Effects of Selected Personal Environmental, and Activity Characteristics on Exercise Adherence

by Robert C. Schneider and Fred A. Aiken

Abstract

The purpose of this study was to explore selected personal, environmental, and activity characteristics among individuals who exercise. Subjects volunteered from exercise facilities that agreed to participate (N=203). The Self-Motivation Inventory (SMI) was used to determine the subjects’ level of motivation. Four groups were identified: (a) High-motivation/Low Adherence, (b) High-motivation/High Adherence, (c) Low-motivation/Low Adherence, and (d) Low-motivation/High Adherence. After applying a one-way ANOVA and Scheffe Test, it was found that individuals who exercise regularly derive pleasure from their activity, believe that exercise is beneficial, feel better about their appearance and state of health, and perceive fewer barriers to participation.

Effects of Selected Personal, Environmental, and Activity Characteristics on Exercise Adherence

Despite the overwhelming evidence of the positive effects of exercise, well-intentioned individuals still drop out of exercise programs at an alarming rate of 40 to 60% within the first six months (Dishman, 1986). The Department of Health and Human Services (1990) has set forth five goals in their Healthy People 2000 promotion regarding physical activity and fitness risk reduction objectives. In order to meet these goals, healthcare professionals, public health administrators, and exercise leaders must address two major problems: First, encouraging sedentary people to start engaging in regular physical activity; Second, developing strategies to promote continued exercise participation (Rutherford, Corbin, & Chase, 1992). In an effort to solve these problems, many investigators have studied exercise behavior as it relates to persistence with regular physical activity.

Many common characteristics have been identified regarding those who continue to exercise, as well as those who stop exercising. According to Dishman, Sallis, and Orenstein (1985) and Martin and Dubbert (1982), factors or characteristics that have been found to predict exercise participation and level of adherence may be divided into personal characteristics, activity/characteristics, and environmental characteristics.

Two major personal characteristics related to exercise adherence include self-motivation (Dishman, Ickes, & Morgan, 1980; Rutherford et al., 1992) and the perceived personal control and responsibility one has toward his or her health (Ziff, Conrad, & Lachman, 1995). These studies have concluded that people who have high self-motivation and/or perceive they have more control over their health are more likely to maintain a regular exercise program. Lechner and DeVries (1995) found that low-adherence subjects and dropouts were least convinced of their ability to participate in the program. A report by Napolitano and Marcus (2000) substantiates the importance of self-efficacy related to exercise compliance.

There are several other personal characteristics that influence continued participation in an exercise program. Past participation (Dishman, 1982; Morgan, 1977; Oldridge, 1982) has a positive association with adherence, while blue-collar occupations, smoking (Cox, 1984; Fielding, 1982; Oldridge, 1982; Oldridge et al., 1983), and being overweight (Brownell, Stunkard, & Albaum, 1980; Dishman, 1981) are negatively associated with adherence. Age has demonstrated no association with adherence according to Morgan (1977), Oldridge (1982), and Dishman (1982).

Activity characteristics refer to either lifestyle activities or fitness-related activities. Lifestyle activity patterns include activities related to daily living and occupational activities. These activities do not differ greatly by age or gender, but men and younger adults are more likely to engage in fitness-related activities. While more men than women will adopt vigorous or fitness-related activities in the period of a year, a large proportion of women will increase lifestyle activities. In addition, lifestyle activities have a drop out rate of about one-half that of fitness-related activities (Dishman et al., 1985; Michigan Department of Health, 2000). Intensity and perceived exertion have demonstrated a negative association with continued exercise (Epstein, Koescz, & Wing, 1984; Martin & Dubbert, 1982; Pollock et al., 1977). According to Pollock et al. (1977), attrition due to injury from over training was the leading reason for discontinuing an exercise program. Physical activity produces results that can either encourage or discourage continued participation. Perceived discomfort during an exercise program, regardless of exertion, has been reported among women who drop out (Oldridge et al., 1983).

Environmental characteristics can have a mixed effect on exercise adherence. Spouse support (Dishman, 1982; Morgan, 1977; Oldridge, 1982; Wallace, Raglin, & Jastremski, 1995) and social reinforcement either by an exercise leader or partner (Dishman, 1984; Wankel, 1984) demonstrated a positive correlation with continued exercise. These findings illustrate the power of the social environment in shaping exercise patterns. An individual’s perceived available time has been the most common reason given for dropping out of an exercise program (Dishman, 1982; Gettman, Pollock, & Ward, 1983; Oldridge, 1982). Interestingly, active individuals are as likely, or more likely, than sedentary individuals to view time as a barrier to activity (Canada Fitness Survey, 1983; Perrier Great Waters of France, 1979). Access to a facility, whether it is only perceived as convenient or is actually in close proximity geographically to home or work, influences adherence to a fitness program (Dishman et al., 1985; Oldridge, 1982). Enrollment fees have been reported not to be a barrier to exercise participation according to survey results by the Canada Fitness Survey (1983) and Iverson, Fielding, Crow, and Christenson (1985). However, already-active individuals were twice as likely to claim that less expensive facilities would increase involvement in exercise (Perrier Great Waters of France, 1979).
Research has demonstrated that people who have a higher level of self-motivation are more likely to adhere to an exercise program. Studies have also identified environmental and activity factors that may either help or hinder an individual’s level of participation in an exercise program. The purpose of this study was to identify selected personal, environmental, and activity factors which can be incorporated into fitness programs that will enhance the retention of individuals who are less likely to continue a regular exercise program. The specific problem addressed was an identification of the personal, environmental, and activity characteristics that influence exercise adherence.

The following research questions were investigated:

1. Can common personal, environmental, and/or activity characteristics be identified among people who exercise?
2. Is there a relationship between selected personal, environmental, and/or activity characteristics and exercise adherence?
3. Are there common personal, environmental, and/or activity characteristics among those who have low self-motivation and high exercise adherence?

Methodology

Subjects

The population consisted of members of selected fitness facilities who were 21 years of age or older. The areas in which the facilities were located were three counties in southern NJ. Twenty-one facilities were selected randomly using the telephone book. The name of each facility listed in the telephone book was placed in three separate hats representing each county. Seven names were drawn from each hat. The managers of the facilities were contacted by telephone or in person by one of the researchers. The study was explained verbally and written information was provided upon request. Out of 21 facilities 6 were willing to participate in the study. Those facilities that declined to participate stated several reasons which included: an unwillingness to disrupt club members with the survey, a lack of interest in the study, and an unwillingness to admit non-members into the facility. Two additional facilities were recruited from outside of the defined area before the study began. One facility was in northeastern MD and the other was in central NJ. The researchers were familiar with the managers at these two facilities, who expressed an interest in being a part of this study.

Three hundred seventy survey packets were distributed at eight different facilities. Two hundred three returned surveys comprised the total number of subjects for the study. Subjects from the following eight facilities agreed to participate in the study: (a) a non-profit organization, n = 68; (b) a phase four cardiac rehabilitation program, n = 24; (c) a privately owned health club, n = 23; (d) a privately owned health club, n = 8; (e) a privately owned health club, n = 16; (f) a franchised aerobic dance program, n = 24; (g) a corporate fitness facility, n = 28); and (h) a college operated facility, n = 12. The response rate was 54.86%. Presented in Table 1 is the demographic data of the sample.

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Note. HS = high school.

Table 1. Demographic Data of the Sample Based on the Responses from the Participant Profile Questionnaire (N=203)

Instruments

Development of the Participant Profile Questionnaire (PPQ) included a panel of experts. Pertinent elements related to personal, environmental, and activity factors from the literature were selected for analysis. Based on the literature, the PPQ was developed. The panel members also received a copy of the SMI and a copy of Dishman et al. (1985), which summarizes pertinent elements related to personal, environmental, and activity factors. The panel was asked for suggestions to improve the PPQ.

Based on their suggestions, significant content and format revisions were made and the questionnaire was returned for further review. The panel was satisfied after this rewrite. This process helped establish content validity for the questionnaire.

The questionnaire was then field tested by 16 individuals (two staff representatives from each facility who were not selected for testing). During this process, the following were evaluated: (a) testing time, (b) ambiguity of the questions, (c) confusion with the directions, and (d) relevance. Based upon feedback from this
Effects of Selected Personal Environmental

Data Collection Procedures

The questionnaire packet consisted of the following: (a) instructions for completing the packet, (b) the SMI, (c) a PPQ, and (d) an answer form. The SMI and PPQ were completed during the same testing period. The packet was administered to the subjects by one of the researchers.

One of the researchers visited each facility twice, on different days of the week and at different times of the day. Members were approached while attending the facility. One of the researchers provided an overview of the study and recording procedures to each potential subject. Those members who agreed to participate in the study were considered as subjects. The participants were given four weeks to return the questionnaire. There were no means to identify who may have completed a questionnaire; therefore, no follow-up was done.

Each subject was provided with an anonymous code. This code was placed on both the instruction page, which the subject took with him or her, and the answer sheet, which was returned to one of the researchers.

Monitoring Procedure

An attendance sheet was developed containing a matrix with the subject’s code and date. It was left at the facility for tracking purposes. Bimonthly for the 12 weeks of the study, one of the researchers collected the attendance sheet and replaced it with a new one.

Attendance was calculated over a 3-month period. Subjects were instructed to record each time they came to the facility to exercise. The subjects were instructed to place an (X) in the matrix with their corresponding code and date if they exercised at the facility. The subjects were instructed to place an (O) in the matrix with their corresponding code and date if they exercised outside of the facility. If the subject exercised both at the facility and outside the facility on the same day, the instructions were to record an (X) and an (O) on that date. Instructions were written on the attendance sheet as a reminder for the subjects. The attendance sheet was located in a convenient location designated by the facility.

Data Analysis

An alpha value of .05 or less was required for statistical significance. Frequency distributions and contingency tables were generated to adequately describe the sample and its demographic and influences on exercise behavior. A principal components analysis was performed on the 60 items on the PPQ defined earlier as being related to personal, environmental, and activity characteristics. Each subject’s attendance was calculated and separated into Exercise at the Facility, Exercise Outside the Facility, and Total Exercise. Pearson correlations were computed to examine any relationship between selected personal, activity, and environmental factors and the three exercise variables.

A multiple regression was performed to examine whether any predictability of exercise adherence was observed from selected personal, activity, and environmental factors. In order to identify whether any common characteristics existed among individuals with low self-motivation and high exercise adherence, a one-way analysis of variance (ANOVA) and Scheffe Test were calculated.

Results

Self-report Questionnaire

The mean score for the Self-report Questionnaire was 153 with a standard deviation of 21.6 for the subjects who participated in this study. According to Dishman et al. (1980), the mean score for the SMI is 140 for college age subjects with a standard deviation of 20.

Exercise Adherence Data

Of the 203 subjects, 174 completed the tracking of their exercise at the facility and outside the facility. This was 85.7% of the original study participants. Not all of the subjects recorded exercise participation for the 12 weeks of this study. Exercise participation was calculated in 2-week intervals.

One hundred fifty subjects (86.2%) completed 10 to 12 weeks of the study. The remaining 24 subjects (13.8%) recorded their exercise participation for 8 weeks or less. All of the data gathered were incorporated into the findings regardless of the number of weeks the subjects participated. The actual adherence may be under reported because some subjects may have stopped recording their participation but continued to exercise.

Research Question 1

A principal components factor analysis using a varimax rotation was performed to determine the underlying dimensions for items on the PPQ. Variables loading at .30 or higher were used in naming the factors. The rotated factors explained 63.8% of the variance among the items. Even though 11 factors were identified, only 4 factors provided a significant relationship with exercise adherence: Perception of Health and Appearance, Climate, Facility Accessibility, and Fear of Health Problems.

Research Question 2

There was a modest relationship between selected personal, environmental, and activity characteristics and exercise adherence. A positive correlation existed between Exercise at the Facility and the following items: (a) Appearance (r[174] = .16, p < .05), (b) State of Health (r[174] = .17, p < .05), (c) Time to Exercise (r[174] = .16, p < .05), and (d) Perceived Motivation (r[174] = .16, p < .05). Members of this group expressed greater contentment with their physical appearance and current state of health as exercise adherence increased. Making time to exercise was a greater priority for those with higher exercise adherence and as perceived level of
motivation increased, likewise exercise compliance increased.

A negative correlation between Exercise at the Facility and Time of Year ($r_{174} = -.21, p < .01$) was observed. The item was inserted to determine whether seasonal changes influenced exercise adherence. Seasonal changes have less influence as exercise adherence at a facility increases.

A negative correlation was observed between Exercise Outside the Facility and the following five environmental attributes: (a) Convenient Hours ($r_{174} = -.23, p < .05$), (b) Equipment Availability ($r_{174} = -.15, p < .05$), (c) Staff Supervision ($r_{174} = -.17, p < .05$), (d) Travel Distance ($r_{174} = -.21, p < .05$), and (e) Membership Cost ($r_{174} = -.16, p < .05$). These five items were related to aspects associated with facility management or location. As exercise adherence increased, these elements became less of an influence on exercise patterns.

A negative correlation was reported for Travel Distance ($r_{174} = -.22, p < .01$) and Convenient Hours ($r_{174} = -.15, p < .05$) with regards to Total Exercise. For this group of subjects, attitudes associated with the physical environment were not perceived as a significant barrier to exercise compliance. The concern regarding Future Health Problems ($r_{174} = -.19, p < .05$) was inversely correlated with Total Exercise. As exercise adherence increased, the concern for Future Health Problems decreased. The attribute Happy with Appearance ($r_{174} = .18, p < .05$) was positively correlated with the same exercise variable.

Pearson product-moment correlations were computed to examine whether any relationships existed between the three exercise variables and the 11 identified factors. Perception of Health and Appearance had a positive correlation with Exercise at the Facility ($r_{174} = .16, p < .05$) and Total Exercise ($r_{174} = .15, p < .05$). For this group of subjects, participation was higher for those who perceived health and appearance to have a stronger influence on exercise involvement.

A negative correlation was observed between Exercise at the Facility ($r_{174} = -.16, p < .05$) and Climate. Concerns about weather-related factors decreased as exercise participation increased. Similarly, Facility Accessibility was inversely correlated with Exercise Outside the Facility ($r_{174} = -.26, p < .01$) and Total Exercise ($r_{174} = -.23, p < .01$). As Exercise Outside the Facility and Total Exercise increased, Facility Accessibility became less of an influence.

Fear of Health Problems (Factor X) was negatively correlated with Total Exercise ($r_{174} = -.15, p < .05$). As Total Exercise increased, Fear of Health Problems became less of an influence for exercise adherence.

**Stepwise Multiple Regression**

To investigate further, correlates were determined of exercise adherence, for the three variables (a) Exercise at the Facility, (b) Exercise Outside of the Facility, and (c) Total Exercise. To do so, stepwise multiple regressions were performed.

With regards to Exercise at the Facility, Climate was the best predictor of exercise adherence. Level of Education was the next best predictor of exercise adherence. These were the only two predictors for Exercise at the Facility. Climate had a negative correlation with Exercise at the Facility, suggesting that subjects with higher exercise adherence were less affected by the weather with regards to exercising at the facility.

There were no predictors for Exercise Outside the Facility. And, the only predictor for Total Exercise was Facility Accessibility.

**Research Question 3**

Four groups were defined using scores on the SMI and exercise adherence data: (a) Low Motivation/Low Adherence, (b) Low Motivation/High Adherence, (c) High Motivation/Low Adherence, and (d) High Motivation/High Adherence. The group in which this investigation was most interested was Low Motivation/High Adherence. The purpose was to examine whether there were any common characteristics among those individuals who continued to exercise but were not highly self-motivated. The results of the one-way ANOVA and Scheffe Test revealed that there were no common characteristics among this group that completely differentiated it from the others, regardless of the exercise variable.

**Discussion**

Prior research has found that those who believe exercise has little value for health, and that health outcomes are uncontrollable, were more likely to exercise less and drop out (Dishman et al., 1985). This study demonstrated higher exercise adherence at the facility among those subjects who expressed greater satisfaction with their appearance and state of health. The fear of future health problems decreased with the same subjects as total exercise increased. These findings supported those of other research that suggests that a belief in the value of exercise as it relates to health was a significant influence on exercise compliance.

Most people who enter into an exercise program share similar positive attitudes and beliefs about exercise, perception of ability, and health responsibility, but these do not predict adherence to the program. Health beliefs can influence the intention to be active, but intentions have failed to predict continued participation (Dishman et al., 1985). Wankel (1985) found that those with higher exercise compliance scored higher on the goals to develop recreational skills, reported a greater increase in positive reactions to the program, and reported a greater satisfaction with program activities. The subjects in this study scored above the established mean on the SMI and expressed enjoyment with activity.

Field and Steinhardt (1992) reported that individuals with a “self-control” orientation were more likely to exercise to improve physical appearance or performance. Their research indicated that individuals who reported exercising to improve appearance and/or physical performance had a higher dropout rate than those with higher self-esteem who exercised for pleasure and athletic reasons. The mean score for the SMI in this study was higher than the one determined by Dishman et al. (1980), which may indicate higher self-esteem among these subjects. As stated previously, enjoyment of exercise and activity was positively correlated with exercise adherence between various groups and exercise variables.

Significant individual attributes and those contained within the two factors, Intensity and Contentment and Perception of Health and Appearance, were similar to ones identified by Field and Steinhardt (1992) and Wankel (1985). These relationships identified personal attitudes about exercise that were related to an increase in exercise adherence. The subjects displayed greater enjoyment with exercise and activity and higher satisfaction with health.
and appearance. Research has identified positive attitudes about activity and beliefs about exercise to have a significant influence on whether an individual persists with an exercise program (Field & Steinhardt, 1992; McAuley & Courneya, 1993; Ziff et al., 1995). The results of this study demonstrate the influence of both belief and enjoyment related to exercise adherence.

An initiative of this study was to identify common personal, environmental, and activity characteristics among low self-motivated individuals who continued to exercise. Previous research has identified common characteristics among people with low self-motivation who drop out of exercise programs and interventions that have supported short-term compliance. Based on a one-way ANOVA and Scheffe Test to determine differences between the Low Motivated/High Adherence group and the other three groups, there were no common personal, environmental, and/or activity characteristics that completely distinguished the Low Motivation/High Adherence group from the others regardless of the exercise variable.

Dishman et al. (1985) and Wankel (1985) identified the same five attributes (Convenient Hours, Equipment Availability, Staff Supervision, Travel Distance, and Membership Cost) as common complaints among those individuals with higher dropout rates from exercise programs. Items related to the facility had a negative correlation with exercise adherence for this sample; therefore, attributes related to the physical environment were not a deterrent to exercise. A positive correlation was computed between exercise compliance and the willingness to make time to exercise. These results were similar to those that found a higher dropout rate among those who perceived inconvenient time, lack of time, and program convenience as barriers to program adherence (Andrew et al., 1981; Dishman et al., 1985; Wankel, 1985). The higher mean score on the SMI may have contributed to these results.

Literature presented by Dishman et al. (1985) and Martin and Dubbert (1982) described attributes associated with the social environment as having a significant influence on exercise adherence. This analysis did not reveal the same findings; so, for this group of subjects, social support (spouse, family, and/or peers) was not a significant factor in exercise compliance. These results did not demonstrate the level of importance for the social environment as prior research (Dishman et al., 1985; Martin & Dubbert, 1982; Wallace et al. 1995; Wankel, 1984, 1985). Social support was not significantly related to exercise adherence for this population even though Peer Support, Family Support, and Staff Support were identified by the principal components analysis.

This study found that demographic attributes were not significantly correlated with exercise. Gale, Eckhoff, Mogel, and Rodnick (1984) identified 11 variables related to exercise adherence; these variables were demographic and performance related. Their research concluded that for healthy volunteers, participant characteristics were not good predictors of exercise compliance. Their results were consistent with this study.

Contributing to these results may be the fact that the cut-off for low self-motivated group was a score of 140 on the SMI, one standard deviation above the 120 recommended by Dishman et al. (1980). This score was adjusted because only 14 subjects scored below the recommended cut-off. The mean score on the SMI for this study was 153; Dishman’s investigations have computed a mean score of 140. These self-selected volunteers appeared to be more closely aligned with the High Motivated/High Adherence group. In addition, the mean adherence score for both Exercise at the Facility and Total Exercise fell within the guidelines for exercise participation. Therefore, the subjects in this study were already exercising at a prescribed range.

Conclusions

Based on the results of this study, individuals who exercise regularly derive pleasure from their activity, believe that exercise is beneficial, feel better about their appearance and state of health, and perceive fewer barriers to participation. The findings support the position of the Department of Health and Human Services (1996) that the influences on physical activity patterns among adults and young people include self-efficacy, enjoyment of physical activity, support from others, positive beliefs concerning the benefits of physical activity, and lack of perceived barriers to being physically active. These common characteristics lead to the conclusion that attitudes, beliefs, and self-motivation internally drive exercise compliance.

Implications and Recommendations

For the practitioner, this study reflects the importance of providing exercise alternatives clients enjoy. In addition, educational programs emphasizing the benefits of exercise should be offered in a variety of formats so that lifetime participation is encouraged. Facility managers should explore the possibility of providing some type of motivational testing to identify potential dropouts and implement appropriate interventions. For the researchers, this study demonstrates the need for accurate tracking of exercise participation utilizing electronic record keeping. The researchers need to be aware of the difficulty in identifying a substantial number of low self-motivated subjects who are physically active. Surveying the entire membership or doubling the sample size of the present study are suggested solutions to this problem.

Dr. Robert C. Schneider is an Associate Professor of Sport Management at the State University of New York at Brockport in Brockport, New York and Dr. Fred Aiken is an Assistant Principal at Burlington County Institute of Technology at the Medford Campus in Medford, New Jersey.

References

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Health Promotion.


