dimensions were related to greater workout enjoyment. Thus, regardless of the focus of one's initial motive, greater motivation appears to be associated with greater task enjoyment.

Some limitations of these studies need to be considered. First, both studies occurred in a university setting and were limited to students and university employees, most of whom were young adults. The extent to which these results generalize to other settings (e.g., private health clubs) is unknown. In addition, there is emerging evidence that people's reasons for exercise differ as a function of age (e.g., Brodtkin & Weiss, 1986; Morris et al., 1995), so that examination of these motives in other age groups is warranted. Second, it is clear that different motives are associated with different types of physical activities (Frederick & Ryan, 1993; Gill et al., 1983; Morris et al., 1995), and in these studies only a few selected activities were examined. The dynamics of adherence may be different for other types of exercise or sport activities. Furthermore, there are many reasons for exercising, and the motives examined here do not represent an exhaustive list. In other studies we are, for example,

studying how the desire to compete can be a motive for participating in some physical activities, and in the recent Morris et al. (1995) study nine motive factors were assessed.

Finally, and perhaps most importantly, other factors aside from initial motives affect adherence to activities (Ryan, Plant, & O'Malley, 1995; Williams, Grow, Friedman, Ryan, & Deci, 1996). In the context of exercise, such factors as the training atmosphere, one's perceived attainment of outcomes, or the occurrence of injuries also influence one's continuing motivation. Clearly, our focus on initial motives addresses only one aspect of the adherence issue. In fact, it should be expected that initial motives will account for only a small to moderate amount of variance in the prediction of adherence, not only because numerous other contextual variables may intervene, but also because initial motives may themselves change over time. For example, a person who begins to exercise for fitness reasons may come to enjoy the activity, and may eventually adhere for the latter reason. This suggests a need for longitudinal designs that assess the development of one's motives and goals over time.

Despite these important caveats, the current results lend support to the need to examine the role of both intrinsic and extrinsic factors in the motivation of physical activity. Although extrinsic motives such as appearance and fitness may be important in initiating exercise programs (e.g., Wankel, 1993; Frederick & Ryan, 1993), these extrinsic foci may not be enough to maintain exercise behavior. Instead, initial motives and process variables more closely linked with intrinsic motivation, particularly those concerning enjoyment and competence, appear to be factors that are associated with greater adherence. Continued study of how to enhance intrinsic motivation in exercise promotion and instruction may thus contribute to increased adherence to exercise and the health benefits associated with it.

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