ABSTRACT


This study investigated the effects of rewards on the intrinsic motivation of exercisers (E) and nonexercisers (NE). Furthermore, this study investigated the effects of fitness testing on the intrinsic motivation of E and NE. 73 female volunteers completed 2 fitness tests and the Intrinsic Motivation Inventory (IMI). The IMI is an instrument that divides intrinsic motivation into 4 subscales: interest-enjoyment (IE), perceived competence (PC), effort-importance (EI), and pressure-tension (PT). The subjects were classified as E and NE and subsequently randomly divided into reward and no reward groups. A 2 (E, NE) X 2 (reward, no reward) ANOVA revealed that there was no significant difference between the reward and no reward groups on any subscale (F = .53; p ≥ .05). However, there was a significant difference between the E and NE on 3 (IE, PC, and PT) of the 4 subscales (F = 23.72; p ≤ .001). No interaction effect was revealed for the E and reward groups. These data point to the fact the E and NE are intrinsically motivated differently. Because perceived competence can effect intrinsic motivation, education and familiarity may be important factors when using fitness tests to motivate NE.
THE EFFECTS OF REWARDS ON INTRINSIC MOTIVATION OF EXERCISERS AND NONEXERCISERS

A THESIS PRESENTED TO THE GRADUATE FACULTY UNIVERSITY OF WISCONSIN—LA CROSSE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE

BY ELIZABETH TALLY DECEMBER 1993
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CHAPTER I
INTRODUCTION

The U.S. Department of Health and Human Services stated two goals for the year 2000. They were to increase moderate daily physical activity to at least 30% of the population (a 36% increase), and to reduce sedentary lifestyles to no more than 15% of the population (a 38% decrease) (U.S. Department of Health and Human Services, 1990). Two major problems found with meeting these goals were: 1) developing strategies to ensure that those who began regular exercise stayed with it and 2) finding ways to entice inactive people to begin regular physical activity.

Background

Close to one third of all adults participate in exercise on a weekly basis, while 41-51% of adults are sedentary. The lack of physical fitness caused by sedentary habits leads to a much more restricted lifestyle and quality of life (Knadler, Rogers, Mitchell, & Blair, 1987). The person with low exercise capacity is not able to enjoy vigorous leisure time pursuits with family and friends and is limited in the performance of household and occupational tasks as well (Knadler et al., 1987).

However, surveys show that very high percentages of the public report positive attitudes about exercise and health
(Knadler et al., 1987). Although a high percentage of the public have positive attitudes about exercise and health, approximately 50% still drop out within the first 6 months upon entering an exercise program (Biddle & Smith, 1991; Custer & Doty, 1992; Dishman, Ickes, & Morgan, 1980). Dishman and Gettman (1986) stated some discriminating variables between exercisers and dropouts or nonexercisers. These discriminating variables were self-motivation, body fat, and body weight. Biddle and Smith (1991) stated that preprogram screening may help those adults who are more prone to dropping out when starting an exercise program. Preprogram screening may involve the use of questionnaires and fitness tests. One of the purposes of fitness testing stated by the American College of Sports Medicine (1991) is to motivate participants by establishing reasonable and attainable fitness goals.

Participants who engage in regular physical activity, without any extrinsic motivation such as fitness testing, seem to be self-motivated, well educated, and have the behavioral skills to plan an exercise program (Dishman, Sallis, & Orenstein, 1985). Dishman (1982) defines self-motivation as a "generalized nonspecific tendency to persist in habitual behavior regardless of extrinsic reinforcement and is thus largely independent of situational influences".
Barriers

Active people tend to expect and believe that they receive personal health benefits from exercise (Dishman et al., 1985), while sedentary people have certain perceived barriers that are major detriments of adherence to exercise. Some of the perceived barriers are that exercise takes too much time, creates a tired feeling, or that exercise will be unpleasant (Sonstroem, 1982). Other perceived barriers have been work, schedule conflicts, program inaccessibility, or lack of proper facilities (Sonstroem, 1988).

Harris (1970) found that the beliefs and attitudes of a "sedentary-made-active" group shifted during a year long exercise program and approached those beliefs and attitudes held by a volitionally active group. In Harris's study, he made no attempt to change target beliefs but after a year of behavior change Harris found a change in two beliefs: the first was the physiological value of exercise and the second was about the subjects' physical ability to participate in vigorous activity.

Company Motivational Tactics

Companies are trying to have their employees overcome those perceived barriers by developing strategies to motivate them to exercise. To encourage regular physical activity, 1500 major companies implemented employee fitness programs which saved them about 37% in health related costs, according to a survey conducted by the Health Research
Institute (Yenney, 1986). Companies save in health care costs because employees are becoming more physically fit, fewer work days are lost because of personal problems, and there are lower insurance rates because of decreased medical care costs. A statement by Peter Soderberg, President of Johnson and Johnson HMI quotes, "Our research time and again confirms the benefits of healthier, fitter employees. They have fewer and lower long-term medical claims, they are absent less, their disability costs are much lower, and their perceived personal productivity and job/life satisfaction levels are higher." (Luneau, 1992)

Realizing the benefits associated with healthier employees, companies are trying to entice their employees to become active in their fitness programs by providing extrinsic motivation through the use of rewards. In the past and present, companies have used rewards to improve work performance, increase sales, reduce accidents or waste materials, and/or reward loyalty (Yenney, 1986). They are now extending the use of rewards to encourage good health habits as well (Yenney, 1986).

**Rewards with Fitness Testing**

The types of rewards that are being used to encourage good health habits range from personal recognition to health care benefits. A recent study examined the practice of giving financial rewards for fitness test performance, and the effects of such rewards on the intrinsic motivation to
participate in future physical activity (Prong, Rutherford, & Corbin, 1992).

Their findings and many others fail to support the practice of offering rewards to enhance the intrinsic motivation associated with fitness tests and activities. One main reason stated is that there is such a high failure rate with these types of fitness tests. From a young age, those individuals who are not in the elite category for performance are not receiving rewards (Ryan, 1982). This is thought to be producing the opposite effect to the one intended.

Effectiveness of Rewards

Research of the effectiveness of these extrinsic rewards shows that other factors may be involved in exercise motivation. Biddle and Smith (1991) state that extrinsic motivational strategies are appropriate until such individuals can develop intrinsic motivation for exercise. As stated by Prong et al. (1992) low fit individuals need to be given every consideration with respect to the achievement of rewards and rewards should recognize participation and not performance.

Previous research has not examined both exercisers and nonexercisers in the fitness testing environment to see the effect of rewards on their intrinsic motivation. Research in this area is needed to see if in fact there is a
difference between exercisers and nonexercisers intrinsic motivation.

**Statement of the Problem**

Prong et al. (1992) study only looked at males when observing the practice of giving financial rewards for fitness test performance and the effects of such rewards on their intrinsic motivation. Additionally, research has not studied the effects of rewards on exercisers and nonexercisers.

**Purpose of the Study**

The purpose of this study was to examine the effect of extrinsic rewards on intrinsic motivation of 73 female subjects through the use of an Intrinsic Motivation Inventory (IMI). Additionally, this study investigated the differences in the intrinsic motivation between exercisers and nonexercisers when performing fitness tests.

**Hypotheses**

The hypotheses for this study were:

1. There will be a significant difference in intrinsic motivation between exercisers and nonexercisers on the IMI.
2. There will be a significant difference in intrinsic motivation between the nonexercisers reward and no reward group on the IMI.
Assumptions

The following assumptions were made in this study:

1. Subjects responses on the IMI were honest and valid.
2. Each subject performed to their maximal effort when performing the 60 second curl-up test and the 30 second modified Wingate bicycle test.

Limitations

The following limitations were present in this study:

1. This study was limited to female subjects.
2. The subjects were volunteers from a general education wellness class at the University of Wisconsin-La Crosse.

Delimitations

The following delimitations were present in this study:

1. This study incorporated both exerciser and nonexercisers.

Definition of Terms

Exerciser - an individual who exercises at least three times per week for at least 20 minutes per session (American College of Sports Medicine, 1991).

Extrinsic Motivation - external events causing an external locus of causality (Ryan, 1982).

Intrinsic Motivation - the amount of time individuals voluntarily spend at an activity during their free time (Deci & Ryan, 1985).

Nonexerciser - an individual who has exercised one or less times per week for the last 6 months.
Rewards - incentives designed to entice people to action (Yenney, 1986). In this study rewards were operationalized as a $5 incentive.

Self-Motivation - conceptualized as a generalized nonspecific tendency to persist in the absence of extrinsic reinforcement and is largely independent of situational influence (Sonstroem, 1988).

Wingate Anaerobic Bicycle Test - a 30 second power bicycle test that, for the purposes of this study was modified by decreasing the assigned workload (Lamb, 1984).
CHAPTER II
REVIEW OF LITERATURE

Introduction

Many health promotion professionals and human resource managers recognize that in order to obtain maximum payoff from efforts to encourage good health and safety habits, visible support for such habits must be integrated into company policies and practices (Yenney, 1986), (i.e., if a health promotion program encourages employees to follow a prudent diet, something other than sweets and high sodium snacks must be available during working hours). The following subsections are contained in this review of literature: disease, benefits of worksite exercise programs, company examples of exercise programs, types of incentives, adverse effects of rewards, drop-out rates associated with exercise, and self-motivation.

Disease

It is apparent that there is a considerable health benefit associated with moderate levels of exercise, although the precise intensity and amount of exercise required for preventing premature morbidity or death is not known specifically (American College of Sports Medicine, 1991). According to the American College of Sports Medicine, many sedentary individuals would be healthier if
they simply took a brisk walk for 30 to 60 minutes every other day.

Sedentary living and low physical fitness are linked with high disease rates (Knadler et al., 1987). Some of the diseases stated by Knadler et al. (1987) associated with little exercise and low levels of fitness include hypertension, obesity, cancer, and coronary heart disease. Sedentary living is a risk factor that has important economic implications for society. Heart attacks are expensive to the individual, employees, and society together. Cardiovascular disease accounts for $72.1 billion in medical care costs and lost productivity each year and is the leading cause of death in the United States and most of the developed world (American College of Sports Medicine, 1991).

Benefits of Worksite Exercise Programs

Research for the past few years has focused on the ways exercise affects fitness, other physiological indicators of health (e.g., smoking, blood lipids, and psychosocial factors), job performance and satisfaction, absenteeism and turnover, and medical and health care costs. Especially important to employers is the increase in studies directed at identifying the relationship between worksite exercise programs and "bottom-line" variables (Knadler et al., 1987). Following are a few examples by Knadler et al. (1987) of successful programs for each variable. Modest differences
in absenteeism were shown between intervention and control employees among Canadian Life employees. "High adherent" participants experienced an almost 50% drop in average absenteeism relative to the year prior to the fitness program. The New York State Education Department showed a net reduction of 4.7 hours of sick leave per employee per year and for Prudential employees, a 20.1% reduction in average disability days was seen for one group of program participants.

Most studies report the short-term effects of the worksite program on medical care costs. The Canadian Life program, showed that the total cost for medical care increased by 35% in a control company but only by 1% at Canadian Life. High-adherent participants at Canadian Life actually showed a 5% reduction in their medical care costs from the year before to the year following introduction of the program.

The H-E-B Independent School Districts reported an average $253.42 reduction in medical care costs for the comprehensive program participants, while the randomly assigned control group averaged a $6.62 increase in medical care costs during the experimental period. Some examples of successful long-term medical care studies are the Los Angeles County Firefighters and the Blue Cross and Blue Shield of Indiana. The Los Angeles County Firefighters showed a 45% reduction in workers' compensation costs per
$100 of payroll during the first 10 years of their program. The Blue Cross and Blue Shields differences in discounted average medical care costs were $519.09 between one group of participants and a nonparticipant control group. For every $1.00 in medical care costs spent on participating employees, $1.73 was spent on nonparticipating employees.

**Company Examples**

Roberts and Harris (1989) stated that while many people look at the money-saving aspect of worksite programs, most successful wellness programs started for other reasons than saving money.

Following are some examples of companies that have been very successful with using various incentives. Jess Bell, president of Bonne Bell brought the spirit of fitness to the company. He encouraged employees to ride bikes to work and arranged for them to purchase bikes at cost. In 1976 Bonne Bell began its first official fitness program, building volleyball and tennis courts, a track, showers, and locker facilities. The company also constructed exercise rooms at both of its office locations in Ohio. Bonnie Bell set up generous incentives to keep employees interested. Workers could use the facilities, they could take an extra 30 minutes at lunch if they wanted to exercise, and workout clothes are acceptable attire after lunch. Employees can also purchase running suits and shoes at discount prices. Bonne Bell's newest incentive promises a check for $250 to
employees who exercise 4 days a week from January to June (Roberts & Harris, 1989).

Laser Craft in Santa Rosa, California uses a low-cost but effective incentive for participants. They give gift certificates for the winners of a weight loss program. Of the 168 employees in the company, 80 have participated in the program with a total weight loss of 300 pounds (Yenney, 1986).

L.L. Bean rewards the physically fit by giving long-sleeved t-shirts to those who logged 200 miles for the running club. To those special classes which cost $20 or less, gift certificates were given to those who attended 80% of the classes. The employees of L.L. Bean could learn about lower-back-pain on company time, and for those employees who wanted to study stress reduction or first-aid, L.L. Bean split the cost (Roberts & Harris, 1989).

Newman’s Computer Exchange employees in Ann Arbor, Michigan know they don’t have to get sick to benefit from the company’s sick leave policy. Newman’s employees are eligible for 2 weeks sick leave each year, but if they do not use it, they can receive the equivalent in cash. Newman also has other incentives to encourage good health among the employees.
Types of Incentives

The same type of incentive may be used for different purposes. Yenney (1986) categorized incentives to encourage healthy lifestyles in businesses in the following ways:

1. Corporate policies and practices
2. Facilities and equipment
3. Personal recognition
4. Tangible rewards
5. Teams/competitions
6. Health care benefits

Examples of corporate policies and practices are bringing programs to the worksite, scheduling activities conveniently, granting paid time to participate in health promotion classes, and making programs available to families (Yenney, 1986). Most companies do not have special equipment or facilities at the company location, although this could be an important motivator. The availability of showers, bicycle racks, jump ropes, refrigerators, and audio cassettes with relaxation tapes can be equally effective in encouraging healthy lifestyles.

Personal recognition is a strong motivator. People get positive feelings from public acknowledgement of one's efforts and accomplishments. Tangible rewards are by far the most frequently used incentives. Items such as gift certificates, merchandise, rebates on fees, cash, trips,
discounts, and t-shirts are just some of the types of rewards given for incentives.

Teams and competitions seem to reinforce the social support of group activity (Yenney, 1986). The thought behind teams and competitions is that when making a commitment to others as well as getting help from others, it helps in achieving the desired goal. Health care benefits are not as readily used, because it has been difficult to create health care plans that reward healthy behaviors while still providing benefits for those who need them.

**Adverse Effects of Rewards**

Rewards it seems, may be motivating when they are earned, but amotivating to those who fail to earn them (Prong et al., 1992). Deci and Ryan’s (1980) cognitive evaluation theory stated that internal rewards that are viewed as "informational" may increase intrinsic motivation, but that external rewards perceived as "controlling" may undermine intrinsic motivation. If individuals begin an activity with the expectation of being paid, they are more likely to be more extrinsically motivated for the activity (Staw, Calder, Hess, & Sandelands, 1980).

Rotter (1966) expressed a growing concern over the possible side effects of the use of tangible extrinsic rewards and explicit contractual systems in classrooms. The results of Rotter’s study provided a near perfect replication of an earlier study by Lepper, Greene, and
Nisbett (1973). Children who expected and received an award for engaging in the target activity showed significantly less subsequent intrinsic interest in the drawing activity than did children who had engaged in the activity with out expectation of an extrinsic reward. However, children expecting a reward tended to draw more pictures during the experimental sessions than children not expecting a reward, although those pictures were judged significantly lower in overall quality, than the no reward group (Rotter, 1966).

**Drop-out Rates Associated with Exercise**

Approximately 85% of exercise participants report that they feel better when exercising (Dishman et al., 1980) and that physical activity has positive health implications (Haynes & McNamara, 1989). Even with this high percentage, adult fitness programs report adherence rates of only 40-65% indicating a substantial dropout percentage among those who volunteer to enter an exercise program (Dishman et al., 1980; Robinson et al., 1992). Among those 40-65% adherers, less than 10% are participating at the levels suggested by the 1990 Physical Fitness Exercise Objectives established by the Public Health Service (1986). According to Biddle and Smith (1991) the most common reasons for ceasing activity are lack of time and inconvenience. Other reasons cited were situational factors, medical problems, and lack of motivation.
Earlier attempts to characterize the type of individuals who adhere versus the type who is likely to drop out of an exercise program have not been successful. Self-motivation was demonstrated in Dishman et al. (1980) two field studies to be significantly associated with adherence to programs of physical exercise and to be the best discriminator of adherence behavior when compared to other conceptually relevant psychometric variables. The data collected from their second field study suggest that prediction of adherence can readily be enhanced by employing two easily measured biologic variables, total body weight and percent body fat, in concert with self-motivation.

**Self-Motivation**

Motivation is often used to describe some critical force or energy that leads to task engagement or sustained involvement (Lewthwaite, 1990). Adherers are usually characterized as being more self-motivated, using more self-regulatory skills such as goal setting, having greater self-confidence in exercise settings, receiving support from their spouses, and not performing exercise to involve uncomfortable amounts of effort (Biddle & Smith, 1991).

Sonstroem (1988) looked at two studies that examined the interaction of self-motivation; one investigating intervention factors of social support by Wankel and Yardley, and the other using a decision balance sheet by Wankel and Graham. The investigators hypothesized that low
self-motivators would be influenced by external motivation whereas high self-motivators would be relatively unaffected by these psychological interventions.
CHAPTER III

METHODS

Procedure

Seventy-three female subjects volunteered for this study. They were classified as exercisers (n = 39) or nonexercisers (n = 34). Those subjects who exercise at least 3 times per week for at least 20 minutes per session signed up (see Appendix A) as an exerciser (American College of Sports Medicine, 1991). Those subjects who have exercised one time or less per week for the last 6 months signed up (see Appendix B) as a nonexerciser. Each group was then randomly assigned to a reward or no reward group. The research design was as follows:

![Research design diagram]

Figure 1. Research design
Each subject performed two exercise tests in the Human Performance Laboratory (HPL). Upon entering the HPL the subject signed a consent form (see Appendix C), and then listened to a prerecorded message (see Appendix D) informing the subject about the exercise tests. If the subject was assigned to a reward group, they listened to part A (see Appendix D), if they were assigned to a no reward group the subject listened to part B (see Appendix D). Each message informed the subjects about the procedure of the exercise tests. The difference between the two messages was the reward groups message informed each subject that if they performed the exercise tests they will receive $5. The $5 was put in full view of each reward subject for both tests. The no reward message merely explained to each subject to "do their best". Following the message, each subject walked on the treadmill for 5 minutes and performed a standard set of stretches (Branner, 1989) (see Appendix E) to assure proper and consistent warm-up and stretching.

The first test the subjects performed was the 60 second curl-up test. Each subject was instructed to lie on the mat, with knees bent, and curl high enough to raise the shoulder blades off the ground, keeping the lower back touching the floor at all times. The fingers of the subject touched the heels each time a curl-up was performed. The test was timed for 60 seconds. A recovery period of 5
minutes was allotted for each subject to fully recover before performing the bicycle test.

Following the curl-up test the subjects performed a modified 30 second Wingate Anaerobic bicycle test on the Monark bicycle ergometer. This test is actually a measurement of anaerobic power, but was not used for that purpose in this experiment. This test was selected because of its short duration and maximal effort needed to perform the test, which was thought to require motivation.

The equation for the modified Wingate was based on the persons body weight. According to Lamb (1984), the optimal loads for the test was .075 multiplied by the persons body weight in kilograms. For the purpose needed for this study .040 was used as the weight. The test was preceded by an adequate warm-up of 3-5 minutes at 300-600 kgm/min interspersed with 2-3 all out bursts of 4-8 seconds of fast pedaling. To begin the test the subject started pedaling as rapidly as possible. The weight (.040 x body weight in kilograms) which was held on a basket, was let down as soon as the subject felt that they were pedaling as fast as they could. The subject pedalled for 30 seconds. At the end of 30 seconds the weight was removed and the subject cooled down by pedaling slowly. During cool down the subject was encouraged to keep pedaling until their heart rate was below 120 bpm.
Following both exercise tests, the subjects were administered an Intrinsic Motivation Inventory (IMI) (see Appendix F). The IMI is a pencil and paper test which examined four elements of intrinsic motivation: interest-enjoyment, perceived competence, effort-importance, and pressure-tension. Interest-enjoyment refers to the level of interest and enjoyment experienced by the participant during the exercise tests. Perceived competence relates to feelings of efficacy associated with the performance of the fitness test. The effort-importance subscale denotes the level of effort expended and importance attached to the activity. Finally, the pressure-tension subscale measures to what extent the subject experiences pressure of tension during the fitness test (Prong et al., 1992). This instrument utilized a 7-point Likert-type scale. To facilitate interpretation, each of the four subscale scores was calculated by dividing its total score by its number of items. The IMI was originally developed by Ryan (1982), although the one administered in this experiment was the variation modified by Whitehead and Corbin (1991) for use in fitness testing situation. Acceptable validity and reliability of this instrument in this setting has been established previously by Whitehead and Corbin (1991).

**Statistical Treatment**

For this study, a 2 (exerciser, nonexerciser) x 2 (reward, no reward) ANOVA was used to compare the group
scores on the IMI. Means and standard deviations were calculated for the subscales according to exercise and reward categories, and the descriptive means and standard deviations were reported for the group.
CHAPTER IV
RESULTS

The purpose of this study was to examine effects of exercise testing on the intrinsic motivation of exercisers (E), and nonexercisers (NE). Furthermore, this study investigated the effects of rewards on the intrinsic motivation of E and NE.

Seventy-three female students participated in this research. These students volunteered as exercisers and nonexercisers. If the student exercised 3 or more times per week for at least 20 minutes per session she was classified as an "exerciser". If the student exercised 1 or less times per week for the last 6 months she was classified as a "nonexerciser". After forming the exercise and nonexercise groups, the subjects were then randomly divided into a reward (R), and no reward (NR) group. The groups were exercise-reward, exercise-no reward, nonexerciser-reward, and nonexerciser-no reward. The mean age, height, and weight of these subjects can be seen in Table 1.

Upon entering the testing area, the subject filled out a consent form and listened to a prerecorded message about the protocol of the fitness tests. The subject then warmed up by walking on the treadmill and performed a standard set of
Table 1. Subject’s descriptive data

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<td>±3.84</td>
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<tr>
<td>Height (inches)</td>
<td>65.74</td>
<td>±2.68</td>
</tr>
<tr>
<td>Weight (lbs)</td>
<td>143.44</td>
<td>±27.34</td>
</tr>
</tbody>
</table>

stretches. The fitness tests consisted of 60 seconds of curl-ups and 30 seconds of bicycling. The curl-up test performed by each subject was familiar to them, because the subjects had recently performed the same test for their basic studies wellness class. The bicycle test was considered novel to them, since they had little data on which to judge their ability to complete the test. Five dollars, which was put in full view during the fitness tests, was given to the reward subjects for performing the tests and the no reward subjects were simply instructed to "do their best". After completing the fitness tests, the subjects were then instructed to complete the IMI.

A 2 (E, NE) X 2 (R, NR) ANOVA analyzed the data collected from the scores on the IMI to determine whether the group differed on any of the four subscales. The subscales were interest-enjoyment, perceived competence, effort-importance, and pressure-tension. Interest-enjoyment refers to the level of interest and enjoyment that the subject experienced while performing the fitness tests.
Perceived competence relates to the feelings of efficacy associated with the performance of the tests. Effort-importance refers to the level of effort expended and importance attached to the activity. Finally, the pressure-tension subscale measures to what extent the subject experiences pressure or tension during the fitness tests. Acceptable validity and reliability of this instrument in a setting similar to the one used for this study, has been established previously (Whitehead, 1988; Whitehead & Corbin, 1991).

The IMI is a 7-point Likert-type scale inventory with 4-5 questions per subscale. The expected mathematical mean = 3.5. A review of Table 2 shows the subjects in this study to score slightly above the predicted mathematical mean. Some explanations of this could be (a) they may have been influenced by the tester being present and/or (b) both the exercise and nonexercisers were volunteers which may mean that they were slightly more intrinsically motivated towards exercise. However, the means of both groups are slightly lower than that of the Prong et al. (1992) study for all four subscales. This correlates with Whitehead's study (1988), and Corbin's study (cited in Whitehead, 1988) reflecting that there is a gender difference in intrinsic motivation.
Table 2. IMI subscales

<table>
<thead>
<tr>
<th></th>
<th>Exercisers</th>
<th>Nonexercisers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>(n = 20)</td>
<td>(n = 19)</td>
</tr>
<tr>
<td>Interest - enjoyment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5.21</td>
<td>5.14</td>
</tr>
<tr>
<td>SD</td>
<td>±.50</td>
<td>±.40</td>
</tr>
<tr>
<td>M</td>
<td>5.18</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>±.45</td>
<td></td>
</tr>
<tr>
<td>Perceived competence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.93</td>
<td>4.85</td>
</tr>
<tr>
<td>SD</td>
<td>±.48</td>
<td>±.39</td>
</tr>
<tr>
<td>M</td>
<td>4.89</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>±.44</td>
<td></td>
</tr>
<tr>
<td>Effort - importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>5.36</td>
<td>5.17</td>
</tr>
<tr>
<td>SD</td>
<td>±.32</td>
<td>±.34</td>
</tr>
<tr>
<td>M</td>
<td>5.27</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>±.33</td>
<td></td>
</tr>
<tr>
<td>Pressure - tension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>4.26</td>
<td>4.46</td>
</tr>
<tr>
<td>SD</td>
<td>±.55</td>
<td>±.47</td>
</tr>
<tr>
<td>M</td>
<td>4.36</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>±.51</td>
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</tr>
<tr>
<td>Totals</td>
<td></td>
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<tr>
<td>M</td>
<td>4.96</td>
<td>4.92</td>
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<tr>
<td>SD</td>
<td>±.32</td>
<td>±.30</td>
</tr>
<tr>
<td>M</td>
<td>4.94</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>±.31</td>
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</tr>
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</table>

The 2 (E, NE) X 2 (R, NR) ANOVA (Table 3) revealed that there was a significant difference between E and NE (23.72; p = .001) in intrinsic motivation (see Table 3). The significant difference between E and NE was shown in three of the four subscales. The Effort and Importance subscale showed no significant difference, but its means for both E and NE were the highest reported. Both groups may have
thought that they gave equal effort on the tests, since there was not any feedback provided on their performance.

Rewards did not have a significant effect on intrinsic motivation. No interaction effect was revealed for the exercisers and rewards.

Table 3. Subscale ANOVAS

<table>
<thead>
<tr>
<th>subscale</th>
<th>F value</th>
<th>P value</th>
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<tbody>
<tr>
<td>INTEREST - ENJOYMENT</td>
<td></td>
<td></td>
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<tr>
<td>EXERCISE</td>
<td>6.39</td>
<td>.02*</td>
</tr>
<tr>
<td>REWARD</td>
<td>.93</td>
<td>.34</td>
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<tr>
<td>INTERACTION</td>
<td>.22</td>
<td>.64</td>
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<tr>
<td>PERCEIVED COMPETENCE</td>
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<tr>
<td>EXERCISE</td>
<td>50.63</td>
<td>.00*</td>
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<tr>
<td>REWARD</td>
<td>.00</td>
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<td>INTERACTION</td>
<td>.49</td>
<td>.49</td>
</tr>
<tr>
<td>EFFORT - IMPORTANCE</td>
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</tr>
<tr>
<td>EXERCISE</td>
<td>2.03</td>
<td>.16</td>
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<tr>
<td>REWARD</td>
<td>1.75</td>
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<tr>
<td>INTERACTION</td>
<td>.68</td>
<td>.41</td>
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<tr>
<td>PRESSURE - TENSION</td>
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</tr>
<tr>
<td>EXERCISE</td>
<td>6.24</td>
<td>.02*</td>
</tr>
<tr>
<td>REWARD</td>
<td>.00</td>
<td>.96</td>
</tr>
<tr>
<td>INTERACTION</td>
<td>2.24</td>
<td>.14</td>
</tr>
<tr>
<td>SUM OF SUBScales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXERCISE</td>
<td>23.72</td>
<td>.001*</td>
</tr>
<tr>
<td>REWARD</td>
<td>.53</td>
<td>.47</td>
</tr>
<tr>
<td>INTERACTION</td>
<td>.07</td>
<td>.79</td>
</tr>
</tbody>
</table>

* significant difference (p ≤ .05)
CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The purpose of this research was to investigate the effects of exercise testing on the intrinsic motivation of exercisers (E) and nonexercisers (NE). Furthermore, this study examined the effects of rewards on their intrinsic motivation in the fitness testing situation. The findings from this study correlates with the findings of Prong et al. (1992) revealing that the use of monetary rewards as incentives did not influence intrinsic motivation of either group. These statistics are consistent with previous research (Deci & Ryan, 1985, 1980), which suggests that rewards do not affect intrinsically motivated subjects (exercisers). This study also supports the assumption that rewards do not affect the less intrinsically motivated (nonexercisers), which Rutherford (1990) suggested. Rutherford stated that "nonexercisers", like exercisers, may participate in fitness tests because of the inherent informational value and not because of the reward.

Fitness Tests

It has been suggested that rewards may be necessary to get people who need exercise the most (the unfit), to become involved. One way of screening the unfit is by fitness
tests. Fitness tests begin as early as elementary school. Concern about youth fitness levels first became a national issue when results were published of a large scale study which compared the fitness of American and European youth. One of the responses by organizations to this problem has been to develop fitness test batteries. The different fitness test batteries have, almost without exception, been accompanied by incentive or award schemes that are ostensibly designed to motivate children and youth to become fit.

Incentive schemes originally began by awarding individuals according to a percentile of fitness. Most youth could not achieve the level of fitness needed for the reward. This has been found to be amotivating to those who did not receive the award. Whitehead and Corbin (1991) support the argument against percentile based interpretation of fitness tests after performing their study. Recently organizations have developed "process" awards that reinforce exercise rather than "product" awards. Three fitness test batteries that developed process awards are Fit Youth Today, Fitnessgram, and Physical Best. The Presidential Physical Fitness Award program is still currently providing awards on a percentile-based program. The logic of the fitness tests is to target the unfit population, yet this population would seem to have little hope of achieving any reward for high performance.
Corporations

Companies offer similar rewards in an attempt to increase physical activity of their employees (Prong et al., 1992). These rewards are frequently monetary in nature. Many program planners believe that cash may be the strongest motivator, perhaps because the recipient can use it for something that is personally meaningful, rather than accept a prize selected by someone else.

Cognitive Evaluation Theory

Rewards as a whole may be amotivating, according to Deci and Ryans Cognitive Evaluation Theory (Deci & Ryan, 1985). This theory suggests that the use of extrinsic rewards based on interpersonal comparisons of fitness may adversely affect intrinsic motivation. This is partly because doing the test to win an award might externalize the locus of causality of the fitness behavior and perhaps more importantly, because perceived fitness competence could be reduced by a failure to win the award or by receiving a low percentile ranking on a test.

Perceived Competence and Intrinsic Motivation

According to Rutherford, Corbin, and Chase (1992), feelings of perceived competence tend to enhance intrinsic motivation. People who feel competent find physical activity enjoyable, interesting, and important. They do not feel that physical activity requires great effort, nor does it make them feel pressured or tense.
Fitness tests are often given to help clients and students learn about their current fitness status. It is often assumed that those who do not score well will be motivated to improve their fitness. The findings of Prong et al. (1992) and Whitehead (1988) suggest that "failure" on a fitness test makes people feel less competent, more tense, and less likely to give future effort in physical activity. Clearly the opposite effect may be occurring in these situations.

Feedback on Intrinsic Motivation

In previous studies examining the effect of feedback on motivation (Prong et al., 1992; Whitehead, 1988), the researchers found that those who failed fitness tests reported giving less effort during their performance. Although this study did not look at the effects of feedback, both E and NE reported giving almost equal effort, which was well above the calculated mean (see Table 2). This could have been because the groups were not given any type of feedback on their performance. The purpose of the fitness tests was to have the subjects perform the tests and then fill out the questionnaire according to how they felt during the fitness tests. It was not to give them feedback on the tests.

Sports Experience on Intrinsic Motivation

Sports experience has also been proven to increase perceived competence. People with little experience in
Sports felt much more competent when they had information about their performance. In fact, in Rutherford's et al. (1992) study, perceived competence was 19% higher, which was statistically significant, when performance information was available. With more experience, people begin to find physical activity more enjoyable and interesting, put more effort into and place greater importance on it, and feel less pressure and tension when performing it. Rutherford et al. (1992) state that the important message for people with little sport and physical activity experience is that these changes occur through the enhancement of feeling of competence and that this competence can be fostered by providing performance information.

**Application to Current Study**

Implications of this and other studies are that there is a difference in intrinsic motivation between exercisers and nonexercisers. When using fitness tests as motivation tools for these groups, different tactics may be necessary. The NE may need to feel more competent at the activity before being tested, whereas this may not affect the E.

As discussed by Deci and Ryan (1985), rewards may be amotivating to those who do not receive the reward. Therefore, rewards should be made available to all participants, not only to those who do well on the fitness tests. Also, the reward should be motivating to the type of group receiving the reward. The subjects in this study were
not affected by the reward, which may have been because it was not substantial enough to motivate them.

Recommendations for Future Research

The recommendations below are those which seemed particularly clear from the results and experience of this study.

1. One recommendation would be to investigate NE intrinsic motivation after they have practiced the fitness tests. This may improve their perceived competence about the fitness tests which may increase their intrinsic motivation.

2. Future research could also look at different types of populations, (e.g., blue collar workers and fifth graders) and examine the effects of different types rewards (e.g., t-shirts, sweatshirts, and lower insurance rates) as intrinsic motivators.

3. Previous research has examined those individuals with little sports experience and the use of feedback and rewards. A final recommendation would be to examine the effects of feedback on "true" nonexercisers' intrinsic motivation.
REFERENCES


APPENDIX A
EXERCISERS
EXERCISERS

(SIGN UP ONLY IF YOU EXERCISE 3 TIMES PER WEEK FOR AT LEAST 20 MINUTES PER SESSION!)

<table>
<thead>
<tr>
<th>NAME</th>
<th>PHONE</th>
<th>AVAILABLE TIMES</th>
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<tbody>
<tr>
<td></td>
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</table>
APPENDIX B
NONEXERCISERS
NONEXERCISERS

(SIGN UP ONLY IF YOU EXERCISE ONE TIME OR LESS PER WEEK FOR THE LAST SIX MONTHS!)

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<thead>
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<th>NAME</th>
<th>PHONE</th>
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</tr>
</thead>
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</tbody>
</table>
APPENDIX C
INFORMED CONSENT
INFORMED CONSENT FOR THESIS TESTING

Explanation of the Exercise Test

You will perform two exercise tests, one 60 second curl-up test and one 30 second bicycle test. The curl-up test will consist of doing as many curl-ups as you can do in one minute. The 30 second bicycle test is an all-out power test. This test consists of pedaling as hard and as fast as you can in 30 seconds. You may stop performing either test if you feel any signs of dizziness, discomfort, or lightheadedness. Also, you may stop the tests at any time because of personal feelings or excessive fatigue.

Risks and Discomforts

There exists the possibility of certain abnormal changes occurring during the tests. They include atypical blood pressure and heart rate responses, fainting, disorders in heart beat, and in rare instances heart attack, stroke, or death. Also, if you have any joint or lower back problems you may want to determine if these tests will injure you in any way. Slight stiffness or soreness in the abdominal area or legs may follow the tests however, every effort will be made to properly warm-up and cool down your body to prevent injuries from occurring.

Responsibilities of the Participant

I consider myself to be in good health and to my knowledge I do not have any limiting physical condition or disability, especially with respect to my heart, that would preclude my participation in the exercise test as described above. I have read the foregoing and I understand what is expected from me. Furthermore I know I may withdraw from these tests at any time.

Inquiries

Any questions about the procedure used in the exercise test or in the estimation of functional capacity are encouraged. If you have any doubts or questions, please ask for further explanations.

Freedom of Consent

Your permission to perform these exercise tests is voluntary. You are free to deny consent or stop the test at any point, if you so desire.

I have read this form and I understand the test procedures that I will perform. I consent to participate in this test.

Subject Signature: ___________________ Date: __________

Tester Signature: ___________________ Date: __________
APPENDIX D

RECORDED MESSAGES
PART A

REWARD GROUP

Thank you for participating in this experiment. You will be asked to perform two tests. By participating in these two tests you will receive a $5 reward. The first test will be a 60 second curl-up test and the second will be a 30 second bicycle test. Before you start, you will warm-up by walking on the treadmill for 5 minutes. Following the warm-up on the treadmill, you will be asked to do a set of stretches to prevent injury and to make sure you are lose.

After you have properly warmed-up and stretched you will perform as many curl-ups as you can do in 60 seconds. You will have 5 minutes to cool down between the tests. Following the curl-up test, you will perform a 30 second bicycle test. After you are comfortable on the bike, the resistance will be added and you will pedal as rapidly as possible for 30 seconds. If for any reason you feel you can not finish the test because of physical or personal reasons, please let the tester know. At the end of 30 seconds the resistance will be removed and you will pedal slowly until your heart rate has reach 120 beats per minute or lower.

After full recovery you will given the Intrinsic Motivation Inventory. You are asked to please give your best performance on both exercise tests and you will receive a $5 reward. Thank you.

PART B

NO REWARD GROUP

Thank you for participating in this experiment. You will be asked to perform two tests. The first test will be a 60 second curl-up test and the second will be a 30 second bicycle test. Before you start, you will warm-up by walking on the treadmill for 5 minutes. Following the warm-up on the treadmill, you will be asked to do a set of stretches to prevent injury and to make sure you are lose.

After you have properly warmed-up and stretched you will perform as many curl-ups as you can do in 60 seconds. You will have 5 minutes to cool down between the tests. Following the curl-up test, you will perform a 30 second bicycle test. After you are comfortable on the bike, the resistance will be added and you will pedal as rapidly as possible for 30 seconds. If for any reason you feel you can not finish the test because of physical or personal reasons, please let the tester know. At the end of 30 seconds the resistance will be removed and you will pedal slowly until your heart rate has reach 120 beats per minute or lower.

After full recovery you will given the Intrinsic Motivation Inventory. You are asked to please give your best performance on both exercise tests. Thank you.
APPENDIX E

STRETCHES
THE FIVE MINUTE STRETCH

Follow this sequence for a safe, efficient flexibility workout. Remember to warm-up before you start, hold each position for at least 10 seconds and do not bounce. Close your eyes, take a few deep breaths and clear your mind. This is your time to relax.
APPENDIX F

INTRINSIC MOTIVATION INVENTORY
Opinions about the Fitness Tests

There are no right or wrong answers to this survey – it is to find your opinions.

No one except the investigators at the University of Wisconsin – La Crosse will see your answers, so please be as honest as you can. Your name will not be used in any way in the future.

For each of the questions below, check the box which best describes how you feel.

1. I enjoyed doing the fitness test very much.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

2. I think I was pretty good at the fitness test.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

3. I put a lot of effort into the fitness test.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

4. I did not feel nervous at all while doing the fitness test.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

5. The fitness test was fun to do.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

6. I think I did pretty well at this test, compared to other students.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

7. I did try very hard to do well at the fitness test.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

8. I felt very tense while doing the fitness test.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree

9. I thought that the fitness test was a boring activity.
   - Strongly Disagree
   - Disagree
   - Somewhat Disagree
   - Not Sure
   - Somewhat Agree
   - Agree
   - Strongly Agree
10. After doing the fitness test I felt that I was pretty good at it.

11. I tried very hard on the fitness test.

12. I was very relaxed while doing the fitness test.

13. I would describe the fitness test as very interesting.


15. It was important to me to do well at the fitness test.

16. I was anxious while doing the fitness test.

17. I thought the fitness test was quite enjoyable.

18. The fitness test was an activity that I couldn't do very well.

19. I didn't put much energy into the fitness test.

20. I felt pressured while doing the fitness test.
APPENDIX G

INTRINSIC MOTIVATION INVENTORY RESEARCH