2007

Changes in exercise identity among three groups of exercisers over twelve weeks

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Changes in exercise identity among three groups of exercisers over twelve weeks

by

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A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Kinesiology (Behavioral Basis of Physical Activity)

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Ames, Iowa
2007

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ABSTRACT

Because of the health crises in the United States, there is a need to better understand exercise patterns and how they are developed and maintained. Many scholars have suggested that an individual’s concept of self is composed of numerous identities. As role identities motivate behavior consistent with the identity, role-identity salience may predict future exercise behavior. Therefore, the purpose of this study was to examine the relationships between exercise identity, stage of exercise, and total number of exercise sessions, over 12 weeks, among three groups of exercisers (group fitness, personal coaching, and self-controlled exercisers).

Two waves of data collection, separated by 12 weeks, were performed with members of a fitness center located in a rural community in the Midwest. Attrition rate was 21% resulting in a final sample of 89 participants. Ninety-five percent of the survey participants self-identified as Caucasian and 75% were female. Average age was 52 years. Stage of exercise behavior was assessed using a five-item instrument related to regular exercise behavior and intentions (Marcus, Selby, Niaura & Rossi, 1992). Exercise Identity was measured by the sum of nine Likert-type items (Anderson & Cychosz, 1994) designed to measure the extent to which exercise was descriptive of the concept of self (alpha = .93).

A one-way MANCOVA tested the effects of participant group upon participant’s total number of exercise sessions over 12-weeks and post program exercise identity score, controlling for initial exercise identity score. The combined dependent variables were significantly related to the covariate of initial exercise identity score $F(2,81) = 66.11, p < .001$, but after adjustments for the covariate, results indicated that there was no statistically significant participant group effect $F(4,162) = 1.77, p = 0.14$. Univariate tests indicated that
both of the dependent variables were significantly related with the covariate. A one-way MANCOVA was also utilized to test for effects of initial stage of exercise upon participant’s total number of exercise sessions over the 12-week program and post-program exercise identity score, while controlling for initial level of exercise identity score. After controlling for the covariate, results indicated that there was no statistically significant exercise stage effect $F(4,162) = 1.77, p = .14$. These data suggest that merely exercising may not be enough or that a 12-week program may not be long enough to produce significant changes in exercise identity.
CHAPTER 1: INTRODUCTION

Despite the numerous benefits of physical activity, approximately 30% of American adults report no participation in leisure time physical activity, with 60% not getting the recommended amount (Satcher, 1997). In addition, nearly half of young people, age 12-21 years, are not vigorously active on a regular basis (Satcher, 1997). Due to the large number of inactive persons, the percentage of individuals who are overweight or obese is on the rise in America. In 2002, the National Heart, Lung, and Blood Institute reported 61%, (113 million adults), as being overweight or obese, with 34% (63 million) overweight and 27% (50 million) obese (Chenoweth & Leutzinger, 2006). In addition, the percentage of overweight young people has doubled in the past twenty years, increasing from 7% in 1980 to 18.8% in 2004 (Martin, Morrow, Jackson, & Dunn, 2000; Chenoweth & Leutzinger, 2006).

Excess weight places economic burdens on the United States. A recent report estimated excessive weight costs the nation $75-117 billion annually, with the cost of physical inactivity alone $24 billion (Chenoweth & Leutzinger, 2006). It was also estimated that if 10% of sedentary adults would begin walking, annual spending would be cut by $5 billion. Moreover, active adults use $1000 less annually in medical care services than inactive adults.

Physical inactivity and excess weight not only place economic costs on society, but costs to the inactive individual as well. Physical inactivity is related to increased risk of premature death, developing diabetes, high blood pressure, some cancers, and osteoporosis (Ogden, Flegal, Carroll, & Johnson, 2002; Chenoweth & Leutzinger, 2006, Berger, 1996; Schechtman, Barzilai, Rost, & Fisher, 1991; Heath, Pate, & Pratt, 1993). Physical inactivity
has also been documented as a primary risk factor for cardiovascular disease (CVD). CVD is the leading cause of death, killing 950,000 Americans each year (2,600 per day) and accounting for 40% of all deaths. In 1997, CVD alone cost the economy 260 billion dollars, with 425 billion spent on medical care costs to treat all chronic diseases. In addition, data suggests that mortality rates from coronary heart disease are declining, stroke rates are remaining the same, whereas heart failure mortality rates are on the rise (Satcher, 1997).

Physical activity may also be linked to mental health, because planned and structured physical activity is associated with enhanced mood, stress reduction, more positive self-concept, and higher quality of life (Berger, 1996). Psychological benefits have also been found to be more pronounced in special populations, such as depressed or anxious individuals, coronary heart disease patients, and the elderly (Berger, 1996). Because of the individual and societal costs, it is important to understand why people exercise and to clarify personal beliefs and meanings related to physical activity.

While the benefits of physical activity are well-documented, knowledge of these benefits does not appear to consistently affect behavior, as approximately 50% of adults who initiate an exercise program will drop out in the first 3-6 months (Martin, et al., 2000; Wallace, 2002; Blair & Brodney, 1999; Chenoweth & Leutzinger, 2006). Therefore, determinants associated with physical activity must be examined, and population segments that may be responsive or resistive to different physical activity interventions must be identified and better understood.

In view of the many benefits of physical activity, it is surprising that only a small portion of American adults participate in regular physical activity. This lack of participation and maintenance of physical activity has influenced many researchers to explore numerous
theoretical models as a basis to explain early and continued participation in exercise behavior, including social cognitive theory, the health belief model, the stages of change model, self-efficacy, and the theory of reasoned action or planned behavior. However, much of this research has had only limited success (Rhodes & Courneya, 2003; Annesi, 2004; Storer, Cychosz, & Anderson, 1997; Jones, Harris, Waller, & Coggins, 2005).

**Purpose**

Theoretical discussion and research which argues that role identities are pivotal factors for behavioral regulation within larger social structures may have provided a useful framework for the investigation of exercise adherence behavior (Cast & Burke, 2002; Stets & Burke, 2000; Stryker & Burke, 2000). Central to this line of thought is identity theory (Burke & Reitzes, 1991) which recognizes the importance of socio-structural influences on identity formation and behavior, and accounts for the self’s internal dynamics that impact behavioral decisions. Consequently, it may prove useful to examine the importance of one’s role identity as an exerciser in the initiation of and adherence to an exercise program.

Measuring exercise identity in terms of the reciprocal relationship between exercise identity salience and exercise behavior may be useful in recognizing those individuals more likely to maintain an exercise program and in developing successful intervention programs. The purpose of this study was to examine changes in exercise identity among three groups of exercisers: those who work one on one with a personal coach, those who attend group exercise classes, and those who are members of a fitness center (self-controlled exercisers).
The examination of role identities may serve as a useful approach to better understand exercise behavior. Callero (1985) and Wininger and Pargman (2003) state that an individual’s concept of self is composed of numerous role identities. A specific role identity is defined as one dimension of the self, and is formed based on an individual’s behavior, attitudes, and beliefs. When these identities are combined, they define who a person is. Identity theory suggests that the core of an identity is the categorization of the self and incorporation, into the self, the meanings and expectations associated with the role and its performance (Burke & Tully, 1977; Thoits, 1986). Meanings and expectations attached to an identity are thus the basis of standards that guide behavior. As an individual enacts certain behaviors, the behaviors often become part of an identifiable role and are incorporated into one’s concept of self. In turn, the self-image and behaviors attached to it become important to the individual (Charng, Piliavin, & Callero, 1988).

As patterns of behavior become internalized as a central role identity, and thus become increasingly important to a person’s sense of self, intentions to engage in the relevant role behaviors increase based on the salience of the role identity and related behaviors (Charng, Piliavin, & Callero, 1988). Identity salience is defined as the relative importance or centrality of a given identity for defining oneself and the importance of the identity in one’s self structure (Hoelter, 1983; Charng, Piliavin, & Callero, 1988). As an identity becomes more salient, the more representative of self it becomes. In turn, the individual begins to define him or herself in terms of salient identities (Callero, 1985; Stryker & Burke, 2000; Wininger & Pargman, 2003).
Callero (1985) stated that the most visible consequence of role identity salience is one’s behavior. As role identities increase in salience and individuals begin to define who they are based on these roles, they begin to enact behaviors that are related to the salient identities (Stryker & Burke, 2000; Wininger & Pargman, 2003). As individuals act out these behaviors, they may, through social interaction, have these identities reinforced and validated. Concurrently, validation of the role identity increases the likelihood of future behavior related to the identity. Once these behaviors have been initiated or mobilized by a person and are recognized and reinforced by others, they are likely to become important to one’s concept of self, and in turn may become primary salient beliefs. If the role identity becomes a valued aspect of one’s self and a primary salient belief, it may also become important in directing future exercise behavior (Anderson & Cychosz, 1995; Anderson, Cychosz, & Franke, 1998, 2001), and may therefore be viewed as “an important predictor of behavior” (Stryker, 1968).

As individuals hold multiple role identities, identity theory suggests these identities are organized into a hierarchy (Chang, Piliavin, & Callero, 1988). This implies that the identities most important are located at the top of the hierarchy with less salient roles falling near the bottom (Callero, 1985). In any given situation, people will seek out opportunities to enact a highly salient identity. The more salient identities located at the top of the hierarchy are more likely to be activated (Stets & Burke, 2000). For example, Callero (1985) studied role identity salience among blood donors. He hypothesized that salience of the blood donor role identity would be positively associated with self-definition as a blood donor. Secondly, he proposed that identity salience would be linked to the likelihood to donate in the future. Callero found significant correlations between role-identity and self-definition ($r = .37$, $p <$
.001), as well as role-identity and the probability of future blood donations \((r = .20, p < .001)\). Results suggest that the more one defines him or herself as a donor, and views donor behavior as part of the self, the more likely he or she will donate.

Religious identity salience has also been examined. Wimberley (1989) explains that when one holds multiple identities in which behaviors for those identities are incompatible, the hierarchy of salience influences the choice of behavior. Thus, if religious identity is highly salient for a given person, the behavioral requirements for the religious role are likely to take precedence over behaviors of other roles, should a conflict arise. Stryker and Serpe (1982) measured the salience of religious identity relative to the salience of the three identities of parent, spouse, and worker. It was hypothesized that the presence of other roles would be inversely related to the salience of the religious identity. Using a two-item scale, respondents were asked to rank religion in relation to the other roles in the study. The higher one ranked religious identity relative to other roles, the higher the religious identity salience. Standardized regression coefficients suggest there may in fact be an inverse relationship between the presence of the parental role \((b = -.26)\), spousal role \((b = -.12)\) and worker role \((b = -.35)\) and the salience of the religious identity \((b = .47)\). Therefore, when behaviors associated with less salient roles are incompatible with the religious identity, one will choose to engage in behaviors related to the religious role identity where salience is high.

Grube and Piliavin (2000) utilized American Cancer Society (ACS) volunteers to understand the participation and retention of volunteers in organizational settings. Perceived expectations, personal importance to the organization, prestige of the organization, and organizational commitment were measured. In addition, number of hours donated to the ACS per month, as well as hours donated to other volunteer organizations were reported.
Findings were consistent with previous research on blood donors in that perceived expectations of others was the single best predictor of role identity importance. Past behavior was also found to be a significant predictor of role identity salience and ACS hours.

Research examining role identities has found intention to donate and past behavior as important predictors of future behavior (Callero, 1985; Grube & Piliavin, 2000). Lee, Piliavin, and Call (1999) examined whether or not intention and past behavior would extend to donating time and money. The relationship among three types of giving (time, money, and blood) was examined utilizing a telephone interview of a probability sample of 1,002 adults, with 78% responding. Results suggest personal norms are a stronger predictor of blood donor identity \( R^2 = .29 \) than time \( R^2 = .15 \) or money \( R^2 = .16 \) identities. Past behavior was found to be a more important determinant of giving blood \( R^2 = .46 \) than time \( R^2 = .37 \), with intention a greater predictor of giving time \( R^2 = .29 \) than money \( R^2 = .21 \). One explanation for these findings may be due to differences in social relationships. Blood and money donation allows for anonymity, whereas time donation requires individuals to meet face to face with recipients. Giving time also requires donors to work closely with other volunteers. Identity theory suggests that a role identity is sustained partly through relationships developed in the particular setting. Thus, time donors may feel stronger social pressure to donate than money or blood donors.

Identity theory has also been utilized to examine gender and work roles. Wiley (1991) examined gender roles and stress attached to each role. Stress may occur when one must choose between role behaviors that confirm identities of similar salience and commitment. Thus, stress may occur when an individual attaches equal salience to multiple identities, such as work and family. Traditionally, women’s family role takes precedence
over work, whereas men’s work role is more salient than the family role. However, Wiley (1991) suggests women who invest in both family and career suffer conflict and associated depression. Working mothers with preschool children have displayed poorer mental health (McLanahan & Adams, 1987), and report spillover between work and family (Crouter, 1984), and role-related tensions (Kelly & Voyandoff, 1985). In addition, men who place emphasis on the family role, particularly those with children, are more likely to experience conflict with work roles. These findings were consistent with studies by Baruch and Barnett (1986) and Berry and Rao (1997), in that fathers participating in child-related events experienced higher levels of stress due to lack of time for career work.

Ellestad and Stets (1998) also studied the issue of inadequate role performance by examining motherhood and jealousy related to feelings of poor performance of the mother role. Identity theory states that an identity is a set of meanings connected to various roles. Thus, mother identity is the set of meanings women attribute to themselves while in the mother role. The mother role is thought to be nurturing and comfort-giving, while the father role is more likely one of a playmate. Ellestad and Stets (1998) examined how the importance and salience of the mother identity invokes emotional responses, such as jealousy, to father-child interactions. When women experience jealousy due to father-child interactions, it is suggested that the mother may feel she is inadequately performing the mother role. Stryker (1987) suggests the strength of emotional responses may be tied to identity salience, which suggests that women experiencing strong jealous feelings place the mother identity high in the salience hierarchy. In turn, women experiencing strong feelings of jealousy may develop coping strategies to manage negative feelings. Ellestad and Stets (1998) hypothesized those women who report emotional responses due to father-child
interactions place importance on the mother identity. Secondly, women who place a great
deal of importance on the mother identity will experience stronger emotional responses when
the father steps into the nurturing role. Lastly, women who are salient in the mother identity
will use coping strategies in response to negative feelings of jealously. Eighty-six parents
(51 mothers and 35 fathers) responded to two vignettes which served as measures of jealous
feelings and coping strategies. Results supported each of the hypotheses in that the
importance of the mother identity relates to the emotional experience of jealousy ($R^2 = .11$)
In addition, salience of the mother identity corresponds to how a mother behaves, copes with,
or responds to jealous feelings in a given situation.

The salience of blood, time, and money donor, religious identity, and mother identity
were found to be good predictors of future behavior. These results suggest that as
individual’s act out certain roles and the roles are reinforced, they may become important to
one’s concept of self. In turn, as the identity becomes more salient to one’s definition of self,
the likelihood one will seek out situations in which to act out the salient role increases.
Therefore, identity theory may be an effective approach to the study of exercise behavior.

**Athletic Identity**

Recent research has begun to explore identity formation among college athletes and
the degree or strength of commitment to the athlete role, as well as the salience of the athlete
identity. Miller and Kerr (2003) explain athletic identity as reflecting cognitive, affective,
behavioral and social elements which identify exclusively with the athlete role. They
examined the relationship of student athletes and investment in athletic, academic and social
roles through interviews with four male and four female senior athletes. Athletes reported as
heavily identifying with the athlete role early in their career. However, as the athletes
matured, interests began to diversify and the athletic identity began to dissipate, such that a shift toward academic identity was evident.

Adler and Adler (1989) examined the creation and character of gloried self among participants in a major college basketball program. Gloried self, a form of self-identification, arises when individuals become the focus of intense interpersonal and media attentions, develop a public persona and cast off other self-dimensions. Individuals with high athletic identity are more likely to develop stronger gloried selves, such that the athlete is no longer an integrated person incorporating various identities (Adler & Adler, 1989).

Stryker and Serpe (1982) suggest role conflict may occur when one must choose between two salient identities in a single situation. For example, Stevenson (1991) interviewed thirty-one former elite Christian athletes to examine the way the two roles contrasted. Three types emerged in which these individuals accommodated the expectations associated with the two roles. The segregated type occurs when there is complete segregation between the two identities, and individuals isolate Christianity to Christian settings. Selective individuals permitted performance of the Christian identity in sport, but preferred the athletic identity. Lastly, committed individuals were dedicated to the Christian identity, which was dominant in both athletic and nonathletic settings. The presentation of each type of accommodation is dependent on the understanding of the expectations associated with the role, as well as the outcomes one may experience from choosing to enact the role.

Other research has studied behaviors associated with specific athlete or sport roles. Schouten and McAlexander (1995) examined how individuals organize their lives and identities around Harley-Davidson Owners Groups (HOGS). Williams and Donnelly (1985)
as well as Donnelly and Young (1988) discussed the power of identity construction among rock climbers. Socialization and identity construction among bicycle racers were examined by both Leonard (1991) and Albert (1991). Recently, in the area of sport marketing, there has been considerable interest concerning role identities among sport fans (Trail, Anderson, & Fink, 2000; Trail, Anderson, & Fink, 2005).

**Exercise Identity**

In an attempt to examine salience of the exerciser role, a research perspective based on the reciprocal relationship between role-identities and behavior was developed. As discussed, some research has shown that role identities help give meaning to past behavior as well as motivate future behavior. Because role-identities motivate behavior consistent with the identity, role identity salience may predict exercise behavior. By understanding the relationship between exercise behavior and exercise identity, one may be able to identify individuals most likely and least likely to begin as well as maintain a physically active lifestyle.

Exercise behavior and identity have been studied in association with health beliefs. The Health Belief Model (HBM) with its emphasis on one’s perceptions of susceptibility, benefits, social influences, cues to actions, and barriers is a motivational model that has been utilized to study and understand health related behavior. While the HBM is able to identify factors which may influence health behavior, it hasn’t been real effective in predicting exercise behaviors. Storer, Cychosz, and Anderson (1997) examined whether HBM factors, along with physical self-efficacy and locus of control were possibly constellations of beliefs or attitudes that could be connected to role identities. They examined how constellations of beliefs, values and attitudes may define role identities and result in behavior. Values are said
to generate behavior through the mediation of attitudes. Strader and Katz (1989) explain that behavior is determined by intention. Intention is determined by personal attitude and an individual’s perception of social influences, or subjective norms. Both attitude and subjective norms are based on individual beliefs. Individual’s values and beliefs are tied to specific role identities. In turn, the study of role identities may be a better approach to explaining how attitudes and beliefs influence behavior. As an individual’s behavior becomes reinforced through involvement and social interaction, attitudes, beliefs and values may become part of a salient role identity and a better predictor of future behavior.

Iowa Department of Transportation employees were utilized to examine the relationship between HBM perceptions and beliefs concerning exercise behavior and competence in physical activity with the presence of or absence of four health lifestyle behavior indicators (cholesterol level, percent fat, physical endurance (METS), and smoking (Storer, Cychosz, & Anderson, 1997). Results from a canonical correlation analysis displayed two statistically significant functions between employee’s attitudes and beliefs and the four measures of CHD risk factors. The first function suggested that employees who did not perceive short-term benefits or long-term health benefits of exercise and did not feel susceptible to the health risks associated with a lack of exercise were those employees who smoked, had higher percent bodyfat, and lower physical endurance (METS). This constellation of attitudes and beliefs was labeled as wellness rejection identity, as it is inversely related to several health-enhancing behaviors. The second function indicated that employees who perceived themselves as physically competent, susceptible to health risks associated with a lack of exercise, and valued the benefits from exercise, displayed a lower
percent bodyfat and higher physical endurance (METS). This function was labeled Exercise Identity (Storer, Cychosz, & Anderson, 1997).

Anderson and Cychosz (1995) studied the relationship between two behavioral measures of exercise commitment and a measure of exercise identity among employees of a medical center. Instruments were mailed to 800 randomly selected employees and 351 members of the facility fitness center. Exercise identity was measured by the sum of two Likert-typed items, which asked the importance of exercise behavior for one’s concept of self. The two behavioral measures were self-reported type of exercise and reported minutes of exercise per week. Results of a regression analysis showed that as minutes of exercise per week increased, level of exercise identity also increased ($r = .58$). The R-square from the regression analysis indicated that almost 35% of the variance in exercise identity was explained. Results suggest the possibility of a mutually reinforcing relationship between the role of exerciser and one’s behavior as an exerciser. Recognition and reinforcement from others may in fact validate a person’s identity as an exerciser, and in turn, a person feels pressure to continue acting out exercise behaviors.

To further examine the idea of role identities relating to exercise behavior, Anderson and Cychosz (1994) developed a nine item instrument to measure the salience of exercise identity and the extent to which exercise was descriptive of one’s concept of self. A sample of college students completed the scale, and also provided self-report data concerning exercise including number of weeks of exercising, frequency per week of exercise, minutes of exercise per session, and perceived intensity of exercise. Exercise identity scores showed a significant positive correlation with the four self-reported behavior indicators of exercise participation (number of weeks $r = .68$, frequency/week $r = .49$, minutes/session $r = .39$, and
intensity $r = .29$). Forty-seven percent of the variance in exercise identity was explained by these four behavioral indicators. Individual’s scoring higher on the exercise identity scale were more involved in exercise. Internal consistency of the Exercise Identity Scale was assessed using Cronbach’s reliability coefficient (alpha = 0.94). A single factor was displayed with factor loadings from .91 to .62. The test, re-test reliability was assessed over a one-week interval and displayed an alpha value of .93. Therefore, the Exercise Identity Scale was found to be a reliable and valid measure of salience of the role of exerciser (Anderson & Cychosz, 1994).

Holmquist (1997) measured exercise identity and wellness rejection identity, along with five exercise behavior measures among 1551 randomly selected home-office employees and 2000 randomly selected field employees of a large financial corporation in the midwest. Behavioral measures included self-report type of exercise, number of years of regular exercise, average number of minutes of exercise per session, average number of sessions per week, and the relative intensity of the performed exercise. Findings from a stepwise regression displayed a significant relationship between exercise identity scores and the behavior measure of minutes per week ($R^2 = .24$), with number of weeks, ($R^2 = .03$), and type of exercise ($R^2 = .01$), also contributing significantly. Approximately 28% of the variance in exercise identity was explained by the five behavioral measures. This study provides support to Anderson and Cychosz’s (1994) Exercise Identity Scale in that salience of exercise identity may be predictive of maintenance or expansion of exercise behaviors.

In another attempt to study the relationship between exercise identity and exercise behavior, Anderson, Cychosz, and Franke (1998) examined the relationship between exercise identity with age of subject, three dimensions of exercise behavior, three physiological
indicators of fitness, and total cholesterol/HDL ratio. Behavioral measures included minutes per week of exercise, number of weeks of exercise and perceived level of exertion.

Physiological indicators of exercise included standardized muscle endurance, standardized percent body fat, and standardized VO$_2$max. Data were collected from 448 law enforcement personnel of the State of Iowa’s Department of Public Safety. Findings showed that behavioral measures and physiological indicators were significantly associated with Exercise Identity. Behavioral measures had an independent $R^2 = .48$, and physiological measures an independent $R^2 = .23$. However, total cholesterol/HDL ratio was non-significant. These findings suggest that participation in physical activity and improvements in fitness may contribute to the development of role identity underlying maintenance and expansion of exercise.

Anderson, Cychosz and Franke (2000) continued to examine the relationship of exercise identity with measures of exercise behavior by using a community context. Data were collected from two samples of community residents via a telephone survey. The first sample consisted of worksites participating in the 5 + 5 Challenge health promotion program, with the second sample a control group of randomly selected community residents. The 5 + 5 Challenge program was a community-based intervention program which encouraged participants to eat five or more servings of fruits and vegetables daily, as well as participate in 30 minutes of physical activity five days a week. Results were consistent with previous findings, in that a significant relationship between exercise behavior and exercise identity was found ($R^2 = .27$). These results support the view that duration of participation and perceived intensity may be significantly associated with one’s exercise identity.
Miller, Ogletree and Welshimer (2002) examined the relationship of level of physical activity and the length of time of adherence to physical activity with physical activity identity (PAI) and physical activity self-efficacy (PASE). Data were collected from 409 employees at a midwestern university using four survey instruments, the Physical Activity Assessment Tool, the Exercise Identity Scale/Physical Activity Identity Scale, the Physical Activity Self-Efficacy Scale and a demographic data sheet. Anderson and Cychosz’s (1994) Exercise Identity Scale was modified to use the broader term “physical activity,” rather than “exercise,” therefore being referred to as Physical Activity Identity (PAI). Results indicated that PAI ($r = .58$) and PASE ($r = .56$) were significantly associated with level of physical activity. Respondents who reported that they were engaged in more vigorous activity scored higher on PAI and PASE. These data suggest that one’s physical activity level may have greater importance on predicting physical activity identity and physical activity self-efficacy than length of time of adherence to physical activity. “Because behaviors, identity and self-efficacy reinforce each other in a reciprocal manner, more vigorous activity could result in greater identification with and self-efficacy for physical activity, thus increasing the likelihood of adhering to physical activity program” (Miller, Ogletree, & Welshimer, 2002). These findings are consistent with studies by Anderson, Cychosz and Franke in which behavioral measures were statistically significant predictors of exercise identity. Therefore, if one has a strong identity for being a physically active person, one may thus be motivated to engage in behaviors consistent with that identity. These behaviors may then reinforce and strengthen the identity.

Cardinal and Cardinal (1997) examined the relationship between exercise behavior and exercise identity utilizing a sample of college aged women. Participants in the
experimental group attended aerobic exercise classes two days per week for one hour per session. Participants in the control group attended a non-exercise, health education course. Exercise behavior was assessed using Godin and Shephard’s (1995) self-report “Weekly Leisure Time Exercise Questionnaire.” Exercise Identity was measured using Anderson and Cychosz’s (1994) nine-item “Exercise Identity Scale.” Results showed that over a fourteen-week period participants in the experimental group increased both exercise behavior and exercise identity. However, those in the control group showed a decrease in exercise behavior while exercise identity remained the same. They also found that exercise identity scores at weeks one and seven were significant predictors of exercise involvement through week fourteen.

Vlachopoulos, Kaperoni, Moustaka, and Anderson (unpublished) translated Anderson and Cychosz’s (1994) Exercise Identity Scale into Greek and examined its cross-cultural validity. Three samples of Greek exercisers and non-exercisers (n = 33, 103, 647) and one sample of United States exercisers (n = 800) were utilized to examine the structural validity and reliability, cross gender and cross-cultural invariance, and construct validity of the Exercise Identity Scale. Results supported each of the constructs of the Exercise Identity Scale translated into Greek. Moreover, exercise identity scores were positively correlated with attitude toward exercise ($r = .47$), self-efficacy for continued exercise ($r = .38$), exercise enjoyment ($r = .30$), and intention for continued exercise involvement ($r = .39$). In addition, correlations of exercise identity with strenuous ($r = .59$) and moderate ($r = .47$) exercise were stronger than correlations between exercise identity and mild exercise ($r = .18$). These findings suggest exercises identity measured by the Exercise Identity Scale has been
extended to the Greek population and may be a useful tool in measuring exercise identity within and outside the United States.

All studies reviewed which examined the salience of the role identity of exercise consistently showed significant correlations between behavioral measures of exercise commitment and exercise identity. Anderson and Cychosz (1994) found a significant positive correlation between four behavioral indicators of exercise and exercised identity including number of weeks of exercise, frequency per week, minutes per session and intensity of exercise. Anderson and Cychosz (1995) studied two behavioral measures of exercise and reported that as minutes of exercise per week increase, level of exercise identity increases as well \( r = .58 \). Anderson, Cychosz, and Franke (1998) also showed that behavioral measures and physiological indicators were associated with exercise identity \( r^2 = .48 \) and \( .29 \), respectively. Anderson and Cychosz (1994, 1995) and Holmquest (1997) reported 47%, 35% and 31% variance in exercise identity explained by the behavioral measure of exercise commitment.

These findings suggest that exercise identity may be an important predictor of the maintenance and expansion of the role of exerciser. As one engages in behaviors associated with the role of exerciser, and the behavior is reinforced and validated, the likelihood of future behaviors associated with exerciser increases. In turn, the role of exerciser becomes increasingly important to one’s concept of self, and a predictor of future behavior. Therefore, a measure of exercise identity may aid in the development of better motivational strategies and improved fitness programming that could increase the likelihood of adoption and maintenance of exercise behavior and other health related behaviors as a meaningful lifestyle change.
CHAPTER 3: METHODS

Participants

Questionnaire data were collected from 112 members of a fitness center located in a rural community. Ninety-three percent of the initial respondents self-identified as Caucasian and 78% were female. Average age was 56 years with a range of 20 to 81 years. Respondents were from one of three groups: personal coaching (n = 19), group fitness (n = 9), and self-controlled exercisers (n = 58).

Personal Coaching

Individuals enrolled in personal coaching had contact with the coach once a week for twelve weeks via e-mail, phone, and/or personal contact. The coach assisted each individual in developing a fitness program to suit their wellness and fitness level, helped set personalized short-term and long-term goals, as well as provided instruction pertaining to aerobic exercise, strength training, and nutrition. Each meeting lasted 30-60 minutes in which the personal coach and client reviewed a food log and exercise log the client had kept, as well as discussed thoughts and feelings the individual had throughout the past week. The participant then set goals for the upcoming week. After the session was over, the individual was on his/her own until the following week’s meeting. Throughout the twelve weeks, personal coaching participants were allowed membership to the community hospital fitness center.

Group Fitness

Individuals in the group fitness group were members of a small, hospital-owned, fitness studio in a rural community, which provide group fitness classes. They paid a
monthly membership fee which allowed them to participate in unlimited classes throughout the month, or purchased a 10-punch card which allowed them to attend ten classes throughout a two month period. They also had the opportunity to purchase a yearly, unlimited membership. Classes were offered at various times throughout the day, Sunday through Saturday, and lasted 45-60 minutes per session. Classes offered included Spinning (stationary bicycling), step aerobics, yoga, Pilates, and power pump (a full body toning class). Each class was lead by an Aerobics and Fitness Association of America (AFAA) Primary Group Exercise certified instructor.

Self-Controlled Exercise

Individuals in the self-controlled exercise group were members of a rural community hospital fitness center. Members paid a six-month or yearly membership fee and were allowed unlimited access to the facility. The fitness center offered a variety of cardiovascular exercise equipment, strength training machines, and other equipment (stability balls, medicine balls, therabands, etc.) for individuals to use. Self-controlled exercisers were exercising on their own with no scheduled classes or groups sessions, and no instructor or coach to help motivate them.

Instruments

Exercise identity was measured using Anderson and Cychosz’s (1994) nine item Likert-type Exercise Identity Scale (EIS), which measures the extent that exercise is descriptive of one’s concept of self. The nine items were ranked on a scale ranging from (1) “strongly disagree” to (7) “strongly agree.” The items included statements such as: (a) “When I describe myself to other people, I usually include my involvement in physical exercise,” (b) “Physical exercise is a central factor to my self-concept,” (c) “For me, being an
exerciser means more than just exercising.” Internal consistency has been assessed using Cronbach’s reliability coefficient in numerous studies and has usually been found to display alpha-values greater than 0.90 (Anderson & Cychosz, 1994; Storer, Cychosz, & Anderson, 1997; Anderson, Cychosz, & Franke, 1998, 2001; Miller, Ogletree, & Welshimer, 2002, Vlachopoulos, Kaperoni, Moustaka, & Anderson, unpublished). Likewise, numerous studies have found that the nine-items usually load on a single factor. One-week test, retest reliability was found to display a value of 0.93 (Anderson & Cychosz, 1994), and six-week intra-class correlation coefficient was 0.99 (Vlachopoulos, Kaperoni, Moustaka, & Anderson, unpublished). The alpha coefficient for initial respondents on the Exercise Identity Scale was 0.93 and item-correlations ranged from 0.61 to 0.89. A principal components factor analysis displayed a single factor with an eigenvalue of 6.09 and factor loading ranging from 0.71 to 0.91. Post-test participants displayed an alpha value of 0.94 with a range of 0.70 to 0.85 for item-total correlations and the factor analysis once again revealed a single factor with an eigenvalue of 6.24 and factor loadings between 0.72 to 0.90 (Table 1).

Exercise stage was measured using a 5-item, dichotomous scale (yes/no) related to regular exercise behavior and intentions. Regular exercise was defined as three times per week for twenty minutes or longer each session (Marcus, Selby, Niaura, & Rossi, 1992). This measure was based on the Transtheoretical Model (TTM) of behavior change developed by Prochaska and DiClemente (1983). The model suggests that there are five unique stages of behavior change. The descriptions of the five stages and the number of participants at each stage are presented in Table 2. Because of the small number of participants in the first three stages, these stages of exercise were combined into one with 16 participants, the fourth
Table 1. Item Characteristics of the Exercise Identity Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Preprogram</th>
<th>Postprogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>I consider myself an exerciser.</td>
<td>.81 r_{it}</td>
<td>.87 Loading</td>
</tr>
<tr>
<td></td>
<td>.83</td>
<td>.89 Loading</td>
</tr>
<tr>
<td>When I describe myself to others, I usually include my involvement in exercise.</td>
<td>.77 r_{it}</td>
<td>.83 Loading</td>
</tr>
<tr>
<td></td>
<td>.82</td>
<td>.87 Loading</td>
</tr>
<tr>
<td>I have numerous goals related to exercising.</td>
<td>.68 r_{it}</td>
<td>.76 Loading</td>
</tr>
<tr>
<td></td>
<td>.62</td>
<td>.72 Loading</td>
</tr>
<tr>
<td>Physical exercise is a central factor to my self-concept.</td>
<td>.89 r_{it}</td>
<td>.92 Loading</td>
</tr>
<tr>
<td></td>
<td>.85</td>
<td>.90 Loading</td>
</tr>
<tr>
<td>I need to exercise to feel good about myself.</td>
<td>.65 r_{it}</td>
<td>.72 Loading</td>
</tr>
<tr>
<td></td>
<td>.70</td>
<td>.77 Loading</td>
</tr>
<tr>
<td>Others see me as someone who exercises regularly.</td>
<td>.86 r_{it}</td>
<td>.91 Loading</td>
</tr>
<tr>
<td></td>
<td>.83</td>
<td>.87 Loading</td>
</tr>
<tr>
<td>For me, being an exerciser means more than just exercising.</td>
<td>.77 r_{it}</td>
<td>.81 Loading</td>
</tr>
<tr>
<td></td>
<td>.76</td>
<td>.83 Loading</td>
</tr>
<tr>
<td>I would feel a real loss if I were forced to give up exercising.</td>
<td>.74 r_{it}</td>
<td>.81 Loading</td>
</tr>
<tr>
<td></td>
<td>.77</td>
<td>.84 Loading</td>
</tr>
<tr>
<td>Exercising is something I think about often.</td>
<td>.61 r_{it}</td>
<td>.71 Loading</td>
</tr>
<tr>
<td></td>
<td>.70</td>
<td>.79 Loading</td>
</tr>
</tbody>
</table>

On the basis of Nunnally’s criterion of .70, the Exercise Identity Scale demonstrated acceptable internal consistency each time.

stage, action, had 19 participants, while the fifth stage, maintenance, initially had 77 participants.

The seven point Likert-type scale was also utilized to examine respondents perception of several barriers to exercise. A 30-day recall of number of exercise sessions per week, minutes per session, type of exercise, and perceived intensity of exercise was obtained.
Table 2. Stages-of Change Items

<table>
<thead>
<tr>
<th>Stage</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>I currently do not exercise, and I do not intend to start exercising in the next 6 months.</td>
</tr>
<tr>
<td>Contemplation</td>
<td>I currently do not exercise, I am thinking about starting to exercise in the next 6 months. (n=4)</td>
</tr>
<tr>
<td>Preparation</td>
<td>I currently get some, but do not exercise regularly. (n=12)</td>
</tr>
<tr>
<td>Action</td>
<td>I currently exercise regularly, but I have only begun doing so within the last 6 months. (n=19)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>I currently exercise regularly, and have done so for longer than 6 months. (n=77)</td>
</tr>
</tbody>
</table>

Participants also reported whether or not they were members of the hospital fitness center, how often they use the facility, and if they were enrolled in a formal program. Perceived intensity was obtained by respondents reporting the level of exertion in an average exercise session ranging from (1) breathless, unable to talk, sweating (2) breathing heavily, sweating, (3) energetic, but able to talk, often sweat, (4) energetic but able to talk conversationally, rarely sweat, (5) rarely or never sweat, (6) not much different from other parts of my daily routine. The format for these items was consistent with several large scale epidemiologic investigations (Heath, Pate, & Pratt, 1993; Schechtman, Barzilai, Rost, & Fisher, 1991; Siconolfi, Lasater, Snow, & Carleton, 1985).

Participants provided a self-report of their present height and weight, as well as other demographic variables such as gender, date of birth, marital status, education, and
race/ethnicity. Subjects were also asked if they had a regular exercise partner, and if so, whether it was a spouse, co-worker or other friend. Previous athletic participation was also examined including athletic participation from childhood through adulthood. The complete instrument is provided in the Appendix.

**Procedures**

This investigation utilized a panel design that comprised assessment on two occasions. The two waves of data collection were separated by at least 12 weeks. This procedure resulted in a response attrition of 23 participants. Thus, final sample size was 89, with a follow-up response rate of 80%. An initial paper questionnaire, with an informed consent letter, was distributed to the group fitness and self-controlled groups when they attended class or enter the fitness center to exercise. Personal coaching participants were asked to complete the questionnaire upon inquiring about the program, prior to contact with their coach. Each personal coaching participant was taken through a fitness test. The test included height, weight, resting heart rate, blood pressure, circumference measurements, optional body fat percentage and sub-maximal treadmill test. Body mass index and waist to hip ratio were also reported based on measurements during the test. Group fitness and self-controlled groups performed a fitness test prior to membership and annually, thereafter. Throughout the twelve weeks, number of exercise sessions for each participant was monitored.

Upon completion of the 12-week program, personal coaching participants were given the same questionnaire as a post measurement. A post-questionnaire was also distributed to group fitness and self-controlled exercisers at this time.
To maintain anonymity, birthdate was used to match initial data to post data and to the fitness assessment data, as well as monitor exercise sessions per week. Procedures were approved by the hospital fitness center supervisor and hospital administration, as well as the Iowa State University Review Board on the Use of Human Subjects.
CHAPTER 4: RESULTS

The present investigation utilized a panel design that comprised the assessment of several variables over time. As indicated in the methods, the two waves of data collection were separated by 12 weeks. This procedure resulted in an attrition rate of 23 participants or 21%. As a result, most of the statistical analyses were based upon a sample size of 89.

As can be seen in the results presented in Table 3, 76% of the respondents to both surveys were female compared to 78% in the initial sample. Similarly, there was little difference in the racial distribution of respondents. The results also presented in Table 3 suggest that rate of dropping out of the investigation did not vary across the three participant groups ($\chi^2 = 1.90, p = 0.39$). This was not the same for exercise stage of the respondent. As could be expected, respondents that were initially in the earlier stages of exercise (contemplation, preparation, and action) were more likely to dropout ($\chi^2 = 7.70, p = 0.05$). Unfortunately, this reduced the proportion of respondents at these important exercise stages for the final analysis.

A MANOVA was performed comparing the respondents which dropped out to the participants that completed both surveys and gender with the dependent variables of initial exercise identity score and age. The interaction effect for group and gender was not statistically significant. However, the main effects for group ($F(2,109) = 5.21, p = .007$) and gender ($F(2,109) = 11.59, p < .001$) were significant. Examination of the univariate results indicated that initial exercise identity score was significantly associated with dropping out ($F(1,108) = 10.43, p = .002, \eta^2 = 0.09$) but not age, while gender was significantly associated with age ($F(1,108) = 21.63, p < .001, \eta^2 = 0.17$) but not initial identity score. As would be
Table 3. Demographics of study sample.

<table>
<thead>
<tr>
<th></th>
<th>Pre (n=112)</th>
<th>Post (n=89)</th>
<th>Drop Outs (n=23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>78%</td>
<td>75%</td>
<td>93%*</td>
</tr>
<tr>
<td>Caucasian</td>
<td>93%</td>
<td>95%</td>
<td>93%</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Contemplation</td>
<td>3.4%</td>
<td>3.5%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Preparation</td>
<td>10.3%</td>
<td>7.1%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Action</td>
<td>17.1%</td>
<td>14.1%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>69.2%</td>
<td>75.3%</td>
<td>48.2%</td>
</tr>
<tr>
<td>Group Fitness</td>
<td>24.8%</td>
<td>22.4%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Personal Coach</td>
<td>12.0%</td>
<td>10.6%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Self-Controlled</td>
<td>62.4%</td>
<td>67.1%</td>
<td>53.8%</td>
</tr>
</tbody>
</table>

expected, the mean value for initial exercise identity score for the group of respondents dropping out of the program was significantly lower (39.33) than the mean value (46.91) for participants that completed both surveys. However, even the mean score for dropouts was above the middle score possible and appears to be higher than mean scores for nonexercisers reported by Anderson, Cychosz, and Franke (2001).

Although gender and age were related, a correlation analysis indicated that age and initial exercise identity score were not ($r=0.21$, $p=0.82$). The mean age for respondents to both surveys was 52 years. This sample of fitness center participants appears to be relatively old. Thirty-six percent of the participants were 60 years or older while almost 17% were 70 years or older. The preprogram mean exercise identity score for respondents to both surveys that were 50 years old or older was 46.7. The mean scores among exercisers for this age group in the two samples studied by Anderson, Cychosz, and Franke (2001) were only 36.5 and 42.8.
A one-way MANCOVA was utilized to test the effects of participant group upon participant’s total number of exercise sessions over the 12-week program and post-program exercise identity score, while controlling for initial exercise identity score. With the use of Wilks’ criterion, results showed that the combined dependent variables were significantly related to the covariate of initial exercise identity score ($F(2,81) = 66.11, p < .001$), and the association was large ($\eta^2 = 0.62$). After adjustments for the covariate, results indicated that there was no statistically significant participant group effect ($F(4,162) = 1.77, p = 0.14$) on the combined dependent variables, and the association was small ($\eta^2 = 0.04$).

Univariate tests indicated that both of the dependent variables were significantly related with the covariate. Initial exercise identity score was significantly related to post-program exercise identity score ($F(1,82) = 133.20, p < .001$) and the association was large ($\eta^2 = 0.62$). Likewise, initial exercise identity score was significantly related to participant’s total number of exercise sessions over the 12-week program ($F(1,82) = 10.64, p = .002$) but the association was less ($\eta^2 = 0.12$). Means and standard deviations for the covariate and dependent variables by participant group are presented in Table 4. Examination of the means suggests that any differences in exercise identity score that may have existed at the start of the program still existed with little change after 12-weeks. Initially, the highest mean exercise identity score (52.58) was found for participants in the group fitness classes while the lowest mean exercise identity score (32.00) was found for the participants in the personal coaching group. This trend still existed twelve weeks later. Examination of means for total number of exercise sessions showed that the participants in the general membership group had the lowest mean for total number of exercise sessions (36.98), about three sessions per week, while the participants in the group fitness classes had the highest mean for total number of
Table 4. Means and standard deviations for PreID, PostID, and total number of exercise sessions by participant group.

<table>
<thead>
<tr>
<th>Group</th>
<th>PreID</th>
<th>PostID</th>
<th>Total Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Group Fitness (n=20)</td>
<td>52.6</td>
<td>8.7</td>
<td>52.9</td>
</tr>
<tr>
<td>Personal Coaching (n=10)</td>
<td>32.0</td>
<td>15.8</td>
<td>33.6</td>
</tr>
<tr>
<td>Self-Controlled (n=59)</td>
<td>47.4</td>
<td>12.3</td>
<td>46.6</td>
</tr>
<tr>
<td>Total (n=89)</td>
<td>46.9</td>
<td>13.1</td>
<td>46.6</td>
</tr>
</tbody>
</table>

exercise sessions (49.63), about four sessions per week. The standard deviations for total number of exercise sessions appeared to be quite large, usually equal to at least half of the mean value.

A one-way MANCOVA was also utilized to test for effects of initial stage of exercise upon participant’s total number of exercise sessions over the 12-week program and post-program exercise identity score, while controlling for initial level of exercise identity score. It should be remembered that 77% of the participants had indicated that they were in the maintenance stage of exercise, “currently exercise regularly, and have done so for longer than six months.” We have previously shown that the covariate, initial exercise score was significantly associated with the two dependent variables. After adjustments for the covariate, results indicated that there was no statistically significant exercise stage effect $F(4,162) = 1.77, p = .14$. Means and standard deviations for the covariate and dependent variables by exercise stage are shown in Table 5. Examination of the means once again
Table 5. Means and standard deviations for PreID, PostID, and total number of exercise sessions by exercise stage.

<table>
<thead>
<tr>
<th>Exercise Stage</th>
<th>PreID</th>
<th>PostID</th>
<th>Total Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Preparation (n=10)</td>
<td>24.4</td>
<td>13.4</td>
<td>25.8</td>
</tr>
<tr>
<td>Action (n=13)</td>
<td>43.0</td>
<td>9.3</td>
<td>44.9</td>
</tr>
<tr>
<td>Maintenance (n=66)</td>
<td>50.8</td>
<td>10.0</td>
<td>49.5</td>
</tr>
<tr>
<td>Total (n=89)</td>
<td>46.9</td>
<td>13.1</td>
<td>46.3</td>
</tr>
</tbody>
</table>

suggests that any differences in exercise identity score that may have existed at the start of the program still existed with little change after 12-weeks. As could be expected, participants in the preparation stage of exercise displayed the lowest mean in initial exercise identity score (24.44) while participants in the maintenance stage of exercise displayed the highest mean exercise identity score (50.80). Similar mean values, 25.78 and 49.50, were found for post-program exercise identity scores. As could also be expected, the participants in the preparation stage of exercise showed the lowest mean value for number of exercise sessions (23.50), about two sessions per week while the participants in the maintenance stage of exercise displayed the highest mean value in total number of exercise sessions (44.76), almost four sessions per week. Once again, the standard deviations for total number of exercise sessions appeared to be quite large.
CHAPTER 5: DISCUSSION

The purpose of this investigation was to examine changes in exercise identity among three groups of exercisers by measuring the reciprocal relationship between exercise identity salience and exercise behavior. It is important to note that at the time of the initial survey, 75% of the participants indicated that they were in the maintenance stage of exercise, meaning they were exercising regularly and had been for longer than six months. Another 14% indicated they were in the action stage of exercise, as they were currently exercising regularly but had only begun doing so within the last six months. The remaining 11% of the study participants were not exercising regularly at the initiation of data collection, placing them into the contemplation or preparation stages of exercise. This seems to be reflected in differences for initial exercise identity scores by exercise stage. As would be predicted, mean value for preprogram exercise identity score (24.4) for the small number of participants in the contemplation or preparation stages was very similar to the norm values for nonexercisers reported by Anderson, Cychosz, and Franke (2001) for two similar samples, law enforcement employees and corporate employees. Mean preprogram exercise identity score value for the small group of participants in the action stage (43.0) appears higher than participants in the contemplation or preparation stages and was similar to the norm values for exercisers reported by Anderson, Cychosz, and Franke (2001). Finally, mean preprogram exercise identity score value for participants in the maintenance stage was the highest mean for initial exercise identity score (50.80) and was also higher than the norm values for exercisers reported by Anderson, Cychosz, and Franke (2001). This higher mean value for initial exercise identity is possibly a reflection of their longer history of exercise, longer than six months. As a result, the overall mean value for initial exercise identity score for the total
sample was slightly above the norm values for exercisers in the samples studied by Anderson, Cychosz, and Franke (2001). These data seem to indicate that at the start of this study, a large proportion of participants in this investigation already had relatively high exercise identity scores clearly reflecting their history of regular exercise.

This discussion relating to initial exercise identity scores is important because the MANCOVA results clearly indicate the importance of initial exercise identity score for explaining the outcome variables of post-program exercise identity score and total number of exercise sessions participated in during the 12-week program. Initial exercise identity score explained 62% of the variance in post-program exercise identity score and 12% of the variance in total number of exercise session participated in.

Cardinal and Cardinal (1997) also found that exercise identity score at weeks one and seven were significant predictors of exercise involvement through week fourteen. Likewise, Vlachopoulos et al. (unpublished) found a six-week intra-class correlation coefficient of 0.99 in their Greek sample. These results also appeared to indicate that type of exercise program and stage of exercise were not significantly associated with these two outcome variables. However, because of the large standard deviations found, one should not completely rule out the possibility of differences in mean initial and post program exercise identity scores or total number of exercise sessions for participants at the different stages of exercise.

The same may also apply for differences across the exercise groups. The exercise group participants with regularly scheduled exercise sessions with an exercise leader displayed the highest mean value for both initial and post-program exercise identity scores as well as the total number of exercise sessions over the 12-week program. It appears that total number of exercise sessions was less in the personal coaching and self-scheduled exercisers.
Possibly, this is the result of a lack of a specific exercise class schedule. It appears that having a specific day and time of day scheduled for an exercise class or that one has paid an additional amount for this exercise class may enhance the likelihood that one will exercise regularly at that time.

Results appeared to be inconsistent with findings by Cardinal and Cardinal (1997), such that an increase in exercise behavior and exercise identity was demonstrated throughout a 14-week intervention. However, the sample was much younger, consisting of college women, 18-52 years of age (M = 27.3). The women reported lower initial exercise identities (M = 28.0), as well as lower initial exercise behavior. Thus 66% of the exercise sample was categorized as unfit and not regular exercisers prior to intervention, whereas in the sample studied here, a large percentage of group fitness and self-scheduled exercisers had already developed a pattern of regular exercise over a six month period, as evidenced by their exercise stage and exercise identity score.

Cardinal and Cardinal (1997) also demonstrated similar findings in that participants in the exercise group were enrolled in an aerobic exercise class, with students attending class twice a week. Thus, as with the group fitness participants in this study, exercise was regularly scheduled at a specific time and day. In this study, participants in group fitness demonstrated the highest mean exercise identity score and the highest mean for total exercise sessions. In the Cardinal and Cardinal (1997) investigation, exercisers attending structured aerobic classes reported higher exercise identity and exercise behavior than non exercisers. Again, this suggests a regular scheduled time may increase the likelihood one will exercise.

It is important to note this sample may be somewhat unique. As reported previously, respondents in the sample were older with a mean age 52 years, with 36% of participants
older than 60 years, and nearly 17% over the age of 70. It is possible that in this community, this fitness center attracts elderly exercisers. The college in this community houses its own facility for college students, faculty, and staff. Also, high school students and school employees may utilize school facilities. In addition, the fitness center is connected to the community hospital, and has cardiac and pulmonary rehabilitation located within the fitness center. Rehabilitation graduates are encouraged to continue exercising to improve health and prevent reoccurring episodes, and are referred to the fitness center for continued supervised exercise. Thus, a large percentage of participants in this study may have experienced a cardiac event. This may provide insight into the high initial mean exercise identity among this sample. Participants having experienced an event may report high exercise identities simply because they are able to exercise. Intensity, frequency, and duration may not be as important contributing factors to exercise identity of this particular sample as previous research has indicated. Miller and Ogletree (2002) suggested vigorous exercise was correlated with high physical activity identity, and Vlachopoulos et al. (unpublished) suggested strenuous and moderate exercise demonstrated stronger correlations with exercise identity than mild exercise, but the people studied in this investigation were younger. The exercise identity of this unique sample may be better explained from a social psychological view, in that participants are encouraged by others to exercise, as well as to prevent a further cardiac event from occurring.

Even though the mean value for total number of exercise sessions was at or above the minimum recommendation of at least three sessions per week, no statistically significant change over the 12-week period in exercise identity score was seen. Regardless of the type of program, and exercise experiences provided these participants, significant increases in
exercise identity scores were not noted. This means that merely exercising was not enough or that a 12-week program was not long enough to produce significant changes in the salience of one’s role identity as an exerciser. These results suggest that one may need to implement intervention programs which are specifically targeted at mechanisms which may clearly and positively connect behavior (exercise) and role identity of exerciser.
Exercise and Fitness Survey

Your feedback is valued and greatly appreciated. All information is confidential. Please answer all questions, however you may skip any question(s) you do not feel comfortable answering. Do not place your name on the survey. Thank you for your time!
Dear Participant:

We are conducting this research investigation in order to gain a clearer understanding of exerciser motivation and behavior. As members of Paul W. Ahrens Fitness Center and Fly High Fitness Studio, we are requesting your participation in a study that is concerned with exercise behavior and feelings toward exercise. Your openness and cooperation are extremely important and greatly appreciated. The results of this study are expected to yield a better understanding of our members and of possible ways we may enhance the effectiveness of our program in helping you reach your health and fitness objectives.

The study consists of two parts. You will be asked to complete an initial survey and then complete a 12-week post survey. Your most recent fitness test results will be utilized to measure your fitness level. Your number of visits to Paul W. Ahrens Fitness Center and Fly High Fitness Studio will also be documented throughout the 12-week study.

We ask that you complete this questionnaire, which should take no longer than 10 minutes. There are no known physical or psychological risks associated with completing this survey, however, some questions may be considered sensitive. You may skip any questions you do not feel comfortable answering. Your participation is completely voluntary, and you may discontinue the survey at any time. Your name will not appear on the questionnaire, and you may be assured of complete confidentiality. Individual responses will not be identified or reported. Your birth date will be used to match the two survey and your fitness test results, as well as document your exercise sessions each week. Once all information is matched, all birth dates will be removed from the data base. The published results will not refer to any individual and all discussions will be based on group data.

You are encouraged to ask questions at any time before or during this investigation. If you have any questions, please contact Heather Dillman, Wellness Specialist at (641) 236-2999 or stoakesh@iastate.edu or Dr. Dean Anderson, professor of Health and Human Performance at Iowa State University, at (515) 294-3427. If you have any questions about the rights of research subjects, please contact the Human Subjects Research Office, Jan Canny, 1138 Pearson Hall, Ames, Iowa, 50011, (515) 294-4566; jcs1959@iastate.edu, or Diane Ament, Director of Research Assurances, (515) 294-3115; dament@iastate.edu. Thank you for assistance with this research.

Sincerely,

Heather Dillman
(641) 236-2999
stoakesh@iastate.edu

Dr. Dean F. Anderson
(515) 294-3427
deanf@iastate.edu
207 Forker Bldg
A. Please place an (x) on the line that best describes your present behavior. “Regular exercise” equals three or more days per week for 20 minutes each day (e.g. swim, walk). Mark only one of the five statements about your exercise behavior.

____ I presently exercise on a regular basis and have been doing so for longer than 6 months.
____ I presently exercise on a regular basis, but I have only begun doing so within the past 6 months.
____ I presently get some exercise, but not regularly.
____ I presently do not exercise, but I have been thinking about starting to exercise within the next 6 months.
____ I presently do not exercise and do not plan to start exercising in the next 6 months.

B. If yes, what types of exercise are involved?

___ Walking  ___ Steps
___ Running   ___ Nordic Track
___ Lifting    ___ Bike
___ Swimming   ___ Other (rowing, etc.) ____________________

C1. Do you use the hospital fitness/wellness center? ________Days/week
C2. How long have you been a member? _________________ Years

D. Are you enrolled in a formal exercise program?

____ Group Fitness
____ Personal Coaching
____ Fitness center membership

E1. What percentage of your coworkers do you think have exercised regularly for at least the past month? ______ %
E2. What percentage of your friends do you think have exercised regularly for at least the past month? ______ %

F. If you exercise regularly, please indicate the percentage of time you exercise alone and with others.

___ % alone    ___ % with others    ___ Does not apply

G. Please estimate your average exercise pattern for the last thirty days.

An average of _____ exercise sessions per week.
An average of _____ minutes per session of workout time.

H. Please check off the level of exertion which best describes your average exercise session:

____ Breathless, unable to talk, sweating
____ Breathing heavily, sweating
____ Energetic but able to talk, often sweat
____ Energetic but able to talk conversationally, rarely sweat
____ Rarely or never sweat
____ Not much different from other parts of my daily routine

Date of birth ______/______/______
**IIA. Directions**: Please circle the number which best describes your personal opinion. For each item indicate on a scale from (1) likely to (7) unlikely, how you feel. Please answer all the questions and do not make more than one mark per item.

### (1) My exercise is or could be prevented by: Likely

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<th>4</th>
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<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>A. lack of time</td>
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<td>B. injuries or soreness</td>
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<td>C. my work schedule</td>
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<td>D. family responsibilities and/or children</td>
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<td>E. unsuitable weather</td>
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<td>F. lack of facilities or equipment</td>
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<td>G. lack of desire or interest</td>
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<td>H. lack of energy</td>
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<td>I. lack of enjoyment</td>
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<td>J. a preference to do other things with my time</td>
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<td>K. lack of self-discipline</td>
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<td>L. confusion regarding the use of training techniques</td>
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<td>M. lack of someone to exercise with</td>
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<td>N. confusion in choice of shoes or other equipment</td>
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<td>O. not knowing how to avoid injuries</td>
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<td>P. the cost of participating</td>
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### (2) My exercise activity is supported by: Likely

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<tbody>
<tr>
<td>A. my spouse or loved one</td>
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<td>B. my children</td>
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<td>C. my friends</td>
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<td>D. my physician</td>
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<td>E. my co-workers</td>
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<td>F. my employer</td>
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### (3) My motivation to exercise is influenced Likely

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<tbody>
<tr>
<td>A. a desire to lose weight</td>
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<td>B. a desire to get in shape</td>
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<td>C. a desire to improve my cholesterol level</td>
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<td>D. a desire to relieve tension or stress</td>
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<td>E. a desire to improve or maintain health</td>
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</table>
### IIB. Directions: The following questions ask you to describe yourself and how you feel. Please circle the number which best describes your personal opinion. For each item indicate on a scale from (1) strongly disagree to, (7) strongly agree.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
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</thead>
<tbody>
<tr>
<td>A. I consider myself an exerciser.</td>
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<tr>
<td>B. When I describe myself to other people, I usually include my involvement in physical exercise.</td>
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<tr>
<td>C. I have numerous goals related to exercising.</td>
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<tr>
<td>D. Physical exercise is a central factor to my self-concept.</td>
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<td>E. I need to exercise to feel good about myself.</td>
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<td>F. Other people see me as someone who exercises regularly.</td>
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<td>G. For me, being an exerciser means more than just exercising.</td>
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<tr>
<td>H. I would feel a loss if I were forced to give up exercising.</td>
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<tr>
<td>I. Exercise is something I think about often.</td>
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</table>

### IIC. Directions: The next three questions ask about your satisfaction level. Please circle the number which best describes your personal opinion. For each item indicate on a scale from (1) not at all satisfied to, (7) very satisfied.

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Very</th>
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<tbody>
<tr>
<td>(1) How satisfied are you with your current level of exercise?</td>
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<tr>
<td>(2) How satisfied are you with your current physical condition/fitness level?</td>
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<tr>
<td>(3) How satisfied are you with your current health?</td>
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</table>
III.

A. Sex:    Male ______  Female ______

B. Age: ______

C. Please estimate your:  Height _______ Weight _______

D. Currently are you? _____ Married      _____ Single      _____ Divorced      ____Other

E. Do you have any medical problems which keep you from exercising?
   ___ No   ___Yes: (Identify) _______________________________

F. Race/Ethnicity (Circle one)
   (a) White, not of Hispanic Origin. Persons having origins in any of the original people of Europe.
   (b) African-American. Persons having origins in any of the Black racial groups of Africa.
   (c) Asian or Pacific Islander. Persons having origins in any of the original people of the Far East, Southeast Asia, Indian Subcontinent, or the Pacific Islands.
   (d) Middle Easterner or North African.
   (e) American Indian or Alaska Native. Persons having origins in any of the original peoples of North America.
   (f) Hispanic. Personal of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of language
   (g) Other: ____________________________

G. Please mark the highest education level complete:
   ___ Elementary-8th grade
   ___ High School
   ___ Community College (Associate Degree)
   ___ College/University (BA, BS)
   ___ Graduate School (MS, MBA)
   ___ PhD, MD, JD, DO, DVM, or equivalent
   ___ Other ___________________________

H. Please identify the:
   Interscholastic sports you participated in high school __________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
   Intercollegiate sports you participated in during college __________________________________
   ______________________________________________________________________________
   ______________________________________________________________________________
REFERENCES


Psychology Quarterly, 91(54), 239-251.


