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The Effect of Task Versus Ego Oriented Feedback on Exercise Enjoyment

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THE EFFECT OF TASK VERSUS EGO ORIENTED FEEDBACK ON EXERCISE ENJOYMENT

A Thesis
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts

by
Marc A. Fields

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THE EFFECT OF TASK VERSUS EGO ORIENTED FEEDBACK ON
EXERCISE ENJOYMENT

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[Signatures]

Dean of Graduate Studies and Research  Date
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Intrinsic motivation has been shown to be a very important factor in exercise adherence. Research has found that factors such as exercise intensity, social feedback, goal orientation and perceived climate can affect intrinsic motivation. The purpose of this study was to assess situational goal orientation, specifically whether individuals in a task induced condition or ego induced condition would report different levels of intrinsic motivation (i.e., enjoyment, tension, effort and competence during exercise). Participants (N= 114) rode on an exercise bike for 24 minutes at a moderate intensity. A MANCOVA factorial design was used to examine differences in intrinsic motivation. The results of the study did not reveal any significant differences in the level of enjoyment, tension, effort and competence between the task and ego-oriented conditions. However, there were significant differences for outcome feedback (win vs. lose) for competence and tension as well as a significant interaction between goal orientation and outcome feedback for the dependent variable competence. Ego oriented individuals who won in the race function reported significantly higher levels of competence than ego oriented individuals who lost in the race function. Other results and limitations of the study are discussed.
Chapter 1

Introduction

Regular exercise has been established as an essential activity in order to obtain positive health outcomes. Some of the psychological and physiological benefits of exercise include increases in ability to cope with stress, cardiovascular fitness and positive mood, while exercise also decreases blood pressure, hypertension and anxiety. Individuals that exercise on a regular basis have a greater chance of living longer than individuals that do not engage in a regular exercise program. Despite the benefits of exercising, the majority of people in the United States are not engaged in an exercise program (United States Department of Health and Human Services, 2000). In fact, one out of every four Americans fails to engage in any sort of exercise.

Exercise is viewed as such an important issue that our government has issued a document (Healthy People 2010 Review) in which one of the major objectives is to increase the proportion of individuals in all age groups that participate in regular exercise (5 days a week for 30 minutes). People are motivated to exercise for many reasons such as health, enjoyment and social affiliation. Past research has shown that adherence was associated with intrinsic factors such as enjoyment and competence (Ryan et al., 1997). Extrinsic factors such as social approval, fitness, and appearance were shown to be less important. Although there is no current theory of enjoyment, there is a theory closely related, intrinsic motivation.

The Self-Determination Theory (SDT, Deci & Ryan, 1985) combines both intrinsic and extrinsic motivation into one continuum. This theory suggests that people may initially engage in exercise for extrinsically motivated reasons (i.e., self-acceptance,
rewards). However, a person’s extrinsic reasons for exercising can shift into intrinsic reasons (enjoyment) over time because of a greater locus of control. Past studies have indicated that moving toward intrinsic motives is very important for adhering to an exercising program (Maltby & Day 2001). Past studies have also indicated that there is a significant relationship between exercise motivation and well-being. Bakker et al. (1997) showed that exercising for intrinsic purposes resulted in decreased stress as opposed to extrinsic motivation which resulted in increased stress. Another study (Wankel, 1993) indicated that individuals who exercised longer than six months were more intrinsically motivated than individuals who exercised for less than six months. Thus a question of central importance is “What are the main factors contributing to intrinsic motivation in exercise?”

Problem statement

The primary goal of this study is to test how feedback influences an individual’s enjoyment of exercise and related factors. According to previously reported findings, positive feedback within the realm of both sports and education satisfy an individual’s need for competence leading to higher levels of enjoyment. Although the research concerning feedback may be plentiful in the areas of education and sports, there is a sparse amount of research concerning exercise enjoyment and feedback. A greater understanding of factors leading to exercise enjoyment may contribute to individuals adhering to an exercise program. Therefore, it is important to look at the self-determination theory and prior literature on factors that affect intrinsic motivation. It is also important to examine the degree to which feedback leads to exercise enjoyment.
Self-Determination Theory

The SDT looks at factors that enhance or hinder self-motivation and personal well-being. According to self-determination theory, individuals are either intrinsically motivated or extrinsically motivated when it comes to exercise or any activity. Intrinsic motivation refers to engaging in an activity for the sake of the activity because one finds it enjoyable, while extrinsic motivation is used to describe engaging in an activity to attain a separable outcome. The focus of this study is on factors that affect intrinsic motivation.

Deci and Ryan (1985) presented a subtheory of SDT called cognitive evaluation theory (CET) to describe how intrinsic motivation is facilitated. According to CET, there are three needs that must be met to obtain intrinsic motivation: competency, autonomy and relatedness. Competency can be acquired through positive feedback from others or through evaluation that reinforces the subjects efficacy for completing a task. Another variable within the need of competency is challenge. Past research has shown that when individuals view their task as challenging, feelings of competence are enhanced (Deci, 1975). For example, individuals may excel at a sport or activity, but if they don’t feel that the activity challenges them they will not have met the need of competency.

According to the CET, competency will not facilitate intrinsic motivation unless it is accompanied by autonomy. Autonomy refers to self-determined behavior when choosing an activity. In order to achieve autonomy, individuals must experience contextual support for autonomy or have had past encouragement as regards to autonomy. Research by Deci (1999) showed that tangible rewards and pressured situations tend to diminish intrinsic motivation because autonomy (or locus of control) is
being dictated by external factors. In contrast, individuals who are allowed to determine their own behavior will increase their intrinsic motivation because individuals will have a greater feeling of autonomy.

A third factor and least important (according to Deci & Ryan, 2000) for intrinsic motivation is relatedness. Relatedness refers to having a secure and supportive relational base with others. However, many intrinsic behaviors, such as exercising and learning, have been performed individually. Therefore, relatedness is not as important as competence or autonomy.

Despite the important implications of intrinsic motivation, many people engage in activities in which they are not internally motivated. For example, a person may engage in exercise due to pressure from a family member or spouse to lose weight. A person may enroll in college in order to acquire a degree that can result in more money in the future. Although these are different examples within motivation, they both illustrate how individuals can become motivated by extrinsic factors. Extrinsic motivation refers to engaging in an activity in order to attain a specific reward. The next section will address the characteristics and factors that contribute to extrinsic motivation.

Deci and Ryan (1985) introduced a second sub-theory within SDT called organismic integration theory (OIT). OIT describes different kinds of extrinsic motivation and factors that affect internalization and integration. The first extrinsic motivational type that contains the least amount of autonomy is referred to as external regulation—more specifically, an individual is motivated by rewards or punishments (i.e., operant conditioning). People usually engage in this type of behavior strictly for rewards. Introjected regulation is a second type of extrinsic motivation. This type of motivation
involves engaging in an activity; however, the activity is not accepted as one’s own. People often engage in this kind of behavior to avoid guilt or anxiety. Although these behaviors are somewhat internally driven, they are still primarily controlled by external factors (i.e., being accepted).

The third extrinsic motivational type is identified regulation. Identified regulation occurs when individuals begin to see the personal value of their behavior and how it leads to the obtainment of a self-selected goal. Finally, the most autonomous form of extrinsic motivation is integrated regulation. In this stage integration has taken place and the individual views these behaviors as part of his/her self-concept (e.g., self-schema). Integrated regulation shares many of the same attributes as intrinsic motivation such as autonomy and relatedness, although it lacks the pure enjoyment that is associated with intrinsic motivation.

Factors Affecting Enjoyment/Intrinsic Motivation

*Exercise Intensity and Affect*

There has been a sparse amount of research concerning the relationship between exercise intensity and enjoyment. The relationship between exercise intensity and affect has been looked at in recent studies (Kennedy et al, 1997). Positive affect is described as positive feelings such as well-being and satisfaction, while negative affect is associated with feelings of depression, guilt, and distress. Individuals who experience positive affect during exercise are more likely to report higher levels of exercise enjoyment compared to individuals who experience negative affect from exercise.
Tate et al. (1995) looked at two levels of moderate exercise intensity compared to a control condition. The two levels of moderate intensity were at 55% VO$_2$max and 70% VO$_2$max. VO$_2$max is defined as the maximum capacity for oxygen consumption by the body during maximum exertion. The more oxygen an individual can use, the more fit that individual is. Less fit individuals bodies will resort to other sources of energy (e.g., proteins) at lower exercise intensities while a more fit persons body will continue to utilize aerobic resynthesis. VO$_2$max is often used to determine the aerobic fitness of an individual. The exercise was aerobic and involved riding a stationary bike. They hypothesized that for both levels of moderate exercise, energetic arousal (positive affect) would be elevated during exercise more than a non-exercise control group. They also hypothesized that both levels of moderate exercise would result in increased levels of energetic arousal compared to pre-exercise levels.

The subjects in this study were 20 undergraduate volunteers (15 males, 5 females) who exercised on a regular basis. Subjects filled out the Activation Deactivation Adjective Check List (Thayer, 1986). The Activation Deactivation Adjective Check List (AD-ACL) is a self-report measure of arousal state that consists of energetic (positive affect) and tense (negative affect). Measurements were assessed before, during and after the exercise and non-exercise conditions. A 15-point Borg scale was used to assess perceived effort during exercise. The Borg scale is a self-report scale in which participants rate their perceived exertion (RPE). Subjects were required to participate in each condition of the study and, therefore, made multiple visits to the laboratory on different days. The conditions were: A) control condition, which involved sitting quietly on the bike for 30 minutes; B) cycling for 30 minutes at 55% VO$_2$max, and C) cycling for
30 min at 70% \( \text{Vo}_2\text{max} \). At the 5-minute, 15-minute and 25-minute point in the exercise, subject’s RPE and affect were assessed. Subject’s affect was assessed for the control condition. Affect was also assessed at 5, 10, 20 and 30 minutes after exercise. The results of this study showed that within the moderate exercise intensity condition there was no significant change that occurred in positive or negative affect. Also in the control group, there was no significant change that occurred in positive affect, although negative affect was reportedly lower.

A similar study by Farrell et al. (1987) examined mood alterations after the effects of prolonged exercise. The exercises consisted of two 80-minute runs on a treadmill at \( \text{VO}_2\text{max} \) levels of 40% (low intensity), 60% (moderate intensity), and a 40-minute run at 80% (high intensity). The subjects in this study were seven experienced male distance runners who participated in each condition. Subjects were given the tension sub-scale of the Profile of Mood States Questionnaire (McNair et al., 1971) prior to and after testing. The results of this study showed that subjects participating in the moderate intensity condition (60%) and high intensity condition (80%) experienced a significant decrease in psychological tension. However, subjects in the low intensity condition (40%) did not experience a significant decrease in tension. This study provided similar results to the Tate and Petruzello’s study (1995), which also indicated that individuals exercising at a moderate intensity experienced lower levels of negative affect after exercising.

Steptoe and Cox (1988) also conducted a study on the effects of high and low intensity exercise on mood. The study consisted of 32 female medical students (18-23 years old) participating in four 8-minute trials on a stationary bike. The high intensity trials consisted of individuals cycling at 50 revolutions per minute (rpms) against a
resistance of 100 watts, while individuals in the low intensity trials cycled against a resistance of 25 watts. One high and low exercise trial were combined with music while the other two trials were paired with a metronome. The subjects participated in each of the four conditions. After each condition, subjects rested until their heart rate returned within 12 beats of their original rate. The Profile of Mood States Questionnaire (POMS) was administered to subjects before and after each trial. The State Anxiety Trait Inventory was also used to assess mood in subjects. The results of the study showed that tension levels in high intensity exercise increased significantly, while tension in the low exercise condition did not change significantly. The results also indicate that vigor significantly increased for pre-exercise to post-exercise in the low intensity condition. However, vigor significantly decreased in the high intensity condition. Exhilaration in the low intensity condition increased significantly from pre-exercise to post-exercise. Yet, for the high exercise intensity condition, there was no significant change. The metronome or music aspect of the study did not have an effect on mood.

The results of this study are contrary to the study by Farrell et al. (1987), in that the low intensity group experienced significantly lower levels of tension than the higher intensity condition. It is possible negative affect emerged in the high intensity group because mood was assessed right after exercise. A past study by Janel et al. (1984) reported positive mood changes with post exercise intervals of more than 20 minutes in high intensity exercise. It is possible that higher exercise intensity may have resulted in improved mood if the assessments were repeated at longer intervals.

Although the literature on varying levels of exercise is scarce, the evidence thus far has suggested that moderate levels of exercise has yielded the most consistent
evidence in terms of increased positive affect and decreased negative affect. Motl et al. (1996) looked at mood and exercise intensity in collegiate cyclists. They found that moderate intensity exercise (69% heart rate maximum) led to significant decreases in depression, anger, fatigue and increases in vigor. However, high intensity only resulted in higher levels of fatigue and vigor and did not significantly decrease levels of anger or depression. Past studies (Farrell, 1987; Steptoe & Cox, 1988) have shown inconsistent results concerning low and high intensity and their effects on mood.

Social Feedback

The social environment in which an individual exercises can influence one’s enjoyment of an activity. Individuals often place a great emphasis on physical activity as regards to its importance on their self-esteem. As a result, feedback may be very crucial in terms of how individuals view their performance and competence within an activity. Individuals who view their coaches’ feedback as encouraging are more likely to sustain their self-esteem and enjoyment of the activity. The same may also be true for individuals in an exercise program. They may be more likely to perceive an activity as more enjoyable if they receive positive feedback from their instructor or other people in the class. Even informational feedback that is perceived as positive can increase an individual’s level of enjoyment and competence.

Rutherford et al. (1992) investigated the influence of positive feedback on intrinsic motivation among individuals who were highly experienced in sports, moderately experienced, or low in experience. The participants in this study were all males (N=60) who were volunteers from a Southwestern University. Before the start of the testing, participants filled out a Sport Experience Questionnaire to assess the
experience of each individual. Low experienced subjects were designated as having less
than one year of participation in sports on the high school and college level while
moderately experienced individuals had two years of experience but did not win any
awards. Highly experienced subjects were designated as having three years of
participation in college or high school and having won at least one award for competence.

After filling out the Sports Experience Questionnaire participants performed three
20-second speed trials against a workload of 125 watts on a bicycle ergometer. The
experimenter covered the number display on the computer in order to prevent individuals
from observing their score during the ride. Individuals were divided into a group that
received performance information (score on the bike test) after the trials and a control
group that received no information. After the trials, subjects were administered a version
of the Intrinsic Motivation Inventory (McAuley, 1989) that asked questions pertaining to
individuals riding on an exercise bike. The Intrinsic Motivation Inventory (IMI)
questionnaire examines principal components of intrinsic motivation such as enjoyment,
perceived competence, effort-importance and perceived competence.

A 3x2 ANOVA was used to investigate the influences of sport experience and
performance feedback on intrinsic motivation. Participants in the low experience group
achieved a significant increase in perceived competence when they received information
compared to when they didn’t receive information. Participants in the low experience
group also achieved a significant increase in effort when they received information
compared to when they did not receive information. Although not significant, the low
experienced condition that received feedback reported higher levels of enjoyment (12%)
and lower levels of tension than individuals not receiving feedback. There was no significant finding for individuals who were moderately or highly experienced in sports.

This study shows that some individuals do benefit from informational feedback because it increases internal feelings of competence and enjoyment toward their task. Individuals who have been engaged in sports may not need informational feedback because the physical activity in itself becomes intrinsically reinforced. According to the author, one of the major limitations of this study was that it used only male participants. Further studies on heterogeneous samples should be used to achieve a more universal result.

Research in the area of sports has indicated a relationship between social feedback and perceived competence and enjoyment. A study by Horn (1985) explored the relationship between coach feedback (i.e., praise, encouragement, criticism) and its effects on the self-perception of athletes. Horn (1985) looked at coaching behavior in female athletes (N=72) and found that coaching feedback influenced changes in self-perception and skill improvement over the softball season. More specifically, the appropriateness of a coach’s praise and criticisms affected how athletes perceived their own competence in softball. The appropriateness of a coach’s praise and criticism was determined by the Coaching Behavior Assessment Systems (Smith et al., 1977) and a behavioral scale. A coach who gives inappropriate amounts of praise or criticism to athletes may facilitate lower levels of perceived competence in athletes. Although competence is not a direct measure of enjoyment, competence is an important characteristic for an individual to have in order to achieve intrinsic motivation, which is a similar measure of enjoyment.
Black and Weiss (1992) extended Horn’s (1985) findings by examining the social interaction between coaches and age-group swimmers. The purpose of their study was to look at perceived coaching behavior and motivation in competitive swimmers. It was hypothesized that athletes who perceived coaches as more encouraging as regards to positive feedback and praise would report higher levels of intrinsic motivation than athletes who perceived their coach as more demanding and critical. The subjects in this study were 312 competitive swimmers in three different age groups 10-11 yrs (n=121), 12-14 yrs (n=108), and 15-18 yrs (n=83) ranging in competitive level from novice (1) to junior national (7).

The athletes filled out a modified version of the Coaching Behavior Assessment System (Horn & Glenn, 1988) to assess athletes perceived and preferred coaching behaviors. Athletes also filled out questionnaires that measured their self-perceptions of ability and their perception of success concerning how well they were doing during the season. Lastly, athletes filled out two measures that were used to evaluate aspects of motivation: the Intrinsic Motivation Inventory (McAuley et al., 1989) and the Motivation Orientation in Sport Scale (Weiss et al., 1985). The Intrinsic Motivation Inventory (IMI) was used to assess an individual’s overall intrinsic motivation by looking at dimensions of intrinsic motivation such as enjoyment, competence, effort and tension. The challenge subscale of the Motivation Orientation in Sport Scale (MOSS) was used to assess individual’s preference for choosing a challenging activity. A past study by Harter (1981) has shown that preference for challenging activity is an important factor in intrinsic motivation.
The results showed that both male and female swimmers who perceived their coach as giving them praise or encouraging feedback scored higher on perceived success, perceived competence, challenge motivation, and enjoyment than those individuals who perceived their coach as critical and not providing positive feedback. The tension subscale of the IMI was deleted in this study due to poor reliability (alpha= .61). Finally, female swimmers reported higher levels of effort when they perceived their coach as giving them encouraging feedback. The results of this study supported the hypothesis and showed that coaching behavior not only influences enjoyment but also influences perceived success, challenge motivation and effort.

A similar study by Allen and Howe (1998) studied the effects of coach feedback on satisfaction and perceived competence among female athletes. The participants in this study consisted of 123 field hockey players ranging from 14-18 years. Participants were asked to fill out a questionnaire that included the Coaching Behavior Assessment System (CBAS). The CBAS measured athletes’ perception of their coaches’ feedback when responding to a favorable or unfavorable performance. Responses to a good performance were placed into categories such as praise, praise and information, nonverbal praise, or verbal praise. Responses to a bad performance were placed into categories such as encouragement, corrective information, criticism, nonverbal criticism, and a nonverbal response (i.e., shaking their head). Participants were also given the Self-Perception profile for adolescents, which assessed perceived field hockey competence as well as a measurement that assessed their satisfaction with coach and team involvement. Coaches were given a questionnaire in which they were asked to rate each player in comparison to every other player.
The results of this study indicated that coach feedback played a significant role in the perceived competence of athletes. Individuals who perceived that their coach gave them frequent praise and information following a good performance was associated with higher levels of perceived competence than individuals who reported infrequent praise and information following a good performance. Males and females who perceived that their coach gave them frequent praise and information following a good performance reported higher levels of perceived success and challenge motivation than did individuals who perceived their coach as giving infrequent praise or no praise following a good performance. Male and female swimmers also reported higher levels of enjoyment when they perceived that their coach gave them encouragement after a bad performance and praise after a good performance. The results of this study coincide with the study by Horn (1985) who also found that an athlete’s self-perception and competence can be influenced by a coach’s feedback.

The social environment can be an important barometer in terms of how well an individual is performing in a physical activity. Black and Weiss (1992) have shown that social feedback can be used to enhance or undermine individual’s level of competence and enjoyment while competing in sports. Within the realm of sports and exercise, individuals often receive feedback from others that influences their intrinsic motivation (i.e., enjoyment, tension, competence, effort) within their respective setting. More research on this topic needs to be conducted in order to promote a healthier psychological environment in a sports or exercise setting. Although social feedback can be an influential factor in determining one’s intrinsic motivation within an activity, other
characteristics such as one's goal orientation has been shown to be influential in determining one's enjoyment of an activity.

**Goal Orientations and Intrinsic motivation**

Research in achievement motivation in sports has looked at how achievement goals are influenced by our beliefs, and guide our subsequent behavior. The goal perspective theory was originated by Nicholls (1984) and other researchers who looked at achievement goals and motivation within the classroom. Goal perspective theory looks at how personal goals affect the way people act, feel, and think in achievement situations such as exercise. There are two main achievement goals: task involvement and ego involvement. The main difference between task involvement and ego involvement is in the way that competence is viewed. Task involvement views competence in terms of gaining skill and improvement. Task involved individual’s focus primarily on effort and improvement within an activity as opposed to the outcome of the activity. When a person is engaged in task involvement, mastering an activity drives their behavior and therefore high effort that leads to success implies high ability. Individuals engaged in ego involvement view competence in terms of superior ability when comparing themselves to others. Ego involved individuals believe that low effort leading to success implies high ability.

At some point, academics are a very important part of many peoples lives, and there is growing evidence that an individual’s goal orientation can influence one’s perception of school. Recent studies have examined the role that goal orientation plays in learning strategies within academics. A past study by Meece et al. (1988) looked at differences in intrinsic motivation between task and ego involved individuals. The study
consisted of 275 5\textsuperscript{th} and 6\textsuperscript{th} grade students. The students were selected from 10 classrooms. At the beginning of the study, the students were given several questionnaires that were used to assess their dispositional goal orientation and learning strategies within the classroom. Students were administered a perceived competence scale, an intrinsic motivation scale, an active engagement scale and a science attitude scale. The perceived competence scale measured students’ perception of their academic ability. Items on this scale assessed students understanding of schoolwork, how well they are performing in school, and the difficulty of their schoolwork. The intrinsic motivation scale asked students questions that assessed their curiosity toward learning and their preference toward challenging work. A 12-item science attitude scale was also administered to students to assess their attitude toward science. A science activity questionnaire was also included that assessed students cognitive engagement (active or superficial). The questions looked at cognitive strategies and learning, along with help-seeking and effort avoidance strategies.

A structural equation model was used to determine whether or not there was a correlation between intrinsic motivation and task or ego orientation. The structural equation model showed a higher correlation between intrinsic motivation and task-mastery ($r = .28$) compared to ego-involved individuals ($r = -.28$). Meece found that students who adopted task-mastery goals placed emphasis on understanding and learning while ego-oriented students emphasized social recognition and impressing others. Task oriented individuals perceived the subject matter as more interesting and put forth more cognitive effort than did ego-oriented individuals.
A limitation of this study (Meece et al., 1988) was the classroom size that was used. This study looked at goal orientation among a small number of students in the classroom. However, the results may be different for a larger number of students within the classroom. A smaller number of students within the classroom may provide a more task-oriented environment because teachers can devote more time to individual children allowing them to concentrate on the skills that are needed to be successful. Teaching styles may be somewhat modified in a larger classroom setting. Although this study by Meece et al. (1988) has shown the usefulness of the goal perspective theory within an academic setting, research has also shown that the goal perspective theory has also been applicable in sports settings as well.

Research on goal orientation within the domain of sports has also yielded similar results to academic settings as regards to enjoyment. Duda et al. (1992) looked at children’s motivational orientation in sports. The participants in this study consisted of 142 British boys and girls. Participants were given a three-part inventory that assessed their goal orientation, beliefs about success in sports and satisfaction and interest in sports. The Task and Ego Orientation Questionnaire (Duda et al., 1992) was used to assess children’s disposition toward either task or ego oriented behavior in sports. Subjects were administered a belief about success scale that asked children to assess the most important factor for success. This measure included 3 subscales that assessed children’s beliefs that sports success was caused by: motivation/ability, deception/external factors, or natural ability. Two sub-scales that featured 8 total items measured satisfaction and interest. Five items comprised an enjoyment and interest sub-scale while 3 items comprised a boredom subscale.
The correlation for task orientation and effort leading to success was .60 compared to .23 for ego orientation and effort leading to success. The belief that ability results in success was mainly found in ego orientation (\(r = .58\)) but not task orientation (\(r = -.04\)). There was a significant association between enjoyment and task orientation (\(r = .54\)). However, there was no significant positive correlation between ego orientation and enjoyment (\(r = .06\)). The degree of boredom was also positively correlated with ego orientation (\(r = .24\)) as opposed to task orientation in which there was a significant negative correlation (\(r = -.24\)). In general, the results indicated that task-oriented children reported higher levels of enjoyment and believed that success in sports is associated with effort not ability. Ego-oriented children reported higher levels of boredom and lower levels of enjoyment and believed that success in sports is associated with ability.

A study by Duda and Nicholls (1992) looked at task and ego involvement within sports and academics. The purpose of the study was to compare the relationship of goal orientation, perceived ability and intrinsic motivation within the two settings. The subjects’ in the study were 207 high school students from 10th and 11th grade. Students were given the Motivational Orientation Scale (Nicholls, 1989) which assessed their dispositional goal orientation within the classroom. Students were given questionnaires that measured their beliefs about success in school, intrinsic satisfaction and perceived ability concerning academics. Students were given parallel sport specific items regarding goal orientation, intrinsic motivation, beliefs concerning success in sports and perceived ability.

The results of the study showed that there was a positive relationship between task orientation and enjoyment in the academic setting (\(r = .46\)) and in a sports setting (\(r = \)
.34). However, there was only a small positive relationship between ego orientation and enjoyment in a sports setting ($r = .05$) and a negative relationship between ego orientation and enjoyment in the classroom ($r = -.01$). The results also show that there was a positive relationship between ego orientation and ability in the academic setting ($r = .22$) as well as the sports setting ($r = .29$). The results of this study show that satisfaction and enjoyment was related to task-oriented behaviors as opposed to ego-oriented behaviors. The results of this study also show that perceived ability was viewed as more important among ego-oriented individuals.

Fox et al. (1994) examined the effects of goal orientation on sports motivation in children. They used 231 boy and girls who participated in sports and physical education classes. The children in this study were given a series of questionnaires and items that measured their goal orientation, perceived sport competence, enjoyment and boredom regarding sports. Goal orientation in this study was divided into four different groups: high task-high ego, high task-low ego, low task-high ego, and low task-low ego. The results of this study showed that the enjoyment levels of both groups who were high in task orientation were significantly higher than both groups who were low in task orientation. The results also indicate that perceived sports competence was significantly lower in the low task/low ego group in comparison to the other three groups. Finally, there was no significant difference among the groups in terms of level of boredom. The results of this study showed that children with goals that were high in task orientation (regardless of ego orientation) reported higher levels of enjoyment and competence than individuals low in task orientation.

Similar research by Stephens (1998) studied the relationship of goal orientation
and perceived ability on perceived enjoyment. The participants in this study consisted of 212 female soccer players ranging in ages 9-14. Similar to Fox’s study (1994), goal orientation was divided into four groups: high task/high ego, high task/low ego, low task/low ego, and low task/high ego. Participants were given questionnaires that assessed their goal orientation during athletic events, as well as questionnaires that assessed perceived ability, enjoyment and value. A univariate F-test indicated that the four groups differed significantly in enjoyment and value. However, perceived ability was not significant. The mean scores were converted to z-scores so that the magnitude of the differences between perceived ability, value, and enjoyment could be compared. A post-hoc Tukey HSD test was done on each group. Tukey’s test revealed that athletes who were in the high task/low ego group indicated significantly greater enjoyment ($Z_1-Z_2 = .39$) than athletes in the low task/high ego group ($Z_1-Z_2 = -.27$) and athletes in the low task low ego group ($Z_1-Z_2 = -.29$). Tukey’s test also revealed that athletes who were in the high task/low ego condition indicated significant greater value ($Z_1-Z_2 = .41$) than athletes in the low task/high ego group ($Z_1-Z_2 = -.54$) and athletes in the low task low ego group ($Z_1-Z_2 = -.08$). Although the results were not significant, athletes in the high task and ego group also reported higher levels of enjoyment and value than both groups low in task orientation. These findings coincided with Fox’s study in that those athletes who were high in task-orientation experienced greater levels of enjoyment than either group with low task-orientation.

Horn et al. (1993) examined the relationship between goal orientations, the perceived causes of success, perceived ability, and satisfaction in 57 young athletes participating in a basketball camp. After providing demographic information, subjects
were given questionnaires that measured their goal orientation during sports, beliefs about success, perceived ability, and satisfaction and ability. The results of this study showed that athletes who were high in task and ego orientation reported higher levels of ability and reported greater levels of satisfaction regarding sports involvement. Also, regarding basketball success, task-oriented individuals were more likely to equate success with hard work as opposed to ability. These results coincide with the Duda and Nichols (1992) who also found that task-orientation was closely associated to the belief that hard work leads to success.

Boyd et al. (2002) found similar results in a study that looked at the multivariate relationship between physical self-perceptions/goal orientations and intrinsic motivation in exercise. The subjects in this study were 261 female undergraduates who were enrolled in 12 aerobic dance classes. Several questionnaires were filled out during the first 30 minutes of a class session in the last 2 weeks of the semester. The questionnaires included the Physical Self Perception Profile (Fox, 1990) to measure self-esteem in the physical domain, the Perception of Success Questionnaire (Roberts & Balague, 1989) to measure causal attribution for success, and the IMI to assess individuals' intrinsic motivation. The results of the study indicated that task orientation was moderately associated with intrinsic motivation while ego orientation was not significantly correlated with any kind of intrinsic motivation for exercise. The results of this study are consistent with past studies such as Newton and Duda (1999).

Research in academics and sports has shown that there is a positive relationship between task orientation and characteristics of intrinsic motivation such as enjoyment, and effort (Meece et al, 1988; Hom et al., 1985; Fox et al., 1994). Individuals who are task-oriented tend to focus on intrinsic factors such as personal improvement and effort which
results in higher levels of enjoyment and competence than individuals who are ego-oriented. Ego involved individuals spend more time investing in external factors such as social comparison and impressing others. The focus on external factors undermines intrinsic motivation for ego-oriented individuals. As a result they are more likely to place more pressure on themselves and feel more incompetent. Although an individual can have a predisposition toward a task or ego orientation, certain contextual aspects of the environment can influence an individual’s goal orientation.

**Motivational Climate**

According to Ames (1988) motivational climate refers to the occurrence of a situational goal (such as task or ego orientation) at a given time. Individuals within a given environment may adopt a specific goal orientation in order to adjust to their environment. Ames and Archer (1988) examined the effects of perceived motivational climate on motivational processes within the classroom. The participants in this study were 178 academically advanced junior high students randomly chosen from different classes (pertaining to the class from which they were selected). Students were given a series of questionnaires that assessed their situational goal orientation, learning strategies, task challenge, attitude toward class, causal attribution, and perceived ability.

The measurement used for situational goal orientation-assessed students’ perception of task-orientation ego orientation as regards to their classroom. The measurement for learning strategies was used to assess the kind learning styles that students adopted for their respective class. Task challenge was used to assess students preference for challenging tasks, whereas attitude toward class was a measurement used to assess how much a student liked his or her class. The measurement for causal
attribution assessed students’ perceived reasons for doing well or poorly in a class. Lastly, perceived ability was measured by how well students rated their ability in a specific subject matter.

The results of this study indicated that students perceiving the classroom as more task-oriented engaged in more sophisticated learning strategies ($r = .49$) than individuals perceiving their environment as ego-oriented ($r = .12$). Individuals who perceived their classroom as more task-oriented preferred more challenging task ($r = .34$) than ego-oriented individuals ($r = -.09$). Lastly, individuals who perceived the classroom as more task-oriented liked the class more ($r = .63$) than individuals who perceived the class as more ego-oriented ($r = -.14$). Overall, students who perceived the classroom environment as more task-oriented were more intrinsically motivated as regards to learning and exhibited more productive behaviors towards learning than individuals perceiving the classroom as ego-oriented.

A similar study by Newton and Duda (1999) explored the effects of dispositional goal orientations, motivational climate and perceived competence on intrinsic motivation in 385 volleyball players. They hypothesized that athletes who were task-oriented would elicit higher levels of intrinsic motivation than ego-oriented athletes. They also hypothesized that athletes perceiving a task-oriented environment would elicit higher levels of intrinsic motivation than athletes who perceived the environment as ego-oriented.

The volleyball players were given questionnaires to complete between and after games. The questionnaires included the Perceived Motivational Climate in Sport Questionnaire-2 (Newton & Duda, 1998), the Task and Ego orientation in Sport...
Questionnaire (TEOSQ) and the Intrinsic Motivation Inventory (IMI). The Perceived Motivational Climate in Sport Questionnaire-2 (PMSCQ-2) measures the motivational climate of sport teams. The TEOSQ measures an individual dispositional tendency toward task and ego involvement. The IMI was a measure that assessed an individuals overall intrinsic motivation in volleyball.

The results of the study show that task involving motivational climate was the greatest predictor of enjoyment and interest ($r = .38$) and perceived competence ($r = .20$). Dispositional task orientation ($r = .52$) and perceived task orientation ($r = .14$) was significantly related to the belief that effort determined success. Ego orientation was the only factor that had a significant negative correlation to enjoyment ($r = -.11$). Also, ego-orientation ($r = .30$) and perceived ego orientation ($r = .18$) were significantly related to the belief that ability determined success. This study indicates that a motivational climate that is based on task involvement encourages working hard and effort that results in more enjoyment and less pressure/tension. However, an ego-oriented climate emphasizes ability over hard work resulting in individuals having higher levels of tension and lower levels of enjoyment.

Brunel (1999) looked at perceived motivational climate and goal orientation in relationship to the different kinds of intrinsic and extrinsic motivation on the self-determination continuum. Because of the number of stages of intrinsic motivation that are described in this study, more detail will be discussed in the procedure and result section of this study. The subjects were 160 undergraduate students (average age 18.75) who were enrolled in a badminton course. Students were given a number of questionnaires upon completion of the 12-week course in badminton.
Participants were asked to complete the French version of the Perception of Success Questionnaire (Roberts & Balague; 1984). The Perception of Success Questionnaire (PSQ) had participants recall a specific time in which they felt successful in sports before answering questions on a 5-point. Participants were also given a French version of the Sport Motivational Scale (Pelletier et al., 1995), which was used to measure dimensions of intrinsic motivation and extrinsic motivation toward sports. The intrinsic dimensions on the scale included: intrinsic motivation to know (e.g., “The pleasure I receive learning a new sport”); intrinsic motivation to accomplish things (e.g., “I receive pleasure by mastering a new skill”); and intrinsic motivation to experience stimulation (e.g., “For the pleasure I receive from the sport”). The extrinsic motivation items included identified regulation, introjected regulation, external regulation, and amotivation. An example item for identified regulation is “Participation in sports helps me develop as a person.” An example item for introjected regulation would be “I participate in badminton to increase my self-confidence.” An example item for external regulation would be “I participate in badminton to show off my superiority.” An example item for amotivation would be “I often question why I am playing badminton.” Lastly, participants were given the Physical Education Class Climate Scale (Goudas & Biddle, 1994). The measurement was used to determine to what extent participants perceived their physical education class as emphasizing either task or ego oriented goals.

The results showed that task-climate and dispositional goal orientation contributed to the dimensions of intrinsic motivation. Dispositional goal orientation (r=.07) and task oriented environment (r=.28) were significant predictors for intrinsic motivation to accomplish things. However, only task-oriented environment were significant predictors
for intrinsic motivation to know (r=.07) and intrinsic motivation to experience stimulation (r=.27). The results also show that performance climate and dispositional ego orientation contributed to the dimensions of extrinsic motivation. Dispositional ego orientation (r=.23) and performance climate (r=.06) were significant predictors for external regulation. However, only performance climate (r=.10) was a positive predictor of amotivation. The results also show that task climate (r=.07) and dispositional task-orientation (r=.12) were negative predictors of amotivation.

The results of this study (Brunei, 1999) show that students who perceived their physical education class as task-oriented were more likely to concentrate on task-oriented behaviors such as learning or achieving a new skill and improvement. The study also showed that when students perceived the teacher or the climate as ego-oriented they focused on more extrinsic behavior, which undermined their intrinsic motivation within the class. This study showed that dispositional goal orientation can play a role regarding intrinsic motivation within sports.

A similar study by Kavussanu and Roberts (1996) examined the relationship between perceived motivational climate, intrinsic motivation and self-efficacy. The participants in this study consisted of 285 undergraduate students who were enrolled in a tennis class. Seven experienced tennis instructors were used to teach the 17 tennis classes over the course of the semester. Athletes were given the Perceived Motivational Climate in Sport Questionnaire (Seifritz, 1992) to assess their perceived motivational climate during each class. Athletes were also given the Perception of Success Questionnaire to assess their dispositional goal orientation and the Intrinsic Motivation Inventory (IMI). A
14-item measure was also used to assess students’ self-efficacy with regards to their groundstrokes.

The results of this study showed that students who perceived the climate as more task-oriented reported higher levels of enjoyment, effort, perceived competence, and less tension than ego-oriented individuals. The results also show that intrinsic motivation in males was significantly associated with dispositional task orientation ($r=.28$) and perceived ability ($r=.24$). However, intrinsic motivation in males was negatively associated with performance climate ($r=-.27$). Intrinsic motivation in females was positively associated with perceived ability ($r=.53$) and negatively associated with performance climate ($r=-.27$). Individuals who perceived the climate as ego-oriented felt higher levels of tension during the tennis class compared to task-oriented individuals. The results of this study indicate that dispositional task orientation in males and perceived ability in females were the two highest predictors of intrinsic motivation among each gender. Although mastery climate was not significant among males ($r=.16$) or females ($r=.13$) in this study, mastery climate was still a contributing factor with regards to intrinsic motivation.

Past research (Kavassanu & Roberts, 1996) has shown that perceived motivational climate could be a very influential factor in determining one’s goal orientation. Brunel (1999) showed that students’ perception of their teacher or climate was an important factor in how they engaged in their physical education class. A climate that was perceived as emphasized learning and improvement was more likely to result in more task-oriented behavior and higher levels of intrinsic motivation (i.e., enjoyment) than a climate that emphasized outperforming other students. Studies on perceived
motivational climate have shown that situational factors can determine whether or not an individual will be task-or ego-oriented when engaging in an activity. Studies on perceived motivational climate has also shown that goal orientation can be situationally manipulated in a sport or academic setting. The impact of situational manipulation on goal orientation will be explored in the next section.

Situational Manipulation of Goal Orientation

As previously mentioned, it has been shown that in a given situation the perceived climate can influence individual’s goal orientation or motivation. Recent studies have also used induction to intentionally manipulate goal orientation. A study by Reeve and Deci (1985) has shown that this procedure can be effective within the domain of athletic competition. Because situational manipulation is a major feature of the methodology used in this study, the literature review on this topic will be more detailed.

A study by Grieve and Whalen (1994) looked at manipulation of goal orientations within an adult sample, and, whether ego versus task/mastery goal orientation and success versus failure feedback has different effects on participants’ competence, mood and selection of task difficulty. The effects of goal orientation and feedback performance (success vs. failure) were explored in a basketball-shooting task. The participants were 113 college students who were placed in either a mastery or goal orientation situation that resulted in either success or failure feedback.

Prior to testing, participants were asked to fill out the Task and Ego Orientation in Sport Questionnaire (TEOSQ), the Brief Assessment of Mood (Whelan & Meyers, 1994) and the State Sport Confidence Inventory (Vealy, 1986). The TEOSQ (Duda, 1989) was used to assess individual dispositional orientation within a sports setting. The Brief
Assessment of Mood (BAM) was used to measure mood, whereas the State Sport Confidence Inventory (SSCI) assessed perceived ability. The hypothesis was that subjects receiving success feedback would report more positive moods and greater perceived competence across both goal condition groups. Participants were asked to fill out a few inventories before engaging in the actual study. They were given the State Sport-Confidence Inventory, which measured their situational perception of competence. Participants were also given the Brief Assessment of Mood (BAM), which measured their mood state and the Task and Ego Orientation in Sport Questionnaire, which measured participant’s dispositional goal orientation.

After completing the TEOSQ and SSCI questionnaire, the experimenter deceived the participants by telling them that the purpose of the study was to measure the effects of different methods when approaching an athletic event. Participants were told that there were different ability levels and that they would be placed in a comparable level. Subjects were then randomly assigned to receive either the task or ego goal orientation manipulation along with success-failure manipulation. Participants were given either an ego-orientation induction or a task-mastery orientation induction. Individuals who were task induced were encouraged to try their hardest and concentrate on the technique behind making the shot. The emphasis in the ego-induced condition was on making shots and winning. They hypothesized that subjects receiving success feedback would report more positive moods and greater competence across both condition groups. The authors also hypothesized that participants who were given the task-orientation induction across both feedback conditions and participants given the success feedback in the ego-
orientation induction would have higher levels of positive mood than individuals who received failure feedback and were in the ego-oriented induction.

In the shooting task, subjects attempted shots from designated positions on the court. Subjects began shooting at a 45-degree angle from the backboard 6 feet away from the basket. Subjects were given three shots at each position on the court. If subjects made at least one shot they then moved to 6 different arcs on the court at distances of 10 feet, 12 feet, 14 feet, 16 feet, 18 feet, and 20 feet. The trial ended once participants made at least one shot from each of the 8 arc positions or missed nine shots from one position on the court. Half of the participants receiving successful feedback were told that they did better than 50% of the participants and were considered the winner. Participants in the failure feedback condition were told that they did worse than 50% of the people and were declared the loser. Participants were then given the BAM and the SSCI to assess mood state, perceived ability and confidence for a second time.

An ANCOVA was used to examine feedback and mood and dispositional goal orientation (which was a covariate). In terms of perceived ability, individuals who were given successful feedback reported significantly higher ratings of competence ($M=86.11$) and had .92 standard deviations higher than individuals who received failure feedback ($M=67.94$). The main effect for goal orientation and mood approached significance. In other words, subjects tended to report less mood disturbances ($M=6.4$) in the task condition and had .32 standard deviations higher than subjects in the ego condition ($M=7.49$). Individuals who experience increased levels of positive affect were more likely to experience enjoyment than individuals who had increased mood disturbances. Therefore, the mastery and ego induction had an effect on individuals’ level
of mood and competence. Dispositional goal orientation did not significantly influence mood or competence and, therefore, was not included in the analysis.

Plant and Ryan (1985) examined the effects of manipulating situational factors on goal orientation and self-awareness. Subjects in this experiment were 96 introductory psychology students. Subjects were asked to fill out a self-conscious scale before the study. The self-conscious scale was used to measure dispositional self-consciousness. The self-conscious scale consisted of 23 items with 3 factors: social anxiety, public self-consciousness, and public self-consciousness. Private self-consciousness is defined as an individual being aware of their own thoughts and actions, while public consciousness refers to focusing on oneself as others view one from the outside.

After completing the surveys, subjects received sample puzzles to work on. After completing the puzzle task, subjects were asked to rate their interest and enjoyment of the task. Once the subjects rated their enjoyment of the puzzles, they were asked to move to another table where a tape recorder was located. This procedure was done in order to induce self-awareness among subjects. Subjects were then informed that they would be working on several puzzle tasks that were similar to the ones that they had previously worked on. Participants were randomly assigned to receive either the task condition or ego-induction condition. The ego-involving induction described the task as a test of creative intelligence while the task-involved induction simply alerted participants to the activity without relating it to intelligence. Self-awareness was situationally manipulated during the puzzle-solving task. Three conditions of self-awareness were induced: a no self-focus condition, a condition with a surveillance camera, and a condition with a mirror.
After participating in the self-awareness induction of the experiment, subjects moved to another room to participate in the free choice phase of the testing. Subjects were under the same conditions that they were assigned to in the self-awareness induction. However, subjects were allowed to pick their one task. Subjects were given a choice of reading magazines, doing extra puzzles, or sitting quietly. Experimenters used deception by telling subjects that the testing was over but they needed to wait five minutes so they could check responses and prepare for the next subjects. The experimenter secretly recorded the amount of time the subject spent on the free choice activity. Immediately following the free choice period, subjects filled out a questionnaire, which assessed their level of intrinsic interest and enjoyment toward the task.

The main effect for level of enjoyment and goal orientation (task vs. ego) showed that task-oriented individuals reported higher levels of enjoyment than ego-oriented individuals. There was also a main effect for goal orientation and tension/pressure. Individuals who were task-oriented reported lower levels of tension/pressure than ego-involved individuals. The results also showed that the level of public self-consciousness had a significant effect on enjoyment. Individuals in the self-awareness group that did not include cameras had significantly higher levels of enjoyment (.20 standard deviation units higher) than participants with no camera present. Individuals in the self-awareness group without mirrors had higher levels of enjoyment (.15 standard deviations units higher) than participants in the self-awareness group with mirrors present. Private self-consciousness did not significantly effect intrinsic motivation levels in participants. The ego involvement and public self-awareness had the strongest negative effects on intrinsic motivation. The free-choice measure of intrinsic motivation showed that task-involved
individuals had significantly higher standard deviation units (.38) as regards to enjoyment than individuals who were in the ego-oriented condition. In conclusion, this study showed how a situationally manipulated environment can enhance feelings of public self-awareness and undermines intrinsic motivation.

A similar study by Ryan (1982) looked at the effects of situational induction of goal orientation and feedback on intrinsic motivation in 128 undergraduate students completing puzzles. More specifically, Ryan wanted to look at how different types of informational and controlling feedback effected task and ego involvement. Informational feedback can be defined as information concerning one’s performance that is not evaluative. An example of informational feedback would be a statement such as “you finished in 8th place out of 30 runners.” Controlling feedback tends to be more evaluative in nature and emphasizes more of a controlling outcome. An example of controlling feedback would be a statement such as “Your should have done better.” This method approach is considered controlling because the statement is emphasizing a controlling outcome rather than choice.

The task involved three different puzzle problems in which participants had to find hidden figures. Subjects went through three different induction phases in this study. Participants were first given either an ego or a task-involved induction. The ego-involved individuals were told that the hidden puzzle task was a reflection of creative intelligence and that the task requires a lot of cognitive capacity. Merely introducing the participants to the puzzle task without relating it to intelligence induced task-involvement.

After undergoing the involvement induction (task or ego), participants were immediately given a performance induction after completing each puzzle task. For this
induction, participants were placed in an informational induced condition or a controlling induced condition. Subjects in the feedback induction were given either informational feedback or evaluative feedback. The informational induced condition consisted of comparing the number of hidden figures that a participant found with the average number of figures usually found. Subjects in the controlling condition received similar feedback as the informational feedback subjects. However, the controlling condition received more evaluative statements after the completion of each puzzle. Participants received evaluative statements that ranged from “excellent, you’re doing like you should” to “poor, you should be doing better.”

The third induction phase included an administration induction that looked at self-administration other administration. For this induction, participants in the informational-feedback conditions either received their feedback verbally (other administration) or were provided with printouts explaining their results (self-administration). The idea behind this induction was to determine whether or not participants interpreted different types of administration as controlling.

After completing the puzzle task, subjects were allowed to engage in a free period where they could work on some more puzzles or read magazines while the experimenter was gone. However, during the free period, the experimenter observed the subjects behavior in an adjacent room. Subjects’ intrinsic motivation was measured by the amount of time (in seconds) that they spent working on the puzzles during the free period. After the free period, subjects were given the experimental attitude questionnaire to rate their interest, tension and effort levels concerning the puzzles.
The results of this study showed that there was a significant difference in types of feedback (controlling vs. informational) and intrinsic motivation (means are recorded in seconds). Individuals receiving informational feedback reported higher levels of intrinsic motivation ($M=227.7$) and .642 standard deviations more than individuals receiving controlling feedback ($M=134.5$). There was no significant difference between self and other administration. There was a main effect for goal orientation and intrinsic motivation. These results indicate that the task-oriented condition reported higher levels of enjoyment ($M=214.5$) and .442 standard deviations more than the ego-oriented condition. Lastly, the results showed that individuals in the informational control group reported significantly higher levels of effort than individuals in the controlling group. There was no significant difference between self-administration and other administration with regard to effort. Overall, this study showed that different kinds of feedback induction could be used to either enhance or undermine intrinsic motivation within an individual. This study also showed that ego-orientation tends to undermine intrinsic motivation.

Previous literature has shown that a situationally manipulated environment can induce task or ego behavior in an individual. All three studies (Ryan, 1982; Ryan & Plant, 1985; Grieve & Whelan, 1994) introduced specific aspects within the environment (i.e., surveillance camera, performance feedback) that influenced individuals intrinsic motivation or goal orientation. Situations that promoted controlling aspects resulted in lower levels of intrinsic motivation in each study. These studies also showed that individuals who were in the ego-oriented conduction reported lower levels of enjoyment and competence as opposed to those individuals in the task oriented induction.
The implications of this research show that an ego-oriented environment within an academic or sports realm can be replaced by a more task-oriented environment. A task-oriented environment will result in higher levels of enjoyment and competence which it turn may lead to higher achievement among individuals in a sports or academic setting.

Conclusion

Exercise has been shown to be a very important activity for maintaining physical and psychological health. Although exercise is very beneficial, most Americans do not adhere to an exercise program. One of the key components to exercise adherence is intrinsic motivation. An intrinsically motivated person engages in an activity for the sake of that activity itself and not for any external rewards. According to Deci and Ryan (1985), autonomy and competence are essential factors that are needed in order to obtain intrinsic motivation.

Enjoyment is a central feature of intrinsic motivation. Although there are many factors that contribute to enjoyment, there are four main factors that are relevant for this study: social feedback, exercise intensity, perceived motivational climate, and goal orientation. The positive or negative evaluation that an individual encounters in his or her social environment may influence their enjoyment toward that activity. Another factor that was briefly discussed was exercise intensity and enjoyment. Exercising at a moderate intensity level has been shown to result in the largest improvements in mood. However, more literature regarding moderate exercise intensity and positive mood is needed.

The Goal Perspective Theory has looked at how personal goals can influence the way individuals act in achievement situations. Individuals who are task oriented perceive competence in terms of improvement and gaining skills while ego-oriented individuals
view competence as superior ability. Findings on goal orientation indicate that individuals who are in a task-oriented environment tend to feel less pressure and tension because their performance is contingent on effort (Newton & Duda, 1999). An ego-oriented environment creates a tense environment because people are expected to outperform others. The Goal perspective Theory and the factors of enjoyment are all interrelated with the Self-Determination Theory to describe how intrinsic motivation is enhanced in an exercise setting. According to the two theories, task-orientated individuals should experience more self-determined behavior and competence that will lead to increased intrinsic motivation in comparison to ego-oriented individuals. The goal-perspective theory also suggests that a person’s state of task or ego involvement can vary depending on how they view a particular environment. A past study by Grieve and Whalen (1994) demonstrated that the environment could be manipulated in such a way that individuals can adopt task or ego oriented behaviors.

The central question that will be addressed in this study is whether a task or ego induced environment will result in different levels of intrinsic motivation (enjoyment, competence, tension, and effort). The first hypothesis for this study is that individuals who are in a task-oriented condition will achieve a higher level of enjoyment when engaging in moderate exercise than individuals in the ego-oriented condition. A question that will be addressed is whether or not a task or ego induced environment will influence feelings of competence, tension/pressure and effort. The second hypothesis is that individuals who are in the race function will achieve higher levels of enjoyment, competence, effort and lower levels of tension than individuals in the manual function.

The results from this study can help contribute to our understanding of what
factors effect exercise enjoyment. A greater understanding of what effects intrinsic
motivation and exercise enjoyment can result in more effective exercising programs and
higher levels of exercise adherence. Higher levels of exercise adherence can result in
improved physical and mental health in society.
Chapter 2

Method

Participants

The participants in this experiment consisted of 114 undergraduate students enrolled in psychology courses. Of the participants, 38 were male and 76 were female ranging from 18-40 years old (average age 19.9). Participants signed up on the psychology department study board. A copy of the Physical Activity Readiness Questionnaire (PAR-Q) was posted by the sign up sheet. The PAR-Q was one of the screening questionnaires that was used to classify a low risk participant. Students were informed that if they answered “yes” to any of the questions that they should not participate in the study. The Western Kentucky University Human Subjects Review Board approved the procedures for this study (see appendix).

Materials

The experimenter used a Marshall Sprague Rapport stethoscope and a Hanhart Amigo 141.6434 stopwatch to assess subjects’ heart rate for 20 seconds. A model D-339 Detecto medical scale measured participant’s height and weight. After participants completed the preliminary paperwork, they rode on an E3200 upright fitness cycle that assessed distance, speed, time and revolutions per minute (RPM’s). Once participants were finished riding the bike, the experimenter used Clorox disinfectant wipes for sanitary purposes to clean the bike.
Procedures

Upon arrival to the experiment, students were asked to fill out the American College of Sports Medicine (ACSM) risk stratification form, an Informed consent form, a demographic inventory and a subscale intrinsic motivation Inventory (IMI). The ACSM risk stratification form is a screening questionnaire that will determine which individuals are considered low risk and able to participate. The subscale of the IMI assessed an individual’s autonomy and competence prior to exercising. The demographic inventory looked at age, gender, exercise habits, and any type of exercise that participants engaged in during the week. After the questionnaires were completed, heart rate was assessed for 20 seconds. Participants were then given the PAR questionnaire that was used to assess the exercise intensity that they engaged in during the week as well as the duration of the exercise. The PAR questionnaire response was entered into a computer program in EXCEL in order to determine each individual’s estimated VO2max.

After heart rate was measured, participants removed their shoes so that their height and weight could be assessed. Height and weight was also entered into the Excel program in order to assess each individual’s estimated VO2max max. VO2max is defined as the maximum capacity for oxygen consumption by the body during maximum exertion. The more oxygen an individual can use, the more fit that individual is. Less fit individuals bodies will resort to other sources of energy (e.g., protein) at lower exercise intensities while a more fit persons body will continue to utilize aerobic resynthesis. The estimated VO2max max was used to determine the appropriate exercise level for each participant. Participants were also given the choice of exercising at an intensity of 52%, 55%, or 58% of their VO2max. According to Self-Determination Theory, this element of
choice allowed participants to experience a certain level of autonomy which wouldn’t deter enjoyment. After choosing their workout intensity, participants underwent a situational manipulation that induced task or ego orientation. The task and ego involved participants rode the bike for 24 minutes on race mode. Individuals in the control group rode the bike for 24 minutes on manual mode and were not involved in the manipulation. After completing the experimental condition, subjects were given the (IMI) and the Patterns of Adaptive Learning Survey (PALS). Once post-measures and heart rate were assessed, participants were debriefed.

**Conditions**

Subjects were randomly assigned to one of the following conditions A) Informational/Task oriented, B) Controlling/Ego oriented or C) Control condition (see appendix c).

**Measures**

The Intrinsic Motivation Inventory (McAuley et al., 1989) subscale of autonomy and competence was administered before exercise and the (IMI) Intrinsic Motivation Inventory subscales for enjoyment, competence, tension and effort was administered after participants engaged in the exercise or control condition. The IMI was used to measure intrinsic motivation in exercising (dependent variable). The IMI is a 21-item scale that measures four individual dimensions of intrinsic motivation. According to McAuley et al. (1989) the individual dimensions for the IMI have been shown to have adequate reliability: interest/enjoyment (.78), competence (.80), effort/importance (.84), and pressure/tension (.68). The items have a 7-point likert scale ranging from (1) strongly disagree to (7) strongly agree. The IMI has an overall consistency of .86. The four
dimensions of the IMI were compared with the orientation groups. For this study, the individual dimensions of the IMI had adequate reliability for interest/enjoyment (.82), competence (.78), effort/importance (.87), and pressure/tension (.72).

The Patterns of Adaptive Learning Survey (Midgley et al., 1996) was administered to participants after they engaged in the exercise or control condition. The Patterns of Adaptive Learning Survey (PALS) is a measure that is used to assess students’ preference in goal orientation (task and ego), academic self-efficacy, and self-handicapping strategies. For this study, only the goal orientation subscale of the PALS was used. The PALS was modified into 14-item scale that measured two dimensions of goal orientation: task and ego. The items have a 5-point likert scale ranging from (1) Not at all true to (5) Very true. According to Midgley et al.(1998) the goal orientation subscale of the PALS has been shown to have an adequate reliability of .78 for task orientation and .81 for ego orientation. For our study, the modified version of the PALS had an adequate reliability of .77 for task orientation and .91 for ego orientation. The scale items can be found in the appendix B.
Chapter 3
Results

Participants in this study consisted of 76 females and 38 males. Most of the participants in this study were nonsmokers (n=106) and had some previous experience on an exercise bike (n=112). Participants filled out a stages of exercise and behavior change inventory that was developed by Prochaska and Diclemente (1983). The stages of changes model describes different stages that are involved with the attainment and continuation of exercise. According to Prochaska and Diclemente (1985), individuals who engage in new behaviors move through stages of precontemplation (no desire to change their behavior), contemplation (having a desire to change their behavior), preparation (making small changes), action (engaging in behavior change), and maintenance (continuing behavioral change). The breakdown for the study with regard to stages of change was: precontemplation (n=3), contemplation (n=2), preparation (n=34), action (n=39), and maintenance (n=36).

Descriptive statistics for the four dependent variables by group can be found in Table 1. Prior to examining group differences, a MANCOVA was conducted for all 4 dependent variables to look for potential covariates from the three goal orientation subscales and pre-levels of perceived competence. The two significant covariates found in the analysis were pre-exercise level of competence for the dependent variable competence ($\eta^2=.36$) and mastery orientation for the dependent variable effort ($\eta^2=.09$). Participants who reported higher levels of pre-exercise competence also reported significantly higher levels of post-exercise competence $F(1,112) = 30.71, p <.05$. Also, individuals who were more mastery-oriented reported significantly higher levels of
effort $F(1,121) = 6.25, p < .05$.

Table 1

Means and Standard Deviations of Goal Orientation Conditions

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Task (n=36)</th>
<th>Ego (n=40)</th>
<th>Control (n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment</td>
<td>Means</td>
<td>15.3</td>
<td>15.5</td>
</tr>
<tr>
<td>(SD)</td>
<td>(2.8)</td>
<td>(3.5)</td>
<td>(3.5)</td>
</tr>
<tr>
<td>Competence</td>
<td>12.0</td>
<td>11.5</td>
<td>11.8</td>
</tr>
<tr>
<td>(2.8)</td>
<td>(3.5)</td>
<td>(3.0)</td>
<td></td>
</tr>
<tr>
<td>Effort</td>
<td>22.6</td>
<td>23.5</td>
<td>23.8</td>
</tr>
<tr>
<td>(3.8)</td>
<td>(3.4)</td>
<td>(2.9)</td>
<td></td>
</tr>
<tr>
<td>Tension</td>
<td>13.8</td>
<td>13.9</td>
<td>13.4</td>
</tr>
<tr>
<td>(3.1)</td>
<td>(3.4)</td>
<td>(3.3)</td>
<td></td>
</tr>
</tbody>
</table>

It is important to note that outcome feedback was not addressed in the literature review or in the hypotheses. Yet, past research by Turnbull and Wolfson (2002), found that outcome feedback had a significant effect on individuals’ mood and enjoyment after exercising. The race function in our study had an outcome feedback (win vs. lose). Therefore, win/lose was analyzed as an additional independent variable. Overall, there were 56 winners and 20 losers in the race function. The task condition consisted of 27 winners and 11 losers while the ego condition consisted of 29 winners and 9 losers. Winners and losers was not analyzed for the manual mode because there was no outcome feedback.

Four separate ANCOVAs were conducted for each dependent variable comparing the ego vs. task oriented conditions and win vs. lose variable. Descriptive statistics for
the four dependent variables by win/lose are reported in Table 2. There was no significant
difference in enjoyment levels for either of the 2 independent variables. There was a
significant difference in levels of competence between winners and losers. Individuals
who won experienced significantly higher levels of competence $F(1,76) = 13.4, p < .05$
than individuals who lost (see table 2 for means). Outcome feedback accounted for 16% of
the variance in post competence. There was also a significant interaction in
competence levels between the task and ego condition and win vs. lose ($F(1,76) = 3.8,
$ $p > .05$), (see figure 1). Individuals who won in the ego-condition experienced
significantly higher levels of competence than those who lost in the racer condition (see
table 3 for means).

### Table 2

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Outcome Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winners (n=56)</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>Means (SD)</td>
</tr>
<tr>
<td></td>
<td>16.7 (3.5)</td>
</tr>
<tr>
<td>Competence</td>
<td>12.8 (3.0)</td>
</tr>
<tr>
<td>Effort</td>
<td>23.7 (4.6)</td>
</tr>
<tr>
<td>Tension</td>
<td>12.7 (2.9)</td>
</tr>
</tbody>
</table>

There was also a significant interaction in competence levels between the task/ego
condition and win/lose ($F(1,76) = 3.8, p > .05$), (see figure 1). Individuals who won
in the ego-condition experienced significantly higher levels of competence than those
who lost in the racer condition (see table 3 for means). The results also show that there was a significant difference between individuals who won in the task oriented condition and individuals who lost in the ego-oriented condition. Individuals who won in the task oriented condition had significantly higher levels of competence than individuals who lost in the ego oriented condition (see figure 1).

There were no significant differences or interactions for the dependent variable effort for either of the two independent variables. Finally, there was a significant difference in level of tension between winners and losers. Individuals who won in the race function reported significantly lower levels of tension compared to individuals who lost $F(1,76) = 4.464, p > .05$ (see table 2 for means).

Figure 1. Interaction means of competence levels between task and ego orientation and win/lose feedback.
Table 3

Means and Standard Deviations of Outcome Feedback Conditions

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Task Orientation</th>
<th>Ego Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winners (n=27)</td>
<td>Losers (n=11)</td>
</tr>
<tr>
<td>Competence</td>
<td>Means 12.5 (3.2)</td>
<td>11.5 (3.5)</td>
</tr>
</tbody>
</table>

Further analyses were run to determine whether there were any significant differences in individuals in the race mode (task & ego) and individuals in the manual mode. The results showed that the race function did not significantly enhance exercise experience as regards to levels of enjoyment, competence, tension and effort (see table 4 for means).

Table 4

Means and Standard Deviations of Racer Mode and Manual Mode

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Manual (n=56)</th>
<th>Race(n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means (SD)</td>
<td></td>
</tr>
<tr>
<td>Enjoyment</td>
<td>15.3 (5.4)</td>
<td>16.8 (4.3)</td>
</tr>
<tr>
<td>Competence</td>
<td>11.5 (3.4)</td>
<td>12.5 (2.7)</td>
</tr>
<tr>
<td>Effort</td>
<td>23.9 (4.7)</td>
<td>23.9 (4.8)</td>
</tr>
<tr>
<td>Tension</td>
<td>14.1 (3.5)</td>
<td>12.8 (4.3)</td>
</tr>
</tbody>
</table>
Chapter 4

Discussion

The goal of this study was to test how feedback influences an individual’s level of enjoyment, tension, effort and competence during exercise. Individuals’ situational goal orientation (task vs. ego) was manipulated in this study to determine if there were any differences in subsequent intrinsic motivation. Separate ANCOVAs were ran to examine differences for situational induced goal orientation.

There were two hypotheses that were tested in this study. The first hypothesis was that individuals who were in the task-oriented condition would experience higher levels of enjoyment, competence, effort and lower levels of tension than individuals who were in the ego-oriented condition. The rationale for this hypothesis is that task-orientation is more conceptually linked to Self-Determination Theory with regard to intrinsic behaviors than ego-orientation. According to the Self-Determination Theory (SDT), intrinsic motivation occurs when an individual engages in an activity for the sake of the activity instead of an external reward. Individuals who are task-oriented focus more on internal factors (i.e., working hard) in comparison to ego-oriented individuals who focus more on external factors (i.e., showing off, being the best). Also, because task-oriented individuals focus more on the process of the activity as opposed to the outcome of the activity, they are less likely to feel incompetent. Therefore, task-oriented individuals are expected to have higher levels of competence and autonomy. According to the SDT, higher levels of competence and autonomy will lead to more intrinsic behavior.

Individuals who were in the task-oriented condition were also expected to experience higher levels of effort and lower levels of tension. Individuals who are ego-
oriented would not put forth as much effort because they view ability in terms of being successful without putting forth a lot of effort while engaging in an activity. Ego-oriented individuals are more likely to place more pressure on themselves and experience feelings of disappointment and incompetence after failure. Despite the relationship between the goal perspective theory and SDT, the results did not support the main hypothesis in this study. The results of this study did not confirm that task-oriented individuals reported significantly higher levels of enjoyment, competence, effort, and lower levels of tension in comparison to ego-oriented individuals.

The second hypothesis in this study was that individuals who were in the race function would experience higher levels of enjoyment, competence, effort, and lower levels of tension than individuals in the manual function. The rationale for this hypothesis was that the constant feedback provided in the race function would allow participants to feel more in control of the performance, which would allow participants to experience higher levels of intrinsic motivation. Rutherford and Corbin (1992) showed that informational feedback could increase competence levels during exercise. The results of the study did not show any significant differences with regard to the manual function and the race function.

A finding of this study was that pre-competence levels of exercise were significantly related to post-competence levels of exercise. For example, individuals who reported high levels of pre-exercise competence also reported high levels of competence after exercising and individuals who reported low levels of pre-exercise competence also reported low levels of post-exercise competence. According to the Self-Determination Theory, competency is an important need that must be met to fulfill intrinsic motivation.
Another significant finding of this study showed that individuals who were mastery-oriented reported significantly higher levels of effort ($\eta^2 = .09$). This finding is consistent with the Goal Perspective Theory in that task-oriented individuals' perception of success is based on improvement and trying one's best (effort). In fact, a past study by Duda and Newton (1999) showed that there was a positive relationship between dispositional mastery-orientation and effort.

A third significant finding of this study was that outcome feedback (win vs. lose) significantly influenced individuals’ tension and competence levels. The study showed that individuals who won reported lower levels of tension and higher levels of competence compared to individuals who lost in the race function. The results also showed that there was an interaction between goal orientation (task vs. ego) and outcome feedback (win vs. lose) as regards to competence levels. Ego-oriented individuals reported significantly higher levels of competence when they won in the race compared to when they lost. However, task-oriented individuals maintained similar levels of competence regardless of the outcome.

The results of outcome feedback study supported the goal perspective theory. According to the Goal Perspective Theory, individuals who are ego-oriented tend to focus on the outcome aspect of the activity (i.e., winning, superiority) to determine their competence within that activity. Because ego-oriented individuals depend on social comparison, they are more susceptible to incompetence in an activity than task-oriented individuals. Task-oriented individuals are more concerned with the process that goes along with the activity. They view competence as regards to learning and improvement as
opposed to winning. As a result, the outcome of the activity will not impact their competence level to the same degree.

One of the reasons why the main hypotheses may not have been supported was that the manipulation was weak. Prior to riding the bike, subjects were read a script in order to induce task or ego orientation. For example, subjects in the ego condition were told that their goal was to beat the computer racer, while individuals in the task condition were given information only about the bike functions. It is possible that subjects in the ego condition needed a more tangible reward for beating the computer. A more tangible reward may have better defined a more ego-oriented condition in comparison to the task condition. The manipulation may have been more effective had the students been told that they would be ranked according to their performance or that they could win money depending on how well they performed. This procedure may have induced more of a competitive environment for the ego-oriented condition. A second limitation of this study may have been the use of a computer-simulated rider. Past studies such as Grieve and Whalen (1994) have generally used human subjects when conducting manipulation procedures.

Another potential reason for the lack of difference between task and ego orientation has to do with using an exercise context for goal orientation. The majority of studies concerning goal orientation have been used in an academic setting (Ames & Archer, 1997) or other cognitive activities such as solving puzzles (Ryan, 1982). These types of settings are often salient in terms of the type of motivational climate that is presented (i.e., task or ego orientation). For example, in an achievement setting (i.e., solving the most puzzles), the outcome of the activity is more distinct with regard to a
winner and a loser. Similarly in a sports setting, individuals are cognitively engaged regarding the skills required in the activity. However in exercise, there seems to be more physical engagement involved in performing the activity. Pedaling an exercise bike or engaging in a treadmill exercise does not require as much cognitive activity as compared to learning material for a class or trying to understand a sports specific skill. Therefore, with regard to the 1st hypothesis, it is possible that the goal orientation theory may be more applicable in an academic or sports setting than in an exercise setting.

Our 2nd hypothesis may not have been supported because of the race function that was displayed on the bike. The race display consisted of a dot labeled “you” which represented the subject’s racer and a dot labeled “racer” which represented the computer racer. The display of two dots may not have been realistic enough to capture the subjects attention within the two conditions. A recent study by Plante et al. (2003) showed that virtual reality when paired with aerobic exercise enhanced enjoyment, energy and reduced tiredness compared to aerobic exercise without virtual reality. Perhaps, if the bike display showed two bikes side by side each other going around a track subjects would be more motivated to try their hardest to beat the computer. A more realistic bike display would allow subjects to feel as though they were in an actual race against someone else.

In conclusion, the hypotheses were not supported in this study. However, this study could be replicated with a few improvements. The results of both hypotheses may have been significant with a stronger manipulation procedure and a more realistic bike feedback function. A stronger manipulation procedure may have resulted in a clearer distinction between the task and ego oriented conditions. It is also possible that a more
realistic feedback function would have allowed a subject to feel more involved in the race function. The results of both hypotheses may have also been significant if a different population were used. A more representative population that used males and females from a fitness and exercise program may have yielded stronger results in terms of enjoyment levels among the different conditions. Using this population may have resulted in less confounds concerning exercise habits among subjects.

Although our main hypotheses were not supported, there were some significant findings. The study showed that there were significant differences for outcome feedback (p < .05) for competence and tension as well as a significant interaction between goal orientation and outcome feedback for the dependent variable competence. Ego-oriented individuals reported significantly higher levels of competence when they won in the race function as opposed to when they lost. Outcome feedback did not significantly influence task-oriented individuals' level of competence. Individuals who won or lost in the task oriented condition reported similar levels of competence. This finding lends support to the Goal Perspective Theory in that task-oriented individuals focus more on the process of the activity as opposed to ego-oriented individuals who concentrate on the outcome of the activity. This significant interaction suggests that the situational manipulation was partially effective in inducing a task vs. ego orientation. The results of this study also showed that tension levels were lower in individuals who won in the race function compared to those individuals who lost in the race function.

Despite some of the limitations of this study, future improvements with regard to goal orientation and exercise can increase our understanding of exercise adherence and enjoyment. Many of the characteristics associated with task-oriented individuals such as
working hard, improvement, and learning may be more conducive to exercise adherence than trying to impress friends or trying to receive social recognition. Focusing on the process involved with the activity (i.e., effort, learning) is more under the control of an individual than impressing others or being the best. Therefore, task-oriented individuals are less likely to feel incompetent than ego-oriented individuals, because the focus of their success is not determined by the outcome of the activity. An individual who feels more competent during exercise is more likely to adhere to an exercise program.

Also, individuals who are task-oriented are less likely to encounter feelings of tension/pressure during exercise because the process of that activity defines task-oriented individuals' success. With regard to exercising, ego-oriented individuals focus more on the outcome of the activity such as looking better than a friend (social comparison) or lifting the most weights (superiority). Because they are more dependent on social comparison, ego-oriented individuals may feel more tension in activities such as exercising. Individuals who feel more tension are less likely to enjoy an activity. High levels of tension may also discourage an individual from adhering to an exercising program.

Overall, future research should take a closer look at the effects of feedback displays on bikes in order to discover ways in which individuals can increase their exercise enjoyment. Future research should also examine more closely the effects that the social and physical environment has on goal orientation and intrinsic motivation within exercising. It is possible that more research on these topics can result in better exercise programs that individuals can adhere to more often.
References


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Exercise Psychology, 14, 375-391.


Wankel, L.M. (1993). The importance of enjoyment to adherence and psychological
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   151-169.

   for the youth sport setting: A confirmatory factor analysis. *Journal of Sport
   Psychology, 7,* 75-91.
Appendices
### ACSM Risk Stratification (ACSM, 2000)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date: / /</th>
<th>Gender: Female or Male</th>
<th>Age: __________</th>
</tr>
</thead>
</table>

Do you have any of the following conditions?

1. **Family history of Heart disease:** Heart attack, heart surgery, or sudden death before age 55 (father/brother/son) or 65 (mother/sister/daughter)
2. **Cigarette Smoker:** current or have quit within the past 6 months
3. **High Blood Pressure:** SBP $\geq 140$ or DBP $\geq 90$ (confirmed on 2 occasions or on Blood Pressure medication)
4. **High cholesterol:** total $>200$ (or HDL $< 35$, or $> 130$, or on medication for high cholesterol)
5. **Diabetes (adult or juvenile) or Glucose Intolerance**
6. **Obesity (Body Mass Index $\geq 30$, or waist circumference $> 39$ inches)**
7. **Sedentary Lifestyle:** (less than 30 minutes total “physical activity” most days)

**Total risk factors =**

Do you have any of the following?

1. Pain, discomfort, tightness, or heaviness in the chest, neck, jaw, arms, or other areas
2. Shortness of breath at rest or with mild exertion
3. Dizziness or loss of consciousness
4. Difficulty breathing when lying down or any difficulty breathing during physical exertion
5. Swelling at the ankles
6. Irregular or fast heart rate
7. Intermittent leg pain or limping especially upon exertion
8. Known heart murmur
9. Unusual fatigue or shortness of breath with usual activities

**Total signs/symptoms =**

**Stratification** *(only persons considered as low risk may participate in this study)*

**Low Risk** Younger individuals (males: younger than 45, females: younger than 55) who have no signs/symptoms and no more than 1 risk factor.

**Moderate Risk** Older individuals (males: 45 and older, females: 55 and older) or those who have 2 or more risk factors.

**High Risk** Individuals with 1 or more signs/symptoms or known cardiovascular, pulmonary or metabolic disease.
Informed Consent Form, Project Title: Exercise and intrinsic motivation

Investigator: Marc Fields
Faculty Sponsor: Dr. Steven R. Wininger, Psychology Department, (270)-745-4421

1. The purpose of this study is to examine intrinsic motivation in the context of an acute bout of exercise.

2. As a volunteer in this research project you may be asked to: a) engage in a 24 minute bout of exercise (moderate intensity cycling on a stationary bike) b) provide demographic information, measure your heart rate, complete a series of questionnaires to assess mood, enjoyment, and personality.

3. Potential risks to your health and well-being because of your participation include 1) cardiovascular injury (heart attack or stroke), 2) severe acute fatigue, 3) lightheadedness, dizziness, nausea, 4) all other possible risks associated with engaging in moderate intensity exercise.

- The American College of Sport Medicine (2000) suggests the following regarding the potential for risk/injury as the result of participating in maximum intensity testing or testing in which intensity is contingent upon pre-existing health conditions:
  ▪ Risk of Death during or immediately after is less than 0.01% (1 in 10,000)
  ▪ Risk of heart attack during or immediately after is less than 0.04% (4 in 10,000)
  ▪ Risk of hospitalization as a result of testing is less than 0.2% (2 in 1,000)

- The ACSM goes on to state that the risk associated with physical fitness testing below maximum intensity levels appears to be even lower. Moreover, the screening questionnaires you have completed have lead to your classification as a low risk subject. This should lower these potential risks considerably.

- IF YOU FEEL ILL AT ANY TIME DURING, BEFORE OR AFTER THIS STUDY LET THE INVESTIGATORS KNOW IMMEDIATELY! IF YOU MIGHT BE PREGNANT OR IF YOU ARE TRYING TO CONCEIVE CHILDREN, YOU SHOULD NOT PARTICIPATE IN THE STUDY!!

4. For your participation, you may be awarded extra-credit, which may be applied to your psychology course grade with your instructor’s approval. You understand that there are no other direct benefits to you and that you will receive no monetary compensation for participation in this study.

5. You understand that your responses will be confidential. No identifying information, including your name, will be on any of the forms. The entire experiment should take approximately 45-60 minutes.

6. Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

If you fully understand what will be asked of you (should you participate), please read and sign the following:
I freely and voluntary and without undue inducement or any element of force, fraud, or deceit, or any form of coercion, consent to be a participant in this research project. I have read and understood the screening questionnaires (PAR-Q & ACSM stratification) used to classify me as a low risk participant. I have been given the right to ask and have answered any questions that I may have regarding this research. I have read and understand all of the above.

_I understand also that it is not possible to identify all potential risks in an experimental procedure, and I believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks._

Signature of Participant  

Date

Witness  

Date

Questions regarding Human Subjects Review Board issues should be directed to Dr. Phillip Myers at (270) 745-4652.
1. Gender: Female or Male

2. Age: _______

3. What time did you wake up this morning? ______ Current time? ___

4. Have you ridden on a stationary bike before? Yes or No

5. Which of the following statements best describes you? Please read all 5 statements and then circle your response.
   a. I currently do not exercise and do not intend to start exercising in the next 6 months.
   b. I currently do not exercise, but I am thinking about starting to exercise in the next 6 months.
   c. I currently exercise some, but not regularly (regularly is defined as exercising 3 or more times per week for at least 30 minutes per session).
   d. I currently exercise regularly.
   e. I have been exercising regularly for the past six months or longer.

If you selected c, d, or e please answer the following questions...

6. What mode(s) of exercise do you normally engage in? Frequency? Duration? Intensity (RPE)?

   1) ___________________________ ______ ______ ______
   2) ___________________________ ______ ______ ______
   3) ___________________________ ______ ______ ______
   4) ___________________________ ______ ______ ______

STOP HERE

HR (20 seconds) RPE
Heart rate prior _____ 5 minutes _____
Heart rate after _____ 10 minutes _____
Heart rate 15 minutes after _____ 15 minutes _____
20 minutes _____
24 minutes _____

Height _____ Weight _____

Assigned Level (circle)
L1 L2 L3 L4 L5 L6 L7 L8
L9 L10 L11 L12 L13 L14 L15 L16 Total Distance _____
For each of the following statements, please indicate how true it is for you, using the following scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pre IMI

1. I participated in this study because I wanted to ... 1
   | 2 | 3 | 4 | 5 | 6 |
2. I think I am pretty good riding a stationary bike ... 1
   | 2 | 3 | 4 | 5 | 6 |
3. I felt like it was not my own choice to participate in this study ... 1
   | 2 | 3 | 4 | 5 | 6 |
4. I think I do pretty well at riding a stationary bike compared to other students ... 1
   | 2 | 3 | 4 | 5 | 6 |
5. I didn’t really have a choice about participating in this study ... 1
   | 2 | 3 | 4 | 5 | 6 |
6. I am pretty skilled at riding a stationary bike ... 1
   | 2 | 3 | 4 | 5 | 6 |
7. I felt like I had to participate in this study ... 1
   | 2 | 3 | 4 | 5 | 6 |
8. Riding a stationary bike is an activity that I can’t do very well ... 1
   | 2 | 3 | 4 | 5 | 6 |
9. I participated in this study because I had no choice ... 1
   | 2 | 3 | 4 | 5 | 6 |
Instructions. This questionnaire is concerned with your current feelings. Please answer every question, even if you find it difficult. Answer, as honestly as you can, what is true of you. Please do not choose a reply just because it seems like the 'right thing to say'. Your answers will be kept entirely confidential. Also, be sure to answer according to how you feel AT THE MOMENT. Don't just put down how you usually feel. You should try and work quite quickly: there is no need to think very hard about the answers. The first answer you think of is usually the best.

Here is a list of words which describe people's moods or feelings. Please indicate how well each word describes how you feel AT THE MOMENT. For each word, circle the answer from 1 to 4 which best describes your mood.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definitely</th>
<th>Slightly</th>
<th>Slightly Not</th>
<th>Definitely Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Happy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Dissatisfied</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Energetic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Relaxed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Alert</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Passive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Cheerful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Tense</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Sluggish</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Sorry</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. Composed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. Depressed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. Restful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Vigorous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. Anxious</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Satisfied</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Unenterprising</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. Sad</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. Calm</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22. Active</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. Contented</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24. Tired</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
For each of the following statements, please indicate how true it is for you, using the following scale:

<table>
<thead>
<tr>
<th>Post IMI</th>
<th>1 Strongly Disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6 Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I enjoyed riding the stationary bike very much.......................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2. I put a lot of effort into riding the stationary bike..................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3. I did not feel nervous at all while riding the stationary bike.......</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>4. I think I am pretty good riding a stationary bike.......................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5. Riding the stationary bike was fun........................................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6. I didn’t try very hard to do well at riding the stationary bike......</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7. I felt very tense while riding the stationary bike......................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8. I think I do pretty well at riding a stationary bike compared to other students..........................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>9. I thought riding the stationary bike was boring..........................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>10. I tried very hard at riding the stationary bike........................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>11. I was very relaxed while riding the stationary bike....................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>12. Riding the stationary bike did not hold my attention at all...........</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>13. It was important to me to do well riding the stationary bike.........</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>14. I was anxious while riding the stationary bike..........................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>15. Riding a stationary bike is an activity that I can’t do very well.....</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>16. I would describe riding the stationary bike as very interesting......</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>17. I didn’t put much energy into riding the stationary bike..............</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>18. I felt pressured while riding the stationary bike.......................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>19. I thought riding the stationary bike was quite enjoyable................</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Here are some questions about yourself as a student. Please circle the number that best describes what you think.

1. It’s important to me that I learn a lot of new concepts this year.

   1. NOT AT
   2. SOMEWHAT
   3. VERY
   4. ALL TRUE
   5. TRUE

2. It’s important to me that other students in my class think I am good at my class work.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

3. It’s important to me that I don’t look stupid in class.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

4. One of my goals in class is to learn as much as I can.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

5. One of my goals is to show others that I am good at my class work.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

6. One of my goals is to keep others from thinking I’m not smart in class.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

7. One of my goals is to master a lot of new skills this year.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE

8. One of my goals is to show others that class work is easy for me.

   1. NOT AT
   2. SOMEWHAT
   3. TRUE
   4. VERY
   5. TRUE
9. It’s important to me that my teacher doesn’t think that I know less than others in class.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE

10. It’s important to me that I thoroughly understand my class work.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE

11. One of my goals is to look smart in comparison to the other students in my class.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE

12. One of my goals in class is to avoid looking like I have trouble doing the work.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE

13. It’s important to me that I improve my skills this year.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE

14. It’s important to me that I look smart compared to others in my class.

   1  2  3  4  5
   NOT AT  SOMEWHAT  TRUE
   ALL TRUE  TRUE
A. Instructions for task oriented condition

“In order to ride at the pace you have selected you will need to keep your MPH at approximately ___ (point out MPH feedback location on bike display). In addition, this bike has a feedback function, which constantly informs you as to whether you are below, at, or above your self-selected pace. The blinking “YOU” dot is your pace and the “RACER” dot is the computer simulating someone riding at your self-selected pace. The “RACER” dot advances every 90 seconds, the “YOU” dot’s advancement is contingent upon the pace at which you are riding.”

B. Instructions for Ego-oriented condition

“In order to ride at the pace you have selected you will need to keep your MPH at approximately ___ (point out MPH feedback location on bike display). In addition, this bike has a feedback function, which constantly informs you as to whether you are below, at, or above your self-selected pace. The blinking “YOU” dot is your pace and the “RACER” dot is the computer simulating someone riding at your self-selected pace. The “RACER” dot advances every 90 seconds, the “YOU” dot’s advancement is contingent upon the pace at which you are riding. Your goal is to beat the “RACER” dot. In other words, at the end of the 24 minutes your pace has to have slightly exceeded the pace of the simulated rider. If you exceed the pace of the simulated rider, the screen will flash “WIN!” However, if you fail to exceed the pace of the simulated rider, the screen will flash “NICE TRY.”

C. Instructions for control group (Manual Mode)

“In order to ride at the pace you have selected you will need to keep your MPH at approximately ___ (point out MPH feedback location on bike display).
Marc Fields  
1780 Normal Street  
Bowling Green, KY  42101  

Dear Marc:  

Your research project, “Exercise and Intrinsic Motivation,” was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects’ welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that: (1) signed informed consent will be obtained from all subjects. (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

a. Your research therefore meets the criteria of Expedited Review and is Approved.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project.

Sincerely,

Phillip E. Myers, Ph.D.  
Director, OSP and  
Human Protections Administrator  

[Signature]

c:  Human Subjects File HS03-053  
Dr. Steven Wininger