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**The Effect of Feedback and Motivational Orientations
on Intrinsic Motivations**

**A Thesis Presented
to the
School of Kinesiology
Lakehead University**

**In Partial Fulfilment
of the Requirements for the
Degree of Master of Science
in
Applied Sport Science and Coaching**

**by
Kerri Tolen**

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Abstract

The purpose of the study was to investigate how dispositional motivational orientations effect the perception of external rewards and the resulting effect on intrinsic motivation. Intrinsic motivation was assessed with the Intrinsic Motivation Inventory (IMI) while Motivational orientations were assessed with the Task and Ego Orientation in Sport Questionnaire (TEOSQ). High school students ($n=64$) enrolled in physical education courses volunteered to participate in a study which was purported to collect data for a new fitness test (Illinois Agility run). In the practice session, students completed two untimed practice runs and the TEOSQ (Duda & Nicholls, 1992) combined with a modified, task specific version of the IMI (McAuley, Duncan, & Tammen, 1989). Approximately two weeks later, in the actual session, students completed the runs again. In this session students thought they were being timed by a computer, but in reality the computer was programmed to generate false feedback respective to the randomly assigned treatment condition (positive, negative, or no feedback). The IMI was administered again after the for real runs were completed. Motivational orientations were discarded as a factor due to measurement difficulties. A 3 x 2 (feedback by time) ANOVA was used to investigate the effect of feedback on intrinsic motivation. Negative feedback significantly decreased levels of intrinsic motivation from pre- to post-testing. The three IMI subscales specifically affected were interest/enjoyment, perceived competence, and effort/importance. Contradictory to other studies, positive feedback did not significantly increase levels of intrinsic motivation.

Dedication

**This graduate thesis is dedicated to my grandma Joy Bourre,
who has instilled in me the value of learning.**

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with the help of
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Table of Contents

Abstract	ii
Dedication	iii
Acknowledgements	iv
Table of Contents	v
List of Tables	vii
List of Figures	viii
Introduction	1
Purpose	3
Hypotheses	3
Definitions	5
Intrinsic motivation.	5
External reward.	5
Informational Events.	5
Perceived competence.	5
Locus of causality.	5
Self-determination.	6
Review of Literature	7
Motivation	7
Extrinsic Motivation and Intrinsic Motivation	8
Cognitive Evaluation Theory	10
Propositions of Cognitive Evaluation Theory	11
Information	16
Locus of Causality	17
Motivational Orientations	19
Theoretical Link	21
Method	22
Participants	22
Task	22
Instrumentation	24
Intrinsic Motivation	24
Motivational Orientations	25
Procedure	25
Information Session.	26
Practice Session	27
Actual Session and Debriefing.	28
Design	30

Results	32
Instrumentation Check	32
Intrinsic Motivation Inventory (IMI)	32
Task and Ego Orientation in Sport Questionnaire	32
Statistical Analyses	33
Intrinsic Motivation Inventory (IMI)	33
IMI Subscales	34
Interest/Enjoyment	35
Perceived Competence	35
Effort/Importance	36
Pressure/Tension	37
Motivational Orientations	38
Discussion	42
Overall Intrinsic Motivation	42
Intrinsic Motivation Subscales	44
Motivational Orientations	48
Feedback and Motivational Orientations	49
Conclusions	49
References	52
Appendices	57
Appendix A: Practice Session Questionnaire	58
Appendix B: Informed Consent Package & PAR-Q	64
Appendix C: Actual Session Questionnaire	67

List of Tables

Table		Page
1.	Intercorrelations among IMI subscales.	32
2.	IMI subscale analyses.	34
3.	Specific mean scores per motivation orientation.	39
4.	Description of population by motivational orientation and gender.	41

List of Figures

Figure		Page
1.	Schematic illustration of Cognitive Evaluation Theory	14
2.	The Illinois Agility Run	23
3.	Time and Feedback on Overall IMI mean scores.	33
4.	Time and Feedback on Interest/Enjoyment mean scores.	35
5.	Time and Feedback on Perceived Competence.	36
6.	Time and Feedback on Effort/Importance	37
7.	Time and Feedback on Pressure/Tension.	38
8.	Composition of motivational orientation groups.	40

Introduction

It is possible to control human behaviour with rewards. Rewards can take many forms; candy, money, scholarships, grades, or verbal feedback in the form of praise and criticism. Whatever the form, external rewards are used to elicit desired behaviours (Deci, 1975). Kamal and Gallahue (1980) state that praise and criticism, are probably the most widely used methods of communicating information and enforcing desired behaviours. Early experimental psychology firmly established the notion that extrinsic rewards motivate behaviour (Rummel & Feinberg, 1988); reward individuals with gold stars or verbal praises and they will be motivated to work hard. Unfortunately the relationship between external rewards and human motivation is much more dynamic and complex.

Two theories that attempt to provide insight into how external rewards affect intrinsic motivation are cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1985) and the theory of perceived ability (Duda, 1993; Nicholls, 1984). The main premise of cognitive evaluation theory is that any external reward, including feedback, which affects an individual's feelings of competence and/or self-determination will irrefutably have an impact on his or her level of intrinsic motivation (Deci & Ryan, 1985). Deci (1985) states that external rewards have an informational aspect and a controlling aspect. For example, verbal feedback can be either informational as it refers to one's competence at a task or controlling as it refers to praise or criticism designed to influence one's behaviour (Wann, 1997). If verbal feedback provides information about one's competence, intrinsic motivation will be enhanced. However, if verbal feedback

is presented in a controlling manner intrinsic motivation will decrease as a result of undermining feelings of self-control.

A recent study by Whitehead and Corbin (1991) investigated the effect of percentile-based evaluative feedback with grade seven and eight students who participated in a novel fitness test. Subjects in the negative feedback group reported lower levels of intrinsic motivation than the positive and no feedback groups. More specifically, positive feedback enhanced feelings of competence, whereas, negative feedback decreased feelings of competence. These conclusions are consistent with a number of other studies (Deci, 1971; Duda, Chi, Newton, Walling, & Catley, 1995; Kamal, Blais, McCarrey, Laramee, & Ekstrand, 1992; Koestner, Zuckerman, & Koestner, 1987; Pittman, Davey, Alafat, Wetherill, & Kramer, 1980; Rutherford, Corbin, & Chase, 1992; Ryan, 1982). It is imperative to remember that cognitive evaluation theory is based on perception because the ultimate effect of an external reward will depend on how the meaning is internalized.

Nicholls' (1984) theory of perceived ability alludes to why individuals perceive rewards differently and how these subjective perceptions ultimately affect intrinsic motivation. Two distinct perceptions of ability have been identified; task and ego. In task-orientation, according to Duda (1989) perceived ability is self-referenced and the experience of learning and personal improvement foster feelings of success and competence. Task-oriented individuals are usually happy with their best effort. Conversely, in ego-orientation, perceived ability is normatively referenced and therefore, demonstrating superiority over others determines feelings of success and

competence (Duda, 1989). These individuals often feel pressure to obtain a specific outcome and may become amotivated if they perceive that they are unsuccessful.

In conclusion, it is evident that the potential effect of an external reward is held within the individual's interpretation of the reward via his or her motivational orientation. However, much motivation research has overlooked the extent to which motivational orientations determine how external rewards are perceived and the resulting effect they may have on intrinsic motivation. Brawley (1993) emphasizes that if theories are compatible there is every reason to integrate more than one theory in an attempt to afford a more complete picture of the phenomenon under investigation. This lack of theoretical integration provides an impetus for the present investigation.

Purpose

The purpose of the present study is to replicate and extend a study by Whitehead and Corbin (1991). The specific purpose of the extension is to explore how motivation orientations effect the perception of external rewards and the resulting effect on intrinsic motivation.

Hypotheses

1) The majority of the studies examining the effect of feedback and intrinsic motivation through the vantage of cognitive evaluation theory indicate that positive feedback increases intrinsic motivation and negative feedback decreases intrinsic motivation. It was hypothesised that regardless of motivational orientations;

- ▶ individuals in the positive feedback group will demonstrate significantly higher intrinsic motivation

- ▶ individuals in the negative groups will demonstrate significantly lower intrinsic motivation
- ▶ individuals in the no feedback group will not demonstrate a significant increase or decrease in intrinsic motivation

2) The theory of perceived ability states that ego-oriented individuals perceive their ability and obtain competence information by demonstrating superiority over others and that task-oriented individuals perceives their ability and obtain competence information by performing to the best of their ability. Based on these tenets it was hypothesised that:

- ▶ ego-oriented individuals in the negative feedback group will suffer a significant decrease in intrinsic motivation while ego-oriented individuals in the positive feedback group will experience a significant augmentation in intrinsic motivation from pre- to post-testing;
- ▶ task-oriented individuals in the negative feedback group will indicate a small decline in intrinsic motivation while task-oriented individuals in the positive feedback group will experience a significant increase in intrinsic motivation from pre- to post-testing.

Definitions

Intrinsic motivation

Deci and Ryan (1985) define intrinsic motivation as the innate need to feel confident and in control of one's own behaviour. These needs energize a wide variety of behaviours that are pursued in the absence of any extrinsic pressure (Rummel & Feinber, 1988).

External reward

An external reward is an incentive for engaging in an activity or task. These rewards can be categorized as monetary, symbolic, or feedback. It is a reward that conveys controlling information to the individual (Deci & Ryan, 1985).

Informational events

Informational events are events which allow choice and provide relevant information about one's ability. This information is important with regards to how effectively an individual interacts with his or her environment (Deci & Ryan, 1985).

Perceived competence

Perceived competence is a perception of having the ability or capacity to deal effectively with one's environment (Deci & Ryan, 1985). Perceived competence will affect one's intrinsic motivation. For this relationship to be positive, according to Deci (1995), competence must be accompanied with autonomy.

Locus of causality

Locus of causality has two dimensions; internal and external. An internal locus of causality is adopted when the perception that one's behaviour is initiated or

regulated by an informational event, whereas, an external locus of causality is taken when the perception that one's behaviour is initiated or regulated by a controlling event (Deci & Ryan, 1985). The later will affect intrinsic motivation by undermining feelings of autonomy.

Self-determination

Self-determination is the capacity to choose and have choices rather than reinforcement contingencies, drives, or any other pressures that determine one's actions (Deci & Ryan, 1985). When individuals perceive themselves as the causal agent of their behaviour they will be intrinsically motivated (Deci, 1975).

Review of Literature

Motivation

Motivation is a broadly used term that has fostered a myriad of definitions, from simple to complex. The term motivation is frequently used to describe human behaviour, internal personality dispositions, and external influences (Weinberg & Gould, 1995). Since motivation is an ambiguous term, a few definitions will be presented to highlight its specific features. Littman's (1958) inclusive definition of motivation states:

Motivation refers to processes or conditions which may be physiological or psychological, innate or acquired, internal or external to the organism which determine or describe how, or in respect of what behaviour is initiated, maintained, guided, selected, or terminated; . . . it describes and accounts for various individual differences which appear in respect of various behaviours, conditions, and outcomes (p.2-3).

Littman's explanation of motivation incorporates reasons for participation, adherence, and attrition in activity along with individual differences. A more simplistic definition of motivation adopted by contemporary sport psychologists is; the direction and intensity of effort (Hodge, 1994; Horn, 1992; Weinberg & Gould, 1994). Although it appears to be a simple definition, it has multifarious meaning.

Direction, according to Hodge (1994), refers to whether an individual tends to approach or avoid a particular situation. The concept of motivational direction provides information concerning the appealing and non-appealing aspects about activities and

why people become involved in some activities and not others (Gauvin, 1990).

Intensity, as Weinberg and Gould (1995) explain, refers to the amount of effort an individual exerts in a particular situation. Gauvin (1990) states that intensity-pertinent constructs explain why individuals display different degrees of zeal and commitment once they become involved in an activity. The term motivation, as it is defined by these authors, may be too general and yet too complex for meaningful investigation.

Therefore, specific types of motivation have been identified in an attempt to alleviate confusion and direct the focus of research endeavours. Two liberal genres of motivation are extrinsic motivation and intrinsic motivation.

Extrinsic Motivation and Intrinsic Motivation

Extrinsic motivation prompts individuals to participate in activities or tasks for external tributes such as material rewards. Frederick and Ryan (1995) state that extrinsic motivation is behaviour oriented toward instrumental outcomes that are separable from the behaviour itself. In other words, Deci (1975) explains that extrinsic motivation is a means to an end. When discussing extrinsic motivation it is important to understand that although extrinsically motivated behaviour is typically intentional, it can vary in the degree to which it is self-determined or controlled (Deci & Ryan, 1985). For example, individuals may begin an exercise program because their doctor pressures them to, or because they simply want to become more physically fit. The motivation in both cases is extrinsic but the later is more self-determined or self-controlled.

Extrinsically motivated behaviour, as previously stated, is behaviour incited by instrumental outcomes. Conversely, intrinsic motivation occurs when behaviour

outcomes are inseparable from the behaviour itself. In other words, intrinsic motivation is defined as the stimulus to participate in an activity for its own sake; for enjoyment, interest, and challenge. Intrinsic motivation can further be described as an end in itself (Deci, 1975).

Intrinsically motivated behaviour is behaviour promoted by a need to feel competent and self-determining with one's environment (Deci, 1975). Deci (1995) explains that feelings of competence result when an individual takes on a meaningful and personal challenge and in his or her own view meets this challenge. Self-determination is feeling that one is in control of his or her environment, the causal agent. Implied pressure or control to achieve a particular outcome undermines intrinsic motivation (Deci, 1995). Thus the rewards associated with intrinsic motivation are spontaneous feelings of enjoyment and accomplishment resulting from freely engaging in an activity (Deci, 1995). People who are intrinsically motivated to be physically active are interested in physical activity, enjoy it, and perceive it as being important (Rutherford et al. 1992).

Methods of measuring intrinsic motivation are diverse. Previous researchers (Deci, 1971, 1972; Koestner et al., 1987; Ryan, 1982; Ryan, Mims, & Koestner, 1983) have used the amount of free time spent on a testing task activity as a measure of intrinsic motivation. Other researchers have used the degree to which individuals liked or disliked a testing task (Vallerand & Reid, 1988). Recently, researchers (Duda et al., 1995; McAuley & Duncan, 1989; Seifriz, Duda, & Chi, 1992; Rutherford et al., 1992; Williams & Gill, 1995) have used the Intrinsic Motivation Inventory (IMI) (McAuley et al.,

1989; Duda & Nicholls, 1992) to assess intrinsic motivation. The IMI yields a total intrinsic motivation score by summing four underlying dimensions; interest/enjoyment, perceived competence, effort/importance, and pressure/tension. The subscale constructs of the IMI are based on the formal propositions of cognitive evaluation theory (Markland & Hardy, 1997).

Cognitive Evaluation Theory

The general premise of cognitive evaluation theory is that any event that affects an individual's perception of competence and/or feelings of self-determination will irrefutably have an impact on his or her level of intrinsic motivation (Deci & Ryan, 1985). In other words, cognitive evaluation theory attempts to explain how external rewards, including feedback, affect intrinsic motivation. According to a meta analysis by Rummel and Feinberg (1988), research investigating the tenets of cognitive evaluation theory have been incongruent. These inconsistencies are thought to be the result of inadequately adhering to the framework and operationalized terms set out by Deci and Ryan (1985). Therefore, Rummel and Feinberg (1988) state that it is imperative to clearly link the central concepts of cognitive evaluation theory and the operationalized variables used to measure the concepts. Only by adhering to the constructs of the theory will researchers be able to find more consistent outcomes (Rummel & Feinberg, 1988).

In an attempt to provide this linkage and consistency, six major terms describing the key concepts of cognitive evaluation theory were defined in the introduction. These

terms will be further explained as the propositions of cognitive evaluation theory and related research are presented and discussed.

Propositions of Cognitive Evaluation Theory

Cognitive evaluation theory is a broad based theory comprised of four specific propositions. First, when an activity is intrinsically motivating and an external reward is imposed, the reward has the potential to induce a change in the perceived locus of causality from internal to external (Deci, 1975). More specifically, Deci and Ryan (1985) state:

External events relevant to the initiation or regulation of behaviour will affect a person's intrinsic motivation to the extent that they influence the perceived locus of causality for that behaviour. Events that promote a more external perceived locus of causality will undermine intrinsic motivation, whereas those that promote a more internal perceived locus of causality will enhance intrinsic motivation (p.62)

Therefore, under certain circumstances intrinsic motivation will decrease when an individual receives an extrinsic reward for engaging in an already intrinsically motivated activity (Deci, 1975).

A classic study by Ryan (1977) examined the effect of scholarships on intrinsic motivation in male intercollegiate athletes. Ryan surveyed both scholarship and non-scholarship male athletes and measured their intrinsic motivation towards their sport. When extrinsic rewards are salient, the perceived locus of causality shifts from internal to external resulting in a decrease in intrinsic motivation. Scholarship athletes were

less intrinsically motivated than non-scholarship athletes. The scholarship was generally perceived by the athletes as a way for the coach to control their participation. An external locus of causality not only undermines intrinsic motivation but decreases perceived autonomy.

The second proposition alludes to the assumption that intrinsic motivation is sustained by feelings of competence and challenge (Frederick and Ryan, 1995). Deci and Ryan (1985) further explain this concept by stating that:

External events will affect a person's intrinsic motivation for an optimally challenging activity to the extent that they influence the person's perceived competence, within the context of some self-determination. Events that promote greater perceived competence will enhance intrinsic motivation, whereas those that diminish perceived competence will decrease intrinsic motivation (p.63).

In other words, external rewards, such as feedback, that increase or decrease perceived competence will increase or decrease intrinsic motivation (Deci, 1985).

Whitehead and Corbin (1991) tested this postulate with grade seven and eight students. After completing a physical fitness test students were given bogus percentile- based evaluative feedback; positive, negative or none. Subjects in the negative feedback condition reported lower levels of intrinsic motivation than the positive and no feedback groups. More specifically, positive feedback enhanced feelings of competence whereas negative feedback decreased feelings of competence.

Deci and Ryan's (1985) third proposition states that every reward, including feedback, has three functional significant aspects; a controlling aspect, a informational aspect, and a motivational aspect. Deci and Ryan (1985) explain:

Events relevant to the initiation and regulation of behaviour have three potential aspects, each with a functional significance. The informational aspect facilitates an internal perceived locus of causality and perceived competence, thus enhancing intrinsic motivation. The controlling aspect facilitates an external perceived locus of causality, thus undermining intrinsic motivation and promoting extrinsic compliance or defiance. The amotivating aspect facilitates perceived motivation. The relative salience of these three aspects to a person determines the functional significance of the event (p.64).

These aspects do not work in isolation. A change in perceived locus of causality will promote a change in self-determination when the controlling aspect is operative. A change in information will nurture a change in self-competence when the informational aspect is salient. The resultant or net level of intrinsic motivation is derived from both functional aspects, controlling and informational (see Figure 1).

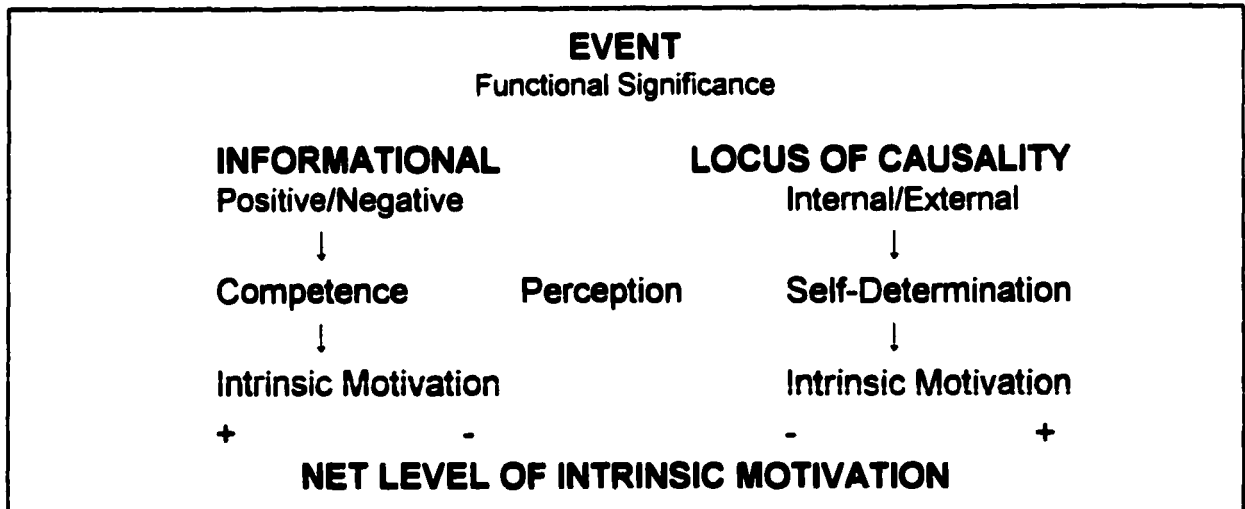


Figure 1. Schematic illustration of Cognitive Evaluation Theory

Ryan (1980) extended the original study to investigate the effect of scholarships on both male and female intercollegiate sport participants' motivation toward their sport. The results indicated that football scholarships undermined intrinsic motivation and that wrestling and female athletic scholarships enhanced intrinsic motivation. Football scholarships were plentiful, almost every football player received a scholarship. As a result, the players perceived the scholarships as controlling rather than informational. The informational aspect was suppressed, because receiving a scholarship did not distinguish one's ability from another's. Conversely, the modest distribution of scholarships in wrestling and female athletics promoted the informational aspect and, therefore, self-competence, which in turn increases intrinsic motivation.

The fourth and final proposition states that informational and controlling inputs are pertinent to not only interpersonal events but also interpersonal dispositions (Frederick & Ryan, 1995). Deci and Ryan (1985) state that:

Interpersonal events differ in their qualitative aspects and, like external events, can have varied functional significance. Internally informational events facilitate self-determined functioning and maintain or enhance intrinsic motivation. Internally controlling events are experienced as pressure toward specific outcomes and undermine intrinsic motivation. Internally amotivating events makes salient one's incompetence and also undermine intrinsic motivation (p.107).

A shift in locus of causality from internal to external decreases intrinsic motivation because the individual no longer feels in control of his or her environment. Control is often imposed by external agents, namely; others, society, or particular situations. However, control can also be inflicted internally by an ego involvement. Deci (1995) describes ego involvement as; ". . . a term psychologists use to refer to the process of people's feelings of worth being dependent upon specified outcomes (p.115)." To feel pressure and to feel controlled to attain a particular outcome creates anxiety but most importantly it undermines autonomy or self-determination.

Ryan (1982) did a study to investigate the effects of an ego versus task induced activity on intrinsic motivation. Undergraduate students were assigned to an ego test-like activity or task game-like activity. Individuals assigned to the ego involvement condition were told that their performance on the target activity was a reflection of creative intelligence. Individuals assigned to the task involvement condition were simply introduced to the activity. In conclusion, subjects assigned to ego involved group reported more pressure, tension, and anxiety about performance than the task

involved group. The results indicated that ego involvement undermines intrinsic motivation because intrinsic motivation is feeling truly free from feelings of pressure and tension (Kimiecik & Harris, 1996). When individuals are freed of such negative emotions they achieve a balance between their perceived ability and environmental demands.

Information

Informational rewards provide individuals with details concerning their effectiveness in the environment (Deci, 1975). According to Ryan, Vallerand, and Deci (1984), the informational aspect is salient when individuals receive information relevant to their competence at a meaningful task for which they feel personal causation. In addition, perceptions and feelings of competence are directly related to intrinsic motivation.

In a study by Vallerand (1983), the relationship between the amount of positive verbal feedback and the resulting intrinsic motivation of male hockey players was investigated. Subjects performed a hockey related task and received either 0, 6, 12, 18, or 24 positive verbal reinforcements regarding their performance. Individuals receiving positive feedback, regardless of the amount, displayed a higher level of intrinsic motivation and feelings of competence than the no feedback group.

Koestner et al. (1987) examined the relationship between praise, involvement, and intrinsic motivation. Individuals were introduced to a hidden figure task in a test-like or game-like condition where they received a type of verbal reward for their performance; either ability-focussed praise, effort-focussed praise, or no praise.

Individuals in the game-like group displayed more intrinsic motivation than individuals in the test-like group. Individuals who received the ability praise reward also reported higher intrinsic motivation than effort or no praise groups. When feedback is presented in an informational manner rather than comparatively intrinsic motivation is enhanced. How the feedback reward is presented and how individuals perceived the feedback will ultimately affect their feelings of competence and level of intrinsic motivation.

Feedback has also been used in a number of other studies to determine how such rewards affect intrinsic motivation. A study by Whitehead and Corbin (1991), the study presently being replicated, studied the effect of percentile based feedback on the intrinsic motivation of elementary students. Students were given bogus feedback, either positive, negative, or none, after completing a fitness test. The instrument employed to measure intrinsic motivation, the IMI, indicated that positive feedback enhanced all aspects of motivation, whereas negative feedback decreased them. Kamal et al. (1992) studied the effect of positive and negative feedback with male and female competitive athletes on a nonathletic task. Overall, both groups reported to be more influenced by negative rather than positive feedback.

Locus of Causality

Rewards not only have the potential to be informational, but also controlling. Locus of causality is a psychological construct that refers to people's belief about whether they can personally control what happens to them (Cox, 1994). An internal locus is adopted when individuals perceive they are in control or responsible for their own behaviour, therefore they are self-determined. This sense of autonomy fosters

feelings of intrinsic motivation. In contrast, an external locus is embraced when individuals perceive they are not in control of their own behaviour. These individuals perceive that they do not have the capacity to choose or make choices, that they are merely pawns (Deci, 1975).

Human behaviour is typically controlled with the use of extrinsic rewards. For example, adults reward children with candy, employers reward employees with money, and teachers reward students with grades. In all of these situations, according to Deci (1975), the rewarder is controlling the rewardee's behaviour. Cognitive evaluation theory does not denounce the effectiveness of extrinsic rewards, instead it attempts to increase the awareness of the unintended negative consequences associated with the use of extrinsic rewards (Deci, 1995).

To further illustrate this precept, early studies indicated that rewards such as money (Deci, 1972), food (Ross, 1975), prizes (Harachiewicz, 1979), and deadlines (Amabile, DeJong, & Lepper, 1976) decreased intrinsic motivation. It was generalized that extrinsic rewards cause a decrease in intrinsic motivation due to a shift in self-determination from internal to external. Therefore, when the controlling aspect of a reward is salient, intrinsic motivation is decreased because autonomy is undermined.

Studies by Ryan (1977) and Ryan (1980) as previously discussed, investigated the effects of scholarships on the intrinsic motivation of intercollegiate athletes. The athletes that perceived the scholarship as controlling reported lower levels of intrinsic motivation than those athletes who perceived the scholarship as informational. These results were consistent with a more recent study by Wagner, Lounsbury, and Fitzgerald

(1989) that investigated the differences between how scholarship and non-scholarship college athletes perceived their sport. Scholarship athletes reported that they perceived their sport as work. These work-oriented attitudes indicate that scholarship rewards received by athletes can be perceived as controlling rather than informational.

Motivational Orientations

Cognitive evaluation theory is based on perception, how external rewards are interpreted by individuals. Deci (1995) states that when it comes to competence and self-determination it is really the individual's own perceptions that are significant. Research has indicated that an extrinsic reward can be viewed as either a bribe or bonus, the foremost view being taken more often as age increases (Halliwell 1978; Karniol & Ross, 1976). Therefore, the motivational implications of perception must be accounted for when investigating how external rewards affect intrinsic motivation.

Nicholls' (1984) theory of perceived ability addresses how individuals perceive themselves in achievement settings. Perceived ability, according to Nicholls (1984), is viewed through either task- or ego-oriented motives. A task motivational orientation is characterized by subjective perceptions of success, persistence with regards to failure outcomes, selection of moderate and realistic tasks, and intrinsic motivation. A positive relationship exists between task motivated individuals and intrinsic motivation because intrinsically motivated behaviour is a consequence of the need to feel competent and self-determining (Duda, 1987, 1996; Duda et al. 1995; Marsh, 1994). An ego motivational orientation is demarcated by peer comparison, dropout in response to failure, selection of easy or difficult tasks, and extrinsic motivation. Ego-orientation,

according to Duda et al. (1995), reflects a type of personally generated or internal control which result in the belief that one's behaviour is externally regulated.

Young children are generally task oriented. Children between two and six years of age base their perception of ability on the difference between how they presently and previously performed a task (Nicholls, 1984). If children perceive that they have improved from one attempt to the next, they assume that their ability has increased and subsequently their perceived competence and intrinsic motivation increase. As children increase in age they adopt a more ego-oriented disposition. At approximately age six or seven they begin to evaluate their ability in comparison with others' ability. High ability and perceived competence result when ability is compared to and perceived to be better than others. Individuals will predominantly demonstrate either a task- or ego-orientation by adolescence or early adulthood.

Motivational orientations can impact intrinsic motivation by influencing either the perceived competence or self-determination mechanisms described in cognitive evaluation theory (Duda et al. 1995). Duda (1989) examined the relationship between an athlete's motivational orientation and the perceived purpose of sport among male and female high school students. Task-oriented students believe that sport should encourage personal improvement whereas ego-oriented students view sport involvement as a way to enhance one's self-esteem and social status. A study by Goudas, Biddle, and Fox (1994) examined the effect of students' goal orientations on intrinsic motivation following a health related fitness test. Students who were identified

as high task/low ego reported greater enjoyment and exerted more effort than those identified as low task/high ego, regardless of their perception of success at the task.

Theoretical Link

A limited amount of research to date has focussed on the effect of motivational orientations and feedback on intrinsic motivation through the vantage of cognitive evaluation theory. As previously mentioned, cognitive evaluation theory explains how intrinsic motivation is effected by an individual's cognitive evaluation of an external event. Deci (1995) states that the ultimate effect of an external event will depend on how the meaning is internalized or perceived because it is evident that individuals do not perceive external events in the same way. The theory of perceived ability attempts to explain why individuals differ in their subjective perceptions of external events. By investigating these two theory together, there is the potential to extract a more accurate explanation of how external events such as feedback effect intrinsic motivation.

Method

The purpose of the study was to investigate the effect of feedback and motivation orientations on intrinsic motivation. Therefore, the study was conducted within the theoretical concepts of cognitive evaluation theory and the theory of perceived ability.

Participants

Participants were recruited from five high schools across northwestern Ontario. A total of 64 senior high school students ($n=51$ males and $n=13$ females) enrolled in grade 12 physical education courses volunteered to participate in the study. The mean age of the students was 17.75 years. Senior high school students were sought because according to Nicholls (1984) adolescent individuals should have established a predominant motivational orientation at this time. Only 12% of the students rated their level of physical activity as low, whereas, 88% rated their level of physical activity as moderate or high.

Task

The performance test used was the Illinois Agility Run (Adams, Hottinger, & McCristal, 1965). It is a fitness test used to measure agility, speed, and change of direction during a running task. This particular shuttle run was chosen for a number of reasons although primarily because it is a novel task. Even though it is similar to existing shuttle runs, it is different enough to ensure that individuals would not have any experience and therefore, pre-conceived ideas about their ability at the task. In addition, it is a relatively easy but yet challenging enough to hold the participant's

interest, and takes minimal time to complete. It was important for the task to be challenging but obtainable, within grasp, or it would not be motivating (Deci, 1995).

The Illinois version of the shuttle run requires three consecutive shuttles between two lines 30 feet apart. The first and third shuttle consist of a 30 foot sprint, a stop and touch of the end line, and a 30 foot sprint back to the start line. The middle shuttle requires individuals to weave around four pylons, spaced 10 feet apart, in a zig zag pattern (see Figure 2). The experimenter used the signal "Ready, go!" to start the test. A portable computer connected to a simulated photoelectric beam detector finish switch was used for mock timing. In addition, a stop watch was used to record actual run times.

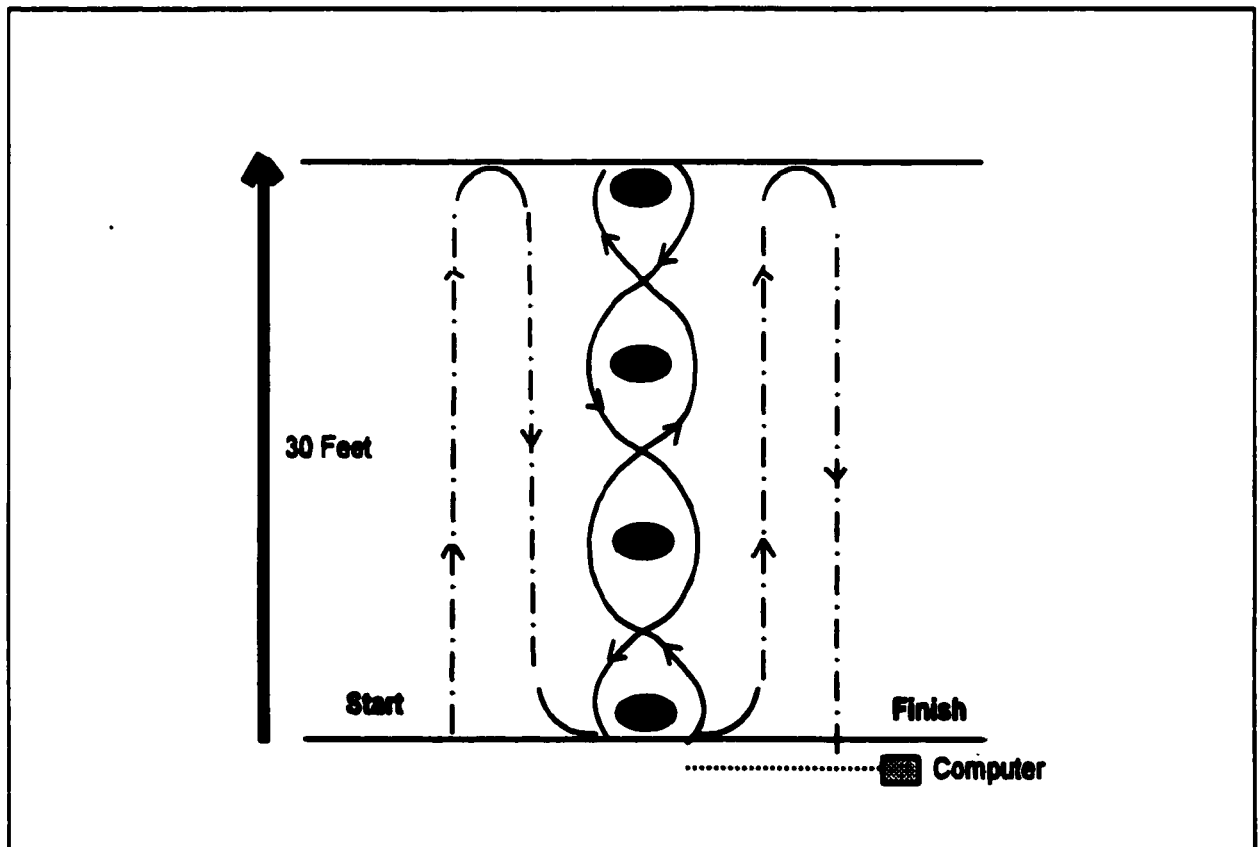


Figure 2. The Illinois Agility Run

Instrumentation

Intrinsic Motivation

The Intrinsic Motivation Inventory (IMI) (McAuley et al. 1989; Ryan, 1982) was used to assess overall intrinsic motivation. It is a self-report questionnaire which has four subscales of intrinsic motivation; interest/enjoyment, perceived competence, effort/importance, and pressure/tension. Items were scored on a seven point Likert Scale from strongly agree (1) to strongly disagree (7). A score was determined for each of the subscales and then summed to give an overall measure of intrinsic motivation. The present study measured both individual subscale scores and the cumulative scores from pre- to post-testing.

The 16 item version of the IMI was used in the study. This version has been utilized and deemed reliable by McAuley et al. (1989) with an alpha coefficient of .85. IMI items are generically worded so that researchers can substitute the activity or task of interest into the item structure. The IMI used in the study was reworded so that participants would specifically refer to the shuttle runs when completing the instrument (see Appendix A). The subscale interest/enjoyment signified the amount of interest and enjoyment experienced by the individual during the shuttle runs. The perceived competence subscale identified feelings of self efficacy associated with one's ability at the shuttle runs. The third subscale, effort/importance, indicated how much effort the individual expended doing the shuttle runs and the amount of personal importance given to the shuttle runs. Finally, the pressure/tension subscale measured the pressure and tension experienced by the participant during the shuttle runs.

Motivational Orientations

Dispositional motivation orientations were measured by administering the Task and Ego Orientation in Sport Questionnaire (TEOSQ), developed by Duda and Nicholls (1992). This particular measure was designed to determine the criteria an individual uses to judge his or her success and competence. Each participant was asked to respond to the statement "I feel most successful when . . ." and indicate his or her agreement on thirteen items reflecting task- and ego-orientations to subjective success. Responses are scored on a five point Likert Scale ranging from strongly disagree (1) to strongly agree (5). A mean score is then calculated for both the task and ego scales. The TEOSQ has been found to be reliable and valid with an alpha coefficient of .72 (Duda, 1992).

Procedure

Once approval for the project was obtained from the University's Ethics Advisory Committee and the Lakehead District School Board, school principals were contacted and given an informational package detailing the importance, purpose, and requirements of the study. Classroom teachers were approached and testing was scheduled into the physical education course agenda.

The test procedure required three sessions; an informational session, a practice session, plus an actual and debriefing session. The purpose of the informational session was to recruit participants on a voluntary basis and obtain informed consent. The practice session was designed to familiarize students with the performance task and obtain both a motivational orientation profile in addition to an initial measure of

intrinsic motivation for the testing task. The actual and debriefing session was used to generate a performance based feedback situation and acquire a post feedback measure of intrinsic motivation. Students were randomly assigned to one of three feedback conditions; positive, negative, or no feedback. Equal ability between the feedback groups was confirmed with an ANOVA comparing actual run time by feedback group ($F = .59, p < .05$). The debriefing session, held directly after the actual session, was used to explain the true purpose of the study.

The gymnasium at each school was used as the testing site. A testing schedule, conducive to other school events and course curriculum, was established by the participating teachers and the researcher. The time separating the practice and the actual testing sessions ranged from five to twenty days. This time spread was not a measurement concern because only one school waited more than 7 days before completing the actual session.

Information Session.

The information session was held at the beginning of a regular class. The session began with a brief introduction of the researcher and the terms graduate student and kinesiology. Due to the design of the study the true purpose could not be revealed during this session. Instead, all students were told that the purpose of the study was to collect performance times on a new test of agility for the Canadian Health and Research Institute. Following the information session students who volunteered to participate completed the consent form and Physical Activity Readiness Questionnaire or PAR-Q (see Appendix B).

Practice Session

The practice session took place either the same day as the informational session or the subsequent day. The 64 students who volunteered to participate in the study, 51 males and 13 females, came to the testing site individually. However, because of time constraints the initial instructions and a demonstration of the task were given to the group of participants as a whole prior to testing.

On arrival at the testing site the supposed purpose of the study was reviewed and the route was re-explained using a diagram. The student was instructed to jog through the task mainly to demonstrate that he or she understood the route. The student was then instructed to complete a second run at full effort in order to simulate the for real session testing situation. Each of the two runs was started with the student at the designated start line. On the researcher's command, "Ready, go!," the student ran the course, finishing by running through the designated finish line. No feedback was given during this testing session.

On the completion of the practice runs, the researcher thanked the student for participating and an assistant administered the Practice Session Questionnaire comprised of the IMI and TEOSQ. To accommodate the number of students to be tested within the class time, the questionnaire was administered away from the testing site under the supervision of the assistant. The importance of answering the questions honestly was stressed and confidentiality was ensured. When the questionnaire was completed the assistant recorded the identification number against the subject's name on a master list, and the student returned to class.

Actual Session and Debriefing.

The ostensible purpose of the for the actual session was to collect performance times for the task runs. To reinforce this deception a portable computer appeared to be attached to the timing equipment, a simulated photoelectric beam detector finish switch. In actuality, the computer was running a program specifically written to generate false feedback respective to the treatment condition (positive, negative, or no feedback) the participant had been randomly assigned to.

Students came to the testing site one at a time. On arrival the supposed purpose of the session and the route of the run was reviewed. Each student was told that this time the task would be for real, that his or her time would be recorded by the computer. Similar to the practice session each student was given two attempts at the run. Feedback was administered by having the students look at their results on the computer screen immediately after they finished each run.

Those students in the positive feedback group were given a time randomly generated by the computer from within a range typical of high performance. On the computer screen the quantitative result was accompanied by the message, "Compared to other high school students your age your score is in the top 20 percent range." Conversely, the negative feedback group was given randomly generated low performance scores. The score was accompanied by a message similar to the positive feedback group except it stated that the score was in the "bottom 20 percent range." Values for both treatment conditions were derived from the standard test scores of the

Illinois Agility Run. Scores were verbally reinforced by explaining that the score was either above or below average compared to others the same age.

Individuals in the control or no feedback condition saw a message on the computer screen stating there had been a "Timing Switch Error" and therefore, no scores were recorded. The students in this group were asked to reschedule. Those students who suggested a third consecutive trial were told that as a result of fatigue and standardized protocol the score from a successive third attempt would not be valid. Actual times were recorded for each participant with a stop watch.

All students were co-operative. The researcher reinforced feedback to ensure deception by explaining that the run measured components of fitness not normally tested and that the computer would not make a mistake. Immediately after the second run was completed and the appropriate feedback was given the individual was thanked and asked to complete the Actual Session Questionnaire comprised solely of the IMI. The order of the questions on the IMI was reversed in an attempt to alleviate any practice effect (see Appendix C). Again, the assistant administered the questionnaire away from the testing site. Vigilance during the questionnaire period was a precautionary action taken to detect any signs of skepticism concerning feedback. No signs were noticed. When the questionnaire was completed the assistant recorded the identification number on the master list, and the student returned to class.

After all the testing had been completed, the students were thanked and debriefed as a group. Students were asked to indicate which feedback group they were in and how the feedback made them feel. During the debriefing the researcher was

careful to watch for any signs of skepticism with regards to the manipulation of feedback. None were observed. In fact, several subjects commented on how much they had believed the results. To conclude the debriefing students were given their real times and thanked again with a Lakehead University pen in appreciation for their participation in the study.

Design

It was hypothesised that individuals receiving positive feedback would report significantly higher levels of intrinsic motivation, whereas, those individuals receiving negative feedback would report significantly lower levels of intrinsic motivation. In addition, ego-oriented individuals would be significantly affected by positive and negative feedback while task-oriented individuals would only be significantly affected by positive feedback.

A mean split had to be used to distinguish motivational orientation profiles because there are no population specific norms for the TEOSQ. Therefore, profile analyses could not be completed until all subjects completed pre-testing. Due to the geographical distribution of schools involved in the study it was impossible to pre test all subjects prior to the post-testing session. Pre-mature distinction of motivational orientations could have lead to 'high' scores being in the 'low' group and 'low' scores being in the 'high' group. Consequently, individuals could not be assigned to treatment levels based on their motivational orientation prior to post-testing so they were randomly assigned to the different feedback conditions.

Originally a 3 (feedback) x 2 (motivational orientation) x 2 (time) quasi experimental, mixed factorial, with repeated measures on the last factor, was to be used to ascertain extrinsic motivational influences on intrinsic motivation. Instead a 3 (feedback) x 2 (time) ANOVA was used to investigate the effect of positive, negative and no feedback on intrinsic motivation from pre- to post-testing.

Results

Instrumentation - Validity and Reliability Check

Intrinsic Motivation Inventory (IMI)

The Intrinsic Motivation Inventory (IMI) and its four subscales were used to measure intrinsic motivation. The overall scale appeared to be reliable with pre $\alpha = .78$ and post $\alpha = .72$. Reliability for the four subscales was as follows; pre $\alpha = .82$ and post $\alpha = .78$ for interest/enjoyment, pre $\alpha = .69$ and post $\alpha = .55$ for perceived competence, pre $\alpha = .78$ and post $\alpha = .77$ for effort/importance, and pre $\alpha = .59$ and post $\alpha = .66$ for pressure/tension. A correlation matrix is presented in Table 1.

Table 1 Intercorrelations among IMI subscales.

	IMI	I/E	PC	E/I	P/T
IMI	—				
Interest/Enjoyment (I/E)	.76	--			
Perceived Competence (PC)	.78	.43	--		
Effort/Importance (E/I)	.76	.32	.58	--	
Pressure/Tension (P/T)	.44	.26	.08	.08	—

Task and Ego Orientation in Sport Questionnaire

Motivation orientations were measured using the TEOSQ (task $\alpha = .77$ and ego $\alpha = .85$). The results of a factor analysis, distinguishing two factors, confirmed the orthogonal relationship between task and ego subscales.

Statistical Analyses

Intrinsic Motivation Inventory (IMI)

To test the hypotheses that positive feedback would significantly increase intrinsic motivation and that negative feedback would significantly decrease intrinsic motivation, a 2 (time) x 3 (feedback) mixed factorial analysis of variance was conducted with overall intrinsic motivation score as the dependent variable. A significant interaction effect for time and feedback was discerned $F_{(2,58)} = 18.95, p < .05$. The results indicated that only negative feedback significantly decreased levels of overall intrinsic motivation (see Figure 3). The results also revealed a significant main effect for time ($F_{(1,58)} = 11.07, p < .05$), with post overall IMI means significantly less from pre overall IMI. There was no main effect for feedback.

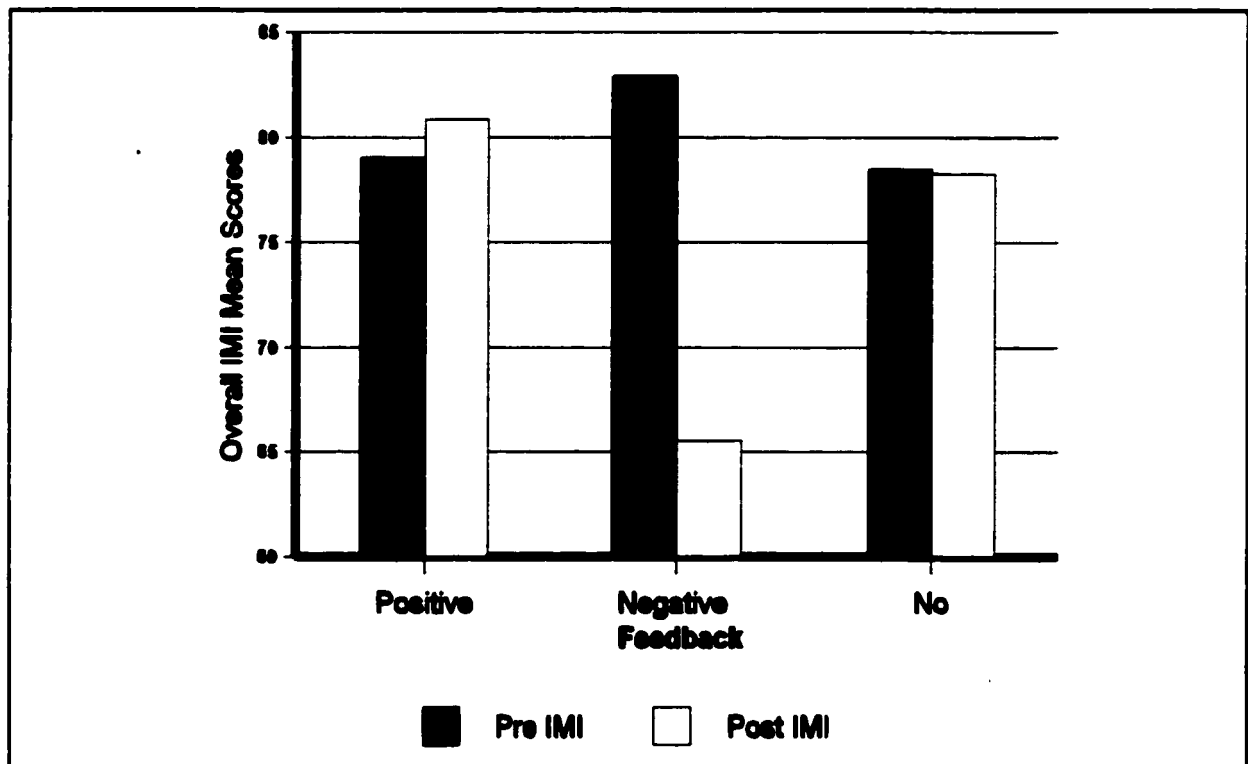


Figure 3 Time and Feedback on Overall IMI mean scores.

IMI Subscales

A 2 (time) by 3 (feedback) mixed factorial analysis of variance was conducted on each of the IMI subscale means to identify what constructs of intrinsic motivation were significantly affected by negative feedback (see Table 2).

Table 2 Statistical analyses of IMI subscales.

Subscale		Time		ANOVA	Sign.
Interest/Enjoyment		Pre Test	Post Test	F	
Feedback	Positive	17.87	19.04	FB = .04	ns
	Negative	20.83	15.62	TM = 7.16	**
	No	18.29	17.88	FB x TM = 13.39	***
Perceived Competence		Pre Test	Post Test	F	
Feedback	Positive	20.00	20.43	FB = 3.33	*
	Negative	21.12	13.71	TM = .537	*
	No	20.37	20.94	FB x TM = 10.09	***
Effort/Importance		Pre Test	Post Test	F	
Feedback	Positive	20.43	21.56	FB = .10	ns
	Negative	22.37	18.58	TM = .8	ns
	No	19.94	21.06	FB x TM = 8.82	***
Pressure/Tension		Pre Test	Post Test	F	
Feedback	Positive	20.65	19.82	FB = 2.45	ns
	Negative	18.58	17.58	TM = 1.45	ns
	No	19.00	18.41	FB x TM = .03	ns

Note: * $p < .05$ ** $p < .01$ *** $p < .001$

Note: FB = Main Effect Feedback
TM = Main Effect Time

Interest/Enjoyment. An interaction effect was observed for time by feedback, $F_{(2,61)} = 13.39, p < .05$. Negative feedback significantly decreased the interest and enjoyment of the task from pre- to post-testing (see Figure 4). A main effect was identified for time $F_{(1,61)} = 7.16, p < .05$, with interest/enjoyment post test means significantly lower than pre test means. There was no main effect for feedback. These results were consistent with overall IMI analyses.

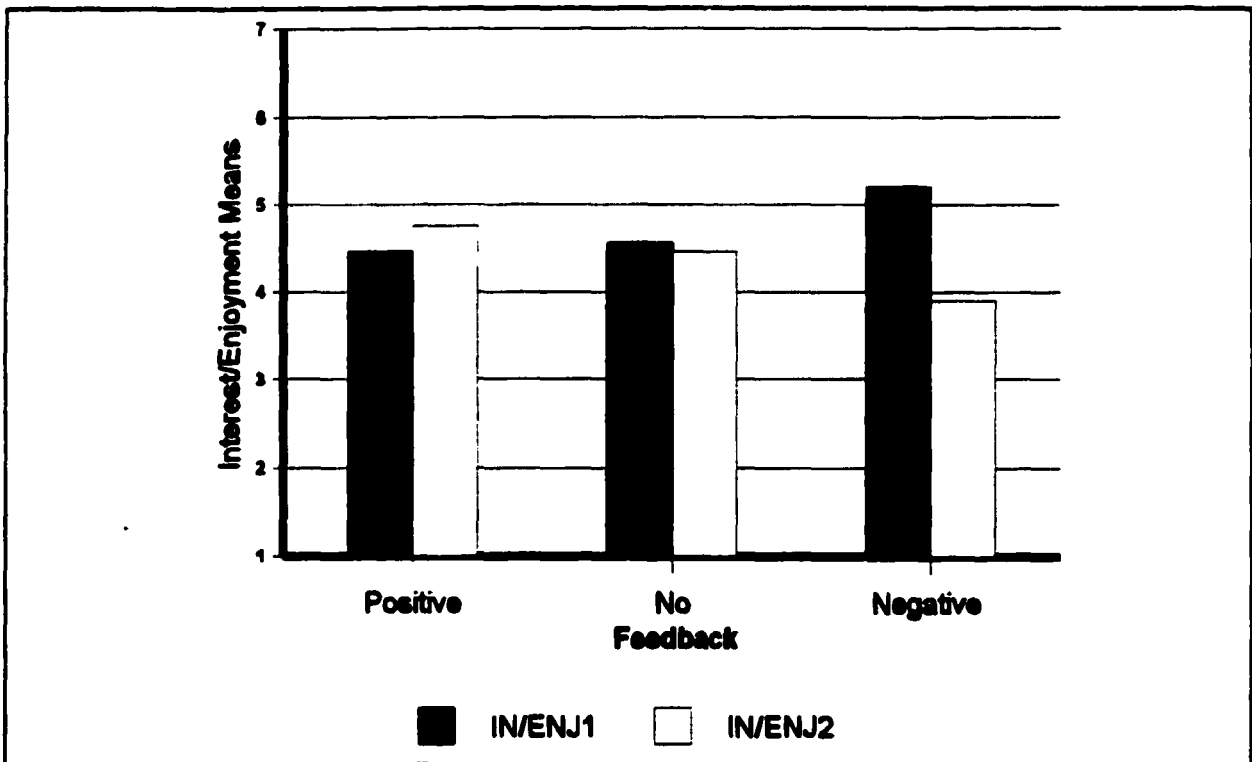


Figure 4 Time and Feedback on Interest/Enjoyment mean scores.

Perceived Competence An interaction effect was observed for time by feedback, $F_{(2,59)} = 10.09, p < .05$. Negative feedback significantly decreased levels of perceived competence from pre- to post-testing (see Figure 5). A main effect for both

time, $F_{(1,59)} = 5.37$, $p < .05$, and feedback, $F_{(1,59)} = 3.33$, $p < .05$ were discovered. Post test perceived competence means were significantly less than pre test means. The results deviated from overall IMI analyses. The almost flat line for pre test means across feedback groups indicated that there was little difference between groups prior to actual testing.

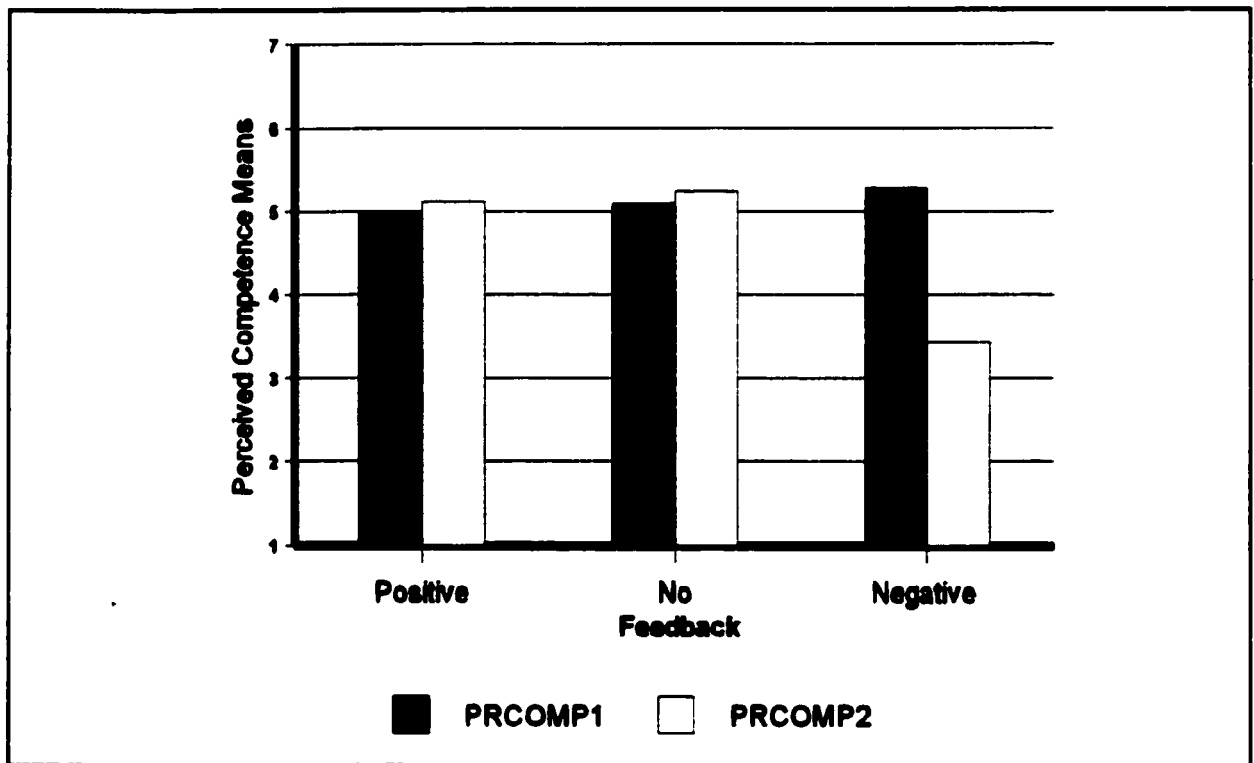


Figure 5 Time and Feedback on Perceived Competence mean scores.

Effort/Importance. An interaction effect was observed for time by feedback, $F_{(2,61)} = 8.82$, $p < .05$. Negative feedback significantly decreased feelings of effort and importance from pre- to post-testing (see Figure 6). There were no main effects for time and feedback.

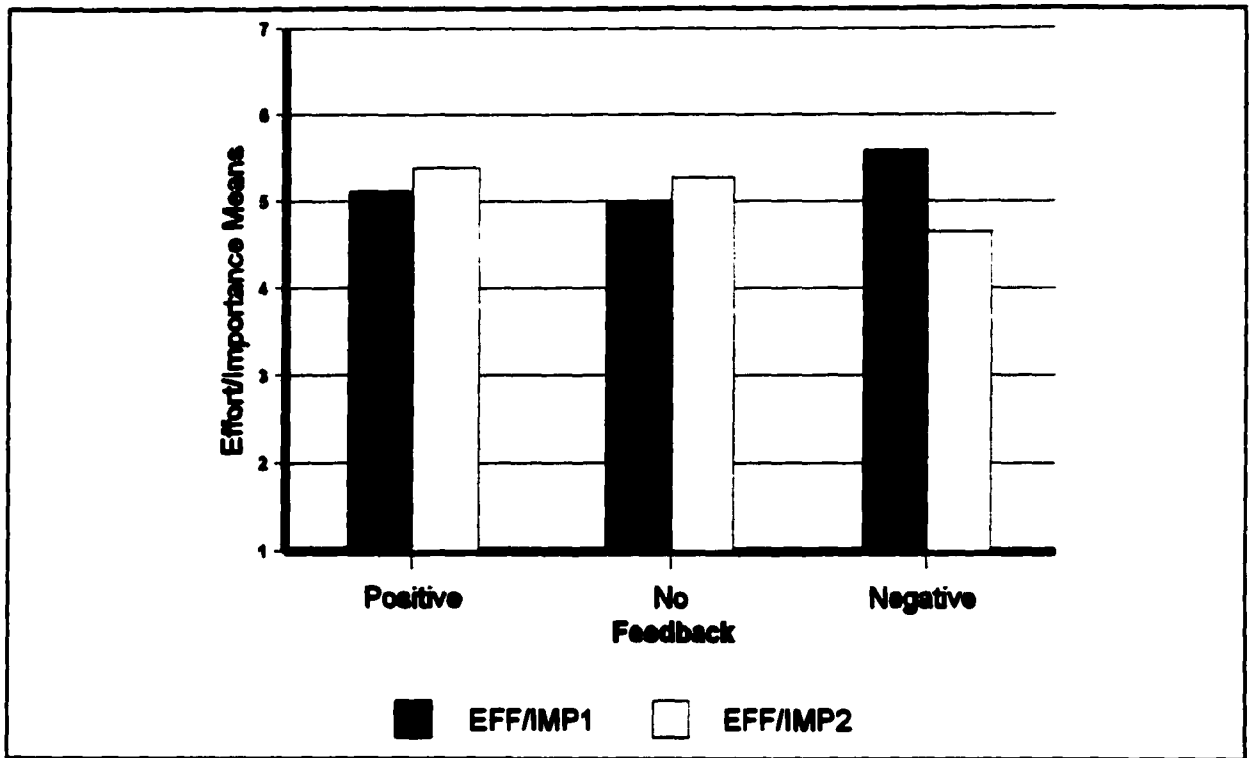


Figure 6 Time and Feedback on Effort/Importance mean scores.

Pressure/Tension No interaction effects occurred (see Figure 7). Feelings of pressure and tension were not effected by time or feedback. There were also no main effects for either time or feedback.

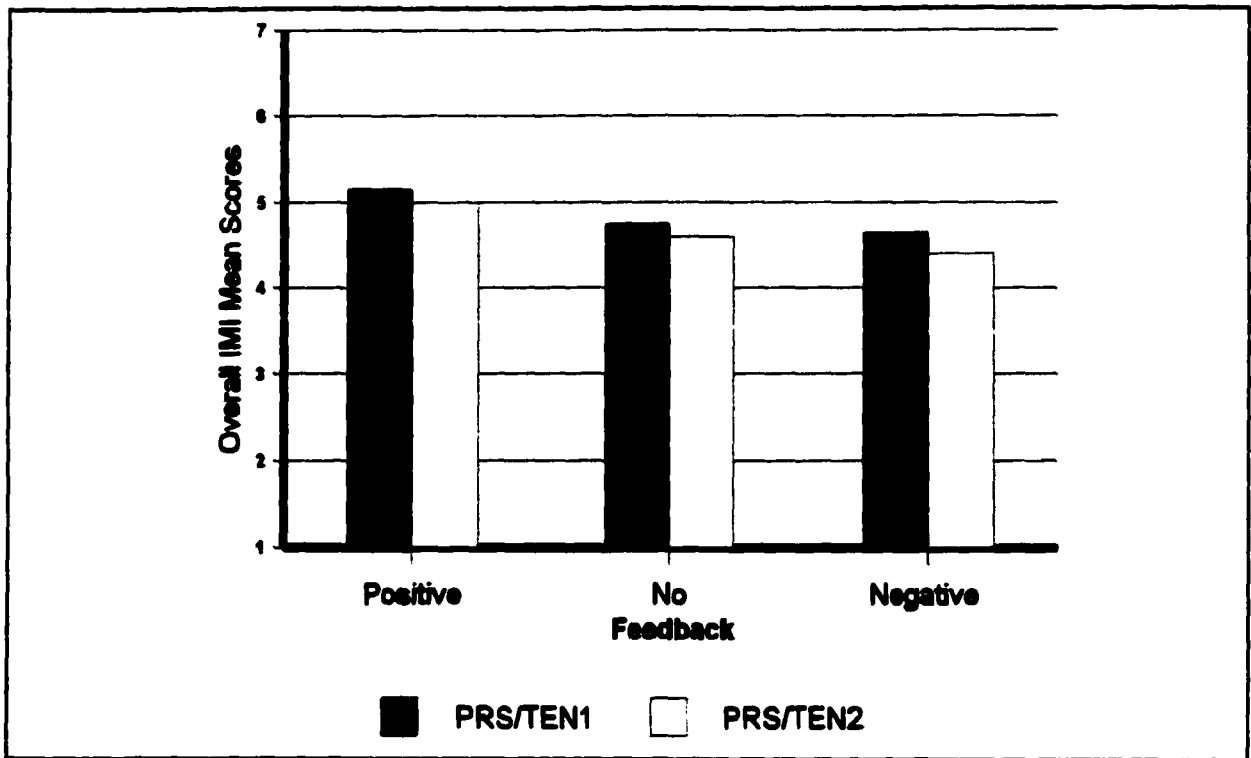


Figure 7 Time and Feedback on Pressure/Tension mean scores.

Motivational Orientations

Motivational orientations were measured with the TEOSQ. The TEOSQ items were scored on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). No population specific norms exist for the TEOSQ, and therefore, a mean split was employed to identify motivational orientation profiles. Other studies (Fox, Goudas, Biddle, Duda, & Armstrong, 1994; Goudas et al. 1994) have found that it is not only possible to have a dominant motivational orientation but equally likely to be high or low in both orientations. Consequently, the present sample was differentiated the into four groups: Lo/Lo, Lo-Task/Hi-Ego, Hi-Task/Lo-Ego, Hi/Hi. The mean score for task-

orientation was $4.12 \pm .59$ and for ego-orientation was 2.8 ± 1.02 . Specific means are presented in Table 3.

Table 3 Specific mean scores per motivation orientation.

Variable	Task		Ego	
	M	SD	M	SD
Motivation Orientation				
Lo/Lo	3.51	.45	2.12	.45
Lo-Task/Hi-Ego	3.66	.30	3.83	.83
Hi-Task/Lo-Ego	4.59	.30	1.74	.57
Hi/Hi	4.49	.58	3.56	.25

The Lo/Lo Group consisted of students low in both task- and ego-orientation, the members in the Lo-Task/Hi-Ego Group were low in task and high in ego-orientation, the members in the Hi-Task/Lo-Ego Group were high in task- and low in ego-orientation, and finally, the members in the Hi-Task/Hi-Ego Group were high in both task- and ego-orientation. In general, task means were high across the groups ranging from 3.51 to 4.49 while ego means varied greatly ranging from 1.74 to 3.38. The group with the highest task means had the lowest ego means (see Figure 8 for group composition).

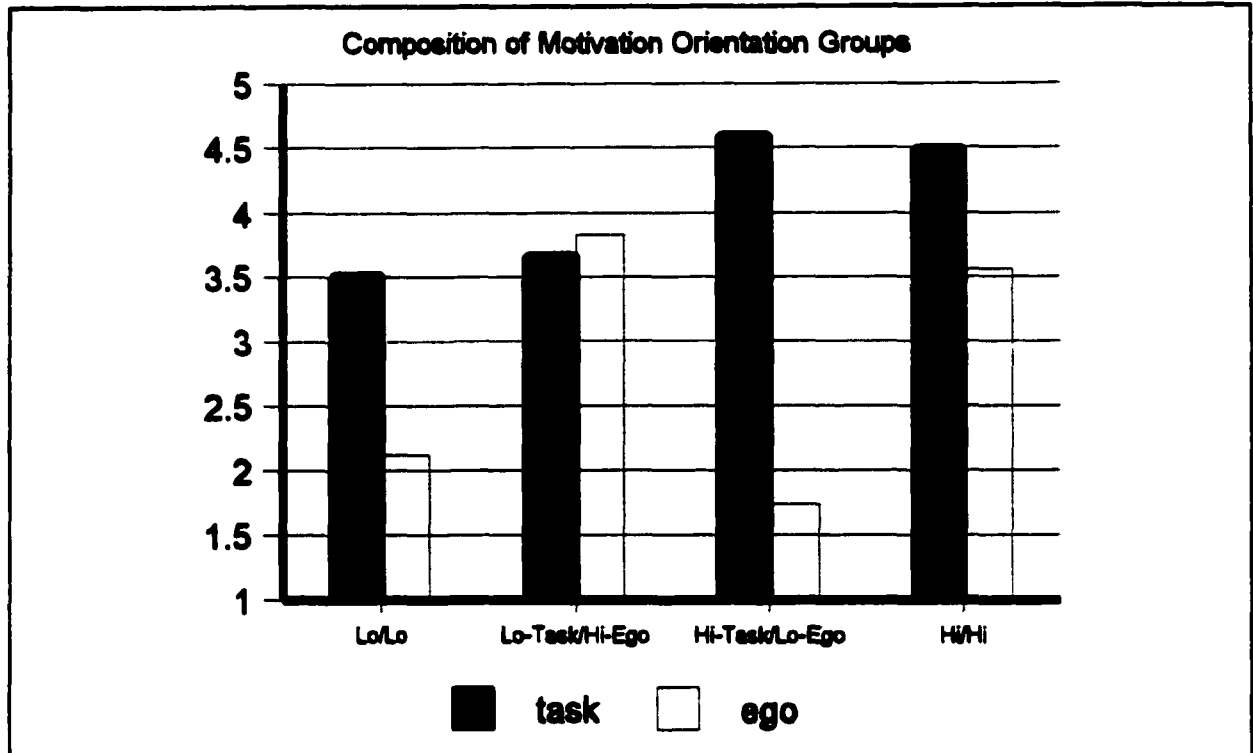


Figure 8 Composition of motivational orientation groups by mean splits.

Most males placed in the extreme groups Lo/Lo or Hi/Hi; one third were categorized into Lo/Lo and one third into Hi/Hi. The remaining third of male students split evenly into the middle groups; Lo-Task/Hi-Ego and Hi-Ego/Lo Task. Female students were unevenly distributed among the four orientation groups. The majority of females had a high task-orientation accompanied by either low ego or high ego orientation. No female student reported to be dominantly ego-oriented (refer to Table 4).

Table 4 Description of population by motivational orientation and gender.

	Lo/Lo	Lo-Task/Hi-Ego	Hi-Task/Lo-Ego	Hi/Hi
Males	17	8	8	18
Females	2	–	5	6

It was impossible to statistically examine the effect of both factors, feedback and motivational orientations, simultaneously on intrinsic motivation. The incompatibility of the study's design and the TEOSQ instrument prevented further analysis.

Discussion

Overall Intrinsic Motivation.

Feedback, according to Kamal and Gallahue (1980), is the information that an individual receives as the result of some response. A number of studies have consistently found that positive feedback increases motivation and negative feedback decreases intrinsic motivation (Deci, 1971; Duda et al., 1995; Koestner et al., 1987; Pittman et al., 1980; Rutherford et al., 1992; Ryan, 1982; Whitehead & Corbin, 1991). The present study only partially replicated these findings.

Levels of IMI for the positive feedback group did not increase from pre to post test as hypothesized. Negative feedback, however, significantly decreased level of intrinsic motivation from pre- to post-testing. These results do not completely support the principles of cognitive evaluation theory which state that any external reward, including feedback, that affects feelings of competence and or self-determination will irrefutably have an impact on intrinsic motivation. More specifically, the theory states that events that promote a greater perceived competence will enhance intrinsic motivation and those that diminish perceived competence will decrease intrinsic motivation (Deci & Ryan, 1985). Inconsistent findings infer that the later statement may be an over generalization.

Kamal et al. (1992) found that individuals were influenced more by negative feedback than positive feedback. They investigated the effect of verbal feedback on the self-esteem of competitive athletes. The athletes were given a nonathletic task and given either positive or negative feedback about their performance. Another study by

Vallerand and Reid (1988) provides further support for the reported effect of positive and negative feedback on intrinsic motivation. Undergraduate students performed a task and received feedback relative to their performance. Negative feedback was found to decrease intrinsic motivation but positive feedback did not always increase intrinsic motivation; males intrinsic motivation was increased with positive feedback, whereas females' intrinsic motivation decreased with positive feedback.

Ryan et al. (1984) state that the inconsistency of how feedback effects intrinsic motivation may be directly related to how intrinsic motivation is measured. These diverse methods of measurement include the amount of time spent on an activity, the degree of likeness for an activity, and formally developed questionnaires such as the Mayo Task Reaction Questionnaire (TRQ) and IMI. The TRQ is a 23 item questionnaire which refers to task liking and interest, feelings of accomplishment and challenge and reasons for performance (Vallerand & Reid, 1988). A competence questionnaire is usually added separately. The IMI measures both specific components of intrinsic motivation, as well as reflecting the overall levels of intrinsic motivation. The IMI was used to measure intrinsic motivation in the present study because it was based on the formal tenets of cognitive evaluation theory and had been deemed reliable by McAuley et al., (1989). Markland and Hardy (1997) reported that all IMI subscales, except pressure/tension, had high intercorrelations to overall IMI. In conclusion, further development of the IMI would increase its value as a valid and reliable measure of intrinsic motivation.

Intrinsic Motivation Subscales

The three IMI subscales significantly affected by negative feedback were interest/enjoyment, perceived competence, and effort/importance. The pressure/tension subscale was not affected.

The subscale interest/enjoyment measured the amount of interest and enjoyment the students experienced during the shuttle runs. In order for a task or activity to be intrinsically motivating it must be interesting and enjoyable to the participant (Deci, 1995). Enjoyment, defined by Wankel (1993), is a positive emotion, involving a cognitive dimension, that focuses on the perception of one's skills to meet environmental demands. When students were given negative feedback, that they scored below average, there was a significant decrease in their perceptions of interest and enjoyment. Deci (1995) states that rewards associated with intrinsic motivation are spontaneous feeling of enjoyment and interest. This statement was further substantiated by instrumentation analyses which discerned a high intercorrelations of the interest/enjoyment subscale to overall IMI.

The perceived competence subscale measured feelings of efficacy associated with the students ability to complete the shuttle run. Deci (1995) supports the importance of this construct as a valid contributor to overall levels of intrinsic motivation by stating that people yearn so strongly to feel competent in their environment that competence should be thought of as a fundamental need. Feeling competent at a task is an important aspect of one's intrinsic satisfaction (Deci, 1995). In the present study students who received negative feedback felt significantly lower levels of efficacy.

These results were not surprising because perceived competence is known to be an important mediator of the effects of feedback on intrinsic motivation. This concept was demonstrated in Vallerand and Reid's (1988) study of stabilometer performance. A path analysis of feedback, perceived competence, and intrinsic motivation showed that perceived competence explained more than 40% of the variance in intrinsic motivation, whereas feedback only explained 8% (Vallerand & Reid, 1984). Whitehead and Corbin (1991) provide further support for the powerful effects of competence perceptions on intrinsic motivation. Path analysis revealed that changes in perceived competence almost exclusively mediated changes in the other aspects of intrinsic motivation (Whitehead & Corbin, 1991). A high intercorrelations to overall IMI further demonstrated the importance of perceived competence as a necessary component of intrinsic motivation.

The subscale effort/importance measured how much effort students expended during the shuttle runs and the amount of personal importance they gave to performing the shuttle runs. Individuals tend to preserve and personally invest in activities they perceive as important (Duda, 1984). This perception of importance is then coupled with the amount of effort expended. Again, in the present study levels of effort and importance were only affected by negative feedback. Students who received negative feedback reported that they expended less effort and perceived the runs as less important than other feedback groups. This emphasizes the potency of negative feedback, information that provides knowledge about one's inability. The degree to

which these constructs relate to intrinsic motivation was also supported with a high intercorrelations to overall IMI.

The last IMI subscale, pressure/tension, measured the extent of pressure and tension students felt during the shuttle runs. These constructs of intrinsic motivation were not significantly affected by time or feedback. These results infer that individuals did not perceive the practice session to be significantly more or less stressful than the actual testing session. In addition, different types of feedback did not alter perceptions of pressure and tension. Pressure and tension are feelings associated with stress and anxiety. Kimiecik and Harris (1996) state in their review of enjoyment that true intrinsic motivation is reflected by an individual feeling free from pressures and tension. A plausible reason for these results was that perceptions of pressure and tension were not as vivid after the fact. Anxiety is sometimes measured moments before an activity in an attempt to obtain a more accurate reading.

Constructs of pressure and tension may not be important predictors of intrinsic motivation because of their retrospective nature. Instrumentation analyses reinforced these findings by indicating a low correlation between the pressure/tension subscale to overall IMI. This study and previous studies have also shown low reliability coefficients, compared to the other IMI subscales, for the pressure/tension subscale (Markland & Hardy, 1997).

A number of studies have found that positive feedback increases intrinsic motivation and negative feedback decreases intrinsic motivation. The homogeneity of the sample may have accounted for the difference between the findings of the present

study and its precursors. The sample population was made up of students, predominately male, enrolled in physical education courses. Grade 12 physical education is not a required course, individuals enrol in it as a result of their own volition. In general, individuals approach situations in which self-competence is sustained or reinforced. Students that enroll in an elective physical education class do so because they have a sense of physical competence. According to Crocker and Ellsworth (1988), students enrolled in physical education classes should have higher perceptions of physical competence compared to those students who do not. Positive feedback would have just enforced these feelings of physical competence, whereas, negative feedback would have created a serious contradiction between perceived physical competence and performance. The discrepancy negative feedback induced between perceived competence and performance feedback may have significantly affected feelings of intrinsic motivation.

The reliability of the percentile-based feedback used to represent positive and negative feedback may have also contributed to the present findings. Positive and negative feedback were presented in a percentile-based manner; top 20th percentile and bottom 20th percentile. It was difficult for some students to conceptualize a percentile-based result, and therefore, performance times were reinforced as being either above or below average, respectively. Norms for fitness tests are derived from the performance of a general population. Achieving an average result on a physical fitness test should have been easily obtainable for physical education students. The reference point for positive feedback, above average, many not have been

representative of positive achievement, whereas, negative feedback, below average, was truly representative of negative feedback for this particular cohort.

Motivational Orientations

Four motivational orientation groups were identified through TEOSQ analyses. As previously mentioned, no normative data exists for this instrument so mean splits were used to differentiate groups. The means used by the present study were very similar to those used by both Fox et al. (1994) and Goudas et al. (1994). The composition of orientations per group was also similar. The high task/low ego groups showed the largest difference in the level of task compared to ego-orientation. Future research should be done to establish normative data so that there is consistency in who is to be defined as what orientation. Standards would also promote a more valid generalizability across population samples and genders.

The results of the present study with regards to gender were not consistent with other motivational orientation studies (Duda, 1989). It has been reported that males are generally ego-oriented, whereas in the present study the majority of males were either low in both orientations and or high in both orientations. The distribution of females was similar to other studies. Females, according to (Duda, 1989), are more task-oriented and the majority of the females in the present study had a high task-orientation. These results may be due to the ratio of males to females which would have affect the means used to differentiate the sample. In conclusion, it is difficult to do cross study comparisons because the sample composition constitutes the mean

splits. Hypothetically, an individual that is discerned as high task-oriented in one study could possibly be low in another depending on the composition of the sample.

Feedback and Motivational Orientations

Two recent studies (Fox et al., 1994; Goudas et al., 1994), investigated the relationship between motivational orientations and intrinsic motivation in physical fitness testing situations. They found that motivational orientations are important factors to consider when investigating the motivational effects of feedback. The present study, therefore, was designed to examine the effect of feedback and motivational orientations on intrinsic motivation. It was predicted that ego-oriented individuals would be significantly affected by positive and negative feedback; positive feedback would increase intrinsic motivation and negative would decrease intrinsic motivation. In addition, task-oriented individuals would only be significantly affected by positive feedback; positive feedback would increase intrinsic motivation. Due to the limitations previously outlined, it was not possible to investigate these hypotheses.

Conclusions

Feedback, a natural consequence of a performer's actions, often takes a verbal evaluative form. The relationship between evaluative feedback and intrinsic motivation have been firmly established in research done testing the tenets of Deci and Ryan's cognitive evaluation theory. The majority have found that positive feedback increases intrinsic motivation while negative feedback decreases intrinsic motivation. The present study, however, found that positive feedback did not significantly increase

intrinsic motivation but that negative feedback significantly decreased intrinsic motivation.

To study the effect of verbal feedback on intrinsic motivation without considering internal constructs such as motivational orientations lead to incomplete and misleading analyses (Vallerand & Reid, 1984; Deci, 1995). The present study, therefore, was designed to examine how motivational orientations effect the perception of external rewards and the resulting effect on intrinsic motivation. Since it was not possible to investigate both factors simultaneously the reader is cautioned not to over generalize the findings of this study.

This study does support the perpetual nature of research, in which the quest for answers is countered by the development of new questions. Future research endeavours need to focus on a number of issues, some already addressed. In general, it is important that researchers continue to examine the combined effects of feedback and motivational orientations on intrinsic motivation. Before this can be done accurately, the way motivational orientations are measured needs to be further developed with population specific norms. The present study, done with adolescent physical education students, should be replicated with different populations and various types of feedback. This would investigate whether adolescents in general are more sensitive to negative feedback than children and/or adults. These variations in design would also address how different types of feedback, informational verses controlling, are perceived through motivational orientations and their consequent affect on intrinsic motivation. This type of knowledge would be invaluable to those individuals who

provide evaluative feedback on a regular basis; teachers, coaches, and all types of educators.

Feedback, both positive and negative, is an essential part of the communication process. Individuals need feedback so they know how they are progressing and how they can improve (Yukelson, 1998). The results of the present study do not infer that positive feedback is ineffective because it did not significantly increase intrinsic motivation from pre- to post-testing. From an optimistic viewpoint, positive feedback preserved students' intrinsic motivation. The fitness of our youth depends on preserving and promoting intrinsic motivation towards physical health and well being. One way this could be accomplished is to evaluate with regards to individual ability and achievement rather than normative standards. Another plausible method would be to critique, provide a ratio of positive to negative feedback, rather than criticise, provide solely negative feedback. Theoretically, these evaluation tactics should promote self-competence, self-determination, and ultimately intrinsic motivation.

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Appendices

**Appendix A:
Practice Session Questionnaire**

PHYSICAL FITNESS TEST QUESTIONNAIRE

Please fill out the following questionnaire to the best of your ability and as honestly as possible.

GENERAL INFORMATION

1 Name: _____

Age: _____

2 Gender: Female
Male

3 I am physically active for at least 30 minutes per day

less than once/week	1-2 times/week	3 times/week	4 times/week	5 or more times/week
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ie. running, cycling,
walking

4 Please indicate whether you have participated in a sport this school year?

Yes
 No

If yes, please indicate the sport and level (school or club) you participated in.

SECTION A

Please carefully read each of the statements listed below and indicate how much you personally agree with each statement by circling the appropriate response.

		strongly disagree						strongly agree
1	I enjoyed the shuttle run very much	1	2	3	4	5	6	7
2	I think I was pretty good at the shuttle run	1	2	3	4	5	6	7
3	I put a lot of effort into these shuttle runs	1	2	3	4	5	6	7
4	It was important for me to do well at the shuttle runs	1	2	3	4	5	6	7
5	I felt tense while doing the shuttle runs	1	2	3	4	5	6	7
6	I tried very hard while doing the shuttle runs	1	2	3	4	5	6	7
7	Doing the shuttle runs were fun	1	2	3	4	5	6	7
8	I would describe the shuttle runs as very interesting	1	2	3	4	5	6	7
9	I felt pressured while doing the shuttle runs	1	2	3	4	5	6	7

		strongly disagree						strongly agree
10	I was anxious while doing the shuttle runs	1	2	3	4	5	6	7
11	I didn't try very hard at doing the shuttle runs	1	2	3	4	5	6	7
12	After doing the shuttle runs, I felt pretty competent	1	2	3	4	5	6	7
13	I was very relaxed while doing the shuttle runs	1	2	3	4	5	6	7
14	I am pretty skilled at doing the shuttle runs	1	2	3	4	5	6	7
15	The shuttle runs did not hold my attention	1	2	3	4	5	6	7
16	I couldn't do these shuttle runs very well	1	2	3	4	5	6	7

PART B

Please carefully read each of the statements listed below and indicate how much you personally agree with each statement by circling the appropriate response.

I feel most successful when . . .

		strongly disagree				strongly agree
1	I'm the only one who can do the activity or skill	1	2	3	4	5

I feel most successful when . . .

		strongly disagree				strongly agree
2	I learn a new skill and it makes me want to practice more	1	2	3	4	5
3	I can do better than my friends	1	2	3	4	5
4	The others can't do as well as me	1	2	3	4	5
5	I learn something that is fun to do	1	2	3	4	5
6	Others mess-up and I don't	1	2	3	4	5
7	I learn a new skill by trying hard	1	2	3	4	5
8	I work really hard	1	2	3	4	5
9	I score the most points, goals, etc.	1	2	3	4	5
10	Something I learn makes me want to go and practice more	1	2	3	4	5
11	I'm the best	1	2	3	4	5
12	A skill I learn really feels right	1	2	3	4	5
13	I do my very best	1	2	3	4	5

Key for the Practice Session Questionnaire

Intrinsic Motivation Inventory (IMI)

- | | | |
|-----|---|------------|
| 1. | I enjoyed the shuttle run very much. | (INT/ENJ) |
| 2. | I think I was pretty good at the shuttle run. | (PRE/COM) |
| 3. | I put a lot of effort into these shuttle runs. | (EFF/IMP) |
| 4. | It was important for me to do well at the shuttle runs. | (EFF/IMP) |
| 5. | I felt tense while doing the shuttle runs. | (PRE/TEN)* |
| 6. | I tried very hard while doing the shuttle runs. | (EFF/IMP) |
| 7. | Doing the shuttle runs were fun. | (INT/ENJ) |
| 8. | I would describe the shuttle runs as very interesting. | (INT/ENJ) |
| 9. | I felt pressured while doing the shuttle runs. | (PRE/TEN)* |
| 10. | I was anxious while doing the shuttle runs. | (PRE/TEN)* |
| 11. | I didn't try very hard at doing the shuttle runs. | (EFF/IMP) |
| 12. | After doing the shuttle runs, I felt pretty competent. | (PRE/COM) |
| 13. | I was very relaxed while doing the shuttle runs. | (PRE/TEN) |
| 14. | I am pretty skilled at doing the shuttle runs. | (PRE/COM) |
| 15. | The shuttle runs did not hold my attention. | (INT/ENJ)* |
| 16. | I couldn't do these shuttle runs very well. | (PRE/COM)* |

- | | | |
|-----------|---|-----------------------------------|
| (INT/ENJ) | = | Interest/Enjoyment - 1,7,8,15 |
| (PRE/COM) | = | Perceived Competence - 2,12,14,16 |
| (EFF/IMP) | = | Effort/Importance - 3,4,6,11 |
| (TEN/PRE) | = | Pressure/Tension - 5,9,10,13 |
| * | = | Reverse Scoring |

Task and Ego Orientation in Sport Questionnaire (TEOSQ)

- | | | |
|-----|---|------|
| 1. | I'm the only one who can do the activity or skill. | EGO |
| 2. | I learn a new skill and it makes me want to practice more | TASK |
| 3. | I can do better than my friends. | EGO |
| 4. | The others can't do as well as me. | EGO |
| 5. | I learn something that is fun to do. | TASK |
| 6. | Others mess up and I don't. | EGO |
| 7. | I learn a new skill by trying hard. | TASK |
| 8. | I work really hard. | TASK |
| 9. | I score the most points, goals, etc. | EGO |
| 10. | Something I learn makes me want to go and practice more. | TASK |
| 11. | I'm the best. | EGO |
| 12. | A skill I learn really feels right. | TASK |
| 13. | I do my very best. | TASK |

TASK - 2,5,7,8,10,12,13

EGO - 1,3,4,6,9,11

**Appendix B:
Informed Consent Package & PAR-Q**

April 1997

Dear Participant,

I am conducting research on the relationship between fitness and motivation under different settings. I would appreciate your perspective on the following fitness experiment.

The procedure for collecting data is divided into two sessions; the Practice Session and the Actual Session. The Practice Session is comprised of two practice runs followed by a questionnaire. The Actual Session, two weeks after the Practice Session, is comprised of two timed runs followed by a questionnaire.

If you agree to partake in the study, please complete and return the attached PAR-Q and participant consent form. All information you provide will be strictly confidential.

Your cooperation is greatly appreciated, thank you.

Sincerely,

**Kerri Tolen, HBA, BEd
Research Investigator**

PARTICIPANT CONSENT FORM

I _____ (please print full name) hereby consent to participate in a research study of the relationship between fitness and motivation conducted by Kerri Tolen, a Lakehead University Graduate student in association with Dr. Joey Farrell, faculty advisor.

I understand that I will be asked to complete the Illinois Agility Run twice for both sessions; the Practice Session and two weeks later the Actual Session. I also understand that I will be asked to complete a questionnaire that will require about 10 to 15 minutes after each testing session.

I also understand that the data derived from each individual participant will remain **confidential** as each participant will be referenced by number. I am aware that all participants will be debriefed and, upon request, receive a summary of the study.

SIGNATURE:

DATE:

**Appendix C:
Actual Session Questionnaire**

PHYSICAL FITNESS TEST QUESTIONNAIRE

Please fill out the following questionnaire to the best of your ability and as honestly as possible.

GENERAL INFORMATION

Name: _____

Age: _____

Gender: Female
 Male

SECTION A

Please read each of the statements listed below and indicate how much you personally agree with each statement by circling the appropriate response.

	strongly disagree						strongly agree
1 I couldn't do these shuttle runs very well	1	2	3	4	5	6	7
2 The shuttle runs did not hold my attention	1	2	3	4	5	6	7
3 I am pretty skilled at doing the shuttle runs	1	2	3	4	5	6	7

		strongly disagree						strongly agree
4	I was very relaxed while doing the shuttle runs	1	2	3	4	5	6	7
5	After doing the shuttle runs, I felt pretty competent	1	2	3	4	5	6	7
6	I didn't try very hard at doing the shuttle runs	1	2	3	4	5	6	7
7	I was anxious while doing the shuttle runs	1	2	3	4	5	6	7
8	I felt pressured while doing the shuttle runs	1	2	3	4	5	6	7
9	I would describe the shuttle runs as very interesting	1	2	3	4	5	6	7
10	Doing the shuttle runs were fun	1	2	3	4	5	6	7
11	I tried very hard while doing the shuttle runs	1	2	3	4	5	6	7
12	I felt tense while doing the shuttle runs	1	2	3	4	5	6	7
13	It was important for me to do well at the shuttle runs	1	2	3	4	5	6	7

**strongly
disagree**

**strongly
agree**

14	I put a lot of effort into these shuttle runs	1	2	3	4	5	6	7
15	I think I was pretty good at the shuttle run	1	2	3	4	5	6	7
16	I enjoyed the shuttle runs very much	1	2	3	4	5	6	7

Key for the Practice Session Questionnaire

Intrinsic Motivation Inventory (IMI)

- | | | |
|-----|---|------------|
| 1. | I couldn't do these shuttle runs very well. | (PRE/COM)* |
| 2. | The shuttle runs did not hold my attention. | (INT/ENJ)* |
| 3. | I am pretty skilled at doing the shuttle runs. | (PRE/COM) |
| 4. | I was very relaxed while doing the shuttle runs. | (PRE/TEN) |
| 5. | After doing the shuttle runs, I felt pretty competent. | (PRE/COM) |
| 6. | I didn't try very hard at doing the shuttle runs. | (EFF/IMP) |
| 7. | I was anxious while doing the shuttle runs. | (PRE/TEN)* |
| 8. | I felt pressured while doing the shuttle runs. | (PRE/TEN)* |
| 9. | I would describe the shuttle runs as very interesting. | (INT/ENJ) |
| 10. | Doing the shuttle runs were fun. | (INT/ENJ) |
| 11. | I tried very hard while doing the shuttle runs. | (EFF/IMP) |
| 12. | I felt tense while doing the shuttle runs. | (PRE/TEN)* |
| 13. | It was important for me to do well at the shuttle runs. | (EFF/IMP) |
| 14. | I put a lot of effort into these shuttle runs. | (EFF/IMP) |
| 15. | I think I was pretty good at the shuttle run. | (PRE/COM) |
| 16. | I enjoyed the shuttle run very much. | (INT/ENJ) |

- (INT/ENJ) = Interest/Enjoyment - 16,10,9,2
 (PRE/COM) = Perceived Competence - 1,3,5,15
 (EFF/IMP) = Effort/Importance - 6,11,13,14
 (TEN/PRE) = Pressure/Tension - 12,8,7,4
 * = Reverse Scoring