Motivation and its Impact on the Performance of Special Olympic

Athletes During the 1.5-Mile Run

By

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A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
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Darren G. Milne

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirements of the degree

of

Master of Science

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Abstract

This research was designed to examine two problems: (a) how the presence of extrinsic motivation affected the performance of two groups of Special Olympic Track athletes on a test of cardiovascular endurance, and (b) assess the athletes' motivational orientation and perceived motivation, and compare these outcomes to their performance on two protocols of the 1.5-mile run.

Both of these problems were addressed by using two groups of Track and Field athletes (entitled Medallion and Track) from Manitoba Special Olympics (MSO).

Athletes were required to perform two 1.5-mile runs, one with verbal motivation from the coaches and one without. In addition, the athletes training programs were examined to determine if there were any real differences. For this research, Motivational Orientation was determined using the Perceived Competence Scale for Children (Harter, 1982). The Manipulation Check of Perceived Motivation was created to determine the athletes perceived motivation before and after each 1.5-mile run.

The results from this research demonstrated that: (a) athletes' performances improved with the presence of extrinsic motivation, (b) there was little difference between the athletes' training programs, (c) motivational orientation did not affect performance, and (d) neither group perceived the effect of motivation any differently than the other.

Among others, one conclusion from the research is that extrinsic motivation is needed for a maximal performance, although some athletes do have intrinsic qualities.

Previous researchers generally have not illustrated the intrinsic qualities found in athletes with a mental disability.

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If I have only learned one thing while completing my thesis, it's that perseverance will build better work. This thesis has been a big challenge for me, with many obstacles that needed to be overcome. That's not to say that I didn't enjoy working through those challenges, but I did consider giving up on my thesis several times (especially when it seemed that the end wasn't in sight). Perseverance, however, helped me to complete my thesis, and not just my perseverance, but also the perseverance of those around me. It is to these people who I owe a great deal of thanks.

First, and foremost, I want to acknowledge and thank my wife Cara. She is a strong woman who gives me strength, encouragement, and motivates me to continue through my struggles. I finished this thesis mainly for her, because she put almost as much time into it as I did. I love you Cara, and thanks for helping me persevere through this work.

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"Therefore, since we are surrounded by such a great cloud of witnesses, let us throw off everything that hinders and the sins that so easily entangles, and let us run with perseverance the race marked out for us"

Hebrews 12:1

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CHAPTER ONE

Introduction

Many authors (Fernhall, 1997; Montgomery, Reid, & Seidl, 1988; Pietti & Tan, 1990) have completed research that has examined the physical/athletic abilities of people with a mental disability. These studies have occurred within a variety of settings, and have included running/walking (Fernhall & Tymeson, 1988; Rintala, Dunn, McCubbin, & Quinn, 1992), cycling (Pitetti & Tan, 1990), and step testing (Montgomery, et. al, 1988). The end results of these studies usually points to poor physical ability/fitness among people with a mental disability. For example, Shepard (1990) suggested that in fitness settings, studies have shown that the performance of people with mental disabilities is lower when compared to people without mental disabilities (Fernhall, 1997; Montgomery, et. al, 1988). This finding has been evident across different disciplines. In educational settings, for example, it has been demonstrated that children with mental disabilities need more encouragement in order to complete school tasks (Switzky & Shultz, 1988). These findings can be very limiting for the individual who has a mental disability. One theory, which may explain the poor performance and/or ability of this population, is attribution theory.

Attribution Theory

Attribution theory assumes "that individuals naturally search for understanding about why events occur, especially when the outcome is important or unexpected" (Stipek, 1993, p. 126). When determining the cause of behaviour, an individual will attribute their actions to one of four causal attributions: (a) ability, (b) effort, (c) task

difficulty, or (d) luck (Crocker, 1993; Cox, 1994; Weiner, 1985). These attributions can be classified into three dimensions: (a) locus of causality, (b) stability, and (c) controllability (Stipek, 1993). Locus of causality refers to the source of the behaviour (ability, effort, task difficulty, and luck), stability differentiates causes based on their consistency over time, and controllability refers to the degree of perceived control an individual has over the cause (Crocker, 1993; Stipek, 1993).

In terms of attribution theory and children, one study has shown that when children who have a history of poor performance actually experience success, they will attribute that success to external causes, whereas failure will be attributed to a lack of ability (Greene, 1985). This has far reaching consequences for children with mental disabilities. It has been suggested that children with mental disabilities have a higher failure rate compared to children without mental disabilities of the same age when performing similar tasks (Harter, 1977). Therefore, it is quite possible that children with mental disabilities who attribute success externally, and failure internally, will not develop a sense of competence. Because children with mental disabilities may fear failure they may not continue in an activity, even if they believe they are performing the activity properly. Instead, these children may rely on external cues from the environment for approval. For example, a child may look for approval from an instructor before continuing with a task (Harter & Zigler, 1974; Stipek, 1993). Continual reliance on external cues prevents the development of competence (Stipek, 1993).

The idea of developing competence is directly related to an individual's attempt to master his/her environment (White, 1959). Attribution theory, however, is concerned with why something happened (Dixon, 1979). Clark (1997) reported that ones'

perception of his/her ability and effort are the two principle causes of success or failure. Clark further states that, "success is seen as the result of personal competence" (p. 69). This suggests that an individual must have competence in a specific activity before they can attribute success to ability and/or effort. Developing competence can only occur through mastery attempts of an individual's environment. In this way attribution theory and the theory of effectance motivation are related.

Effectance Motivation

Effectance motivation was originally referred to as competence motivation by White (1959). The concept of competence motivation emerged as a result of White's belief that traditional drive theories and psychoanalytic instinct theories could not adequately explain motivation in both animal and human behaviour (White, 1959). Competence motivation was initially described as being "directed, selective, and persistent, and it is continued not because it serves primary drives...but because it satisfies an intrinsic need to deal with the environment" (p. 318). This motivational construct was then labelled 'effectance,' as feelings of efficacy would satisfy a need to be competent in the areas of exploration, mastery, and play (Harter, 1978a). The need or urge to be competent and to have control over one's environment is directed towards producing a desirable effect on the environment. When an individual engages in a mastery attempt of their environment, they will become gratified by feelings of efficacy, or intrinsic pleasure (Harter, 1980).

Researchers have demonstrated that many individuals with mental disabilities have low effectance motivation (Harter, 1977; Switzky, 1997a). Low effectance motivation in this population is the result of being "heavily dependent on receiving

environmentally derived external reinforcement feedback in order to perform a task" (Switzky, 1997a, p. 195). In other words, Switzky is suggesting that people with mental disabilities are more affected by extrinsic motivation because they have low levels of effectance motivation. As a result, low levels of effectance motivation leads to an "overreliance on cues from the external environment to help guide behavioural performance with a concomitant increase in extrinsically motivated behaviour" (Haywood & Switzky, 1986, p. 7).

Motivational Orientation

Evidence suggests that people with mental disabilities lack effectance motivation (Harter, 1977; Switzky, 1997a); however this may be misleading as measuring this construct has presented challenges. Harter believed that White's (1959) concept of effectance motivation was too global to operationalize. Therefore, part of her work was to create operational definitions of effectance motivation so that it could be measured. Harter's work led to the creation of the "What I am Like" Perceived Competence Scale for Children (Harter, 1982).

The Perceived Competence Scale for Children (PCSC) is based on the notion that motivational orientation (i.e. intrinsic or extrinsic) and perceived competence are related. Indeed, Harter (1982) found that perceived competence is related to a preference for challenge, to independent mastery, and to curiosity, all of which result from being intrinsically motivated. The scale is composed of four subscales: cognitive competence, social competence, physical competence, and general self-worth (Harter, 1982). The scale provides an assessment of motivational orientation. For example, a high score in any of the subscales would be an indication of the child's high perceived competence, or

intrinsic orientation. Conversely, a low score on any of the subscales would be an indication of low perceived competence, and hence, demonstrate an extrinsic orientation.

The Motivation/Disability Relationship

Motivational orientation (intrinsic or extrinsic) may be a factor that negatively influences the performance of people with mental disabilities on fitness tests. Evidence suggests that many people with mental disabilities lack effectance motivation (i.e., lack intrinsic motivation), and are dependent upon cues from their environment (i.e., need extrinsic motivation). These factors, in tandem, may result in submaximal efforts, which make it very difficult to accurately measure fitness levels in this population (Fernhall, 1997; Shepard, 1990). Consequently, extrinsic motivation is often provided during testing as a means of stimulating maximal effort (Cressler, Lavay, Giese, 1988; Rintala, McCubbin, & Dunn, 1995).

Providing extrinsic motivation to an individual with a mental disability, in order to produce a performance that is closer to maximal, has been examined in several studies. McGuire and James (1988) conducted one study that investigated the "relative success of normal persuasion versus attribution in influencing leisure behaviour" (p.26). The authors were specifically interested in knowing if normal persuasion or verbal attributions were "more effective in modifying swimming behaviour" (p. 26) in adults with a mental disability. Normal persuasion involved messages to the participants about how fun swimming is and about how important it is to be involved (e.g., "Swimming is a lot of fun, and I would sure like to see all of you involved in it"). Verbal attribution involved messages to the participants regarding their effort and ability (e.g., "You all showed great participation and good activity in the water today"). The researchers

hypothesized that individuals who received verbal attribution messages and individuals who received normal persuasion would improve their swimming performance when compared to individuals who received no messages. They also hypothesized that individuals who received verbal attribution would demonstrate improved swimming performances versus those receiving normal persuasion. The results revealed that individuals in the swimming group, who received verbal persuasion, were "more likely to meet their objectives" than were the individuals who received no type of persuasion (p. 29). In addition, the authors found that the verbal attribution messages did not significantly improve swimming performance. In fact, more of the individuals who received normal (verbal) persuasion accomplished their swimming objectives than those who received verbal attribution messages. These findings suggest that the participants' performances were affected more positively by verbal messages, than by verbal attributions.

In a separate study, Watkinson and Koh (1988) examined completion rates in the Canada Fitness Award Adapted Endurance Run. The participants, all of whom had a mental disability, were to perform this run on their own and then with a pacer. Pacers not only set the running speed for the participants, but also provided verbal motivation (e.g., "stay with me") to the participants as they ran. The results showed a decrease in performance times with a pacer. Consequently, although the study did not specifically examine the effect of motivation on performance, the results suggest that individuals will perform better when extrinsic motivation is provided (in this case a pacer).

In previous studies that have examined motivation during fitness testing, research participants have been recruited from group homes or sheltered workshops (Montgomery,

et al., 1988). In many cases, these individuals had not previously made a commitment to sport and had not been exposed to fitness training. Wright and Cowden (1986) suggested that the motivation of individuals who had already shown an interest in physical activity by, for example, joining a Special Olympic program, might be different than those who had no previous experience in physical activity. Therefore, athletes who showed previous interest in an activity, and had their motivational orientation measured, may demonstrate results that differed from past research.

Manitoba Special Olympics

Athletes in Special Olympics are examples of individuals with mental disabilities who have shown an interest in training and/or physical activity. Manitoba Special Olympics (MSO) is one organization in which participants can be found who engage, with varying degrees of frequency, duration, and intensity, in sport specific training programs. This is because MSO has created the Medallion program, "a high performance provincial team training program for athletes with a mental disability" (Dalhgren, Boreskie, Dowds, Mactavish, & Watkinson, 1991, p. 67). Athletes in the Medallion program must make a commitment to train at least three times a week; which differs from typical MSO programs, where athletes train once to twice a week. The Medallion program athletes train more frequently, which should lead, theoretically, to enhanced effectance motivation.

Summary

In order to attribute success or failure to either ability, effort, luck, or task difficulty, individuals must perceive themselves to be competent in the activity.

Competence can be gained through participation in an activity, which may be viewed as

an attempt to master the activity. Evidence suggests that many people with mental disabilities do not have the intrinsic desire necessary to master an activity. Because of this, people with mental disabilities are often more dependent on cues found within the environment for sources of motivation. Without these cues, they are unlikely to perform maximally on a fitness test. To date, researchers have not examined: (a) the impact of motivation on Special Olympic athletes, (b) the relationship between motivational orientation (intrinsic or extrinsic) and performance of these athletes, and (c) the perceived motivation of Special Olympic athletes prior to, and at the completion of, a distance run fitness test. The preceding three points are important areas of inquiry. A generalization from previous research suggests that all people with mental disabilities have low effectance motivation (Harter, 1977: Switzky, 1997a). This generalization, however, fails to account for the possibility that effectance motivation may be affected depending on the nature (i.e., frequency) of a person's involvement in an activity/sport. In addition, understanding athlete's perceptions of the influence of motivation on performance may provide insights about effective ways to facilitate maximal effort and performance.

Statement of the Problem

The purpose of the present study was to examine how the presence of extrinsic motivation affected the performance of two groups of Special Olympic Track athletes on a test of cardiovascular endurance. A subproblem of the study was to assess the athletes' motivational orientation and perceived motivation, and to compare these outcomes to performance on two testing protocols for a 1.5-mile run.

To fulfill the aims of the research, four objectives were established: (a) provide an in-depth, qualitative description of the two training programs, and note the differences between the training programs, (b) determine whether or not extrinsic motivation significantly affects performance on a 1.5-mile run, (c) examine if motivational orientation (either extrinsic orientation or intrinsic orientation) affects performance on the 1.5-mile runs, and (d) assess the athletes' perceptions of their motivation and compare this to their performances on the 1.5-mile run under both testing conditions.

Research Hypotheses

The study was designed to enable testing of the following three hypotheses:

- Both groups (Medallion and Track) would increase their running speeds in the 1.5mile run when extrinsic motivation was present, but only the Track group would show a significant decrease in time.
- 2. Motivational orientation would affect performance on the 1.5-mile run. Specifically, it was believed that athletes with an intrinsic orientation would have relatively constant performances, regardless of the presence or absence of extrinsic motivation (i.e., encouragement). In addition, athletes with extrinsic orientations would perform significantly better in the presence of extrinsic motivation.
- The Track group would perceive extrinsic motivation as significantly affecting their performance on the 1.5-mile runs, while the Medallion athletes would not have this perception.

Operational Definitions

Mental Disability

Previous researchers have often used the term mentally handicapped or mental retardation. Reflecting current language practices within this field, the term mental disability will be used to refer to the condition of mental retardation. The American Association on Mental Retardation (AAMR) defines mental retardation as:

"Substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18" (AAMR, 1992, p.1).

Access to formal diagnostic information for the participants in this study was not possible. As such, membership in Special Olympics, which requires a diagnosis of mental disability, was used as the standard for including participants in this study.

Motivation

Competence motivation. This term was initially coined by White (1959) in reference to an individual's directed, selective, and persistent actions that serve to satisfy an intrinsic need to deal with the environment. This notion suggests that it is through interactions within one's environment that an individual gains competence in his/her abilities. Competence motivation was later termed effectance motivation.

Effectance motivation. Effectance motivation is a "motive which impels one toward competence and is satisfied by a feeling of efficacy" (Harter, 1980, p. 4). It is an intrinsic need to deal effectively with the environment, and "one which when gratified produces inherent pleasure" (Harter, 1980, p. 4).

Motivational Orientation. Motivational orientation is related to effectance motivation. According to Harter (1982) a person with an intrinsic orientation will have high effectance motivation, whereas an individual who is dependent upon motivational cues found within the environment will have low effectance motivation. An individual has either an intrinsic orientation or an extrinsic orientation.

Perceived Motivation. Perceived motivation describes how athletes interpret their desire to perform. This desire will arise from self-motivation (i.e., intrinsic motivation), or will be encouraged by others (i.e., extrinsic motivation). This will be determined by the Manipulation Check of Perceived Motivation (MCPM).

<u>Delimitations</u>

Participation in this study was delimited to Track and Field athletes in three MSO clubs: Medallion, Navvies, and Bulldogs. The Navvies and the Bulldogs were treated as a single group and referred to as the Track group. This program is a "typical" Special Olympic track program in that the athletes train 1-2 times a week. The Medallion program consists of Manitoba's provincial team members. This program requires that athletes train 3-4 times a week. Only athletes who trained exclusively in track (i.e., no other MSO programs) were included in the study.

Potential Limitations

This study was limited by its small sample size (n=13). The number of participants, however, reflected all of the athletes who met the selection criteria. A second limitation of the study was the inability to access information related to the participants' levels of disability. As such possible differences in motivation that may have been related to level of disability were not taken into account. Finally, because all

of the study participants had previous experience in Special Olympics, it was not possible to determine their motivational orientation prior to any involvement in sport.

Assumptions

It was assumed that:

- Athletes who were on the provincial team qualified for the team because of personal commitments to training, and not because their parents/caregivers pushed them into competing.
- 2. Verbal motivation would be enough to extrinsically motivate the athletes, and that this motivation would affect each athlete equally. Similarly, it was assumed that other sources of extrinsic motivation normally found within the environment affected each athlete equally (e.g., parents watching, etc.).
- 3. Athletes would understand how to complete the endurance run after one familiarization trial. This was not an unreasonable assumption, as these athletes were used to running as part of their training programs.
- 4. Athletes were able to accurately report their perceived level of motivation before and after each 1.5-mile run. It also was assumed that athletes would accurately answer the questions on the 'What I am Like' scale (Harter, 1982).

CHAPTER TWO

Review of the Literature

Building on discussion in the introduction, this chapter provides a detailed overview of attribution theory, and includes examples of the use of this theory as a theoretical framework in research involving people with mental disabilities. The relationship between effectance motivation and attribution theory is also addressed in this chapter. Effectance motivation is documented from its origin in 1959, through its revisions by Susan Harter, and concludes with a description of how this construct has been used in research involving Special Olympics. Following this review, measurement issues in accurately assessing people with mental disabilities are considered. The review of the literature concludes with a history of Canadian Special Olympics and Manitoba Special Olympics, and the identification of future directions for research.

Attribution Theory

Attribution theory is a "theory of motivation and emotion that, by virtue of the centrality of causal explanation, represents a general theory applicable to a wide variety of phenomena" (Weiner, 1986, p. 3). Within this statement, Weiner makes the point that attribution theory is not so extensive that it lacks breadth, but is not so precise that it lacks generality. In essence, it is a theory that can be used to explain specific behaviours over different situations. It also would be accurate to describe attribution theory as a theory that attempts to explain why something happened. To do this, causal attributions are formulated to explain success or failure outcomes (Crocker, 1993). Individuals will naturally search for causal attributions in order to understand why an event occurred

(McAuley, 1992; Stipek, 1993). These causal attributions will then influence an individual's future achievement-orientated behaviour (Crocker, 1993).

Four causal attributions are most commonly ascribed to achievement outcomes, these include: ability, effort, task difficulty, and luck (McAuley, 1992; Stipek, 1993; Weiner, 1986). In terms of sport and physical activity it has been acknowledged that there are other causal attributions such as strategy and tactics, facilities, weather, or coaching (Crocker, 1993). In relation to causal attributions, Weiner (1986) makes the point that, on their own, causal attributions can only provide the individual with some information about their behaviour, but that the underlying dimensions of the causal attributions need to be understood in order to fully understand why an outcome occurred. Three underlying dimensions have emerged. These include the: (a) locus dimension, (b) stability dimension, and (c) controllability dimension (Stipek, 1993; Weiner, 1986).

The Three Causal Dimensions. The locus of causality dimension refers to whether the cause of an outcome is perceived to reside within the individual, or external to the individual (McAuley, 1992). In other words, locus of causality refers to a person's belief about whether or not they are personally in control of what happens to them (Cox, 1994). For example, an individual who loses a race may attribute the loss internally to low ability or externally to fatigue. Individuals who internalize tend to believe that their behaviours influence outcomes, whereas people who perceive a cause as occurring externally will attribute outcomes to outside forces, such as chance (Cox, 1994).

The stability dimension differentiates attributions as either stable or unstable (Cox, 1994). The basis for deciding whether or not an attribute is stable is determined by how an individual perceives the attributions' durability over time (Stipek, 1993). For

example, ability and task difficulty are thought to be stable attributions because individuals' perceive them as having relatively little variability over a long period of time (Cox, 1994; McAuley, 1992). Effort and luck, in contrast, are considered unstable attributions because they are perceived as varying from one situation to the next (Dixon, 1979; Weiner, 1986). The stability dimension has important consequences for an individual. If a person attributes failure to a stable cause, they are more likely to believe that they would fail again, especially in comparison to people who attribute failure to unstable causes (Zoeller, Mahoney, & Weiner, 1983).

The controllability dimension refers to the degree of control an individual has over the cause (Stipek, 1993). An individual, for example, can control how much effort they exert during an activity, but have no control over the degree of luck they have during the same activity (Stipek, 1993). Individuals who fail as a result of an uncontrollable factor may feel like quitting or giving up. Conversely, failure, which is attributed to a controllable factor, will cause an individual to feel hopeful that success can occur at a later time (Zoeller, et al., 1983).

Expectancy and Affect. Each causal dimension has a specific affective or expectancy response (Crocker, 1993). For example, the locus of causality affects emotional experiences (Crocker, 1993) such as self-esteem, self-worth, and other outcome dependent emotions (Weiner, 1986). Successful outcomes that are ascribed internally will result in greater self-esteem and pride, as compared to outcomes that are ascribed externally. Contrasting this is failure, which ascribed internally will result in lower levels of self-esteem and pride than it would if failure was ascribed externally (Weiner, 1986).

The stability dimension is associated with expectations about future outcomes (Crocker, 1993). This dimension mainly influences emotional reactions, such as hope and fear (Weiner, 1986). By attributing success to a stable cause, the individual would be hopeful in believing that future outcomes would be successful (Crocker, 1993).

The third dimension, controllability, is associated with feelings such as anger, gratitude, shame, and other emotions that have a moral component (Crocker, 1993).

Failure due to causes that are perceived as controllable by another will elicit feelings of anger towards that person. Similarly, if one perceives having control over another who needs help, and does not help them, feelings of guilt will occur (Weiner, 1986).

Depending on how the degree of control is perceived, an individual can feel emotions of anger, pity, guilt, shame, or gratitude. Anger and guilt are linked with controllable causes, whereas pity and shame are linked to uncontrollable causes (Weiner, 1986). For example, Clark (1997) found that when teachers attributed an individual's learning disability as an uncontrollable cause of failure, they would feel pity for their student and would in turn provide rewards to this child more readily.

The focus of the present study, however, is about how motivation affects people with mental disabilities, and is not as interested in how others attribute an individual's disability. Zoeller and colleagues (1983) used attribution theory as a means of increasing motivation in people with mental disabilities. They measured performance on an assembly task with three groups (control, individual instruction, and filmstrip) of individuals who had a mental disability. The individual instruction group was provided with a trainer who taught them to attribute success to both ability and effort. The filmstrip group received similar instruction via a film. The results indicated that both

groups improved in their reaction to failure compared to the control group. The individual instruction group, however, only approached significance, whereas the results of the filmstrip group were significant in comparison to the control group. The authors concluded that people with mental disabilities, who have apparent motivational problems, could be taught to attribute success to effort and ability, thus improving their motivation and subsequent performance.

More specific to a sport setting, Dummer, Ewing, Habeck, and Overton (1987) studied the attributions of athletes with cerebral palsy who competed in the 1985
National Cerebral Palsy/Les Autres Games. They found that athletes with severe disabilities attributed their performance to external unstable causes (e.g., luck) and also to external stable causes (e.g., skill development). Athletes with more ability attributed performance to both unstable internal and external attributes. The authors suggested that attributing performance outcomes to external causes might have indicated that these athletes realized that their performance might not have been fully under their control, due to their involuntary muscle contractions and reflex activity. Recognizing the fact that none of the athletes in the present research have cerebral palsy, Dummer and colleagues still demonstrate that the attributions of athletes with a disability can be expected to differ from athletes without disabilities.

Attribution Theory and its Relationship to Effectance Motivation

Attribution theory and effectance motivation are two different theories that attempt to explain behaviour. Both theories, nonetheless, share common ground. Effectance motivation will be explained more completely later in the chapter, however, a

brief overview of effectance motivation will be given so that the relationship between it and attribution theory may be explained.

The concept of effectance motivation suggests that individuals attempt to understand their environment through mastery attempts. Once an individual is successful in his/her mastery attempt, he/she will begin to feel competent and become gratified by feelings of efficacy (Switzky, 1997a). Attribution theory, on the other hand, suggests that individuals use causal attributions to explain his or her behaviour (Weiner, 1986). Of all the causal attributions, ability and effort have been most often identified within the literature as the two principle causes to which individual's ascribe success or failure (Clark, 1997). Clark goes on to state, "success is seen as the result of personal competence" (p. 69). This suggests that an individual must have competence in a specific activity before they can attribute success to their ability and/or effort.

Developing competence can only occur through mastery attempts of an individual's environment.

To summarize, attribution theory and the theory of effectance motivation are related because mastery attempts lead to perceived competence in a task. Once an individual believes they are competent in a task they can begin to attribute their successes or failures to causal attributions, such as ability or effort.

Competence Motivation

The concept of competence motivation arose in 1959 when Robert White, a psychologist from Harvard University, began to realize that the existing theories of motivation inadequately explained behaviour in humans or animals (Harter, 1978a).

White (1959, 1960) wrote two articles that criticized the foundations of Hull's traditional

drive theory and Freud's psychoanalytic instinct theory. White (1959) stated that "twenty years of research have thus pretty much destroyed the orthodox drive model" (p. 305), and that the continued use of Freud's theory of instincts would only serve to block insights into ideas surrounding motivation (White, 1960).

After criticizing previous theories of motivation for their inadequacies, White used studies on animals, and Piaget's infant and child development observations to support his new idea of competence. He provided evidence from these studies which demonstrated that behaviours such as exploration, mastery, or play could not be explained by a reduction in deficit motives or by anxiety reduction (White, 1959).

Instead, White (1959) noted that a variety of learned skills (such as sucking, grasping, walking, and language development) were all related to effective interactions with the environment. These learned skills were then categorized by White (1959) as competence. According to White "the competence of an organism means its fitness or ability to carry on those transactions with the environment which result in its maintaining itself, growing, and flourishing" (White, 1960, p. 100). These actions, White argued, were "directed, selective, and persistent, and are continued not because they serve primary drives, but because they satisfy an intrinsic need to deal with the environment" (White, 1959, p. 318).

In short, White believed that individuals were intrinsically motivated to deal competently within their physical and social environments, and do so by engaging in mastery attempts. Successful mastery attempts (which result in a successful outcome) would lead to feelings of efficacy, which in turn would enhance or maintain an individual's competence motivation (Weiss & Chaumeton, 1992). White viewed

behaviours such as mastery, challenge, curiosity, and play as urges directed towards competence that were satisfied by feelings of efficacy, or intrinsic pleasure (Weiss, 1984).

Effectance Motivation

Arising from the concept of competence motivation was effectance motivation. This new motivational concept arose because White (1960) believed that the directed persistence of learned behaviours warranted the assumption of motivation. These behaviours, which impelled a person to deal effectively with their environment, would be satisfied by feelings of efficacy and not by the "vitally important learnings that come as its consequence" (White, 1959, p. 323). The motive, although not as intense as pain or hunger, is persistent in that "it regularly occupies the spare waking time between episodes of homeostatic crisis" (White, 1959, p. 321). In terms of development, White (1959) stated that effectance motivation in infants is undifferentiated, however, as the child grows they begin to distinguish between various motives such as cognizance, construction, mastery, and achievement, all of which have a root in effectance motivation. This statement, however, was simply too broad to be empirically tested, and herein was the problem with White's concept of effectance motivation. It was too global to be systematically measured, and therefore lacked operationally defined constructs (Ulrich & Collier, 1990).

It took almost 20 years before the concept of effectance motivation was

¹ Harter (1978a) initially proposed that this new motivational construct be labelled effectance motivation as it was not only a catchy term, but alluded to several of White's (1959) original facets. Later, however, Harter (1980) stated that competence motivation was more appropriate as it more fully described the characteristics of the entire concept. For the purpose of this research, both effectance motivation and competence motivation will refer to the concept of an individual trying to effectively master their environment.

expanded and operationally defined. Specifically, Harter (1978a) argued that seven components were necessary for a multidimensional model of effectance motivation. The components can be found in Table 1 (p. 22), and are specifically discussed in the following text.

The first component, to view effectance motivation as having specific domains and to move away from a global view of effectance motivation (Harter, 1978a; Weiss & Chaumeton, 1992) was identified by Harter in 1982. Harter (1982) arrived at four specific domains for effectance motivation, demonstrating that it was not a global theory. The domains were (a) cognitive competence, which emphasized academic performance, (b) social competence, which determined how one related to his/her peers, (c) physical competence, which focused on sports and outdoor activities, and (d) general self-worth, which examined how a person felt about him or herself.

Countless studies since 1978, have examined the second component of Harter's model (examining the results of success and failure). These have demonstrated that successful mastery attempts in an activity will lead to feelings of personal competence. This results in high effectance motivation in that activity, which encourages an individual to make further mastery attempts (Cox, 1994). Failure or rejection of mastery attempts, however, may lead to negative effects (i.e. low self-esteem) and low competence motivation (Cox, 1994; Stipek, 1993).

Harter (1978a) chose her third component based on the belief that an optimal degree of challenge would produce the greatest sense of satisfaction. She was correct in this belief. Harter (1978b) found that there was a relationship between pleasure and challenge. This relationship, although originally thought to be linear, proved to be more

Table 1

<u>Harter's (1978a) Seven Components for a Multidimensional Model of Effectance</u> Motivation

- 1. To view effectance motivation as having specific domains and to move away from a global view of effectance motivation (Harter, 1978a; Weiss & Chaumeton, 1992).
- To not only view the result of successful mastery attempts, as White (1959) did, but to determine how failure affects the components of effectance motivation (Harter, 1978a, Weiss, 1984).
- 3. To examine performance outcomes in relation to the difficulty of the task (Weiss & Chaumeton, 1992).
- 4. To consider the influence of "significant others" in an individual's environment, and the effect these people have on an individual's maintenance and enhancement of the components of effectance motivation (Harter, 1978a).
- 5. To determine the effects of reinforcement over time in order to more clearly understand how children internalize a self-reward system and mastery goals (Harter, 1978a).
- 6. To examine the relative strength of an intrinsic orientation versus an extrinsic orientation in individual and group differences (Harter, 1978a).
- 7. To examine consequences of one's motivational orientation, such as an individual's perceived competence or their perception of performance control (Harter, 1978a; Weiss & Chaumeton, 1992).

similar to an inverted U shape. Harter (1978b) demonstrated that children would receive more pleasure from challenging tasks up to a point, at which time performance would begin to be viewed negatively because of frustration, annoyance, embarrassment, or similar emotions. At this point pleasure with the challenging activity would decrease. Stipek (1993) concurred with this theory, stating that children will perform tasks that are up to one step ahead of their current skill level, and beyond this, children have no intrinsic motivation to progress further.

Harter's (1978a) fourth component was to consider the influence of "significant others" in an individual's environment, and the effect that these people have on an individual's maintenance and enhancement of the components of effectance motivation. "Significant others" referred to parents, teachers, or other persons of authority in the child's life.

It was hypothesized by Harter (1978a) that children need to be reinforced not only for their successes, but also for their independent mastery attempts in order to develop an intrinsic orientation (or effectance motivation). Weiss and Chaumeton (1992) referred to two studies that supported this hypothesis. Both studies found that athletes who received praise following a successful mastery attempt, and praise and instruction that followed performance errors, had greater perceived success, higher perceived competence, more enjoyment of their sport, and a preference for optimal challenge.

In addition, research has demonstrated that significant others play many roles in the development of a child's effectance motivation. For example, significant others influence a child's standard of achievement through encouragement and praise during activities (Stipek, 1993). Therefore, praise can help a child develop competence (and

hence an intrinsic orientation), whereas criticism or negative responses may prevent the child from becoming competent (Harter, 1980).

The fifth component of Harter's model aimed to determine the effects of reinforcement on a child over time. This would allow for a clearer understanding of how children internalize a self-reward system and mastery goals (Harter, 1978a). Harter (1978a) argued that when a child received positive reinforcement for independent mastery attempts, they would internalize a self-reward system and a system of standards or mastery goals. If a child received positive reinforcement in their younger years (i.e. before grade school), they would eventually become less reliant upon it, instead developing their own standards for measuring success, and hence develop an intrinsic orientation. Conversely, a child who had a socialization history that reflected a lack of reinforcement and/or disapproval for independent mastery attempts would become more dependent on external motivation, external goals, and external reinforcement. As a result these children were more likely to develop an extrinsic orientation (Weiss, 1984; Weiss & Chaumeton, 1992).

The sixth component questioned the relative strength of an intrinsic versus extrinsic orientation. Harter (1978a) discovered, in terms of relative strength, that children who needed little external approval would place primary importance on mastery motivation. Children, who needed external approval, conversely placed more importance on praise from others. Additionally, Harter (1978a) determined that there were sex differences with regard to the relative strength of intrinsic versus extrinsic motivation. Boys demonstrated more intrinsic mastery motivation, while girls held adult approval as the more important motivational determinant.

The final component to Harter's Multidimensional model included an examination of consequences of one's motivational orientation (Harter, 1978a; Weiss & Chaumeton, 1992). It was hypothesized that an individual with an intrinsic orientation would develop a sense of internal control due to their history of social reinforcement (Harter, 1978a). As a result, Harter further hypothesized that the combination of perceived competence and internal control would enhance an individual's feeling of efficacy, which in turn, would maintain or increase a child's effectance motivation. Conversely, a reinforcement history which discouraged independent mastery attempts would lead to continual dependence and a perception that one has little control over outcomes.

There were gender differences in the perception of control. Harter (1980) found that boys who did not perceive themselves as competent in a sport viewed others as being responsible for their successes and failures. If, however, a boy believed that he was competent in a sport, he would be less likely to perceive others as being in control. Girls, on the other hand, were more likely to discredit the role of others, and instead take personal responsibility of their skill mastery in sport.

Although the multidimensional model provided a context for the development of effectance motivation, it did not specifically explain how one developed their motivational orientation. Switzky (1997b) provided a brief summary of how this occurred. He stated that children who were raised in environments that disapproved of independent mastery attempts, lacked rewards, or reinforced dependency on adults would "manifest strong needs for external approval and dependence on externally defined behavioural goals" (p. 347). This would lead to a feeling that others were in control,

which in turn would lead to low perceived competence. Because of this, feelings of anxiety would occur when the person was placed in a mastery situation. As a result of anxiety, an individual would avoid being placed in a mastery situation, and therefore the development of their effectance motivation would be blocked. This would lead to an extrinsic motivational orientation. In contrast, children who were reinforced for their independent mastery attempts would internalize two self-systems. These two systems, a self-reward system and a system of mastery goals, would diminish a child's dependency on external social reinforcement. The development of the two systems would create feelings of competence and control over their successes and failures, which in turn would lead to higher effectance motivation and hence, an intrinsic orientation (Switzky, 1997b). Perceived Competence Scale for Children

Harter (1982) believed that children had either an intrinsic or extrinsic motivational orientation. She had no way of determining, however, which type of motivational orientation a child had within the context of effectance motivation. In order to alleviate the problem, she developed the Perceived Competence Scale for Children to assess the motivational orientations of children. In keeping with her task of operationally defining effectance motivation, Harter (1981) began by constructing a self-report measure to assess intrinsic motivation in children. The central hypothesis behind this scale was that "motivational orientation and perceived competence should be related such that children with an intrinsic orientation in a given domain would have higher perceived competence in that domain" (p. 301). Conversely, Harter (1981) also hypothesized that if a child had an extrinsic orientation they would have lower feelings of competence in a given domain.

From her initial testing, Harter (1982) was able to find three domains for the Perceived Competence Scale for Children (PCSM). The three competence subscales were (a) cognitive competence, (b) social competence, and (c) physical competence (Cox, 1994). Because of the three separate domains, the PCSM was able to make distinctions about different domains in children's lives. Thus the scale was designed to measure individual domains in a child's life, and was not designed to be a global measure of perceived competence. Harter further hypothesized that children had the ability to make judgments about their own self worth. Therefore, instead of summing up the response scores of the initial three domains, Harter (1982) added a fourth subscale entitled general self-worth. This subscale consisted of questions that made inquiries as to how much a child liked himself or herself. In addition, because the scale measured levels of effectance motivation in each domain, the scale could also determine if the individual had either high or low perceived competence in up to four of the domains (For further information on the PCSM, refer to Chapter three).

Effectance Motivation and Mental Disability

Relatively little research has assessed the levels of effectance motivation in people with mental disabilities. Related to this, there also has been little research that has examined the motivational orientations of people with mental disabilities. One of the first studies to assess effectance motivation in people with mental disabilities was designed by Harter and Zigler (1974). They proposed to identify and create measures of behaviour categories that were an indication of effectance motivation, and to assess the validity and interrelationships of each measure (Harter & Zigler, 1974). The four

behaviour categories were (a) response variation, (b) curiosity for novel stimuli, (c) mastery for the sake of competence, and (d) preference for challenging tasks.

The participants in Harter and Zigler's (1974) study consisted of grades one and two students who had no disability, children with a mental disability who were institutionalized, and noninstitutionalized children with a mental disability. Harter and Zigler (1974) concluded from previous research that children with mental disabilities had a higher need for social reinforcement, were wary of adults, feared failure, and had a lower expectancy for success. As a result, the effectance motivation of children with mental disabilities was expected to differ from that of children without mental disabilities. This difference would provide an avenue for validating the four behaviour categories. There were four measures in the study: (a) a box maze was used to measure response variation; (b) cardboard houses with pictures behind the doors were used to measure curiosity for novel stimuli; (c) placing wooden pegs in holes was used to measure mastery for the sake of competence; and (d) three puzzles, each with a different difficulty level, were used to measure a preference for challenging tasks. Response variation, curiosity for novel stimuli, mastery for the sake of competence, and a preference for challenging tasks all were indications of effectance motivation, and therefore the presence of them in the children were thought to indicate the presence of effectance motivation.

The results of the box maze and the pictorial curiosity tasks indicated greater variation seeking and curiosity in the group of children without a mental disability. The puzzle preference task demonstrated that children with a mental disability preferred easier tasks, whereas the group without a mental disability preferred hard or challenging

tasks. The peg task indicated that the group of children without a mental disability had greater mastery for the sake of competence. Important to the current discussion was that the results from Harter and Zigler's (1974) research demonstrated that children with mental disabilities had less effectance motivation than did the children without a mental disability. This was a key finding as it demonstrated, for the first time, that children with differing mental abilities could be expected to have different levels of effectance motivation.

A follow-up study was undertaken three years later by Harter (1977). In this study, Harter wanted to determine if two groups of children (one with mental disabilities and one without mental disabilities) who had been matched on mental age and had comparable levels of actual competence, would experience different levels of pleasure on the same task. To test this hypothesis, Harter created a set of eight puzzles. Two of every eight puzzles represented a different difficulty level, thus creating four levels of difficulty. The results of Harter's (1977) study demonstrated that the relationship between pleasure obtained from mastery and the difficulty level of the puzzles was "affected by the intellectual level of the child, i.e., whether the child is of normal intelligence or not, and by the presence or absence of social reinforcement for success" (Harter, 1977, p. 489). In addition, Harter found that the group of children with mental disabilities was more concerned about failure, had more doubts about their ability, and was more dependent on the adult experimenter for feedback.

Harter (1977) concluded that effectance motivation (as demonstrated by curiosity, preference for challenge, and mastery for the sake of competence) was lower in the motivational hierarchy of children with mental disabilities. This was because other

motives (such as fear of failure, low expectancy of success, and a need for approval) were more prominent among these children. This finding provided further evidence that children with mental disabilities were more likely to have an extrinsic motivational orientation, not only because they had a high need for approval, but because the components that indicated an intrinsic motivational orientation (e.g., curiosity, preference for challenge, and mastery for the sake of competence) were all overridden by other more prominent motives (e.g., anxiety) (Harter, 1978a).

Other research, however, indicates that not all people with mental disabilities are exclusively extrinsically motivated. Zoerink and Wilson (1995) investigated the views of competitiveness held by athletes with a mental disability and found that these athletes held similar views about competitiveness, winning, and goal setting as athletes without mental disabilities. Specifically, they found that males with a mental disability were more competitive than their female counterparts. In fact, males with a mental disability scored higher on competitiveness than any other group. Females, although interested in competition, showed more of an interest in goal setting than they did in winning.

Zoerink and Wilson (1995) did not equate competitiveness with intrinsic orientation, although it may be indicative of this orientation. As Cox (1994) pointed out, the "motive to achieve success is believed to represent an athletes intrinsic motivation to engage" (Cox, 1994, p. 214). The more an athlete engages, the higher their perceived competence becomes (Cox, 1994; Harter, 1978a; Stipek, 1993). Because athletes with a mental disability in Zoerink and Wilson's study held competitive views suggests the possibility that athletes with a mental disability may be more intrinsically motivated than suggested by previous literature.

Further support for the notion that not all people with mental disabilities have an extrinsic motivational orientation may be seen in individuals who have participated in a physical activity. Wright and Cowden (1986) suggested that the motivation of individuals with a mental disability, who have already shown an interest in physical activity, may be different than those who have no previous experience in physical activity. Ulrich and Collier (1990) stated that an individual must feel competent in an activity before they decide to participate in the activity. This provides further evidence that an individual must have some intrinsic motivation in order to participate in an activity. This information is not meant to downplay the role of extrinsic motivation, but it is likely that athletes compete due to both extrinsic and intrinsic reasons. Thus, there is evidence to suggest that athletes are not solely motivated to participate by extrinsic means alone, but that intrinsic motivation plays a larger role that previously acknowledged.

Harter and Zigler (1974) and Harter (1977) pioneered the exploration of perceived competence in persons with a mental disability. Since then, Zoerink and Wilson (1995) have provided some evidence that not all people with a mental disability are exclusively motivated by extrinsic means. Few studies (Gibbons & Bushakra, 1989; Riggen & Ulrich, 1993), however, have specifically examined the concept of perceived competence within a Special Olympics setting. Wright and Cowden (1986) did not specifically examine perceived competence but examined self-concept among a group of Special Olympic athletes. Self-concept is similar to perceived competence in that self-concept refers to "all the opinions, feelings, and beliefs that a person holds about self" (Sherrill, 1993, p. 3)

In their study, Wright and Cowden (1986) tried to determine if there was a change in the self-concept of youths who had a mental disability and were participants in a Special Olympics swim training program. To measure self-concept the authors used the Piers Harris Children's Self-Concept Scale (Piers & Harris, 1964). Participants swam in one-hour sessions, twice a week, for ten weeks. The results showed that from pre- to post-test the swim group demonstrated significant increases in self-concept, whereas the control group had no change. This suggested, according to Wright and Cowden, that a Special Olympics swim training program could foster an increase in an individual's self-concept.

Olympians was undertaken by Gibbons and Bushakra (1989). The purpose of their study was to determine the effects of a track and field meet on the perceived competence and social acceptance of children with a mental disability. Twenty-four children were placed into either a participant or non-participant group. The non-participant group consisted of children who had previously participated in Special Olympics, but had specifically chosen not to participate in this particular track meet. A modified pictorial version of Harter's (1982) Perceived Competence Scale for Children was administered separately to both groups one day before and one day after the meet in order to measure perceived competence. The results showed that the participation group had significantly improved their physical competence and peer acceptance compared to the participation group. The authors concluded that perceived competence could be associated with successful mastery attempts in an optimally challenging activity. Once again, important to the current discussion, is the fact that this research demonstrated that perceptions of

competence can, and do, vary among different individuals with a mental disability — which is contrary to research that suggests uniformly low ratings for this population. Specifically, individuals who competed in the track meet had higher post-test scores on perceived competence compared to the group that did not compete. This demonstrated that participation during a meet could increase an individual's perceived competence. High perceived competence is an indication of an intrinsic motivational orientation. Therefore, it follows that athletes who train/participate more frequently should be expected to develop an intrinsic motivational orientation versus those who do not participate on a regular basis.

The most recent study published that examined the perceived competence of Special Olympic athletes was conducted by Riggen and Ulrich (1993). This study consisted of 75 adult men with a mental disability. These men were divided equally into three groups: (a) a Unified Special Olympics basketball team, (b) a traditional Special Olympics basketball team, and (c) a control group. One purpose of the study was to "compare the effects of segregated and integrated programs on athletes' self-perceptions of competence in the physical and social domains as well as general feelings of self-worth" (p. 44). To measure these domain specific outcomes, the authors used the Perceived Competence Scale for Children (Harter, 1982).

It is important to note that in Riggen and Ulrich's (1993) study, the frequency and duration of training was similar between the two programs, as were the practice drills, the skill training, and the practice games. Therefore, the only difference between the two teams was that the Unified team included athletes who did not have a mental disability. It was hypothesized that the Unified team would show greater improvements in self-

perceptions, as measured by an increase in perceived competence. Both the Unified team and the traditional team did show improvements in their social, physical, and general self-worth, but none of these differences from pre to post test were statistically significant. Although the results were non-significant, Riggen and Ulrich's findings are still valuable to the current study. The findings demonstrated that Special Olympic athletes, who have regularly participated in an activity, have greater levels of perceived competence.

The previous section has demonstrated that Special Olympic athletes may have different levels of perceived competence. These studies further suggest that one may expect athletes, who have participated more frequently in their training, to have higher levels of effectance motivation, and hence, intrinsic orientations.

Measurement Issues

As illustrated earlier in the chapter, much research has suggested that people with mental disabilities are extrinsically motivated (Harter, 1977; Switzky, 1997a). Other authors in the physical fitness field have supported this, and have suggested that during fitness testing, athletes need to be provided with some type of extrinsic motivation in order put forth a maximal effort (Fernhall, 1997; Shepard, 1990). Therefore, it is important to make sure that the test used for the present research is both reliable and valid for people with mental disabilities. Currently there are only five field tests that meet this requirement. These include the 1.5-mile Run/Walk Test (Fernhall & Tymeson, 1988), bicycle ergometer testing using the Schwinn Air-Dyne (Pitetti & Tan, 1990), the Rockport Fitness Walking Test (Rintala, Dunn, McCubbin, & Quinn, 1992), the Modified Legar and Lambert Shuttle Run (Montgomery, Reid, & Koziris, 1992), and the

Modified Canadian Step Test (Montgomery, et al., 1992). Of these tests, only the 1.5-mile Run/Walk test requires an individual to run for a sustained duration of time, and because of this, the test is specific to the athlete's training. Other studies that have tested cardiovascular endurance in Special Olympic athletes have not always used sport specific tests, which may have been a reason for their non-significant results (Emes & Page, 1992; Riggen & Ulrich, 1993). Therefore, because the 1.5-mile run is sport specific to the activity of the athletes, it was determined as being the most suitable test for the proposed study.

Canadian Special Olympics

Special Olympics has been providing competition and training opportunities to persons with mental disabilities for the past 30 years. The idea for Special Olympics often has been reported as originating in the United States (Block & Moon, 1992; Hourcade, 1989). In fact, Canadians played an important role in the birth of Special Olympics.

In the early 1960's Dr. Frank Hayden, a researcher from Toronto, tested the assumption that children with disabilities were unfit because of their mental disabilities (CSO, 1996). In doing so, Dr. Hayden discovered that low fitness levels were the result of sedentary lifestyles and insufficient opportunities for physical activity (Lewis, 1994). This was a key finding because it provided evidence that the cardiovascular endurance of people with mental disabilities could be improved, and it challenged the assumption that disability was the cause of poor fitness levels. This finding radically changed ideas about the physical competencies of people with mental disabilities.

Based on his research, Dr. Hayden sought to create a national sports program for persons with mental disabilities (Bullock & Mahon, 1997). Unfortunately his ideas were not readily accepted in Canada. It was at this time that Eunice Kennedy Shriver and the Kennedy Foundation became involved. Out of their involvement, Special Olympics in the United States was born (CSO, 1996). The first games were held in Chicago in 1968. Canada attended these games, making them an international event (Lewis, 1994).

Within one year after the incorporation of Special Olympics International, the second games were held in Canada (CSO, 1996). These games (of 1969) were actually a floor hockey tournament that was hosted in conjunction with the National Hockey League (NHL). The games occurred, due in part, to the efforts of a prominent Canadian, Harry "Red" Foster (Lewis, 1994).

Harry Foster dreamed of Special Olympics one day becoming a national program (Lewis, 1994). His dream became a reality. In 1974 Canadian Special Olympics was "incorporated as a national, charitable, volunteer organization" (CSO, 1996, p. 12). Even though CSO was not incorporated until 1974, Canada has been involved with Special Olympics since its inception. Currently, CSO represents ten provincial chapters and two territorial affiliates.

Manitoba Special Olympics Medallion Program

Manitoba Special Olympics (MSO) is one chapter of Canadian Special Olympics. MSO offers a full range of physical activity programs for individuals, from age two and up, who have a mental disability. These programs typically require athletes to train once per week. After many years of providing once a week programs, MSO realized that an alternative program, of better quality and quantity, was needed in order to improve

athletes' training and performance (Dahlgren, et al., 1991). After recognizing this need, MSO developed the Medallion Program, which is "a high performance provincial team training program for athletes with mental disabilities" (Dahlgren, et al., 1991, p. 67). Creating a high performance team which would represent MSO at National Summer and Winter Games involved increasing the intensity, duration, and frequency of training from once per week, to a minimum of three times per week (Manitoba Special Olympics, 1989).

Not only were athletes to increase their frequency of training, but also they were to begin training sport specifically. By encouraging sport specific training, MSO believed that this would enable athletes to achieve a higher level of sport performance (Gislason, 1992). The Medallion summer sport program currently offers sport specific training opportunities in track and field, swimming, soccer, rhythmic gymnastics, five and ten pin bowling, and power lifting (S. Mundey, personal communication, September 8, 1997). It should be noted, that winter Medallion programs are also offered in years leading up to National Winter Games.

The Medallion teams are created each year preceding the National Games (both winter and summer). In order to be a member of the Medallion program, an athlete must have met the following criteria: (a) the athlete must be at least 16 years old, (b) have qualified via their performance at the Provincial games preceding the National Games, (c) have appropriate social and behavioural skills, (d) be able to travel out of province, and (e) be registered as a "member of an MSO club and training for one year" (Dahlgren, et al., 1991, p. 68). Sixty-two athletes met the preceding requirements for the 1997/98

Medallion team which competed at the National Summer Games in Sudbury, Ontario in July of 1998.

Implications for Future Inquiry

This chapter has demonstrated that most research outside the context of physical fitness has classified people with mental disabilities as having an extrinsic motivational orientation. Recent research within a physical fitness domain has begun to suggest that not all people with mental disabilities have an extrinsic orientation, but in fact some individuals with a mental disability have demonstrated qualities that can be found in an individual with an intrinsic orientation. This is one area of research that needs further study. The question that remains is whether people with mental disabilities who continually participate in an activity have greater levels of perceived competence? Further, if this is true, what role does the presence of motivation play in these individuals' performances?

It is anticipated that the results of this thesis will help to fill this "gap" in the literature. By examining two groups of Special Olympic athletes who have different rates of training, one has an opportunity to determine if the motivational orientation of these two groups differs, how motivation affects each of these groups, and how each of these groups perceives the presence of motivation.

CHAPTER THREE

Methods

Research Design

This study utilized a cross sectional design to address four objectives. These four objectives were to: (a) provide an in-depth description of the two training programs, (b) determine whether or not extrinsic motivation significantly affected performance on the 1.5-mile runs, (c) examine if motivational orientation (either extrinsic orientation or intrinsic orientation) affected performance on the 1.5-mile runs, and (d) assess the athletes' perceptions of motivation and compare these to their performance on the 1.5-mile run under both conditions (with and without extrinsic motivation).

The independent variable in this research was two different protocols for administering the 1.5-mile run. The first protocol included extrinsic motivation throughout the 1.5-mile run, and the second was the 1.5-mile run without extrinsic motivation. The dependent variable was the performance velocity on the 1.5-mile runs. Additionally, two categorical variables were used: group (either Medallion or Track) and motivational orientation (either Intrinsic or Extrinsic).

Selection Criteria and Research Participants

In order to become a participant in the study, athletes were required to meet the following criteria:

- Registered members of an MSO sport specific track program (i.e. Medallion, Navvies, or Bulldogs club).
- 2. Regular attendance at their program. This was defined as athletes who attended at least 60% of the practices.

3. Willing to participate in the research. This was determined via a consent process that involved explaining the purpose of the research to the athletes and having them complete a written consent form (See Appendix A).

For athletes who could not provide their own consent, parents or caregivers with legal guardianship were asked to provide consent for them. Athletes who met the three selection criteria were then asked to participate in this study.

Assignment of Research Participants

The athletes were a non-randomly selected group, all of whom were participants in one of three MSO track and field clubs (Medallion, Navvies, or Bulldogs). Participants in the research were divided into two groups, the Medallion group (n=8) and the Track group, which was comprised of athletes from the Navvie and Bulldog clubs (n=5). In addition, athletes in each of these groups only participated in track, and were not involved in any other MSO program.

Program Description

Each MSO track program (Medallion, Navvies, and Bulldogs) trained as an individual club, with the Navvies training on Monday and/or Thursday evenings, and the Bulldogs training on Wednesday evenings and/or Saturday mornings (although these programs trained separately, they were treated as one research group, entitled "Track group"). The Medallion team was required to train a minimum of three times per week, with the option of a fourth practice each week. The Medallion athletes' mandatory training times were on Monday and Thursday evenings and they were expected to train either Wednesday evening and/or Saturday morning.

It should be noted that the Medallion program athletes were selected by MSO. Selection to this team was based on the athletes' performances at the 1997 Manitoba Provincial Summer Games. The Medallion team members were MSO's track and field representatives to the 1998 Canadian Special Olympics (CSO) National Summer Games. Many of these athletes were former Navvie participants. The Navvies, the oldest track and field club in MSO, has a history of producing some of MSO's top athletes in this discipline. Similarly, the Bulldogs have also produced athletes who have qualified for the Medallion team.

In addition, each team (Medallion, Navvies, and Bulldogs) had a provincial team coach as part of their coaching staff. The provincial team coach implemented the Medallion training program to all the teams. Therefore, in terms of program content, all three teams (Medallion, Navvies, and Bulldogs) were intended to have a similar training program. The training program focused on developing technical skills and cardiovascular endurance.

All of the practices occurred at the Max Bell Centre, which is located at the University of Manitoba. All three programs began training in October, and with the exception of the Medallion program, finished in the middle of June. The Medallion team continued their training until the CSO National Summer Games in July, 1998.

Instrumentation

1.5-Mile Run/Walk Test. The 1.5-Mile Run/Walk test was used to measure differences in performance using two testing protocols, one with extrinsic motivation and one without extrinsic motivation. The main reason for choosing the 1.5-mile run, over other field tests, was because it is one of five field tests that has been validated as a

measure of cardiovascular endurance for people with a mental disability (McCubbin, Rintala, & Frey, 1997).

Fernhall and Tymeson (1988) validated the 1.5-mile run using participants from local group homes and vocational training centres. Then, they compared the times to complete two 1.5-mile runs to a direct measure of VO_{2 max} (using a walking protocol on a treadmill). Each run was performed on a 220-yard indoor track. The original protocol also used pacers who ran with the athletes throughout the 1.5-mile test. This was done to alleviate the possibility of low motivation. Although the authors of this study did not provide a reliability co-efficient for the 1.5-mile run, they did provide the concurrent validity. Concurrent validity is a type of criterion validity "in which a measuring instrument is correlated with some criterion that is administered at about the same time" (Thomas & Nelson, 1996, p. 215). In this case the measuring instrument was the 1.5mile run using people with mental disabilities, and the criterion was the direct measure of VO_{2 max}. Thomas and Nelson (1996) indicated that many physical performance measures are validated by this method. The concurrent validity of the 1.5-mile runs and the treadmill test was -0.88, indicating that the 1.5-mile run was a suitable field test to use when measuring cardiovascular endurance of people with mental disabilities (Fernhall & Tymeson, 1988).

The Perceived Competence Scale for Children (PCSC). The PCSC, also called the 'What I am Like' Scale (Harter, 1982), was tested on a population of over 2,000 third to seventh grade students in the United States. Its purpose was to determine motivational orientation (intrinsic or extrinsic) (Harter, 1982). The scale consists of 28 questions, which are divided into four competence subscales: (a) cognitive competence, (b) social

competence, (c) physical competence, and (d) general self-worth. The answers to the questions alternate with half of the questions beginning with an answer that reflects high perceived competence, and half beginning with an answer that reflects low competence (Harter, 1982). This was intended to eliminate the tendency of individuals to either always answer in the affirmative, or to answer according to how they believed they were expected to answer. Table 2 contains an example of a question from the PCSC.

An Example Question from the 'What I am Like' Scale

Table 2

REALLY TRUE	SORT OF TRUE	SORT OF TRUE	REALLY TRUE
for me	for me	for me	for me
	Some kids wish they BUT could be better at sports	Other kids feel they are good enough	

In the example found in Table 2, the question is scored 1, 2, 3, 4 with one indicating low perceived competence (e.g., Really true for me that some kids wish they could be better at sports) and four indicating high perceived competence (Really true for me that other kids feel they are good enough). On the complete scale, no two consecutive questions are from the same subscale, and no more than two consecutive items are keyed in the same direction (Harter, 1982). Scores for each subscale are summed and then divided by seven (the number of questions in each subscale) to get the subscale mean. Data for the scale is ordinal, allowing for the use of parametric statistics (Harter, 1982).

The PCSC (Harter, 1982) demonstrated moderate to high subscale reliability (cognitive - r=0.76, social - r=0.78, physical - r=0.83, and general self-worth - r=0.73). At the time of writing, there were no reliability values available for the 'What I am Like' scale when used with people with mental disabilities. The scale has been used, however, in studies that include persons with a mental disability as their subjects. Silon (1980) found a two-factor structure for 126 children with a mental disability between the ages of 9 and 12. One factor was labelled "competence" and drew items from the cognitive and physical domain. From this, Silon (1980) concluded that children with mental disabilities did not distinguish between the two domains. The other factor was labelled "popularity" and included items from the social subscale. There was no evidence to suggest that children with mental disabilities rated their general self-worth as determined by the items on the PCSM. This does not mean that children with mental disabilities are incapable of perceiving their general self-worth, but suggests that this subscale of the PCSM was not conducive for generating insights about general self-worth among children with mental disabilities (Harter, 1982).

In the present study, the participants completed only the physical competence subscale questionnaire of the PCSM. This subscale was selected as it provided a measure of competence in sports and games. The physical subscale was intended to determine the athletes' perceptions of competence in track. A subscale score of 28 indicated the highest possible level of perceived competence, whereas a subscale score of 7 indicated the lowest level of perceived competence. No distinct cut off values were provided by Harter (1982) for classifying a person as either having high perceived competence or low perceived competence. Therefore, a subscale score of 21 or higher

was arbitrarily chosen as an indication of high perceived competence, as a score of 21 or higher fell within the top one third of all possible scores. This was chosen so athletes could be grouped, for the purpose of statistical analysis, as having either high competence (intrinsic orientation) or low competence (extrinsic orientation).

Manipulation Check of Perceived Motivation. A paucity of research has examined the extent to which Special Olympic athletes perceive themselves to be motivated. Because of this, a Manipulation Check of Perceived Motivation (MCPM) was created specifically for this research. This scale was intended to act as a manipulation check, and therefore, the results from the MCPM served as a secondary measure for confirming the accuracy of the PCSC findings and for assessing how the manipulation of the independent variable affected the athletes' perceptions of motivation on the 1.5-mile run. In this way, the manipulation check assisted in enhancing the internal validity of the study.

The MCPM originally consisted of three questions. Pilot testing was conducted on the scale in order to determine if athletes were generally answering in the affirmative (Table 3). The questionnaire was administered to 17 MSO track athletes, and consisted of three questions. Athletes answered one question before a 12 minute run and two questions after it. The athletes performed two runs, one with extrinsic motivation and one without. Questions were scored on a scale of 1-3, with one indicating low intrinsic motivation and three indicating high intrinsic motivation. From the pilot test data, it appeared that the athletes were answering in the affirmative most of the time, and as such, the questionnaire was modified (Appendix B).

Table 3

Results of MCPM Pilot Testing

Scores and Standard Deviations Average score on MCPM Average score on MCPM with Extrinsic Motivation without Extrinsic Motivation Medallion Team Mean = 2.7, SD = .60 Mean = 2.7, SD = .55Track Team Mean = 2.7, SD = .55 Mean = 2.8, SD = .34

Table 4

Revised Manipulation Check of Perceived Motivation

Question	Response Choices	Scoring
1) Do you feel like running today?	No, Maybe, Yes	1,2,3
2) How much do you feel like running today?	A lot, A little bit, Not at all	3,2,1
3) Did you try to run hard today?	No, Maybe, Yes	1,2,3
4) How hard did you try to run today?	A lot, A little bit, Not at all	3,2,1
5) If your coach cheered you on, do you think you would run faster?	No, Maybe, Yes	3,2,1
6) When your coach cheered you on, do you think it made you run faster?	No, Maybe, Yes	3,2,1

As can be seen in Table 4, the modified MCPM consisted of six questions.

Questions one and two were asked before each run, questions three and four were asked after each run, question five was asked after the run without extrinsic motivation, and question six was asked after the run with extrinsic motivation. The first two questions were intended to measure the athletes' perceived desire to run. Questions three and four measured how the athletes perceived their effort during the run. Question five was designed to measure the anticipated effect of extrinsic motivation before the run, whereas question six was designed to measure the perceived effect of extrinsic motivation after the run. All of the questions were scored on a scale of 1-3, with one representing low intrinsic motivation and three representing high intrinsic motivation. Athletes had the questions and all the answers read to them. Athletes were then asked which response suited them the best.

Equipment

To measure heart rate, Polor Vantage XL heart rate monitors were used. These data provided an indication of the athletes training intensity, which was a way of monitoring potential differences between the two programs. In order to obtain an accurate measurement of the athletes' training intensity, the heart rate monitors recorded the athletes' heart rate every 15 seconds (a more detailed description is found in the Data Collection Procedures).

Data Collection Procedures

The study took place over a four and a half week period, and consisted of 16 practices. During each practice the researcher recorded the distance run by each athlete. Distances were recorded separately for the warm-up, work-out, and warm-down phases

of the training session (the recording procedure is explained on page 48). The PCSC was completed about half way through the study. The 1.5-mile run and the MCPM was administered during the last week of the study.

Objective 1. The first objective of the study was to provide an in-depth description of the training programs that the Medallion and Track groups engaged in, and to note the differences between these programs. Several variables (e.g., frequency, intensity, and duration) were followed throughout the study in order to provide a context for understanding the data that were being collected.

As suggested by Thomas and Nelson (1996), a description of the athletes' frequency, duration, and intensity of training was obtained by observing the athletes in their training environment. The attendance of each athlete was recorded to determine frequency of training. The duration of each practice was expected to remain a constant 90 minutes, however, each practice was timed in order to determine the actual duration of training. A description of the training program, the periodization plan during the study time, and the goals of the program were also determined.

In addition to monitoring the athletes' frequency and duration of training, the intensity of each practice was also recorded. Intensity was determined by monitoring two variables, distance run and heart rate. The distance run at each practice by individual athletes' was recorded on a checklist. The checklist was divided into three sections, the warm-up, the work-out, and the warm-down. Symbols were used to systematically record the distance run by each athlete. For example, I represented one lap or 200m, 1/2 represented 100m, and 1/4 represented 50m. Although the researcher was the primary observer, in order to ensure accuracy in recording the volume run per practice, a second

observer was also used. Kazdin (1982) stated that there are no rules for how often agreement should be checked, but this study utilized a second observer for eight out of the sixteen practices (50%). Kazdin (1982) also suggested that each phase of a study contain a check on interobserver agreement. This study only had one observational phase, but the phase consisted of three sections. Therefore, the interobserver agreement was determined for the warm-up, the work-out, and the warm-down portions of the practice.

According to Thomas and Nelson (1996) a common way of determining interobserver agreement (IOA) is as follows:

IOA = agreements / (agreements + disagreements)

In order to express this as a percent, the result was multiplied by 100. The results of the IOA are noted in Chapter Four.

The second measure used to monitor intensity of training was heart rate, which was also recorded at each practice. Not all of the athletes had their heart rates recorded, as there were not enough heart rate monitors available. Instead, a sample of athletes from each group was used to determine the intensity of training. Initially, three randomly selected athletes from each group (Medallion and Track) were to wear a heart rate monitor during each practice. Unfortunately, one athlete in the Track group was dropped from the research because he did not meet the attendance requirements. The minimum, maximum, and average heart rates of the remaining athletes were recorded. The heart rate monitor used a 15 second interval to determine the athletes' average heart rate during each practice. A measure of heart rate helped to demonstrate if the athletes were working within their target heart rates. As suggested by Rimmer (1992), target heart

rates for people with mental disabilities can be determined by calculating 70% of their maximum heart rate. Therefore, in the research the formula 220 – (age/2) was used for males in order to predict maximum heart rates (Pietti, Fernandez, Pizarro, Stubbs, and Stafford, 1988). The rationale for this decision is based on research by Rimmer (1992), who found that individuals with a mental disability have heart rates that are 8-17% lower than those without a mental disability. If we ignore this fact, then a 20 year old with a mental disability would have a predicted target heart rate of 140 [based on the assumption that maximum heart rate is 220-age(20)=200 bpm x 70%=140 bpm]. In reality, the target heart rates for people with a mental disability are lower. In this research, an incorrect target heart rate would provide misleading information about the intensity of training. Some medications, however, are also known to reduce maximal heart rates (Batshaw, 1997). In order to explore this possibility, MSO agreed to provide medical forms for each athlete. These forms were examined in order to determine if any of the athletes' medications affected their heart rates.

Objective 2. The rationale for the second objective was based on the statement from previous researchers that athletes with mental disabilities lack the motivation required for a maximal performance (Cressler, et al., 1988; Fernhall, 1997; Rintala, et al., 1995). One purpose of this study was to determine if, in fact, this statement was accurate. The second objective of the study, then, was to determine the impact of motivation on performance during the 1.5-mile run.

The 1.5-mile run was completed using two protocols, one with extrinsic motivation, and one without extrinsic motivation. The protocol without extrinsic motivation required the athletes to perform the 1.5-mile run on their own. Neither the

coaches, researcher, nor other athletes communicated with the performing athletes. In order to accomplish this task, athletes who were not performing the 1.5-mile run were taken to another area of the field house for the duration of the test.

The second protocol used extrinsic motivation. For this protocol, one volunteer was placed at each of the four corners on the 200 m track. These volunteers provided verbal motivation via a scripted protocol. Volunteers were told to make specific reference to the athletes (i.e. using their name), and to provide positive encouragement, such as "keep going" and "run harder". In addition, volunteers gave athletes short-term goals, like "Go catch (athletes name), they're just ahead of you", or "Don't let (athletes name) catch up to you, try running faster".

Athletes performed both runs (with and without extrinsic motivation) as a training group. That is, athletes from the Track group did not run with athletes from the Medallion group, and vice versa. In addition, the original 1.5-mile run protocol allowed athletes to either walk or jog (Fernhall & Tymeson, 1988), however, the athletes were encouraged to run as this was consistent with their training program.

In order to control for testing affects, the intervention (with extrinsic motivation or without extrinsic motivation) was counterbalanced. Athletes were randomly assigned to perform either of the two conditions first. In addition, athletes started their runs at 10-second intervals in order to avoid "rabbiting" or "pacing" techniques. Finally, because the track was measured in meters, the distance of the test was converted to meters (1.5-miles is equivalent to 2500 meters, or 12.5 laps of the track). Time to complete the run was measured to the nearest second using hand held stop watches (Fernhall & Tymeson, 1988).

For both conditions, the athletes were warmed up by their coaches and then given the following instructions for the 1.5-mile run.

"This part of the practice requires that you run for 12.5 laps. Remember that in your practice you often run for 15 laps, so this is a little shorter. The difference between this run and the other is that you want to run as best as you can. The 12.5 laps will be over when I tell you. Please just try your best. Any questions?"

After the athletes received these instructions they proceeded to run the 1.5-mile test. One volunteer was assigned to every four athletes to record the distance run and the time to complete the run.

Objective 3. This portion of the study used the PCSC (Harter, 1982) to measure the athletes' motivational orientation. The athletes were interviewed on an individual basis. They were first asked two practice or example questions, and then the seven questions which made up the physical competence subscale. Harter (1982) provided very clear instructions on how to score the subscales. The subscale scores provided an indication as to which athletes had high perceived competence (an intrinsic orientation) and which athletes had low perceived competence (an extrinsic orientation).

Athletes were asked to answer the questions honestly and to the best of their ability. Ulrich and Collier (1990) suggested that for self-evaluations, like the Perceived Competence Scale for Children, which uses a reference group, that the reference group should be familiar and well established to the research participant. They further suggested that the self-evaluations made by people with mental disabilities would be more positive if the reference group was similar to the research participants (Ulrich &

Collier, 1990). Therefore, the athletes were told to compare themselves to other members of their track team.

As noted earlier, a total score of 21 or higher was chosen as the cut off score to distinguish between a person with high perceived motivation and a person with low perceived motivation (for further information refer back to Instrumentation). Within group means of the athletes with an intrinsic orientation and of the athletes with an extrinsic orientation were compared to their performance times on the 1.5-mile runs in order to determine if there was a significant difference. This process was used to determine if motivational orientation affected performance on the 1.5-mile run.

Objective 4. The fourth objective of this study was to examine the relationship between actual performance and perceived motivation of the athletes on two conditions of the 1.5-mile run. To do this, the MCPM was created, which served as a way of checking whether the presence or absence of verbal encouragement affected the athletes' perceived motivation (e.g., did extrinsic motivation result in athletes' perception of greater effort).

The MCPM consisted of questions that were to be asked before and after the 1.5-mile run (See Appendix B). Athletes were taken aside on an individual basis and given the following instructions.

"I want to ask you some questions. There are no wrong answers to these questions, just your honest answer. Do you understand the difference?" If the answer was yes, then, "Okay, tell me the difference". If the answer was no, then further explanations were given.

These instructions were given to the athletes each time. Each set of questions took no longer than five minutes to ask, and thus did not disrupt practice to any great extent.

Data Analyses

It has been suggested that non-random sampling procedures may threaten the normality and homogeneity of variance assumptions for parametric tests (Howell, 1992). Evidence, however, suggests that the importance of these assumptions may be overrated (Kerlinger, 1973). Kerlinger contends that, "unless there is good evidence to believe that they are [sic] seriously non-normal and that variances are heterogeneous, it is usually unwise to use a non-parametric statistical test in place of a parametric one" (p. 287). This statement rests on the notion that parametric tests are almost always more powerful than non-parametric tests. If, however, the data does not have a normal distribution and a normal homogeneity of variance, then non-parametric tests should be considered in place of parametric tests. In order to determine if the data was normally distributed, the homogeneity of variance test was used in the present study. The quantitative data was then analyzed using descriptive and parametric statistics found in SPSS for Windows.

The first objective of the study required a program description and an explanation of the differences in training between the groups. The program description was based on the coaching plan for each program, and observations made during the practice time. As part of the program description, the fitness levels of the two groups were compared. This was done as a means of more accurately explaining the differences between the two groups. To accomplish this task, an independent t-test was used to determine if the two sample means differed from one another (Thomas & Nelson, 1996). The t-test examined the performance velocity means of the Medallion groups' run with extrinsic motivation versus the performance velocity of the track groups' run under the same condition. This analysis was repeated for the group runs without extrinsic motivation.

An independent t-test also was performed on the scores from Harter's (1982)

PCSC between the Medallion group and the Track group. This was done to determine if, in fact, there were significant differences between the two groups on motivational orientation.

Four variables also were graphed in order to observe trends between the two groups. These four variables were: (a) frequency of training, (b) volume run (in meters) each practice, (c) intensity (measured by heart rate) per practice, and (d) duration (measured in minutes) of each practice. The purpose of the program description was to provide a context for understanding how each group was affected by the manipulation of the independent variable.

Hypothesis #1. The first hypothesis stated that, although both groups (Medallion and Track) would decrease their time on the 1.5-mile run when extrinsic motivation was present, only the Track group would show a significant decrease in time. This hypothesis was analyzed using a 2 (Group: Medallion versus Track) x 2 (Type of run: with extrinsic motivation versus without extrinsic motivation) analysis of variance (ANOVA), with repeated measures on the 'type of run' factor, in order to determine if there was support for the first hypothesis. An ANOVA is a "statistical procedure that tests for differences between two or more means" (Ness Evans, 1992, p. 222). This analysis resulted in one interaction and two main effects (Thomas & Nelson, 1996). If the interaction was significant, it meant that the effects of one factor was dependent upon, or changed across, the levels of the other factor (Keppel & Saufley, 1980; Thomas & Nelson, 1996). At this point the interaction would be graphed and explained (Ness Evans, 1992). If the interaction was not significant, meaning that the factors did not affect the research

participants differently, then the main effects would be examined (Ness Evans, 1992). Main effects are tests of each factor when the other factor is controlled (Thomas & Nelson, 1996). An analysis of the main effects occurs by comparing either the column means or row means to each other. This would demonstrate whether the type of run or group had a significant effect on the athletes' performance times.

Hypothesis #2. The second hypothesis stated that motivational orientation would affect performance. To test this hypothesis athletes were grouped, as determined by the PCSC, as having either an intrinsic orientation or an extrinsic orientation (Harter, 1982). A 2 (Motivational orientation: Intrinsic versus Extrinsic) x 2 (Type of run: with extrinsic motivation versus without extrinsic motivation) ANOVA, with repeated measures on the factor 'type of run', was used to test the significance of the hypothesis. The process in determining if there was an interaction, or if the main effects needed to be examined, was the same as in the first hypothesis. It was expected that the intrinsic orientation group would show no difference in performance across the two runs, while the extrinsic orientation group would perform better when the test protocol included verbal encouragement (extrinsic motivation). A result, as just described, would suggest that motivational orientation influences performance.

Hypothesis #3. The last hypothesis was that the Track group would perceive the presence of extrinsic motivation as having a significant influence on performance, while the Medallion athletes would not. Descriptive statistical analysis of the MCPM data was used to asses this hypothesis. Independent t-tests were used to test for differences between athletes' responses to the MCPM questions. These findings were used as a way of confirming the PCSC data and assessing the affects of the two test protocols for the

1.5-mile run. It was anticipated that testing of the three hypotheses would provide a clear indication of the affects of motivation and motivational orientation on performance.

CHAPTER FOUR

Results

The purpose of this investigation was to examine how two protocols, one with extrinsic motivation and one without, for administering the 1.5-mile run would affect performances of two groups of Special Olympic athletes. A subproblem was to assess the athletes' motivational orientation and their perceived motivation. These outcomes were then compared to their performances on both protocols of the 1.5-mile run. Specifically, the research was conducted in an effort to determine how the presence of motivation affected the performance of Special Olympic athletes. This was accomplished by: (a) providing a detailed description of each track program, (b) examining the impact of motivation on performance between two groups of Special Olympic track athletes, (c) assessing the athletes' motivation orientation and comparing this to their performance outcomes, and (d) exploring the athletes' perceptions of motivation while completing the 1.5-mile run. The following chapter includes the program description and the findings from the analyses that were conducted on each of the measures in this study. Each of the analyses were required to attain a minimum alpha level of .05 to be considered statistically significant.

Participant Descriptions

There were no specific hypotheses attached to the first objective of the study as its primary purpose was to: (a) provide a narrative description about the athletes and their training programs, and (b) determine if differences existed between the two training programs. Initially, there were 17 candidates for the study, however of these 17, only 15

returned their signed consent forms. Eight of the athletes were in the Medallion group, and seven were in the Track group. Two male participants in the Track group had to be dropped from the study as one participant did not meet the attendance requirements, and the other participant quit the track program altogether. As a result, a time for the 1.5-mile run with extrinsic motivation could not be attained. The departure of these two athletes resulted in a total of 13 participants in the four and a half week study. Eight participants were in the Medallion group and five participants were in the Track group. Of the 13, only three were females, all of whom were in the Medallion group. The mean age of the Medallion group was 24.1 years (S.D.= 6.4), whereas the mean age of the Track group was 22.1 years (S.D.= 8.5).

Program Description

Having an understanding of the training plan, and understanding what occurred during the course of the season, allows for a more meaningful comparison of the two programs.

Frequency. Table 5 reveals, as expected, that the Medallion group attended more practices per week than the Track group. The Track group was only expected to attend a minimum of four practices and a maximum of eight practices (during the study period) as they only trained up to twice a week. More specifically, they attended an average of 7 practices over the four and a half week study, or 1.6 practices per week. The Medallion group was expected to attend a minimum of twelve practices and a maximum of sixteen practices (during the study period), as they were required to train at least three times a week. The Medallion group attended 10.5 practices on average, or 2.3 training sessions per week.

Table 5

Average Training Values Over 4 ½ Week Study

Group	Frequency of Training per week	Volume Run per Practice (m)	Duration of Training per practice (mins)	Starting Heart Rate (bpm)	Maximum Heart Rate (bpm)	Average Heart Rate per Practice (bpm)
Medallion			-			
Mean	2.3	3391	99.5	78	197	134
S.D.	0.5	721	1.6	5	6.6	10.7
Track						
Mean	1.6	3525	94.4	100	190	144
S.D.	0.4	956	6.1	10	17	13.4

<u>Duration.</u> In terms of the duration of each practice, the Medallion athletes trained approximately five minutes more per session than the Track group. The small standard deviation (1.6 mins) for the Medallion groups' duration of training may be a reflection of the coaches training plan. It demonstrated that the Medallion coaches more consistently planned practices, and more closely followed their practice plan. In addition to recording the frequency and duration of each practice, the volume run during each practice also was recorded.

Volume Run. The volume run by the Track group was an average of 134 meters more per practice than the Medallion group. This may seem like an unexpected finding, but upon closer examination, it was determined that this resulted from three of the five athletes in the Track group training as distance runners. In addition to this fact, it should

be noted that the Medallion athletes also spent a portion of their practices working on field events and skill development. Thus, the Medallion athletes did more than running during their practices.

The volume of running was recorded primarily by the investigator, but also was recorded by an individual who was familiar with the training programs. Both the investigator and the second observer used a checklist to record how many laps each athlete ran. The checklist was broken down into warm-up, work-out, and warm-down sections. Each time an athlete completed one 200-metre lap, the observer would record one check in the appropriate box. A 1/2 symbol was used for a distance of 100 meters, and a 1/4 symbol was used for a distance of 50 meters. An interobserver agreement value was determined for each portion of the practice (the warm-up, work-out, and warm-down). Eight of the sixteen practices were used to determine the interobserver agreement value, with the results being 75% for the warm-up, 87.5% for the work-out, and 75% for the warm-down.

Heart Rates. Differences in heart rates also could be indicative of differing fitness levels between the two groups of athletes. A between group comparison of heart rates on the run with extrinsic motivation showed that there were no significant differences between the groups [t (11)=. 20]. Similarly, there was no significant between group differences for heart rates during the run without extrinsic motivation [t (11)=. 78]. The fact that one of the groups did not perform significantly better than the other suggests that: (a) in terms of fitness levels, the two groups were similar, or (b) the track athletes were mainly distance runners and therefore were better trained to run longer durations.

Motivational Orientation. The athletes also were tested to see if they were different from one another in terms of their motivational orientation. For this purpose, a t-test was used. The mean score for the Medallion and Track groups on the physical competence scale from the PCSC was 20 (S.D.= 2.98, 2.51 respectively). The results of the t-test suggested that there was no significant difference in terms of motivational orientation between the two groups [t (11)= -.25].

The Effect of Motivation

The second objective of the study was expressed in terms of a hypothesis, which stated that both the Medallion and Track groups would increase their running speeds on the 1.5-mile run when extrinsic motivation was present, but that this finding would only be significant for the Track group. Two of the athletes, one from each group, did not complete the entire 1.5-mile run. Because of this, the velocity run per second was used as a measure to adjust for the two athletes who did not complete the full 1.5-mile run.

By converting the times to a measure of velocity, as expressed in meters per second (m/s), all of the athletes could be compared across a consistent measure.

A 2 factor (Group x Type of Run) ANOVA with repeated measures on the "Type of Run" was used to determine if there was support for the hypothesis. Table 6 provides the means for each factor.

As seen in Table 6, there was no interaction between the "Group" and "Type of Run" factors. This was concluded because none of the within group differences on the two runs (Medallion: 3.29 m/s versus 3.6 m/s; Track 2.98 m/s versus 3.50 m/s) and none of the between group differences on both runs (Without Motivation: 3.29 m/s versus 2.98

Table 6

Means of the 2 Factor ANOVA (Group x Type of Run)

Type of Run			
Group	Without Motivation (m/s)	With Motivation (m/s)	Row Means
Medallion	3.29	3.60	3.45
Track	2.98	3.50	3.24
Column Means	3.17*	3.56*	3.35

Note. The interaction between the two factors (Group and Type of Run) was not significant (F<1), *the main effect of Type of Run (the difference between the column means) was significant at the .05 level [F(1,11)=21.79, p=.001], and the main effect of Group was not significant (F<1).

m/s; With Motivation 3.60 m/s versus 3.50 m/s) were significant (F<1). Therefore, the first hypothesis was rejected because performance did not significantly vary between the two groups. Since the interaction was not significant, the main effects were examined. The two main effects examined were "Type of Run" and "Group". Referring to Table 6, the main effects for "Type of Run" was examined by comparing the column means to each other (Without Motivation: 3.17 m/s versus With Motivation: 3.56 m/s). This process demonstrated that there was a significant effect for the "Type of Run" factor [F (1,11)=21.79, p=. 001], indicating that the presence of motivation affected performance. In terms of the main effect for the "Group" factor (Medallion: 3.45 m/s versus Track: 3.24 m/s), the results illustrate that this did not affect performance. In other words, although it appears that the Medallion group ran further than the Track group, differences in the row means of the between subject comparisons were not significant (F<1). To summarize, the results demonstrated that the presence of extrinsic motivation resulted in

both groups increasing their running speed, but this increase was not significantly faster for the Track group. Therefore, the first hypothesis was rejected. However, the presence of motivation did significantly increase running speed when the athletes were considered as a single group.

The Effect of Motivational Orientation

The third objective of the study was to assess the athletes' motivational orientation. It was hypothesized that motivational orientation would affect performance. The physical subscale of Harter's (1982) Perceived Competence Scale for Children (PCSM) was used to determine each athletes' motivational orientation. A score of 21 was chosen as the cut off score between an intrinsic (21 or above) and an extrinsic (20 and below) orientation. Twenty-one was chosen as the cut off score because it represented the top one third of scores. Coincidentally, the median score was also 21, demonstrating that half of the athletes fell above or below this score.

Athletes were grouped according to their motivational orientation into an intrinsic group (n=7) and an extrinsic group (n=6). A one-way ANOVA was used to determine if the two groups were statistically different. The information obtained from this analysis indicated that the two groups were significantly different [F (1, 11)= 15.79, p=. 0022].

Knowing that the two groups were statistically different on motivational orientation allowed for more meaningful comparisons. A 2 (Motivational Orientation: Intrinsic versus Extrinsic) x 2 (Type of Run: With Extrinsic Motivation versus Without Extrinsic Motivation) ANOVA, with repeated measures on the "Type of Run" factor, was performed. The means provided in Table 7 provide a summary of the results.

Table 7

Means of the 2 Factor ANOVA (Motivational Orientation x Type of Run)

	Type o	f Run	
Motivational Orientation	Without Motivation (m/s)	With Motivation (m/s)	Row Means
Intrinsic	3.24	3.64	3.44
Extrinsic	3.08	3.47	3.28
Column Means	3.17*	3.56*	3.36

Note. There was no significant interaction between "Motivational Orientation" and "Type of Run" (F<1), *the main effect of "Type of Run" was significant at the .05 level [F(1,11)=18.05, p=.001], and the main effect of "Motivational Orientation" was not significant (F<1).

The interaction between the two factors, "Motivational Orientation" and "Type of Run", were found to be non-significant (F<1). Referring to Table 7, this finding was illustrated because none of the between group means (Without Motivation: 3.24 m/s versus 3.08 m/s and With Motivation: 3.64 m/s versus 3.47 m/s) and none of the within group means (Intrinsic: 3.24 m/s versus 3.64 m/s and Extrinsic: 3.08 m/s versus 3.47 m/s) for the two factors were significant (F<1), which demonstrated that neither of the factors interacted with the other. This became more evident when the main effect of "Type of Run" was examined. As a whole group, the results verified that the presence of motivation did significantly increase the speed at which the athletes ran [F (1,11)=18.05, p=. 001]. Further to this, the main effect of the factor "motivational orientation" demonstrated that an individual's motivational orientation did not affect performance, as the between group means were not significant (F<1). In sum, while use of extrinsic

motivation during the 1.5-mile run led to enhanced performance this occurred independent of the athletes motivational orientation. Based on this finding, the second hypothesis was rejected.

The Effect of Perceived Motivation

The fourth objective of the study was to assess athletes' perceptions about the degree to which motivation influenced their performances. It was hypothesized that only the Track group would perceive the presence of motivation as significantly affecting their performance. This hypothesis was examined by using the six questions from the Manipulation Check of Perceived Motivation (MCPM). Specifically the hypothesis was tested by questions three and four from the MCPM. However, for the sake of order, questions one and two from the MCPM are discussed first.

Questions one and two were designed to be an indication of an athletes' desire to run on a particular day. The questions were scored on a scale of 1-3, with 3 indicating an affirmative answer. The two questions were examined as one data set for each group. As seen in Table 8, both groups indicated that they felt motivated to run before each 1.5-mile testing session.

Questions 3 and 4 from the MCPM were designed to measure the athletes' perceived effort during the run. It was expected that the Track group, when provided with extrinsic motivation during the run, would perceive themselves as having run as hard as possible. The Medallion athletes were not expected to demonstrate any differences in perceived effort across the two testing protocols. To determine this, questions three and four were collapsed into one data set. The responses from the run with extrinsic motivation and the run without extrinsic motivation were then compared

Table 8

Mean Group Scores on Questions 1 and 2 from the MCPM

Group	With Motivation	Without Motivation
Medallion	2.7	2.7
Track	2.8	2.8

Note. A "No" response was scored as I, a "Maybe" response was scored as 2, and a "Yes" response was scored as 3

via an independent t-test. The results showed that there were no significant differences in the athletes' responses (Medallion Group: t=1.53, Track Group: t=. 88), indicating that both groups did not perceive the presence of extrinsic motivation as having affected their effort. This finding resulted in the rejection of the third hypothesis.

Question five on the MCPC sought athletes' perceptions about the anticipated affects extrinsic motivation. The athletes were asked if they thought the presence of a coach cheering them on would make them run faster. Moving beyond the hypothetical, athletes were prompted (via the sixth MCPC question) as to whether verbal encouragement/cheering by their coach resulted in improved performance. Table 9 reflects the results from questions five and six.

Both groups, on average, indicated that if a coach cheered them on, they believed they would run faster. Similarly, both groups also indicated that when a coach cheered them on, they believed it made them run faster. The results from question five provided support for the findings from the first and second hypothesis that found, as a group, the

athletes tended to run faster when motivation was present even though perceived effort remained consistent.

Table 9

Mean Group Scores on Questions 5 and 6 from the MCPM

Group	Question 5 Response	Question 6 Response
Medallion	1.0	1.1
Track	1.0	1.4

Note. A score of 1 represented a "Yes" answer, whereas a score of 3 represented a "No" answer.

Summary of the Results

The results established that the athletes, when examined as one group, improved their running speed in the presence of motivation. In terms of motivational orientation, the findings suggested that motivational orientation had no effect on performance, and that there was no significant difference between the groups in terms of motivational orientation. The manipulation check confirmed some of these data, finding that: (a) neither group was different from each other in terms of their desire to run, (b) the athletes did not perceive the presence of motivation as having a significant influence on effort, but (c) the athletes anticipated and, in fact, believed (following the 1.5-mile run in which motivation was provided) that extrinsic motivation influenced them in a positive way (i.e., it made them run faster).

CHAPTER FIVE

Discussion and Conclusions

This chapter includes a more in depth discussion and explanation of the data that was introduced in Chapter Four. The descriptive context of the program is discussed, followed by a discussion about the affects of motivation on performance. The athletes' motivational orientation also is examined, as are their perceptions of motivation. The chapter concludes with practical suggestions for Special Olympics, and future research directions.

The Medallion Program Versus the Track Program

The first objective of the study was to provide a description of the training programs so that potential differences between the Medallion and Track groups could be more fully understood. The frequency of training, volume run per practice, duration of training, and heart rate values all were recorded to add to the descriptive context of the program (see Table 5, p. 60).

There were a total of sixteen practices over the four and a half week study. Both groups began each practice with a warm-up. The warm-up consisted of a light jog, followed by stretching. The Track group finished their warm-up with accelerations (e.g., 4x60m), while the Medallion group worked on drills (e.g., A's, B's, and C's) before concluding their warm-up with accelerations. At times the Medallion group incorporated a strength component into their warm-up. This generally involved using medicine balls or performing a circuit consisting of body weight exercises (e.g., push-ups, sit-ups, squat jumps, lunges). The Track group was rarely observed performing these body weight exercises. For the work-out, the Track group spent the majority of their time working on

distance training (e.g., 1500m run, 5x400m, 3x800m), although two of the athletes did spend about half of their time working on sprints. It should be noted that for 1-2 practices per week the Track group and the Medallion group shared the training facility, and therefore trained together. During these times the Track group followed the workout that had been set up for the Medallion team.

The Medallion group divided their work-outs into two halves. The first half was spent on fitness development. The Medallion athletes were divided into sprinters and distance runners and given an appropriate work-out for each discipline. For example, the distance runners may have performed 3x800m runs with a 3:1 rest to work ratio, whereas the sprinters may have done 5x200m sprints with a 2:1 rest to work ratio. The second portion of the Medallion work-out was used for skill development. This included either allowing athletes to practice their specific field events, or to work on specific skills (e.g., practicing with the starting blocks, baton passing).

The final component to each practice was the warm-down. The Track group either spent time performing a light jog, or playing a game (e.g., basketball). There was, however, a noticeable absence of stretching at the end of the Track groups' practice. The Medallion group would end their practice with a 10-minute jog, followed by some stretching.

In terms of program goals, the Medallion coaches had some very specific goals for the program. These goals, listed in Table 10, provided a guideline for developing the athletes training plan (Appendix C).

Medallion Program Goals

- To have the athletes physically, mentally, and socially ready for the National Games in Sudbury.
- To provide the athletes with an appropriate training program that focuses on physical fitness and skill development.
- To teach the athletes skills that will transfer over into their daily lives (e.g., good sportsmanship, fair play, travel skills, etc.).
- To have fun coaching so that the athletes can have fun training.

The Track group had no stated goals for their program. The coaches did indicate that they had some personal goals for the program. The first was to improve the athletes' performance times over last year. In addition, the coaches wanted to improve teamwork. For example, they not only wanted the athletes to get along better socially, but to be able to work together on group tasks, such as the relay.

The goals for the Medallion program were used as a guideline for creating the training plan. Although the plan was designed for the Medallion team, it was to be used for the entire track program. As shown in the training plan, Special Olympics typically divides their training season into three phases, the pre-season or build-up phase, the inseason or competitive phase, and the post-season phase (Bluechardt, 1997). A copy of the season training plan can be found in Appendix C. The pre-season for both groups of athletes in this study began in September and ended in the middle of January. According to their training plan, the athletes were to spend a great deal of time working on aerobic fitness, strength, flexibility, basic techniques, and nutrition. Near the end of this period

the athletes were to begin work on field events. This phase was in accordance with what Special Olympics suggested should occur in a pre-season phase (Bluechardt, 1997).

The in-season phase for all of the athletes began in the middle of January and ran almost until the end of July. This season was sub-divided into three phases, precompetition 1, pre-competition 2, and final competition. The pre-competition 1 phase finished with aerobic training. This did not mean that the athletes were no longer doing any aerobic training; but was instead an indication that the practices were gradually switching from being high volume with less intensity to a lower volume of training with a greater intensity of work. During this phase, the athletes continued to work on strength, flexibility, and nutrition. The pre-competition 1 introduced speed work, and specific skills such as starts, shot-put, long jump, and high jump. It also indicated that during this time the athletes learned tactical skills, such as how to run a race, or when to pass an athlete during a race.

The pre-competition 2 phase began in the middle of March. The first four and a half weeks of this phase represented the period in which the athletes in this study were examined. This phase focused on high intensity workouts with a lower volume of training. Speed, strength, and power were all emphasized in this phase, as were flexibility and nutrition. The field events also were further developed in this phase. In addition, for the first time, imagery techniques were introduced. The coaches tried to teach the athletes how to imagine themselves within their performance. The imagery techniques, when compared to those used by generic athletes, were relatively simple and primarily focused on having the Special Olympic athletes visualize (mentally rehearse) their impending performance.

The last component of the in-season phase, the final competition sub-phase, began after the May long weekend. This phase was essentially an extension of the precompetition 2 sub-phase, however the emphasis now shifted to competition and performance. Near the end of this phase the athletes were practicing at 100% intensity, meaning that they were simulating competition level performance (i.e., completed 2-3 repetitions of their event at competition levels of intensity). This phase was a time for skill refinement and perfecting technique. No new skills were taught in this phase, as the athletes were working towards the outdoor Provincial Games as well as the National Summer Games.

In addition to examining the athletes training plan, heart rates were monitored as a means of examining the athletes' intensity of training. A random sample of athletes from each group was used to obtain the measure of heart rate. Each athlete in this sample wore a heart rate monitor. The monitor provided the starting, maximal, and average heart rates for each athlete. The starting heart rates were taken just before the athletes began the warm-up, and should not be confused with a resting heart rate. The fact that the Medallion athletes had a lower starting heart rate, a higher maximum heart rate, and a lower average heart rate may suggest that they had a better level of fitness. This, however, cannot be definitively stated. The maximum heart rate may be higher for the Medallion group because the majority of these athletes were sprinters who produce short, maximal efforts. The average heart rates of the Medallion athletes also could be lower because theses athletes spent more time on less intensive skill development sessions. The heart rate data becomes more meaningful when it is examined in terms of target heart rates. Rimmer (1992) suggested that people with mental disabilities should

work at a target heart rate that is 70% of their predicted maximum heart rate. For males, predicted maximum heart rate is determined by the equation 205-(age/2) (Pitetti, et al., 1988).

Although Rimmer (1992) suggested that 70% of an individual's predicted maximum heart rate was a good intensity to work at, more recently Fernhall (1997) has stated that "exercise intensity should be between 60% and 80% of maximal functional capacity" (p. 223) for people with mental disabilities. Accordingly, all of the athletes were working in an appropriate intensity level. As shown in Table 11, athletes A, D, and E were working closer to their target heart rates, as demonstrated by their average heart rates. Athletes B and C may initially seem to be out of an appropriate intensity range.

Table 11

Predicted, Average, and Target Heart Rates* for 5 Athletes

Athlete	Group	Average Heart Rate (bpm)	Predicted Maximum Heart Rate (PMH) (bpm)	Target Heart Rate (bpm)	Actual Percentage of Predicted Maximum
			[205-(age/2)]	(70% of PMH)	Heart Rate (%)
Α	Track	134	190	133	70.7
В	Track	153	196	137	78.1
С	Medallion	122	192	134	63.5
D	Medallion	143	195	136	73.5
E	Medallion	136	197	138	69.0

^{*}Heart Rates in this study were monitored by the Polar Vantage XL Heart Rate Monitors

One reason for athlete B's high percentage of maximum heart rate may be the result of medication. This athlete was taking methylphenidate, which is commonly known as Ritalin. One side effect of Ritalin is arrhythmia (Batshaw, 1997), which is a variation from normal heart beat rhythm (Vander, Sherman, & Luciano, 1994). Ritalin may cause an increased heart rate because it acts as a stimulant for the heart (Canadian Pharmaceutical Association, 1997). Therefore, the higher average heart rate from athlete B can most likely be attributed to Ritalin's side effects. Athlete C was lower than the appropriate intensity range, working an average of 12 bpm lower than his target heart rate. No medical or physiological reason could be found for this result. It may simply have been that he chose not to work outside of his comfort level.

In examining the two training programs there appeared to be little difference between the two groups in terms of training. The intensity of training for the athletes (Appendix D, Figure 1) fell within the suggested 60% to 80% of maximal functional capacity range (Fernhall, 1997). There was little difference in terms of the volume run per practice (less than 200m), and little difference (approximately five minutes) in the duration of training per practice (Appendix D, Figures 2 and 3). The frequency of training appeared to be the most important difference. The Medallion athletes trained 2.3 times per week versus 1.6 times per week for the Track group. That equates to almost one additional practice per week (Appendix D, Figure 4).

This research set out to examine the differences between the Medallion and Track groups within a practice environment. In this environment the groups were found to be quite similar, as were their performances on the 1.5-mile run with extrinsic motivation.

This research did not set out to examine the two groups in a competitive environment, however, differences were observed in a competitive event that took place shortly after the study concluded. At the Kinsmen Indoor Provincial Games, a Track and Field meet, eight Medallion athletes set 20 personal bests, and five athletes from the Track group set seven personal bests. Given the similarities in the training programs this was an unexpected finding, which left the researcher wondering about possible explanations. Among the many possible reasons for the differences in competition performance, four seem most reasonable.

1. It is possible that the Medallion athletes' "personal best" performances were influenced by the heightened extrinsic motivation found within the competitive environment. For example, in this study verbal prompting was used to create extrinsic motivation on the 1.5-mile run. At the Track meet there were more obvious extrinsic motivators, such as the thought of winning a medal, pleasing their parents, or beating other competitor's. Kittredge et al. (1994) supported this possibility, as they too found that more tangible extrinsic motivators were required for a maximal performance. One reason, then, why the research found no statistically significant differences in performances between the two groups may be because the extrinsic motivation that was provided was inadequate. If this was correct, and the motivation provided in the research was inadequate, it then demonstrated that even high performance Special Olympic athletes are in need of extrinsic motivation, specifically the kind of extrinsic motivation that would be found in a competitive situation.

- 2. A second possible reason is that the Medallion athletes were better prepared athletes, but were not sufficiently motivated to perform maximally during testing. Based on this second rationale, it can be concluded that frequency of training was the most important difference between the programs, especially since the intensity and duration of training were relatively similar for both groups. This finding reiterates the perception that typical once per week Special Olympic programs are insufficient in producing the necessary positive training effects needed for competition, even if the intensity and duration of training is appropriate.
- 3. The theory of effectance motivation, the guiding theoretical concept for the research, may also provide an explanation for why the Medallion group performed better than the Track group in a competitive situation. This theory contends that individuals derive feelings of efficacy from successful mastery attempts, thus leading to feelings of competence (Harter, 1978a; Sharpiro & Dummer, 1998; White, 1959). In turn, failure of mastery attempts would lead to low competence motivation (Cox, 1994). There was one occasion, found in the narrative description, which indicated that the Medallion athletes were engaging in more successful mastery attempts. This instance can be seen in their attendance records. The Medallion athletes who attended at least 75% of the practices also had an average score of 21.5 on the PCSC (which was an indication of an intrinsic orientation). This may have indicated that some of the Medallion athletes were feeling successful in their mastery attempts (i.e., practice), and in turn were receiving feelings of efficacy that motivated them to continue

practicing. As a result of increased practices, the Medallion athletes were able to develop greater effectance motivation, thus resulting in an intrinsic motivational orientation. This, combined with the higher frequency of training allowed the Medallion athletes to perform better at the Track and Field meet.

4. It is most likely that the Medallion athletes' better performances in a competitive environment were due to a combination of two factors. First, the Medallion athletes were more intrinsically motivated during the testing, but because of the small sample size, this was not clearly seen. Second, their higher intrinsic motivation combined with preferred forms of rewards (i.e., medals) led to better performances and hence, higher perceived competence in their abilities.

To summarize, the results of the narrative description demonstrated that the two groups were more similar in the observed areas then they were different. It is likely, however, that the extrinsic motivation provided during the testing phase was insufficient. Once the athletes were placed in a competitive situation, where extrinsic motivation was greater and the possibility of extrinsic awards (e.g., medals) was added, the Medallion athletes achieved higher levels (i.e., more personal best performances) of performance than the Track group athletes.

How Motivation Affected Performance

The first hypothesis stated that both groups would perform better on a 1.5-mile run in the presence of motivation, but that only the Track group would perform significantly better. In fact, both groups performed better in the presence of motivation, but neither of the groups performed significantly better (i.e., the first hypothesis was rejected). There may be two reasons for this result. First, the Track group consisted

mainly of distance runners and therefore, they were better trained to run a 1.5-mile distance than were the Medallion athletes. Fitness levels, then, may have negated or minimized the effect of the extrinsic motivation. The small sample size also may have masked the potential influence of extrinsic motivation on performance during the 1.5-mile run. This contention is strengthened when one recalls that when data for both groups were condensed into a single set, significant improvements in velocity of running were observed when motivation was provided (3.17 m/s to 3.56 m/s, as found previously in Table 8). Although these findings did not support the hypothesis, they are consistent with previous findings that indicate people with mental disabilities need extrinsic motivation in order to produce maximal performances (Fernhall, 1997; Rimmer, 1992; Shepard, 1990; & McCubbin et al., 1997).

The rational for the first hypothesis was grounded in evidence, which suggested that not all people with mental disabilities were solely extrinsically motivated, and that some people with mental disabilities demonstrated intrinsic qualities (Zoerink & Wilson, 1995). The results from this study, although demonstrating that some people with mental disabilities were extrinsically motivated, do not refute the concept that some people with mental disabilities have qualities of an intrinsic motivational orientation. Five of the Medallion athletes scored 21 or higher on the PCSM, versus only one athlete from the Track group (a score of 21 or higher indicated an intrinsic orientation). This evidence confirms that some athletes with mental disabilities do in fact have intrinsic qualities. This data is important because it still allows for the possibility that athletes with a mental disability can be intrinsically motivated to perform. It also provides some evidence to refute generalizations that all athletes with mental disabilities are solely motivated by

extrinsic means. It should be acknowledged, however, that based on the athletes performances at the Track meet, there is a possibility that extrinsic motivation (i.e., verbal prompting/encouragement) paired with potential extrinsic rewards (i.e., medals) may reinforce or complement the athletes' intrinsic motivation to perform to the best of their ability.

Motivational Orientation

The second hypothesis in this study stated that motivational orientation would affect performance. To determine if motivational orientation would affect performance, the athletes were divided into an intrinsic group and an extrinsic group based on their scores from the PCSC. It was theorized that the extrinsic group would be most affected by the presence of motivation. The data showed that both groups improved their velocity of running in the presence of motivation, but not significantly. For the second time, only when the athletes were considered as a whole, was there a significant increase in the velocity of running when motivation was present. This provided further support to previous statements that indicated the need for extrinsic motivation in order to produce a maximal performance (Fernhall, 1997; Rimmer, 1992; Shepard, 1990; and McCubbin, et al., 1997).

The results, however, provided no support for the hypothesis that motivational orientation affected performance. The athletes were placed into an intrinsic and an extrinsic group based on their scores on the PCSM. A one-way ANOVA was performed using the scores from the PCSM to determine if the groups were statistically different from each other. Because the groups were statistically different, it was expected that the presence of motivation would affect each group in a distinct way. The fact that this did

not happen may be the result of two factors. First, as previously discussed, it could be that the extrinsic motivation provided was inadequate. The athletes may have needed more concrete forms of motivation/rewards, such as winning a medal, or having a prize at the end of the run. Thus, factors beyond motivational orientation need to be considered when examining the effort a Special Olympic athlete puts into their performance. For example, 5 of the 7 athletes with an intrinsic orientation were from the Medallion team. As noted earlier, one of the assumptions in this study was that the Medallion athletes were more involved in Track and Field mastery attempts prior to making the Medallion team. As a result, it was expected that they would have increased perceived competence, and subsequently, would have developed an intrinsic motivational orientation. The fact that the Medallion athletes did not perform better than the Track athletes (in either of their groups, or when divided by motivational orientation), suggested that there were other factors involved. Without stating definitively what these factors were, it was possible to theorize about them. For example, athletes may have been motivated to attend practices due to the social aspects of training. Had the testing with extrinsic motivation occurred as a whole group where friends raced against friends, versus a counterbalanced start, the outcomes may have been different. Athletes also may have been attending the Track programs due to parental influences, or to the desire to retain team membership. Being expected to attend a program without having the voluntary desire to do so may have prevented the development of an intrinsic motivational orientation. This would have been especially true if the athletes' performance was met with criticism and/or negative responses by someone who the athlete viewed as a significant other, such as a parent or coach (Harter, 1978a; Stipek, 1993).

Second, the small sample sizes also could have affected the results. Had the groups been larger, the differences in performances between the intrinsic group and the extrinsic group may have been significant. The groups had to be examined as a whole in order to find significant results and this demonstrated that the sample size might have been a limiting factor.

One final factor to consider in determining why motivation did not significantly affect performance was the athletes' level of disability. Since this research did not determine level of disability, it cannot be clarified with any certainty the role that level of disability may have played.

Sherrill (1993) explained that individuals with lower, or more severe, levels of disability may attribute success to luck versus ability or effort. As noted earlier, if an individual was not competent in an activity, then they would not be able to attribute success to their ability, thereby stifling any chance of developing greater competence. If some athletes in this study were classified as having a severe level of disability, this may have explained why the role of intrinsic motivation was not clearly evident. The athlete may not have attributed their success to themselves, and therefore never had been able to develop high competence, or an intrinsic motivational orientation. The athlete would then become quite dependent upon the correct type of extrinsic motivation in order to perform maximally.

To summarize, this portion of the research found that the athletes were no different from each other in terms of motivational orientation. As a result, the second hypothesis was rejected. However, it was recognized that the lack of differences might have been related to other behavioural factors that were not examined during the study.

These factors could have included rewards, social aspects, parental influences, or level of disability.

The Perception of Motivation

The third hypothesis in the study stated that the Track group would perceive the presence of extrinsic motivation as significantly affecting their performance on the 1.5-mile runs. The results from questions 3 and 4 of the MCPM demonstrated that the Track group did not perceive the presence of motivation any differently than did the Medallion athletes, and thus the hypothesis was rejected. In light of earlier findings, this result should be expected, as it has become obvious that both groups were more similar than they were different. For example, the groups both improved their performance in the presence of motivation and both had similar motivational orientations. The MCPM provided information that confirmed previous findings from the standardized assessments (i.e., the PCSC, 1.5-mile run), and served to increase the internal validity of the study.

The MCPM also provided other interesting information. For example, based on the analysis of Questions 3 & 4, the athletes did not perceive motivation as having a significant influence on effort. However, following the test in which motivation was provided, the athletes believed that extrinsic motivation influenced their performance in a positive way (they ran faster). This suggests that verbal encouragement resulted in enhanced performance without increasing perceived effort or exertion. If correct, this information is important to those coaching and training Special Olympic athletes. Many athletes with a disability are uncomfortable and sometimes unwilling to work outside of their comfort zone (Howley & Franks, 1997). If verbal encouragement can be used to enhance performance without the athletes perceiving an increase in effort, then coaches

should be able to expect better performances and more effective practices from their athletes without the athletes feeling overly exerted.

There was one other noticeable finding in the current study that was derived from examining data on two athletes (one from the Medallion group and one from the Track group) who did not complete the entire 1.5-mile run. The athlete from the Track group simply had neither the fitness ability to complete the run, nor the desire to perform the run. He answered "maybe" to question 1 of the MCPM ("Do you feel like running today?"), and answered "a little bit" to question 2 of the MCPM ("How much do you feel like running today?") for both the run with and without extrinsic motivation. In addition, he had a score of 20 on the PCSM, indicating an extrinsic orientation. Interestingly, this athlete was greatly affected by the presence of motivation. Each time the athlete ran 1300 m, but increased his running speed from 1.73 m/s to 2.73 m/s in the presence of motivation. This athlete, unlike the other athletes, not only stated that he thought a coach cheering him on would help, but perceived his performance as being better once he was cheered on by the coach. The second athlete, from the Medallion group, did not complete the run because of a lack of fitness. Again, this athlete also was interesting as she was actually discouraged and frustrated by the cheering. She often told the coaches to "shut-up" and "leave me alone" during the run. Her score of 16 on the PCSM indicated that she had an extrinsic orientation. Yet she ran faster without any motivation (1.77 m/s) versus with motivation (1.53 m/s) and scored 16 on the PCSC. These two athletes demonstrated that different athletes respond in different ways, and add support to the idea that not all athletes have the same motivational orientation, or will respond in the same way to forms of motivation.

Conclusions and Future Directions

Although the three hypotheses were rejected, the study still provided valuable information in four areas. First, the study added to the existing evidence, which suggests that extrinsic motivation is needed in order to produce a maximal performance. This was demonstrated by the fact that the athletes, as a group, ran with greater velocity when extrinsic motivation was present. Furthermore, the Medallion athletes, when in a competitive situation, had better performances that were most likely due to a combination of the extrinsic rewards (i.e., medals) and a realization of perceived competence. Second, Special Olympic athletes in this study, for the most part, had an extrinsic orientation. It was initially thought that because the Medallion athletes had already demonstrated some intrinsic motivation by making the commitment to training needed to make the Medallion team, that they would have an intrinsic orientation. The data did not support this hypothesis. Instead, the results from the research demonstrated that there were factors, other than motivational orientation, which may have affected an athletes' performance. Third, the study concluded that most Special Olympic athletes believed that extrinsic motivation would help them perform better. Finally, it was determined that there was little difference between the Medallion and the Track groups' training program. Two important differences were, however, evident: (a) the Medallion athletes did far more work on technique and field events during their practices, and (b) the Medallion athletes engaged in a greater frequency of training. These two factors, especially frequency of training, can be attributed to the Medallion teams better success in a competitive environment. This reinforces the need for greater frequency within

Special Olympic programs if the organization is committed to improving athletes' abilities.

Practical suggestions/Future research.

In conclusion, the results of the present study offer three practical suggestions for Special Olympic organizations:

- 1. Special Olympics should move towards programs that offer opportunity for greater frequency of training. It is clear from the present study that athletes who train at an appropriate intensity and duration, but at a low frequency, do not exhibit the same level of performance as similar athletes with a greater frequency of training.
- 2. Special Olympics should provide more training to their coaches about the importance of motivation and techniques of enhancing motivation when working with athletes. By attending to these considerations, coaches can positively influence athletes' performances, perception of competence, and faster development of an internalized self-reward system.
- 3. Special Olympics should encourage researchers to create and validate additional tests of cardiovascular endurance that are suitable for their athletes. These tests need to address factors that may negatively influence the performance of individuals with a mental disability (e.g., low motivation, need for familiarization trails).

In addition to the three practical suggestions, there are three areas related to the current study that require future research. First, it is important to determine if athletes, like those found in the Medallion group, require more tangible or concrete forms of motivation in order to produce a maximal performance. Does an athlete become more intrinsically motivated at a competition, or do the extrinsic motivators found within the

environment inspire better performances? Related to this concept, it also would be valuable to compare whether an athlete's motivational level varies in training versus competition. Second, a study should be undertaken to determine if there are limits to the effectiveness of extrinsic motivation. Can athletes actually become saturated by too much extrinsic motivation? Finally, another important study would be to determine if there is a relationship between higher frequencies of training and greater mastery attempts, and if so, what affect does this have on Special Olympic athletes.

In conclusion, many questions remain to be answered if we are to fully understand how motivation and motivational orientation affects the performances of athletes with a mental disability.

References

American Association on Mental Retardation (1992). Mental Retardation:

Definition, Classification, and Systems of Support. Washington, D.C.: American

Association of Mental Retardation.

Batshaw, M.L. (1997). <u>Children with Disabilities (4th ed.)</u>. Baltimore, ML: Paul H. Brookes Publishing Company.

Block, M.E., & Moon, M.S. (1992). Orelove, Wehman, and Wood revisited: An evaluative review of Special Olympics ten years later. Education and Training in Mental Retardation, 27, (4), 379-386.

Bluechardt, M. (1997). <u>National Coaching Certification Program Level II</u>

<u>Technical Course Coaches Manual.</u> Toronto, Ont.: Canadian Special Olympics.

Bullock, C.C., & Mahon, M.J. (1997). Introduction to Recreation Services for People with Disabilities A Person-Centered Approach. Champaign, IL: Sagamore Publishing.

Canadian Pharmaceutical Association (1997). Compendium of Pharmaceuticals and Specialties (32nd ed.). Ottawa, Ont: Canadian Pharmaceutical Association.

Canadian Special Olympics (1996). <u>Canadian Special Olympics.</u> Toronto, Ont.: Canadian Special Olympics, Inc.

Clark, M.D. (1997). Teacher response to learning disability: A test of attributional principles. <u>Journal of Learning Disabilities</u>, 30, (1), 69-79.

Cox, R.H. (1994). Sport Psychology Concepts and Applications. Dubuque, IA:

Brown & Benchmark.

Cressler, M., Lavay, B., & Giese, M. (1988). The reliability of four measures of cardiovascular fitness with mentally retarded adults. <u>Adapted Physical Activity</u>

<u>Quarterly, 5, (4), 285-292.</u>

Crocker, P.R.E. (1993). Sport and exercise psychology and research with individuals with physical disabilities: Using theory to advance knowledge. <u>Adapted Physical Activity Quarterly</u>, 10, (4), 324-335.

Dahlgren, W.J., Boreskie, S., Dowds, M., Mactavish, J.B., & Watkinson, E.J. (1991). The Medallion program: Using the generic sport model to train athletes with mental disabilities. <u>Journal of Physical Education, Recreation, and Dance, 62</u>, (9), 67-73.

Dixon, J.T. (1979). The implications of attribution theory for therapeutic recreation service. Therapeutic Recreation Journal (First Quarter), 3-11.

Dummer, G.M., Ewing, M.E., Habeck, R.V., & Overton, S.R. (1987).

Attributions of athletes with cerebral palsy. <u>Adapted Physical Activity Quarterly</u>, 4, 278-292.

Eichstaedt, C.B., and Kalakian, L.H. (1987). <u>Developmental / Adapted Physical</u>
Education. New York, NY: Macmillian Publishing Company.

Emes, C., & Page, S. (1992). Training Special Olympic athletes: A pilot study.

Perceptual and Motor Skills, 75, 413-414.

Fernhall, B., (1997). Mental Retardation. In American College of Sports Medicine, ACSM's Exercise Management for Persons with Chronic Diseases and Disabilities. (pp 221-226). Champaign, IL: Human Kinetics.

Fernhall, B., & Tymeson, G.T. (1988). Validation of cardiovascular fitness field tests for adults with mental retardation. <u>Adapted Physical Activity Quarterly</u>, 5, (1), 49-59.

Gibbons, S.L., & Bushakra, F.B. (1989). Effects of Special Olympics participation on the perceived competence and social acceptance of mentally retarded children. Adapted Physical Activity Quarterly, 6, (1), 40-51.

Gislason, G. (1992). The Winter Medallion program of Manitoba Special
Olympics an evaluation. Vancouver, B.C.: The ARA Consulting Group Inc.

Greene, J.C. (1985). Relationships among learning and attribution theory motivation variables. American Educational Research Journal, 22, 65-78.

Harter, S. (1977). The effects of social reinforcement and task difficulty level on the pleasure derived by normal and retarded children from cognitive challenge and mastery. Journal of Experimental Child Psychology, 24, 476-474.

Harter, S. (1978a). Effectance motivation reconsidered toward a developmental model. Human Development, 21, 34-64.

Harter, S. (1978b). Pleasure derived from challenge and the effects of receiving grades on children's difficulty level choices. <u>Child Development</u>, 49, 788-799.

Harter, S. (1980). The development of competence motivation in the mastery of cognitive and physical skills: Is there still a place for joy? <u>Psychology of Motor</u>

<u>Behaviour and Sport</u>, 3-29.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. <u>Developmental</u>

<u>Psychology</u>, 17, (3), 300-312.

Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.

Harter, S. & Zigler, E. (1974). The assessment of effectance motivation in normal and retarded children. <u>Developmental Psychology</u>, 10, (2), 169-180.

Haywood, C.H. & Switzky, H.N. (1986). Intrinsic motivation and behaviour effectiveness in retarded persons. In N.R. Ellis & N.W. Bray (Eds.). International Review of Research in Mental Retardation (pp 2-40). Orlando, Fl: Academic Press.

Hourcade, J.J. (1989). Special Olympics: A review and critical analysis. Therapeutic Recreation Journal, 23, (1), 58-65.

Howell, D.C. (1992). <u>Statistical Methods for Psychology, (3rd Ed.)</u>. Belmont, CA: Wadsworth Publishing Company.

Howley, E.T., & Franks, B.D. (1997). Health Fitness Instructor's Handbook (3rd ed.). Champaign, IL: Human Kinetics.

Kazdin, A.E. (1982). <u>Single-Case Research Designs, Methods for Clinical and Applied Settings</u>. New York: Oxford University Press.

Keppel, G., & Saufley, W.H. (1980). <u>Introduction to Design and Analysis A</u>

<u>Student's Handbook.</u> San Francisco, CA: W.H. Freeman and Company.

Kerlinger, F.N. (1973). <u>Foundations of Behavioral Research (2nd ed.)</u>. New York: Holt, Rinehart, & Winston.

Kittridge, I.M., Rimmer, J.H., & Looney, M.A. (1994). Validation of the Rockport Fitness Walking Test for adults with mental retardation. <u>Medicine and Science</u> in Sports and Exercise, 26, (1), 95-102.

Lewis, P.E. (1994). "Ladies and Gentlemen, Mr. Harry 'Red' Foster". Toronto, Ont.: NC Press Limited.

Manitoba Special Olympics (1989). <u>Proposal to establish the Medallion program:</u>

A provincial team concept. Winnipeg, MB: Manitoba Special Olympics.

McGuire, F.A., & James, A. (1988). Attribution versus normal persuasion in the acquisition of aquatic skills by mentally retarded adults. Therapeutic Recreation Journal. 22, (2), 24-30.

McAuley, E. (1992). Self-referent thought in sport and physical activity. In T.S. Horn (Ed.), <u>Advances in Sport Psychology</u> (pp 101-118). Champaign, IL: Human Kinetics.

McCubbin, J.A., Rintala, P., & Frey, G.C. (1997). Correlational study of three cardiorespiratory fitness tests for men with mental retardation. <u>Adapted Physical</u>

<u>Activity Quarterly, 14, (1), 43-50.</u>

Montgomery, D.L., Reid, G., & Koziris, L.P. (1992). Reliability of three fitness tests for adults with mental handicaps. Canadian Journal of Sports Sciences, 13, 73-78.

Montgomery, D.L., Reid, G., & Seidl, C. (1988). The effects of two physical fitness programs designed for mentally retarded adults. <u>Canadian Journal of Sport Sciences</u>, 13. (1), 73-78.

Ness Evans, A. (1992). <u>Using Basic Statistics in the Behavioral Sciences</u> (2nd ed.). Scarborough, Ont.: Prentice-Hall Canada Inc.

Piers, G.V., & Harris, D.B. (1964). Age and other correlates of self-concept in children. Journal of Educational Psychology, 55, 91-95.

Pitetti, K.H., Fernandez, J.E., Pizarro, D.C., Stubbs, N.B., & Stafford, J.A. (1988). The cardiovascular fitness of non-Downs syndrome, moderately mentally retarded individuals as an additional indice for job placement. In F. Aghazadeh (Ed.), <u>Trends in Ergonomics/Human Factors V</u> (pp 909-1005). New York, NY: Elsevier Science Publishers B.V.

Pitetti, K.H., Jackson, J.A., Stubbs, N.B., Campbell, K.D., & Battar, S.S. (1989).

Fitness levels of adult Special Olympic participants. <u>Adapted Physical Activity</u>

Ouarterly, 6, (4), 354-370.

Pitetti, K.H. & Tan, D.M. (1990). Cardiorespiratory responses of mentally retarded adults to air-brake ergometry and treadmill exercise. Archives of Physical Medicine and Rehabilitation, 71, 318-321.

Riggen, K., & Ulrich, D. (1993). The effects of sport participation on individuals with mental retardation. Adapted Physical Activity Quarterly, 10, (1), 42-51.

Rimmer, J.H. (1992). Cardiovascular fitness programming for adults with mental retardation: Translating into practice. <u>Adapted Physical Activity Quarterly</u>, 9, (3), 237-248.

Rintala, P., McCubbin, J.A., & Dunn, J.M. (1995). Familiarization process in cardiorespiratory fitness testing for persons with mental retardation. Sports Medicine, Training, and Rehabilitation, 1, (6), 15-27.

Rintala, P., Dunn, J.M., McCubbin, J.A., & Quinn, C. (1992). Validity of a cardiorespiratory fitness test for men with mental retardation. <u>Medicine and Science in Sports and Exercise</u>, 24, (8), 941-945.

Sharpiro, D.R., & Dummer, G.M. (1998). Perceived and actual basketball competence of adolescent males with mild mental retardation. <u>Adapted Physical Activity</u> Quarterly, 15, (2), 179-190.

Shepard, R. (1990). <u>Fitness in special populations</u>. Champaign, IL: Human Kinetics.

Sherrill, C. (1993). Adapted physical activity, recreation and sport cross disciplinary and lifespan. Dubuque, IA: Brown & Benchmark.

Silon, E. (1980). Perceived competence, anxiety, and motivational orientation in educable retarded children who are mainstreamed compared to those in self-contained classrooms. Unpublished doctoral dissertation, University of Denver, Colorado.

Stipek, D.J. (1993). <u>Motivation to Learn From Theory to Practice (2nd ed.).</u>

Needham Heights, MA: Allyn and Bacon

Switzky, H.N. (1997a). Mental retardation and the neglected construct of motivation. Education and Training in Mental Retardation and Developmental Disabilities, 32, (3), 194-196.

Switzky, H.N. (1997b). Individual differences in personality and motivational systems in persons with mental retardation. In W.E. MacLean, Jr. (Ed.), Ellis' Handbook of Mental Deficiency, Psychological Theory and Research (3rd ed.) (pp 343-377).

Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Switzky, H.N. & Schultz, G.F. (1988). Intrinsic motivation and learning performance: Implications for individual education programming for learners with mild handicaps. Remedial and Special Education, 9, (4), 7-14.

Thomas, J.R. & Nelson, J.K. (1996). Research Methods in Physical Activity (3rd Ed.). Champaign, IL: Human Kinetics.

Ulrich, D.A., & Collier, D.H. (1990). Perceived physical competence in children with mental retardation: Modification of a pictorial scale. <u>Adapted Physical Activity</u>

Quarterly, 7, (4), 338-354.

Vander, A.J., Sherman, J.H., & Luciano, D.S. (1994). Human Physiology The Mechanisms of Body Function (6th ed.). New York, NY: McGraw Hill, Inc.

Watkinson, E.J., & Koh, S.M. (1988). Heart rate response of moderately mentally handicapped children and youth on the Canada fitness award adapted endurance run.

<u>Adapted Physical Activity Quarterly</u>, 5, (3), 203-211.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. Psychological Review, 92, (4), 548-573.

Weiner, B. (1986). <u>An Attributional Theory of Motivation and Emotion.</u> New York, NY: Springer-Verlag.

Weiss, M.R. (1984). A theoretical overview of competence motivation. In M.R. Weiss & D. Gould (Eds.), Sport for Children and Youths, 10, (pp 75-80). Champaign, IL: Human Kinetics.

Weiss, M.R., & Chaumeton, N. (1992). Motivational orientations in sport. In T.S. Horn (Ed.), <u>Advances in Sport Psychology</u> (pp 61-100). Champaign, IL: Human Kinetics.

White, R.W. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, (5), 297-333. White, R.W. (1960). Competence and the psychosexual stages of development. In M.R. Jours (Ed.), Nebraska Symposium on Motivation, 8, (pp 97-141). Lincoln, NE: University of Nebraska Press.

Wright, J., & Cowden, J.E., (1986). Changes in self-concept and cardiovascular endurance of mentally retarded youths in a Special Olympics swim training program.

Adapted Physical Activity Quarterly, 3, (2), 177-183.

Zoeller, C., Mahoney, G., Weiner, B. (1983). Effects of attribution training on the assembly task performance of mentally retarded adults. <u>American Journal on Mental Deficiency</u>, 88, (1), 109-112.

Zoerink, D.A., & Wilson, J. (1995). The competitive disposition: Views of athletes with mental retardation. Adapted Physical Activity Quarterly, 12, 34-42.

Appendix A

Consent Form

CONSENT FORM

Participants with a Disability, Caregiver, and Public Trustee

You are being asked to take part in a project that will determine what impact motivation has on your performance in track. The project is being conducted by Darren Milne at the University of Manitoba, as part of the requirements for a Masters degree.

If you decide to take part, you will be asked to participate in a total of two runs. Each run is 12.5 laps on the Max Bell Track. You and your teammates will perform one run without any cheering from the coaches, and one run with cheering from your coaches. Both runs will occur during your practice time. In addition to this, you may be asked to wear a heart rate monitor each practice so that I can see how hard your are working. You do not have to get a heart rate monitor; it will be supplied to you by myself.

Before you make a decision about taking part, I want to make sure that you fully understand that:

You are free to withdraw from this project at any time. Even if you decide to stop running, or decide that you no longer want to be in the study, you can still keep your spot on the team. This project will not affect your position with the team at all.

All of the information you give me will be kept totally private and in a safe place. Also, any information that might help other people find out who you are will not be in the report that will be written about this project.

If you want, a summary of the written report will be available to you when it is completed. Aside from helping me understand more about how motivation affects your performance, you will not receive anything for participating in this project.

1)	To be signed below by an individual who is able to read and understand the above
	and can write his or her signature.

I have read and I understand the above information, and I agree to participate in the project. A copy of this has been given to me.

(name of participant)	(signature)	(date)
(substitute consent giver or co-consent giver, if applicable)	(date)	
(witness)	(date)	

(name of participant)		
(name of evaluator)	(signature)	(date)
ubstitute consent giver or o-consent giver, if applicable)	(date)	
(witness) To be signed below by the the information and write have received the above informe project. A copy of this agree	his or her own signatur mation and understand when	e. nat it is about and agree to
To be signed below by the the information and write that have received the above information.	participant who is not a his or her own signatur	e. nat it is about and agree to
To be signed below by the the information and write have received the above informe project. A copy of this agreement	participant who is not a his or her own signature mation and understand wheement has been provided	e. hat it is about and agree to to me.
To be signed below by the the information and write have received the above informe project. A copy of this agree (name of participant)	participant who is not at this or her own signature mation and understand wherement has been provided (signature)	e. nat it is about and agree to to me. (date)

2) To be signed below by an individual who cannot read and is unable to write his or

her name, but can understand the information above.

4) To be signed to order of supe	y the <u>Public Trustee</u> when the inter vision.	ested participant is under an
has expressed into	intention of the study and recognizing rest in participating and can withdrawnission for (pad research.	at any time, the undersigned
(Trustees name)	(signature)	(date)
I wish to receive a	copy of the final report. Please check	k you answer.
Yes, I wou	ld like a copy	
No thank-	ou	

Appendix B

The Manipulation Check of Perceived Motivation

Name
Date
Run with extrinsic motivation
Run without extrinsic motivation
1) Do you feel like running today?
□ No □ Maybe □ Yes
2) How much do you feel like running today?
A lot A little bit Not at all
3) Did you try to run hard today?
□ No □ Maybe □ Yes
4) How hard did you try to run today?
A lot A little bit Not at all
5) If your coach cheered you on, do you think you would run faster?
□ No□ Maybe□ Yes
6) When your coach cheered you on, do you think it made you run faster?
□ No□ Maybe□ Yes

Appendix C

Medallion and Track Athletes Yearly Training Plan

Events	Monus	
	Week Date	
	Competition	\pm
	Social	-
		CARLOGI TREE OUT OF THE DATES
	Season	2
	Tosting	
Physical	Aerobic	
	Anaerobic	
	Strength	
	Speed	<
	Рожег .	L
	ily	
Skill Dev.	BASIL TECH.	
1 0011111021	DECTET IEH	
	STAKTS	X
	TOHOL	
	SAMO!	X
Tactical	KACE	X
Mental	Social	
	na	
	ion	
	Imagery	
	Simulation	
	Travel Skills	
Targets:		
Comments:		

Appendix D

Descriptive Figures and Graphs

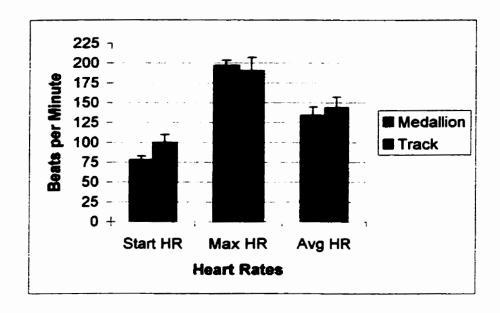


Figure 1. Average heart rates of the Medallion and Track groups.

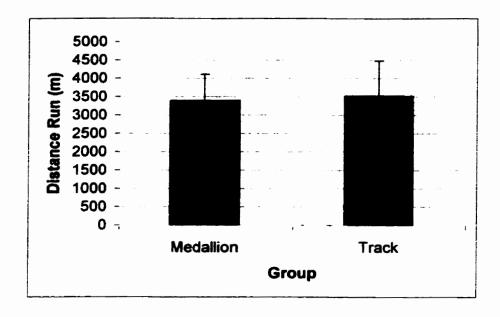


Figure 2. Average distance run per practice.

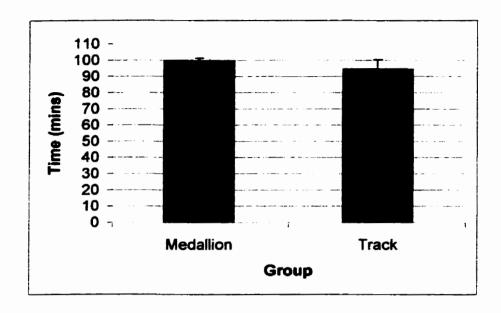


Figure 3. Duration of training values.

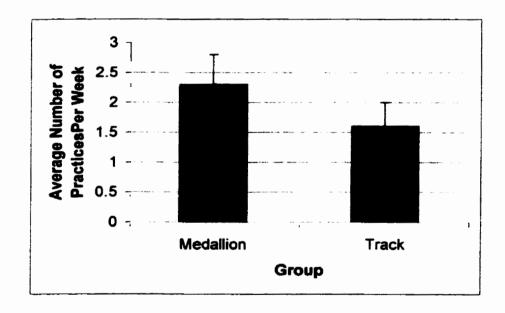


Figure 4. Frequency of training: Medallion versus Track.