A Pictorial Motivational Scale In Physical Activity For People with A Mild Intellectual Disability

by

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Abstract

There is considerable interest in the motivational effects of success and failure on subsequent performance of individuals who are intellectually disabled. These studies have yielded conflicting results due to variations in subjects and methods used, particularly in physical activity where use of extrinsic reinforcements often make people act for the sole purpose of receiving rewards. Yet lack of a suitable instrument to assess motivational orientation resulted in this study which was designed to develop and validate a pictorial motivational scale in physical activity for people with a mild intellectual disability. The Poulin Pictorial Motivational Scale (PPMS) attempted to measure separately four differents types of motivation; intrinsic motivation, extrinsic motivation/self-determined, extrinsic motivation/non self-determined, and amotivation.

Sixty-two high school students were tested with the PPMS. These individuals with a mild intellectual disability were grouped according to age level (12-13, 14-15, 16-18) and academic ability (low, average, high). They answered two questionnaires; the PPMS and Harter's scale (to test students' self-competency). Other scales, made for teachers, were used to assess the validity of the PPMS, a Physical Educator's rating scale and a Teachers' questionnaire.

The reliability estimates of internal consistency (Cronbach's alpha) and temporal stability were sufficiently high to conclude that the PPMS was a reliable instrument. The results also revealed that

the PPMS is valid and it correlates in the expected directions with the other scales which followed the self-determination theory of Deci and Ryan (1985a). Therefore, it was concluded that the PPMS is a valid and reliable instrument.

Résumé

Un intérêt grandissant se fait ressentir au niveau des études en psychologie, pour démontrer l'influence que peut avoir le succès et l'échec sur la motivation d'une personne ayant une déficience intellectuelle. La majorité de ces études ont revélé des résultats divergeants dûs aux différents échantillonnage ou à la méthodologie utilisée. Particulièrement en éducation physique, ou l'utilisation de renforcements extrinsèques sont grandement enseignés, ce qui amène parfois les personnes ayant une déficience intellectuelle à démontrer un comportement dans le but de recevoir une récompense. Le manque d'instrument pour aider une personne dans son orientation motivationelle en éducation physique a amené cette étude à développer une échelle de motivation picturale en éducation physique pour les gens ayant une déficience intellectuelle légère. L'échelle picturale de motivation (PPMS) a été dessinée pour être en mesure d'évaluer séparément quatre types de motivation: la motivation intrinsèque, la motivation extrinsèque auto-déterminée, la motivation extrinsèque non auto-déterminée et l'amotivation.

Soixante-deux sujets ayant une déficience intellectuelle légère âgés de 12 à 18 ans ont participé à cette étude. Ils étaient classés selon leur niveau académic (faible, moyen, fort) et de leur âge (12-13, 14-15, 16-18). Les sujets ont répondu à deux questionnaires: le premier étant l'échelle de motivation picturale (PPMS) et le deuxième l'échelle de Harter, (pour mesurer le niveau d'auto-compétence). D'autres questionnaires ont été utilisés par les

professeurs pour mesurer la validité et la fidélité de l'échelle: un questionnaire pour l'éducateur physique et un questionnaire pour les enseignants.

Les résultats de la fidélité de la consistence interne (Alpha de Cronbach) et ceux de la stabilité temporelle ont démontré qu'ils sont suffisamment élevés pour conclure que la PPMS est un instrument fidèle. De même, d'autres résultats ont démontré que la PPMS est un instrument valide qui se corrèle dans les directions désirées avec les autres échelles tout en suivant la théorie d'auto-détermination de Deci et de Ryan (1985a). Donc nous pouvons conclure que l'échelle PPMS est valide et fidèle.

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Chapter 1

Introduction

The study of human motivation is the study of human action and its determinants. It is concerned with the analysis of factors which initiate individual action, why it persists and why it varies in intensity. It is a search for why humans behave the way they do.

For many years, motivation has been a prime subject for researchers. In general, it has been refered to as "an intervening process or an internal state of an organism that impels or drives it to action" (Reber, 1985, p. 454). However, variations have been formed through the years (Deci & Ryan, 1985a). Two main theoretical frameworks have emerged. The first are mechanistic theories such as instinctual energy (Freud, 1962), drive (Hull, 1943), and operant conditionning (Skinner, 1953). Mechanistic theorists view the human organism as being manipulated by various forces and focus on the interaction of physiological drives and environmental stimuli. The second thrust are organismic theories which view the organism as as active (Deci & Ryan, 1985a). These include effectance motivation (White, 1959) and Cognitive Evaluation Theory (Deci & Ryan, 1985a).

Cognitive Evaluation Theory (Deci & Ryan, 1985a) explores more thoroughly the components of intrinsically motivated behaviors. According to Deci (1971), intrinsically motivated behaviors are those that are engaged in for the pleasure and satisfation derived from

performance. They are activities that people voluntarily perform in the absence of material rewards or constraints (Deci & Ryan, 1985a).

Cognitive Evaluation Theory explores the components of intrinsically motivated behavior. According to Deci and Ryan (1985a), intrinsic motivation is based on the basic psychological need to feel competent and self-determining in dealing with one's surroundings.

The Deci and Ryan (1985a) Cognitive Evaluation Theory acknowledges that two other types of motivation exist: extrinsic motivation and amotivation. Extrinsic motivation explains a wide variety of behaviors which are engaged in as a means to an end and not for their own sake (Deci, 1975; Deci & Ryan, 1985a). Amotivation is refered to as a general condition when an individual does not perceive contingencies between outcomes and actions. There is an experience of incompetence and lack of control. Amotivated behaviors are neither intrinsically nor extrinsically motivated: they are non motivated. In many ways amotivation is similar to learned helplessness (Abramson, Seligman & Teasdale, 1978) since the individuals will experience feelings of incompetence.

In addition, motivation within a Cognitive Evaluation Theory framework has been re-conceptualized recently (Vallerand & O'Connor, 1990) into four types: intrinsic motivation, extrinsic motivation/ self-determined, extrinsic motivation/non self-determined and amotivation.

It has been argued that the sport domain posesses all the elements to be intrinsically motivated (Vallerand, Deci & Ryan, 1987). When free to choose, sports provide an excellent opportunity

to be self-determining, to receive competence feedback and to have social involvement (Deci & Ryan, 1985a).

Findings from the intrinsic motivation research show that the participation in interesting activities with an extrinsic orientation produces decreased performance, interest and intrinsic motivation toward the activity (see Deci & Ryan, 1985a; Lepper & Greene, 1975 for reviews). These findings are very important in the sport domain which uses extrinsic rewards such as trophies, money, glory, peer pressure etc. It is also important in physical activity to understand the effects of different motivational approaches toward special populations.

Special populations have often been encouraged in physical activity by a behavioral approach. Behavior modification is a set of procedures which are based on operant and classical conditionning principles of learning. Therefore, appropriate behaviors and successful task completion are reinforced with extrinsic incentives (Cohen, 1986). Because this approach places an emphasis on extrinsic reinforcement, children learn to behave in order to receive rewards but not as self-determined individuals interested in engaging in human movement (Vallerand & Reid, 1990). While it might be successful in the short run, this approach may turn exceptional children away from the activities that professionals wish to promote (Vallerand & Reid, 1990).

Considerable interest has been generated in the motivational influence of success and failure experiences on the performance of individuals who are intellectually disabled. The majority of these

studies have yielded conflicting results due to variations in subjects and methods used (Hoffman & Weiner, 1978). According to Zigler (1969), "a retarded person follows the same developmental sequence and qualities as do nonretarded persons, but more slowly and to a less highly developed endpoint..." (Haywood & Switzky, 1986, p.2). Reported behavioral differences between the non disabled person and the person with an intellectual disability of the same mental age are seen as a product of motivation and experiential differences, rather than as a result of any inherent cognitive deficiency, (Haywood & Switzky, 1986; Silon & Harter, 1985).

In an attempt to resolve these differences, research over the last decade has been directed towards investigating causal factors associated with performance outcomes. This research basically reveals that these individuals hold an external locus of control orientation, low level of self-esteem and perceived control, as well as an extrinsic personality orientation (Vallerand & Reid, 1990). In general, it is likely that individuals with an intellectual disability are generally characterized by non self-determined forms of motivation and may be amotivated (Vallerand & Reid, 1990).

Because very little work has been conducted on the motivation of intellectually disabled individuals, it is difficult to determine specifically the type of motivation which may characterize them (Vallerand & Reid, 1990). Although it is generally accepted that exceptional children display low levels of motivation (Harter, 1981a; Silon & Harter, 1985; Harter & Pyke, 1984; Haywood & Switzky, 1986), "Persons who have an intrinsic motivated orientation, even though

mentally retarded, appear to work harder, to prefer not to be paid off for their work with task-extrinsic rewards, and to persist in tasks longer than predominantly extrinsic motivated persons" (Haywood & Switzky, 1986, p.17). However, findings from Haywood and Switzky (1986) have shown that individuals with an intellectual disability can show an intrinsic motivation and are "capable of more self-regulating behavior and may be able to function more effectively in independent living situations than will extrinsically motivated persons of comparable age, sex, and IQ" (Haywood & Switzky, 1986, p.40).

Accurate measurement is often hampered by the lack of standardized operational definitions resulting in equivocal findings (McAudley, Ducan & Tammen, 1989). Thus the validity of measurement of intrinsic motivation could be called into question. Therefore professionals need to assess accurately the motivation of special populations in physical education settings. A motivational scale based on Cognitive Evaluation Theory would be beneficial. Such a scale could provide a fast and accurate measure of an individual's motivation. This scale could be functional with educable intellectually disabled individuals.

Cognitive Evaluation Theory is an excellent theory upon which to base such a scale because of the multidimensional nature of people's motivational orientation. To date, only a few scales have been produced to assess motivational level in general for individuals with no intellectual disability (Harter, 1982; Harter & Pike, 1984). Others have used Cognitive Evaluation Theory (Deci & Ryan, 1985a)

as a measure of motivation for individuals with no intellectual disability (Vallerand, Blais, Brière & Pelletier, 1989) and for the elderly population (Vallerand & O'Connor, 1990).

Two scales have been design to study the motivation of athletes. One looked at intrinsic and extrinsic motivation in general, (Weiss Bredemeir & Shewchuk, 1985) and the second applied the Cognitive Evaluation Theory of Deci and Ryan (Brière, 1987; 1991).

One scale has been produced (Kunca & Haywood, 1969) using pictures and sentences to assess the general motivational orientation of individuals with an intellectual disability. Later, Silon and Harter (1985) initiated a study that used the Perceived Competence Scale (Harter, 1982) with individuals having an intellectual disability. Furthermore, Gibbons and Bushakra (1989) used Silon and Harter's pictorial scale to assess intellectual disabled athletes. Thus no scales have been developed for individuals with an intellectual disability in sports settings. A scale which used the Cognitive Evaluation Theory with individuals having a mild intellectual disability would be desirable. A scale of this nature would be theoretically sound and could be used in applied or theoretical research.

Statement of the Problem

The purpose of this study is to develop and validate a pictorial motivational scale which measures intrinsic motivation, extrinsic motivation and amotivation in physical activity for people with a mild intellectual disability.

Hypothesis

1. The Poulin Pictorial Motivational Scale in physical activity for individuals having a mild intellectual disability will be reliable and valid.

Delimitations

1. The participant's mental age was eight years old and over.

2. Subjects attended the Thérèse-Martin High School in Joliette, Québec.

3. Subjects were classified as being educable intellectually disabled.

Limitations

1. Only one teacher per pupil was asked to answer questions about a particular student.

2. Only four types of motivation were explored, intrinsic motivation, extrinsic motivation/self-determined, extrinsic motivation non/self-determined and amotivation.

Definitions

Motivation: "Often used as synonym for drive or activation; implies that the organism's actions are partly determined in direction and strength by its own inner nature" (Coleman, Butcher & Carson, 1980).

Intrinsic motivation: Behaviors engaged in for their own sake for the pleasure and satisfaction derived from their performance (Vallerand & Reid, 1990).

Extrinsic motivation: When behaviors are performed to receive or avoid something from an external source.

Extrinsic motivation/self-determinated: When the individual choose the activity to fulfill an end. The individual

feels a sense of direction rather than pressure and obligation (Vallerand & O'Connor, 1990).

Extrinsic motivation/non self-determinated: Behaviors performed when motivated by external factors such as reward, money or to avoid an activity which produced a negative response..., it is not chosen.

Amotivation: Lack of motivation.

Intellectual Disability: "Refers to a subaverage intellectual functionning existing with deficits in adaptive behavior and manifested during the developmental period". (Grossman, 1977)

Educable intellectually disabled: "A label for a child who scores below the "normal" range on a standard IQ test and although formally still classified as (EMR) mentally retarded can still profit from education and instruction. Generally the IQ range for the EMR is 50-69" (Reber, 1985, p.225).

Subaverage intellectual functioning: Defined as approximately IQ of 70 or below.

Adaptive behavior: The effectiveness or degree with which individuals meet the standards or personal independence and social responsability expected for age and culture group.

Developmental period: The period of time between birth and the eighteenth birthday.

Chapter 2

Review of Literature

For several years, intrinsic motivation has been explored in a number of ways in the psychology domain. Motivation theories are built on a set of assumptions about people's nature and drives them to action. This study was designed to develop, validate and assess a pictorial motivational scale in physical activity for individuals having a mild intellectual disability. This chapter is a review of literature pertinent to the formation and understanding of the scale. This chapter will be divided into several sections: i) early motivational theories, ii) emergence of intrinsic motivation, iii) cognitive evaluation theory, iv) intellectual disability, v) motivation of persons with an intellectual disability, vi) research on intrinsic motivation, and vii) review of existing scales.

Early Motivational Theories

Motivational research has had two basic perspectives, mechanistic and organismic.

Mechanistic approaches:

Mechanistic theories "tend to view the human organism as passive, that is, as being pushed around by the interaction of physiological drives and environmental stimuli" (Deci & Ryan, 1985a, p.3). For example, the behaviorial approach focuses on associations between stimuli and responses. According to Deci (1975), psychoanalytic theory was also mechanistic. This theory assumes that humans were driven by the interplay of "id" forces and environmental forces (Freud, 1962).

Behaviorism emphasizes observable and objective descriptions of stimuli, responses and reinforcements. It ignores internal processes and does not recognize inner constructs such as motivation. According to behaviorists, behaviors are determined by past reinforcements and the contingencies in the present environment. In essance, one has no choice about what he/she does; "a person's thoughts or cognitions are irrelevant to the causes of his behavior" (Deci, 1975, p. 8). Skinnerians claimed that to understand behavior, one should look at the behavior and the environment and ignore inner processes. Thus intrinsic motivation is not a recognized concept within this approach.

Organismic approaches:

Whereas mechanistic approaches assume that humans are passive and under the control of the environment, organismic approaches

assert that they act on their environment to produce adaptive changes (Deci, 1975). In contrast with behaviorism, an emphasis is placed on cognitive and/or affective processes as determinants of behavior. "Humans act on their environment in a lawful and ordered way, as determined by their thoughts and feelings" (Deci, 1975, p.13). This general approach lead eventually to three conceptualized theories. First, the affective arousal theories (McClelland, Atkinson, Clark, Lowell, 1953), considered all motives to be learned. They focus primarily on affect by explaining the causes of behavior by anticipating a "recurrence of an affective state previously experience" (Deci, 1975, p. 14). Furthermore, the affect must represent a change from the present affect; an individual will not be motivated to approach or avoid a situation which would not produce or have the potential for producing a positive or a negative affective change (Cofer & Appley, 1965).

The second types of theories, Humanistic theories, view humans as free agents who make unpredictable choices. These theorists place great emphasis on personal experience, "a fully functioning person is one who is "in touch" with his own experience"... (Deci, 1975, p.17), thus follows the assumption of free will. Due to its young age Humanistic theory is still developing and not fully recognized by psychologists.

A third type of theory, the cognitive approach, places primary emphasis on a person's thought processes. It assumes that individuals decide on how to behave on the basis of their evaluations of likely outcomes (Deci, 1975). "A cognitive approach to motivation proposes

that people make choices about what to do on the basis of their goals"... (Deci, 1975, p. 16). This approach views human as striving to satisfy their needs by setting goals and choosing the appropriate behaviors which aim toward these goals.

Emergence of Intrinsic Motivation

Woodworth in 1918 was the first psychologist to outline a theory that addressed directly the issue of intrinsic motivation (Deci & Ryan, 1985a). According to Woodworth, behavior can provide its own drive through general motives, such as curiosity, self-assertion and constructiveness (Deci, 1975). His notion that an activity provides its own drive was an important initial contribution.

Due to strong emphasis for decades, on behaviorism, it was not until 1943 that Woodworth's writings were reemphasized among psychologists with Hull's publication on drive theory. According to Hull, all behaviors are based on four primary drives: hunger, thirst, sex and pain avoidance. These drives provide the energy for behavior (Deci & Ryan, 1985a). Other psychologists support the notion that that curiosity, manipulation and exploration are intrinsically motivated behaviors. They also tried to show with animals that organisms need a certain amount of novel stimulation to function effectively and the oppportunity for novel stimulation (Deci, 1975).

The concept of intrinsic motivation per se was not introduced until White (1959) proposed the concept of effectance motivation,

"which is an innate, intrinsic energy source that motivates a wide variety of behaviors and is central to much of a child's development" (Deci & Ryan, 1985a, p.19). The focus of this approach is to understand the need and capacity of organisms to deal effectively with their environment. "The behaviors that lead to effective manipulating, for example, are selective, persistent and directed. They are not random; they are motivated by the intrinsic need to deal effectively with the environment" (Deci, 1975, p.55). Effectance motivation results in behaviors which allow a person to have feelings of efficacy. An individual is intrinsically motivated by effectance motivation to engage in behaviors which will allow him/her to feel competent and efficient. "Competence is the accumulated result of one's interactions with the environment, of one's exploration, learning and adaptation" (Deci & Ryan, 1985a, p.27).

The study of intrinsic motivation has required the assumption that people are active organisms working to master their internal and external environments (Deci & Ryan, 1985a) and it has led to an examination of the importance of self-determination. To be self-determined (deCharms, 1968) with respect to outcomes, individuals experience choice or the experience of an internal perceived locus of causality. They must have control over these outcomes without feeling pressured. Therefore, to be truly intrinsically motivated, a person must also feel free from pressures such as rewards or contingencies. Thus, according to Deci and Ryan (1985a), intrinsic motivation will be operative when action is experienced as autonomous and it is

unlikely to function under conditions of control or reinforcement.

According to the Cognitive Evaluation Theory of Deci and Ryan (1985a), human motivation is based in the needs for self-determination and competence. Thus any events which can affect individual's feelings and perceptions of self-determination or competence can affect the various forms of motivation (Vallerand & Reid, 1990).

Cognitive Evaluation Theory

Cognitive Evaluation Theory is organized around three sets of motivational processes: intrinsic, extrinsic and amotivation, and their relationships to the concept of self-determination (Deci & Ryan, 1985a). According to the theory, self-determined behaviors are those which are initiated and regulated by choices using information from internal and external sources, based on awareness of one's needs and goals (Deci & Ryan, 1985a). There are two types of self-determined behaviors: intrinsically and extrinsically motivated behaviors.

Intrinsically motivated behaviors are those which are experienced as "self-initiated and choiceful because they are part of a self-selected goal sequence" (Deci & Ryan, 1985b, p.131). The individual engages in intrinsically motivated behaviors to feel competent and self-determined (Deci & Ryan, 1985a). Extrinsically

motivated behaviors are those which are shaped by external controls. The individuals performs to receive some extrinsic reward (Deci & Ryan, 1985b). Extrinsically motivated behaviors can be self-determined, if they are chosen, based on one's needs and integrated goals (Deci & Ryan, 1985a).

Amotivated behaviors are those which are regulated by forces beyond the person's own control. These behaviors are not intrinsically motivated because they are not intentional. The individual often feels unable to regulate his/her behavior to achieve the desired results. Amotivation had been studied as personal helplessness (Abramson et al., 1978) in which environmental forces are neither predictable nor controllable.

Recently, a more detailed version of Cognitive Evaluation Theory has been proposed (Vallerand & Blais, 1987 cited by Vallerand & Brière, 1990). This new version explored different kinds of intrinsic and extrinsic motivation. Intrinsic motivation has been divided into three types: intrinsic motivation of knowledge, intrinsic of accomplishment and intrinsic motivation of sensation. Extrinsic motivations has been divided into four types: external regulation, introjected regulation, identified regulation and integration.

Part of the intrinsic motivation, intrinsic motivation of knowledge can be seen when an individual participates in an activity for the pleasure and satisfaction of learning something new (Vallerand & Brière, 1990). Intrinsic motivation of accomplishment refers to as behaviors demonstrated to seek pleasure and

satisfaction within an activity by creating, accomplishing or experiencing new challenge (Vallerand & Brière, 1990). Intrinsic of sensation is seen when someone does an activity for the sole purpose of seeking new feelings and to have fun.

As for extrinsic motivation, external regulation is viewed as the lowest form of extrinsic motivation. It occurs when one's behavior is done in a specific way due to feelings of being controlled or by external constraint and rewards. The behavior is neither chosen nor self-determined. The reason for participating lies outside the activity (Vallerand & Reid, 1990). The individual perceives the source of motivation outside of him/herself and often feels obliged to behave this way. As an example, someone does an activity in order to receive a trophy (Deci & Ryan, 1985a). Introjected regulation occurs when someone begins to feel a sense of control. "Rewards or constraints are now imposed by the individual and not by others" (Vallerand & Reid, 1990, p. 162). This form of extrinsic motivation is not "truly self-determined since it is limited to the internalization of external contingencies" (Vallerand & Reid, 1990, p.162). For example, someone goes to a practice to avoid feeling guilty. Identified regulation is seen when a behavior is valued, perceived as important, chosen by the individual. For example, an individual may participate in sport to keep in shape. The motivation is extrinsically oriented because the activity is performed as a mean to an end and not for itself. The motivation tends to become less stressful and it provides a sense of direction and purpose to the individual because he/she had decided

what will be good. The behavior is self-determined (Vallerand & Reid, 1990). Integrated regulation occurs when the individual behaves willingly and accepts that such behavior is part of his/her personality. For example, I like to be successful in life therefore I will go to all my practices to be a winner in my competition. This is the highest level of self-determined extrinsic motivation obtained only by adults with highly integrated self-concepts (Brière, 1987).

These distinctions between intrinsic and extrinsic motivations are important to understand theoretically differences among humans. Nonetheless a third concept must be considered to make all behaviors explainable. This concept is amotivation. Amotivation implies a non-regulated behavior. "Individuals perceive a lack of contingency between their behavior and outcomes. There is an experience of incompetence and lack of control" (Vallerand & Reid, 1990, p. 163). The person is not motivated. These behaviors are the least self-determined because there is no sense of purpose and no possibility of changing the course of events (Vallerand & Reid, 1990). Amotivation can be seen as similar to learned helplessness (Abramson et al., 1978). For example, I had never been very successful in sport, therefore why bother to engage in any activity. The amotivation concept is well documented as being part of the attitude of special education students (Abramson et al., 1978; Adelman, 1978; Cohen, 1986).

Theoretical framework for special populations

A simpler version has been recently elaborated by Vallerand and O'Connor (1989), to be used with elderly people. This version distinguishes between four types of motivation intrinsic, extrinsic/ self-determined, extrinsic/non self-determined and amotivation. These four types of motivation vary in degree of self-determination. Intrinsically motivated behaviors are the most self-determined, followed by extrinsic/self-determined, non self-determined and amotivated behaviors as the least self-determined (Vallerand & O'Connor, 1989).

The most significant changes in this theoretical perspective is within intrinsic motivation which is viewed as being one entity, and extrinsic motivation as two entities. In this version, extrinsic motivation has been identified in two different types, extrinsic motivation/self-determined and extrinsic motivation/non self-determined. Extrinsic motivation/self-determined results when a behavior is internally regulated. Individuals purposely choose and value the behavior. The motivation is considered to be extrinsic because the activity is performed as a mean to an end. The individual experience a sense of direction and purpose, instead of pressure and obligation to participate (Vallerand & O'Connor, 1989). Extrinsic motivation/non self-determined refers to behaviors which are externally regulated through constraints or rewards. The reason to participate is due to an external factor. The individual experiences an obligation and a feeling of control to

behave in a specific way; it is often not chosen (Vallerand & O'Connor, 1989).

Intellectual Disability

Society's attitude toward individuals with an intellectual disability has become more humanistic. Commonly called, Mental Retardation, intellectual disability is a new term which reflects a new attitude toward disability.

The most commonly accepted definition of "mental retardation" was established by the American Association on Mental Deficiency (AAMD). "Mental retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behaviors and manifested during the developmental period" (Grossman, 1977, p.11). Thus, in order to be classified as intellectual disabled, one must be well below the norm in both measured intelligence and adaptive behavior. According to Sattler (1974) a) "the diagnosis of mental states must be only a description of present behavior; prediction of later intelligence is a separate process; b) the contribution of individually administered intelligence tests is specifically recognized; c) diagnosis is tied to the developmental process rather than to etiology, with behavioral description related to the individual;

d) the emphasis is given to mild forms of retardation" (Matson & Mulick, 1991, p.196).

Today, intellectual disability is not viewed as a permanent condition which characterizes individuals throughout their lives. According to current knowledge, individuals may be considered intellectual disabled at one time in their lives but not at another (Arnheim & Sinclair, 1985). "Mental retardation is seen as no more or less than a behavioral symptom, not necessarily stable from one time of life to another, and accompanied by any of several genetic, physiological, emotional, and experimental factors" (Matson & Mulick, 1991, p.196). "Mental retardation is not a state unto itself nor a behavior that exist in a vacuum. It is a reflection of the social perceptions of others in regard to the intellectual and social behavior of a given individual" (Matson & Mulick, 1991, p.198).

Subaverage General Intellectual Functioning:

The first criterion, significantly subaverage general intellectual functioning, refers to a person's score on an an intelligence test. Tests today are based on those initially developed by Binet in the early 1900's, which were designed to identify slow children enrolled in regular classes. The Stanford-Binet and the Wechsler Scales continue to be the main instruments for evaluating intellectual behavior in the field of intellectual

deficiency (Matson & Mulick, 1991).

The Stanford-Binet has a standard deviation of 16 while the WISC-R has a standard deviation of 15. Someone with intellectual deficits functions at two or more standard deviations below the mean for each of the intelligence scales. Therefore, an intelligence test score below 68 and 70 denotes an intellectual disability.

The Stanford-Binet originally designed for children can be divided into six broad categorie of cognition: language, discrimination, manipulation, memory, reasoning,and problem solving (Sattler, 1974). Up to now, four editions of the Stanford-Binet Intelligence Scale have been produced, all of which reflect a conceptualization of intelligence as a general factor, based on mental age.

Wechsler Scales are given to clarify the characteristics of the person's response in routine and detached situations. The test ask for facts, conventionally held judgements, and specified manipulations of materials. Up to now, three version of the WISC are available and a series of Wechsler for particular clientele are all based upon deviation IQ such as age, one's flexibility of orientation, capacity to adapt to diverse situations, and ability to shift and alter intentions to met different requirements. The Wechsler series tests include the Wechsler Intelligence Preschool and Primary Scale of Intelligence Scale for Children, Revised (WISC-R), Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and Wechsler Adult Intelligence Scale, Revised (WAIS-R).

"For mildly and moderately intellectual disabled, the WAIS-R produces significantly higher IQs than the Wechsler ch'ldren's scales or the Stanford-Binet, primarily because of inadequate standardization sampling in the lower range of intelligence" (Matson & Mulick, 1991, p.201). Data from several studies indicate that IQ cest results are fairly stable for groups of intellectual disabled above age six. Similarity of IQ depends on the age when the test was first given, the time interval between tests and retests (Matson & Mulick, 1991; Robinson & Robinson, 1976).

The most widely accepted classification system based on the severity of the symptoms is one suggested in the 1973 manual of AAMD which uses four categories of intellectual function, mild, moderate, severe, profound (Robinson & Robinson, 1976). The first level, mild, refers to individuals having minimal intellectual disability. These individuals can develop social and communication skills and are often not distinguished from individuals with no intellectual disability until school age. They can learn academic skills up to approximately sixth grade by late teens and are thus considered as being educable. Also they can be guided toward social conformity. Moreover they achieve social and vocational skills for adequate to minimum self-support, but may need guidance and assistance when under unusual social or economic stress. The second level, moderate, described individuals who can profit from training in social and occupational skills. They are unlikely to progress beyond second grade level in academic subjects.

They may learn to travel alone in familiar places and may achieve self-maintenance in unskilled or semi-skilled work under sheltered conditions. Level three, severe, includes individuals who can talk or learn to communicate and can be trained in elementary health habits under controlled environments. Level four, profound, described individuals who have minimal capacity for independent functionning and need care throughout the day (Sherill, 1981).

Deficits in Adaptive Behavior:

This second criterion refers to "the degree of effectiveness with which the individual meets age and cultural group standards of personal independence and social responsibility" (Arnheim & Sinclair, 1985, p.195). Because these expectations may vary within different age groups, deficits in adaptive behavior will also vary at different ages. To measure this type of deficit, standardized instruments such as the Vineland Social Maturity Scale, and the Gesell Developmental Schedules are frequently used.

The AAMD over the years, specified different levels of adaptive behaviors for individuals with an intellectual disability. Adaptive behavior is becoming increasingly important as a criterion for determining intellectual disability. It is important that both the intellectual level and the adaptive behavior be considered in classification.

Developmental Period:

The third criterion of the definition, specifies that deficits in intellectual functioning and adaptive behavior must occur between conception and the first eighteen years of life. Intellectual disability occuring beyond this period is referred to as neurological damage, brain damage or mental illness.

Mental age:

One practical evaluation of a person's functional intellectual ability is to determine the individual's mental age. IQ scores are sometimes perceived as abstract statistics, but a measure of mental age can be concrete indicator of intellectual maturity (Eichstaedt & Kalakian, 1987). An individual with a mental age of seven, regardless of chronological age, can be expected to function somewhat like a seven years old. Thus mental age help professionals assess an age. Thus mental age help some professionals to assess an individual. Mental age can be estimated from the child's IQ multiplied by chronological age in months and divided by 100. Thus, a child tested at ten years 120 months) who had an IQ of 70 would have a mental age of seven years (84 months) (Eifchstaedt & Kalakian, 1987).

Prevalence:

Within most demographic surveys, individuals with an intellectual disability represent three percent of the population. Among this three percent, 90 percent are classified as being mildly disabled, 6 percent as moderate, 3.5 percent severely and about 1.5 percent are labeled profound (Kirk, 1972; Arnheim & Sinclair, 1985).

Many factors affect the prevalence of intellectual disability. Among these factors are the gender (due to chromosomal differences, a higher percentage of boys have an intellectual disability) and standards and practices of a community. Other factors related to age, ethnic group and geographical residency (intellectual and scholastic attainment tend to vary to some degree by region). Generally there is a higher number of individuals with intellectual disability in lower socioeconomic status groups (Robinson & Robinson, 1976).

Characteristics of individuals with mild intellectual disability

Learning Characteristics:

The area in which individuals with a mild intellectual disability differ the most from other individuals is in cognitive behavior (Zigler, 1969). Considerable research has identified the general differences in learning between children with an without

intellectual disability. According to Zigler (1969), the learning process and stages of learning are the same for all people, individuals with intellectual disability learn at a slower rate and hence achieve less academically (Zigler, 1969). By contrast, most theorists in intellectual disability take the position that individuals having an intellectual disability suffer some physiological or cognitive defect. The cognitive-developmental approach of Zigler, in contrast of the defect-oriented approach, helps to direct professionals' attention toward the needs of these people and forces professionals to looked at individual differences.

The learning rate of children with mild intellectual disability is usually 50% to 70% of the rate of nondisabled persons. The primary educational objectives involve mastery of the basic life skills as well as communication skills. These individuals are often less capable of applying past experience and previously learned information to new or similar task (Winnick, 1990). Also concrete tasks and information are more easily retained than abstractions.

Physical and Motor Characteristics:

Individuals with a mild intellectual disability achieve at a lower level of physical and motor performance but they tend to be more similar to their chronological age peers in physical and motor performance than in any other respect (Dobbins & Rarick, 1975).

Individuals with an intellectual disability experience

developmental motor delays but it seems to be related to the cognitive factors of attention and comprehension rather than to physiologic or motor deficits (Winnick, 1987). Reid (1980) found that individuals with an intellectual disability do not spontaneously remember movement cues. According to Horgan (1983) "the deficit in the mentally retarded is metamemorial in nature and not a result of a faulty storage mechanism" (p.556). These individuals are capable of coding, processing and retaining movement cues but have to be tought (Horgan, 1983; Reid, 1980).

Francis and Rarick (1959) were among the first researchers to assess physical fitness in individuals with an intellectual disability. They found their performance was two to four years below chronological peer groups but, trends for age and gender followed the same developmental pattern. Most experts agreed that the fitness level of these individuals, regardless of the measurement procedures, is generally inferior to the person with no intellectual disability. It has been shown that they are generally less active than individuals with no intellectual disability and this alone contributes to many of the performance differences.

They talk and walk later, they tend to be shorter and will often require more medical attention due to illness. Some of these problems may be due to lack of fitness (Dobbins & Rarick, 1975). Many of these individuals are hypotonic and overweight, and because of their disproportional bodies they encountered mechanical and balance problems. Maksud and Hamilton (1974) and Reid, Montgomery and Seidl, (1985) demonstrated that they have a high percent of body fat,

a low oxygen uptake and perform less well and with greater within and between subject variability on measures of strengh.

Another major problem regarding physical fitness is motivation. According to Moon and Renzaglia (1982), maintenance of fitness is hard to achieve with individuals having an intellectual disability because these individuals may not be motivated initially by weight loss, increased energy and other intrinsic benefits which can be viewed by nondisabled person.

Social and Emotional Characteristics:

Individuals with an intellectual disability will exhibit the same ranges of social and emotional behavior as other individuals. Nonetheless, they will often demonstrate inappropriate responses to social and emotional situations. Due to their difficulty to generalize information from past experiences, these individuals often do not fully comprehend what is expected of them and they may respond inappropriately due to their lack understanding. Maintaining a job may be a problem because they are often exposed to situations unprepared and difficult to handle. Educational programs for these children should always include experiences to help them determine social behaviors and to develop self-competence. These individuals must learn how to maintain a sense of control over the events of their life as well as proper social relationships (Winnick, 1990; Lawrence & Winschell, 1975).

Motivation of persons with an intellectual disability

Behavioral differences within each individual, such as personality and motivational characteristics, are a source of much discussion among psychologists, but hardly anyone does anything about them, especially in the field of research of intellectual disability (Haywood & Switzky, 1986). In spite of this general neglect, there have been some efforts to explain behavioral differences. These attempts to understand behavior are due primarily to the overwhelming predominance of cognitive deficiencies in the daily performance of individuals with an intellectual disability. Cognitive defects are such an important feature of intellectual disability that other issues may seem negligible by comparison (Zigler, 1969). Consequently, there is a tendency to consider cognitive subnormality as the major cause of all phenomena in the realm of intellectual disability (Kreither & Kreither, 1988).

Due to new demands in current educational practice, professionals are experiencing a crisis of self-confidence because they are now responsible for instructing individuals with disabilities, these professionals may have had little or no training in special education. In addition, instructional approaches tend to be dominated by externally controlling teaching practices and extrinsic motivational incentives such as behavior modification (Switzky & Shultz, 1988).

Behavior modification is a set of procedures which are based on

operant and classical conditioning principles of learning (Robinson & Robinson, 1976), such as positive reinforcement, extinction, punishment, and stimulus control. Behavior modification provided hope among professionals to implement the education and training of individuals with an intellectual disability. This approach is important in teaching special children new skills, but recently research has show that over usage may be detrimental in the long term to the motivation of individuals with an intellectual disability (Cohen, 1986; Switzky & Schultz, 1988).

The awareness of the importance of motivation in learning among special populations has caused an increased need for a theory, to help explain how people perceive or attribute their failure. It has been suggested that the negative attitude of individuals with an intellectual disability was due to feelings of helplessness.

The attribution theory of Weiner was the first model to conceptualize learned helplessness (Gibson, 1980). This model acknowledges four causal elements by which people explain success and failure. One dimension is based on internal and external factors, with ability and effort comprising the properties that are internal to an individual. Task difficulty and luck are external causes. Ability and task difficulty are the stable causes, whereas effort and luck are relatively unstable. This attribution model of motivation posits that the individual employs all four elements to interpret his/her outcome in an achievement-related situation. Individuals with an intellectual disability blamed themselves significantly more than non intellectually disabled persons (Horai & Guarnaccia, 1975). It

has been purported that individuals having an intellectual disability are susceptible to helplessness because of their frequent exposure to failure (Zigler, 1969) and the negative feedback received from society. Learned helplessness has become an important issue with persons having an intellectual disability to help explain their deficient ability. Some research has investigated the ability of the intellectually disabled to make causal ascriptions (Hoffman & Weiner, 1978; Horai & Guarnaccia 1975). They found that these individuals were able to make causal ascriptions similarly as do person with no intellectual disability. They attributed failure to lack of effort and bad luck more than they attributed success to effort and good luck.

This theoretical point of view is important due to the reference often used within the special population literature. Attribution theory is closely related to concepts of intrinsic motivation. Within one task, an intrinsically motivated person may believe that performance is due to effort, whereas an extrinsically motivated person may believe that external factors determine success and failure.

Research on motivation concerning special populations demonstrated that individuals with an intellectual disability are, in general, more extrinsically motivated than individuals with no intellectual disability (Harter & Pike, 1984; Zigler, 1969; Haywood & Switzky, 1986). This extrinsic orientation is likely due to a socially depriving life history, failure experiences and their cognitive deficiencies (Robinson & Robinson, 1976). Therefore, these

children are less and less inclined to approach novel stimuli and derive less information from their encounters with their environment. Thus, this limited information about the world gives them a less adequate knowledge base to evaluate and understand new information (Haywood & Switzky, 1986). Due to their many failure experiences, these individuals are also distrusful of their own solutions to problems and thus tend to look for cues and solutions provided by others (Zigler, 1969). Individuals with an intellectual disability also have a tendency to concentrate their attention upon non-tasks, to avoid disatisfaction and failure rather than to seek satisfaction and success (Haywood & Switzky, 1986). "The experience of being retarded makes one more retarded" (Haywood & Burke, 1977 cited by Haywood & Switky, 1986). This particular statement is verified when institutionalized versus non-institutionalized individuals have been compared. Institutionalized individuals demonstrated higher dependency, lower expectancy of sucess, and less curiosity (Alexander et al., 1985; Harter & Zigler, 1974). Haywood and Weaver (1967) found that institutionalized intellectually disabled are predominantly extrinsically oriented. Waywood and Weaver (1967) and Haywood and Switzky (1985, 1986) demonstrated that individuals with an intellectual disability can be intrinsically motivated. These individuals would work harder, particularly under self-monitored conditions), would set higher goals, would explore more and would learn more efficiently than extrinsic oriented individuals.

Researchers such as Harter (1978) tried to explain intrinsic and

extrinsic motivation and motivational differences among persons who were intellectually disabled through the effectance theory of White (1959). Harter's theory is organized around the idea that the development of an intrinsic motivational orientation is believed to be the result of positive reinforcement or from adults' approval for independent mastery attempts early in children's development. Also dependency on adults is not reinforced. As a result, children internalize two critical systems: a self-reward system and a system of standard or mastery goals that diminishes the children's dependency on external social reinforcement (Harter, 1978). This leads children to develop feelings of competence and being in control of their success and failure which in turn increases their effectance motivation and their intrinsic motivation (Harter, 1978). As a result, children's motivation is enhanced to engage in mastery behavior.

Extrinsically motivated children do not develop these systems because adults in their lives do not reward or approve their independent mastery attempts (Harter, 1978). Thus dependency behavior is reinforced. Children in these circumstance increasingly manifest strong needs for external approval and dependence on externally defined behavioral goals. This leads to feelings of low perceived competence and perceptions that external agents and events are controlling what is happening. These feelings of not being in control of one's sucesses and failures lead to feelings of anxiety in mastery situations and attenuate the motivation to be engaged in mastery behavior. Thus, these children's effectance motivation

is blocked and reduced, resulting in an extrinsic orientation from early failure and dissapproval.

Research on intrinsic motivation

Cognitive Evaluation Theory:

Research in the area of motivation has focused principally on intrinsic motivation and its determinants (Vallerand & Bissonnette, 1990). Theoretically human motivation is based on the individual's needs to be effective (White, 1959) and self-determining (deCharm, 1968), thus the development of an individual can be altered by various environmental forces and interactions. These environmental interactions can be experienced by an individual as being informational (supporting autonomy), controlling (feeling pressure) or amotivating (perceiving incompetence) (Deci & Ryan, 1985b). The effects of these events depend on the way they are experienced or interpreted by the individual.

The Cognitive Evaluation Theory explains changes in intrinsic motivation and is formulated in terms of the functional significance of events for one's intrinsic need for competence and self-determination (Vallerand, Deci & Ryan, 1987). It suggests that two processes can be responsible for changes in intrinsic motivation, the perceived locus of causality process and the perceived competence process (Vallerand & Reid, 1984). The first process (locus of

causality) states that intrinsic motivation varies as a function of perceptions and feelings of self-determination. It explains whether events tend to allow autonomous or controlled behaviors, both of which affect the perceived locus of causality (deCharm, 1968). The second process explains how an outcome can enhance or diminish one's sense of effectiveness; that is, perceived competence (Deci & Ryan, 1985b).

"Events and contexts relevant to the initiation and regulation of intentional behavior can function either to support autonomy (i.e. to promote choice) or to control behavior" (Deci & Ryan, 1987, p.1024). The concept of intentional behavior became important through cognitive approaches in which the processing of information was assumed to play an important role in the determination of behavior (Deci & Ryan, 1987). According to Deci and Ryan (1987), when the controlling aspect of an event is perceived as being the most salient, the individual's motivation will vary according to his/her feelings of self-determination. The controlling event directs one's behavior toward specific results which in turn facilitates the perceived locus of causality as being external (Brière, 1991; Vallerand & Reid, 1990). The individual perceives behavior as being linked to external context rather than coming from his/her self, which in terms diminished one's self-determination, intrinsic motivation (IM) and extrinsic motivation/self-determined (EMSD). On the other hand, it increases one's extrinsic motivation/non self-determined (EMNSD). Factors which are perceived as non controlling will lead to an internal locus of causality and therefore enhance

feelings of self-determination.

When the informational aspect of the event is said to be more salient, motivation will vary according to feelings of competence and self-determination. An event is considered to be informational when it communicates to an individual a message of competence. Events enhancing feeling of self-competence in a self-determined context should increase IM and EMSD (Brière, 1991; Vallerand & Reid, 1990).

Finally, when the amotivating aspect of the event is salient, the motivation will vary also according to feeling of competence. An event is considered to be amotivating when an individual perceives no control over the environment. The amotivating aspect will provide feelings of incompetence and will reduced IM and EMSD.

The Cognitive Evaluation Theory acknowledges the fact that internal as well as external events and individual's personality can influenced one's motivation (Deci & Ryan, 1985a). Ryan (1982) argued that the state of ego involvement depends on peformance which leads people to pressure themselves in a way similar to the way external forces can pressure them. Similarly, Ryan (1982) has shown that events which play a significant role in the initiative and the regulation of behaviors can also be informational. Ryan referred to these two classes of events as internally controlling and internally informational to emphasize that they occur inside the person but have different functions. An internally controlling event is a thought or feeling that pressures one to behave in a specified way and thus undermine self-determination and reduce IM and EMSD and enhance EMNSD. For example: I have to go in order to avoid feeling guilty.

This thought puts pressure on people's behavior. Internal information is less pressured thought and involves a kind of interested self-monitoring. They are inputs to the choice process rather than pressures to perform (Plant & Ryan, 1985), which in turn increase IM and EMSD. Finally, when internal events are perceived to be amotivational, individuals will perceive no control which will increase a sense of incompetence and will decrease IM and EMSD.

According to Deci and Ryan (1987), the concept of autonomy "connotes an inner endorsement of one's action" (p.1025) which one is responsible for. Regulation through choice is characterized by flexibility and the absence of pressure. Individuals who tend to be autonomous will seek out opportunities for self-determination and choices, and will be intrinsically motivated (Deci & Ryan, 1985b; Deci & Ryan, 1987).

By contrast, being controlled is "characterized by greater rigidity and the experience of having to do what one is doing" (Deci & Ryan, 1987, p.1025). There is intention, but lacking one's true sense of choice. This sense of control can be generated either by environment or by personal internal contingency. Individuals who are control oriented will seek out pressure, stressful or controlling events to feel determined. People will often do something because they feel obligated which will lead to a more extrinsically motivated personality (Deci & Ryan, 1985b).

The Cognitive Evaluation Theory acknowledges an impersonal orientation. Some individuals perceive their behavior as being beyond

their intentional control. They tend to believe in their inability to regulate their behavior to desired outcomes (Deci & Ryan, 1985b). They will view themself as incompetent, anxious and amotivated. They experience tasks as being too difficult or, controlled by some unknown external event. In general, Cognitive Evaluation Theory (Deci & Ryan, 1985a) acknowledges that events, individuals' perception or individuals' personality will determine whether IM and EMSD determined will be enhanced or diminished.

Perceived Causality Research:

Outcomes can be experienced either as supporting autonomy or as controlling one's behavior. When these outcomes (called informational) (Deci & Ryan, 1985a, 1985b) are supporting autonomy, they tend to enhance feeling of self-determination, facilitating an internal perceived locus of causality and tend to increase intrinsic motivation. On the other hand, events that are experienced as pressure (controlling events), tend to shift the perceived locus of causality toward external sources which in turn undermine self-determination and intrinsic motivation.

Two broad sets of studies had focused on the autonomy versus controlling outcome. The first set explores external events and the second set explores the internal events.

Most research has explored the controlling event. Many studies have shown that rewards such as good player awards (Lepper, Greene &

Nisbet, 1973), prizes (Harackiewicz, 1979), food (Ross, 1975), money (Deci, 1971), surveillance (Lepper & Greene, 1975) and negative performance (Vallerand & Reid, 1984), undermine people's IM because these rewards are perceived to be controlling. When people received rewards for working on an interesting activity, they tend to play less and be less interest in or willing to work on that activity after termination of the rewards (Deci & Ryan, 1987),

In the context of physical activity, Orlick and Mosher (1978) and Halliwell (1977), have tested the impact of rewards (controlling effect) on a motor activity. Both studies showed a decreased in IM following reward conditions in physical activity.

Other experiments on negative effects on intrinsic motivation from psychology laboratories have shown a decrease in IM with threats and deadlines (Deci & Cascio, 1972 cited by Deci & Ryan, 1987; Amabile, Dejong & Lepper, 1976), evaluation and surveillance (Lepper & Greene, 1975; Plant & Ryan, 1985; Pittman, Davey, Alafat, Wetherill, Kramer, 1980; Harackiewicz, Manderlink, Sansone, 1984), and competing to win at all costs (Deci, Nezlek, Scheinman, 1981; Vallerand, Gauvin & Halliwell, 1986a).

Other research has focused on the effects of general contexts rather than specific events such as rewards, deadlines and choice. Some factors (such as teacher orientation) determine whether rewards will be primarily controlling or informational. In the context of physical activity many of these variables are under the influence of the coach. A study from Deci et al., (1981) revealed that teachers having a controlling style altered students' intrinsic motivation,

perceived competence and self-esteem.

According to Vallerand and Reid (1990), these findings have been replicated by Vallerand and Pelletier (1985), in a sport domain. They presented different swimming coaches styles to swimmers and then asked which coaching style increased their motivation. Results revealed that athletes would be most intrinsically motivated with an autonomy-supportive coach style rather than a controlling one. Similar results by Pelletier, Brière, Blais, Vallerand (1988) indicated a positive relationship between the perceived coaching style and student's motivation.

In classroom situation, Deci et al., (1981) described a clear relationship between the characteristics of the rewarder (teacher) and intrinsic motivation and perceived competence of the students. Autonomy-oriented teachers tended to reward and communicate informationally, thereby providing structures that are useful for the children in making their own decisions and getting competence feedback. However, control-oriented teachers tend to reward and communicate controllingly, thereby pressuring the children to behave in specific ways.

Ryan's (1982) study used college students to work on hidden figure puzzles. Half of them were told that hidden figures performance reflects creative intelligence (ego involving) and the other half were given more task-involvement. Subjects who had received the ego-involvement condition reported experiencing significantly greater pressure than did the task-involved condition.

These findings are very important for an athlete as far as

enjoyment, persistence, and performance are concerned, even though it has not been directly tested (Vallerand, Deci & Ryan, 1987). Athletes are constantly regulating their behavior internally. Although they want to perform, to compete and to be able to deal with external variables, it is important that "the informational aspect will have an impact on intrinsic motivation in situations in which the controlling aspect is relatively nonsalient" (Ryan, 1982, p.451; Fisher, 1978).

The one event that has been found to increase intrinsic motivation is the opportunity to choose. The perceived locus of causality becames more internal thus increasing self-determination. A study done by Zucherman, Porac, Lithin, Smith and Deci (1978) found that college students given the choice in doing a task (puzzles) were more intrinsically motivated than those with no choice options. Similarly results have been found in the study done with children from Swann and Pittman (1977), and with motor tasks (Thompson & Wankel, 1980).

Thompson and Wankel (1980) examined the impact of perceived choice of activities on participation in an adult women's fitness program. Subjects were randomly assigned to a choice or no choice condition. Examination of subsequent attendance records over a six-week period revealed that the perceived choice group had significantly higher program attendance.

However, in the area of special populations, the individuals' low perceptions of control (which they experienced) are believed to be the result of their history of failure. Smith, Ademan, Nelson,

Taylor and Phares (1987) demonstrated that special students' low locus of causality is due to the overcontrolling environment encountered through their lives. In recent years, the academic performance of students in public school has been declining, due to lack of active participation in the classroom (Pratton & Hales, 1986). Students who are given the opportunity to participate in their classroom decision making, proved to be more intrinsically motivated (Pratton & Hales, 1986; Cohen, 1986). "Youngsters have strong perceptions and attitudes about the degree of control they have over processes affecting their lives and that these perceptions and attitudes have a profound impact on their actions" (Smith et al, 1987, p.168).

As for individuals with an intellectual disability, Haywood and Weaver (1967) found that these individuals display an external locus of control. However Haywood and Switzky (1985, 1986) found that intrinsic motivated individuals would work harder under a self-monitored condition than under an imposed externally condition. Because the development of self confidence has been a major goal in the education of individuals with an intellectual disability, it is a belief among educators that these individuals should maintain a sense of control over the events of their lives but without using a "laissez-faire" approach. However, according to the general literature, the effectiveness of the development of self-competence and locus of control with these individuals is well demonstrated and must become a conscious goal among professionals, to help to successfully mainstream children with an intellectual disability

(Lawrence & Winschel, 1975). A better understanding of the theory of locus of control may constitute a small contribution to help the transition from special schools to mainstreamed situations.

Perceived Competence Research

To help promote self-determination, professionals must also be aware of people's thoughts and feeling toward a particular outcome. As proposed by Cognitive Evaluation Theory (Deci & Ryan, 1985a) when the informational aspect of the event is salient, motivation varies according to feelings of competency and self-determination. "The informational aspect of the event is said to be salient when individuals receive information relevant to their competence at a meaningful task for which they feel personal causation of self-determination" (Vallerand & Reid, 1990, p.169). Studies had demonstrated that IM and EMSD are more positively correlated with feelings of competence than the other type of motivation (Daoust, Vallerand, Blais, 1988; Vallerand, Blais, Brière & Pelletier, 1989; Vallerand & O'Connor, 1989). Individuals when free from controlling inputs, focus on their feelings of competency (Deci, 1975), particularly when individuals receive information relevant to their competence at a meaningful task for which they feel personal causation of self-determination such as positive feedback or success experience (Vallerand & Reid, 1990).

Since verbal feedback is perhaps the major source of performance

information, this variable has been used in several studies of sport-related activities (Orlick & Mosher, 1978; Vallerand & Reid, 1984, 1988; Vallerand, 1983; Vallerand, Reid & Marisi, 1979). For instance, Vallerand and Reid (1984, 1988), demonstrated that positive verbal feedback about performance can increase intrinsic motivation, whereas negative verbal feedback tends to have a detrimental effect. Subjects performing on a stabilometer task were presented with either positive or negative verbal feedback after every fourth trial. The results revealed that positive verbal feedback increased whereas negative verbal feedback decreased intrinsic motivation for a task.

Vallerand (1983) also investigated whether the amount of positive feedback would determine its impact on the intrinsic motivation of hockey players. The results revealed that subjects perceive themselves to be competent following a modest amount of positive feedback. Additional feedback appears unnecessary.

Vallerand and Reid (1984) investigated changes in intrinsic motivation following feedback designed to change perceived competence. They identified eighty-four subjects who had an interest in a motor task and assigned these subjects to positive, negative or no verbal feedback conditions. As reported previously, results revealed that positive feedback increased whereas negative feedback decreased perceived competence and intrinsic motivation relative to no verbal feedback. With further analyses, it was revealed that perceived competence produced the changes in intrinsic motivation.

Weinberg and Jackson (1979) provided further suppport on the effects of feedback on intrinsic motivation concerning the

attributions that accompany success and failure. Results revealed that success outcomes were attributed to high ability, high effort and good luck whereas failures outcomes were attributed to low ability, low effort and bad luck.

Research with special populations is in agreement with previous findings on intrinsic motivation. For instance, Lincoln and Chazan (1979) used Harter's Perceived Competence Scale for children and Motivational Orientation in the classroom. The subjects were 31 children in a learning disability class and 29 in a regular class. Students were asked to complete Harter's two scales and the teachers were asked to complete a rating form. Results revealed that the students with a learning disability perceived themselves as less competent and less intrinsically motivated in the school domain than regular students. These findings are likely due to the child's disability and the delay in experiencing success and obtaining positive feedback for effort. Furthermore, learning disabled children tended to rely on others to judge how they performed. Learning disabled students are also to attribute success to luck and task ease and failure to lack of ability and sufficient effort (Jacobsen, Lowery & Ducette, 1986; Pearl, Bryan & Donahue, 1980).

Another factor that influences the feelings of competence is competition. Competition generates a great deal of excitement and enjoyment. To some, competition is viewed as either an extrinsic or intrinsic motive (Vallerand, Deci & Ryan, 1987). "Competition constitutes a social event that can provide the individual with competence/incompetence information because social comparison

processes are very prominent" (Vallerand, Gauvin & Halliwell, 1986a, p. 467).

Vallerand, Gauvin and Halliwell (1986b) looked at the effects of competition on children's intrinsic motivation toward a stabilometer motor task. The 26 subjects were assigned to a competition or an intrinsic mastery condition. The results indicated that competition decreased intrinsic motivation toward the motor task. Winning a competition can promote satisfaction which is primarily extrinsic. However, if competition is harmful for the winner it must be devastating for the loser. Since most competition are zero-sum games, they represent a higly negative experience (Vallerand et al., 1986a). Vallerand et al., (1986a) looked at the competency aspect of competition by offering an award to winners. Twenty-six subjects were randomly assigned to either a winning condition or a losing condition. Results indicated that subjects who experienced losing, perceived themselves as less competent.

Although some research has shown that competition can be detrimental to one's competence feeling if it is perceived as controlling, it might also enhance the feeling of competence if it is perceived as informational (Vallerand & Reid, 1990).

In summary, the studies revealed that positive feedback and success in competition can increase intrinsic motivation but only if the individual's feelings are self-determined whereas negative feedback and failure increase amotivation which in turn diminish intrinsic motivation.

Scales

Relatively few instruments have been developed to measure those elements of behavior that identify an individual's motivational orientation. Harter has developed several self-report instruments to measure components of her effectance motivation theory. The scale of Intrinsic versus Extrinsic Orientation in the Classroom (Harter, 1981b) has been used to measure motivational orientation in the classroom for non handicapped children in grades three to nine. This instrument measures the extent to which children's motivation for classroom learning is determined by their intrinsic or extrinsic interest. Five separate dimensions are defined by an intrinsic and an extrinsic pole: preference for challenge versus preference for easy work, curiosity/interest versus teacher approval, independent mastery attempts versus dependence on the teacher, independent judgement versus reliance on the teacher's judgement, and internal versus external criteria for success/failure. Results demonstrated that the scale can meaningfully isolate five measurable components and across grades three to nine there is a shift from intrinsic to extrinsic on the first motivational component.

Silon and Harter (1985) have used the Scale of Intrinsic versus Extrinsic Orientation in the Classroom with a sample of nine to twelve year old mainstreamed and self-contained classrooms of educable children with an intellectual disability. They wanted to examined whether this instrument designed for non disabled children, could be used with a special population and tap the five different

dimensions of a child's orientation to the classroom. Factor analysis of the subject's responses revealed two factors similar to the scale of Harter (1981b) a motivational factor labeled motivation for hard work, and a cognitive informational factor labeled autonomous judgement. No group difference were reported. Children with an intellectual disability appeared to be more extrinsically oriented than children with no intellectual disability. However, the most salient motivational issue for the children with an intellectual disability was the desire to do difficult or easy school work rather than an intrinsic versus extrinsic orientation. The children's main concern seemed to be more on what to do in the class (hard or easy work) than why one performs (curiosity).

Harter (1982) also created the Perceived Competence Scale for Children. This scale was designed to measure four specific competence domains with non disabled third to ninth graders. Then four domains were studied: 1. cognitive competence, with an emphasis on peer relationships, 2. social competence, 3. physical competence, with an emphasis on sports and outdoor games and 4. general sense of self-worth. Harter develop a four choice format answers to avoid a child's tendency to give socially desirable responses. Factor analyses supported the four domains of competence indicating that children as young as eight could make meaningful differentiations among each competence area. The largest correlation was between the social and physical subscales suggesting that one's popularity in school is related to one's ability in athletics.

Harter and Pike (1984) developed a Pictorial Scale of Perceived

Competence and Social Acceptance for Young Children. This scale was designed to assess children from four to seven years old. A pictorial format was used rather than a written questionnaire because experience shows that the children's inability to read and concentrate, attenuates both the reliability and validity of such instruments. In contrast, a pictorial format arouses the child's interest, attention and comprehension.

Two versions of the scale were required, one for pre-school and kindergarden and one for first and second graders. The first factor was labeled perceived competence and was composed of cognitive competence and physical competence subscales. The second factor was labeled popularity and was composed of peer acceptance and maternal acceptance. Factor analysis supported the two domains within each sub-group of children.

Silon and Harter (1985) used the Perceived Competence Scale for Children for educable children with an intellectual disability aged from nine to twelve. Factor analyses revealed that this instrument in the original form is not appropriate for this special population. The data indicate that children with a mildly intellectual disability with a mental age less than eight years appear not to make distinctions about specific competence domains, but simply make judgements about one's competence at activities in general, judging people to be competent or not competent, in the manner of younger non disabled children. They do not structure their self-perceptions with the same degree of cognitive complexity as do children with no intellectual disability but simply desbribed specific behavior, not

abstract traits.

Kunca and Haywood (1969) developed the Picture Choice Motivation Scale specifically for a low mental age, though it can be used as well by non handicapped children. This instrument measures the degree of intrinsic or extrinsic motivation terms of the learned personality trait of motivational orientation. In this scale, each item is a pair of pictures of people engaged in different activities or vocations, pre-determined to be qualitively either extrinsic or intrinsic. The activity is described while the subject looks at the twenty pictures illustrating an intrinsically (eg: opportunity to learn, challenge, intense psychological satisfaction, responsibility) or extrinsically (eg: opportunity for safety, ease, confort, security) motivated activity. The subject is asked which they would like to do and choose between the two activities.

The Picture Motivation Scale is useful with students from a mental age of three years to adolescence and yielded substantial reliability coefficients. It has been found that an intrinsic motivational orientation correlates positively with higher chronological age, mental age and social class (Haywood & Switzky, 1986). As a group, children with a mildly intellectual disability are usually more extrinsic compared with non intellectually disabled children of similar age. However, some of these disabled children are found to be intrinsically motivated.

Haywood and Switzky (1986) have investigated in previous research individual differences, both with individuals having a mildly intellectual disability and non intellectual disabled, in

task-intrinsic and task extrinsic motivation. Intrinsically oriented students with an intellectual disability were demonstrated to be achieving one full grade ahead of the extrinsically oriented student of the same IQ group. These early studies demonstrated that intrinsically motivated students with an intellectual disability may compensate for their lower intelligence levels by increasing their effort levels.

Weiss, Bredemeir and Shewchuk, (1985) developed the Intrinsic/ Extrinsic Motivation the Youth Sport Setting. This scale measures only intrinsic and extrinsic motivation in the sport domain. This scale, based on the Scale of Intrinsic versus Extrinsic Orientation in the Classroom of Harter (1981b), was used with third to sixth graders and was modified with items renamed to comply with the sport setting. Each subscale consisted of six items with a representation of intrinsic and extrinsic statements. The child is asked to decide whether the statement on either side best described her/him and then to specify whether that statement was really true or sort of true. Items were scored four to one according to the degree of motivational orientation expressed. A high score indicated a high degree of intrinsic motivation whereas a low score indicated extrinsic motivation. The data were subjected to a confirmatory factor analysis for the purpose of testing the fit of the sport data with Harter's original structural motivational model. The analysis revealed that major modifications must be made before Harter's model representation is reached.

Brière (1987, 1991) developed a scale to be used in a sport

domain. Her scale (L'échelle de motivation dans les sports or EMS) is based on the Cognitive Evaluation Theory of Deci and Ryan (1985a) which emphasizes the concept of three motivational factors: intrinsic, extrinsic motivation and amotivation. This instrument measures the different motivational types acknowledged by Cognitive Evaluation Theory (intrinsic motivation of knowledge, of accomplishment and of sensation, and extrinsic motivation: external regulation, introjected regulation, identified regulation). This instrument was designed to assess amateur athletes. A questionnaire format composed of seventy mixed questions was used with a format answer of a continous scale of 50 one to seven (one being not at all while seven being absolutely true). Three studies have been used to determine the validity and reliability of this scale. The first study was designed to develop the instrument, verify the item validity, to test factorial structure and internal consistency of the subscales. The second used a more stringent factorial analysis with LISREL program. The third study was a test-retest to assess reliability. The three studies demonstrated instrument is valid and reliable and can be used for further research.

Vallerand and O'Connor (1990) developed a Motivational Scale for the Elderly. This instrument evaluates four types of motivational orientation, postulated by the Deci and Ryan's theory (1985a), IM, EMSD, EMNSD, AM. Through a questionnaire format of seventy-two items (eighteen within each of the four motivational concepts), this instrument was designed to represent different domains in the elderly's life. The developement of this instrument is composed of

four studies which helped establish the validity and reliability of the scale.

Summary

A major obstacle in studying motivation development in special populations is the lack of suitable instrument. Research presented in this chapter, demonstrated the necessity to assess motivation for special populations, within physical activity setting. According to the Cognitive Evaluation Theory of Deci and Ryan (1985b), the higher level of self-determination and self-competence will occur with IM and EMSD whereas the lowest level of self-determination and self-competence will be obtained with EMNSD and AM. Therefore, in order order to promote the highest level of self-determination and self-competence within physical activity with special children, professionals must be aware of the positive or negative consequences on special children.

Chapter 3

Methodology

The purpose of this study was to develop and validate a motivational pictorial scale in a sport setting which measured intrinsic motivation, extrinsic motivation and amotivation for people having an intellectual disability. The following chapter is divided into five sections: (1) Questionnaire development; (2) Subjects; (3) Instrumentation; (4) Procedures; (5) Design and treatment of the data.

Questionnaire Development

Several steps are necessary to create a questionnaire. The development of this scale is included in the main purpose and was composed of seven parts.

Part one

The first part consisted of familiarization with the Cognitive Evaluation Theory of Deci and Ryan (1985a). Also Brière's (1991) scale was examined since its conceptualization combined Cognitive Evaluation Theory and sport. Because of the specificity of Brière's scale for non disabled adult athletes, further readings on children who were intellectually disabled were required.

According to Harter and Pike (1984), it appears that younger and

intellectually disabled children do not make distinctions among domains such a cognitive and athletic skills. Also mental age appears to be a more powerful predictor of overall cognitive maturity than chronological age for children with intellectual disability. Furthermore, it appears that they are not able to make meaningful judgements about their worth as a person until approximately the age of eight. Therefore according to Harter and Pike (1984) several important considerations have to be considered in developing a questionnaire for children who are intellectually disabled. These children require a scale structure that is simpler, items that are concrete and the self-worth construct eliminated altogether. Furthermore, children with intellectual deficits can not be treated as an homogenous group and have a tendency to give socially desirable responses. Therefore the inability to read and to understand the items of a questionnaire, coupled with related attentional problems, creates problems for both the reliability and validity of such instruments for children and individuals with an intellectual disability. In contrast, a pictorial format is easier to comprehend. It engages a person interest, promotes better understanding and sustains a person's attention while providing concrete information (Harter & Pike, 1984). For these reasons a pictorial format was selected in the present study.

Part two

The second part in the development of this scale consisted of gathering information on scale format used to assess individuals with an intellectual disability. Two problems emerged during the gathering of information.

The first problem encountered in existing scales (eg. Harter, 1981, 1982, 1984, 1985; Weiss et al., 1985) was the construct of the scale itself, particularly the lack of independence of intrinsic and extrinsic motivation. These scales measured motivation along a continuum. A high score meant a high level of intrinsic motivation, a low score meant a high level of extrinsic motivation. Neither looked at amotivation. Therefore, according to these scales, an individual can not be motivated by both incentives simultaneously. According to Cognitive Evaluation Theory, an individual can demonstrate a high level of intrinsic and extrinsic motivation in the same activity (Vallerand & Brière, 1990). Therefore, a scale which can measure the different types of motivation independently is needed.

A second problem occured was that no scale for individuals with an intellectual disability in a sport setting was found. Only one scale (Kunca & Haywood, 1969) has been developed to serve this particular population in a non sport setting. This scale has the same construct problem as the others, but it uses pictures similar to the scale created by Harter and Pike (1984), the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children. It is

only with the work of Brière (1987), Vallerand et al., (1989) and Vallerand and O'Connor (1990) that three scales have been developed to measure the three motivational types independently. Briere (1991) developed a scale for athletes while Vallerand and O'Connor (1990) created one for elderly individuals.

Part three

The third part in the development of this questionnaire was formulating statements for each motivational type, on how and why persons who are intellectually disabled participate in sports. Sixty-four statements were generated and one drawing per statement was conceptualized for the sport domain. The main idea was to touch a variety of sports, without any repetition.

Part four

The next phase was the elaboration of the drawings by an artist. It was decided that the pictures must not illustrate: gender, race, cultural or environmental effect. In addition they were not to represent only a specific sport. The pictures were designed to represent simplicity, something that everybody could refer to.

Part five

The fifth part included meeting with two professionals and the researcher to decide which sentences and pictures were best for the

purpose of this study. The meeting was necessary in order to gather important feedback based on knowledge and experience in the sport domain and with this special population. From a pool of sixty-four pictures and sentences, thirty-six were selected as best representing the theoretical construct of Cognitive Evaluation Theory and meeting the criteria outlined in Part four. The scale's structural format was also determined, a dichotomous choice for answer (like me; unlike me) with each picture. This dichotomous choice was chosen to facilitate the questionnaire assessment and to avoid hesitation by subjects. It is difficult for even individuals with no intellectual disability to answer a continuous scale and to distinguish between a four or five, for example.

Part six

The sixth phase was to finalize the pictures. The major decisions included the use of basic motor skills instead of sport activities and that the drawings should focus on facial expressions for intrinsic and amotivation pictures, and on external components for the extrinsic pictures. It was also decided that pictures should include one person only (if possible) and to eliminate verbal statements by the persons cited and unnecessary details. Furthermore, to help to validate this study, it was also decided to use the pictures of physical competence from Harter's 1984 scale (Harter, personal communication, April 1991). Three pictures were chosen, the dribbler, the runner and the climber. This scale

was used because it is well established and reflected self-competence in children which should correlate well with the Cognitive Evaluation Theory. According to the Cognitive Evaluation Theory, events enhancing feelings of self-competence in a self-determined context should increase IM and EMSD. Also the number of sentences and pictures were reduced to twenty and the shorter version of the Cognitive Evaluation Theory was used. Thus as with the elderly scale (Vallerand & O'Connor, 1990), IM, EMSD, EMNSD, AM were used. Furthermore, based on previous research (Vallerand et al., 1989; Vallerand & O'Connor, 1990) and the Cognitive Evaluation Theory, to facilitate validation of the PPMS, a questionnaire for teacher and a questionnaire for the physical educator were formed. The Teachers' questionnaire was based on student's motivation toward school. Twenty questions was developed. This questionnaire was design to assess agreement between the teacher's perception and the actual student's motivational orientation. The Physical Educator's rating scale was developed also as a measure of construct validity. According to the Cognitive Evaluation Theory, persons high in ability are likely to be particularly motivated toward physical activity. This questionnaire was to determine teacher's perception of a student's physical ability regarding student's motivational orientation.

A translation of French to English and English to French was done by professionals to assure consistency. However, all formal assessments of the scale were conducted on the French version.

Part seven

After a thorough presentation at a thesis proposal, other changes were incorporated to improve the scale. Such changes included moderate changes of a few pictures, simplify the sentences, using the term physical activity instead of sport, using suggestions for the amotivation questions, and the addition of a third choice to the scale's answer format. The option "little like me" was added to "like me" and "unlike me". This last change was introduced for statistical purposes. By increasing the variance of responses correlations among different variables would be facilitated. Also, it was proposed to improve the quality of the three pictures proposed by Harter (Harter, personal communication, April 1991), and to remove gender reference in the picture. Furthermore, it was suggested to add a fourth picture (throwing) to the ones suggested by Harter (Harter, personal communication, April 1991). Also changes regarding the Teachers' questionnaire were suggested: to cut down number of questions to fifteen, to change the answer format to one to five and to change the orientation of the subs-sections.

In summary, all seven phases were part of the construction of the pictorial motivational scale in physical activity for individuals with a mild intellectual disability. This scale will be refered to as the Poulin Pictorial Motivational Scale (PPMS).

Subjects

The PPMS was administered to sixty-two subjects. Subjects were thirty-two boys and thirty girls having a mild intellectual disability. These subjects ranged in age from 12 to 18 years, and had a mental age of eight and more. The subjects were attending the French Thérèse-Martin High School (polyvalente in Joliette, Quebec). These individuals were all classified according to school assessment as "groupe d'initiation au travail" and educable.

This school provided regular and special education at a high school level and work experience in their last years. The program separates the individuals according to their age and learning ability (weak, average, strong). The students were classified in six groups: the first group of 12 to 13 having a lower ability included six males and three females; the second group of 12 to 13 having a higher ability was composed of six males and five females; a group of 14 to 15 with all academic ability was composed of seven males and four females; a group of 16 to 18 with a lower ability included two males and eight females; the other group of 16 to 18 having an average ability was composed of five males and six females and the last group of 16 to 18 having a strong ability included six males and four females. Most of the students are at grade one and two in all academic basic programs. All subjects attended physical education classes two to three times a week. They, all understood the concepts of "Like me" "Little like me" and "Unlike me" according to their teacher. These concepts were introduced during elementary school.

Instrumentation

The motivational orientation of the subjects was assessed in three ways. First, the Poulin Pictorial Motivational scale was administered. Secondly, a modified version of Harter's Pictorial Scale of Perceived Competence and Social Acceptance for Young Children was used. Thirdly, a questionnaire was answered by the teacher about each student regarding his/her motivational orientation, such as motivational in physical activity classes, concentration in classroom and their emotional level. In addition to the motivational orientations, the physical educator at the school rated each subject according to his/her physical ability.

The Poulin Pictorial Motivational Scale:

This scale was developed according to the procedures outlined previously to determine an individual's motivational orientation. This scale was designed for individuals having a mild intellectual disability.

The questionnaire was composed of twenty randomly, ordered pictures which reflected four types of motivation: intrinsic motivation (IM), extrinsic motivation/self-determined (EMSD), extrinsic motivation/non self-determined (EMNSD) and amotivation (AM).

Five questions were designed for each motivational type. As stated previously, these choices were made by two university

professors and the researcher based on their knowledge and experience in the sport domain and by working with this particular clientele. The following sentences are related with a particular picture illustrated in appendix A.

The questions from the PPMS include:

Intrinsic motivation:

A) Because it is fun.

B) Because it is exciting.

C) Because it is interesting.

D) Because it is pleasant.

E) Because I enjoy it.

Extrinsic motivation\self-determinated:

A) Because I have decided to become an athlete.

B) Because I decided to get in shape.

C) Because I feel that it is a good way to learn different things which can be useful in life.

D) Because sports is part of who I am.

E) Because I feel that it is a good way for me to meet people.

Extrinsic motivation\non self-determined:

A) To please my parents or my coach.

B) To receive rewards such as medals, trophees.

C) To receive a lot of attention from my teacher.

D) To be popular among my friends.

E) To show others I am good at sports.

Amotivation:

A) I wonder if I should quit.

B) But, I'm not very good.

C) I wonder, if it is worth it.

D) But, it is boring.

E) But, I'm not very successfull.

The French version was as follows:

Motivation intrinsèque:

A) Parce que c'est amusant.

B) Parce que c'est l'fun.

C) Parce que c'est intéressant.

D) Parce que c'est plaisant.

E) Parce que j'y prends plaisir.

Motivation extrinsèque auto-déterminée:

A) Parce que j'ai décidé de devenir un athlète.

B) Parce que j'ai décidé de me mettre en forme.

C) Parce que je sens que c'est une bonne façon d'apprendre differentes choses qui peuvent être utiles dans la vie.

D) Parce que le sport fait partie de moi-même.

E) Parce que c'est une bonne manière de rencontrer des gens.

Motivation extrinsèque non auto-determinee:

A) Pour faire plaisir a mes parents ou mon entraîneur.

B) Pour recevoir des récompenses comme des médailles et des trophés.

C) Pour recevoir de l'attention de la part de mon professeur.

D) Pour être populaire avec mes amis.

E) Pour démontrer aux autres que j'excelle dans les sports.

Amotivation:

A) Je me demande si je dois quitter.

B) Mais, je ne réussis pas très bien.

C) Je me demande si ça vaut la peine de continuer.

D) Mais, c'est ennuyant.

E) Mais, je ne suis pas bon/ne.

The PPMS was composed of twenty drawings. The twenty drawings were preceded by one main question: "I participate in sport...", which began each question refered to a particular picture.

Furthermore, two questions were asked prior to the PPMS, to prepare the subject to answer at the best of his/her ability. They were unrelated to the PPMS except for format. In this manner subjects were prepared for a picture, question and response (like me, little like me, unlike me). The actual order of presentation follows (see Appendix A).

The two pictures created for practice:

A) I watch television after school.

B) I listen to the radio often.

The PPMS questions:

1. To be popular among my friends.
2. I wonder if I should give up.
3. Because sports is part of who I am.
4. Because it is exciting.
5. But, I do not succeed very well
6. To please my parents or my coach.
7. Because I decided to get in shape.

8. Because it is pleasant.
9. Because it is fun.
10. To receive a lot of attention from my teacher.
11. Because I feel that it is a good way for me to meet people.
12. I wonder, if it is worth it.
13. But, it is boring.
14. Because I feel that it is a good way to learn different things which can be useful in life.
15. To show others I am good at sports.
16. Because I enjoy it.
17. But, I am not very good.
18. To receive rewards such as medals, trophees.
19. Because I have decided to become an athlete.
20. Because it is interesting.

(Appendix A for the french version)

The subjects had three answers from which to chose. The three choices were like me, little like me and unlike me. These answers were scored: 1, for like me; 2, for little like me; 3, for unlike me. These subjects were asked to show the appropriate answer.

Harter's questionnaire:

When the main questionnaire was completed the student was asked to answer a part of Harter's questionnaire. This part consisted of four sets of pictures regarding how the subject perceived him/herself in physical activity. The first set showed a person dribbling a ball effectively, and another a person having difficulty. Under the picture of the effective dribbler, two choices were offered with their corresponding scores: 4. really good at (the activity); 3. pretty good. Under the picture not very good, there were two choices available: 2. sort of good; 1. not very good. (Appendix B). The second set of pictures shows a person throwing a ball well and not very well. The third set shows a person running fast and not very fast. The fourth set is a person climbing well and a person who can not climb. These set of pictures had the same responses. These pictures were chosen by Harter (Harter personal communication, April 1991), according to her expertise regarding this clientele.

Teachers' Questionnaire:

The Teachers' Questionnaire was composed of fifteen questions which were divided in three groups of five, regarding the pupils' motivation toward physical activity. The first group related to student's interest toward physical activity; whether he or she found it fun, a favorite subject, interesting, principal hobby, or

pleasant. The second group related to student's behavior in physical education; whether the student listens to the teacher, day-dreamed often, arrives on time, participates well, or does not follow orders. The third group related to the student's emotions toward physical activity; whether he/she feels emotions toward physical activity; whether he/she feels happy, good, elated, excited and content (Appendix C includes the specific questions). All questions were written with a positive statement, except for two questions in the second set, where these questions were written with a negative statement. Because of this difference, question number two and five of the second set, were recoded for statistical purposes.

The scores ranged from one to five (1, not at all; 2, rarely; 3, sometimes/little bit; 4, well/most of the time; 5, very well/ all the time). Two teachers were asked to answer these forms to the best of their knowledge regarding the motivation of each specific students. (Appendix C).

Physical Educator's Rating Scale:

The Physical Educator's Rating scale was designed to measure the student's ability level in the physical education class. The scale was composed of only one score, ranging from one to twenty. One meant very very poor, five poor, ten average, fifteen good and twenty excellent. (Appendix D).

Procedures

A pilot study was conducted with ten adults with an intellectual disability in order to determine the understanding and flexibility of the PPMS. The subjects were ten French Canadians recruited from a Centre D'accueil. These subjects were engaged in a hebdomadal floor hockey game for several years. This pilot study was held in a closed room near the gymnasium where the subjects played. One-by-one the subjects were asked to come into the room and to answer the questions. This first pilot study was done with a dichotomous answer format; yes (like me) or no (unlike me). Results revealed that these subjects were very intrinsically motivated towards sport but the comprehension of the amotivation pictures suggested rephrasing and simplification was in order to assure better understanding among younger subjects.

A second pilot study was conducted after several modifications to the PPMS. These modifications resulted from the experience of the previous pilot study and from suggestions made at the thesis proposal. The major change included the addition of a third choice as an answer (little like me) to facilitate statistical analysis of the study. The need for the second pilot study was necessary to ensure that this population could make a decision between three choices of answers and to determine whether other changes to the scale facilitated comprehension.

The second pilot study was conducted two weeks after the first study at the same place and with the same population. Seven adults

answered the new scale, four of whom did not answer the questionnaire on the first occasion. Furthermore, this new version of the scale was administered the next day to five students from the school where the main study was conducted. It was important to assure that younger individuals would understand the questions and the concepts of the PPMS, as well as adults. Results indicated that the scale was comprehensible for all subjects and discriminated among motivational types.

Permission to conduct the main study at Joliette was first obtained from one experienced staff member who presented the study at a staff meeting. No objections were raised and all staff and principal promised their total support. This main study was was scheduled to start in late spring, 1991.

Through staff members, data on each student's academic ability were obtained but the experimenter only dealt with subjects by number thus ensuring the subject's anonymity (only teachers knew the names of the subjects).

The protocol for the testing was identical for all subjects. The subjects were introduced to the project in their classroom by a staff member and were dismissed individually from the class. All scales were completed in a separate room. The subject was introduced to the researcher and left together to conduct the experiment. The experiment was conducted in a closed room containing two chairs and one table. Both researcher and subject were seated while answering the questions. The testing began by a simple explanation on the study's nature and the reason why the study was conducted

(Appendix E for details). As an example "Thank you for helping me with my school's project. My project is sport related and its purpose is to find out why students in general participate in sports". The researcher asked the subject if there were any questions; if not, the experimenter explained the protocol of testing. Before starting the questionnaire, the experimenter practiced the concept "like me", "little like me" and "unlike me", with the two pictures designed for this purpose. Once it was clear that the subject understood the concepts, the PPMS was administered.

The researcher read the sentence clearly, once, while the subject looked at the picture and concentrated on both the picture and the sentence. After five seconds, the subject was asked to show the appropriate response, or if he/she felt more comfortable, to verbalize the answer. Only one answer was accepted. If needed, the reading of the sentence was repeated once. When the PPMS was finished, the subject was asked to answer Harter's questionnaire which consisted of four other questions regarding his/her perceived competence in physical skill. Upon completion of the testing the subject was asked for feedback on how he/she liked participating in the study and was thanked for his/her cooperation.

Two staff members were asked to answer the Teachers' questionnaire about a particular pupil. The staff member was asked to provide his/her first overall impression that comes immediately to mind. The physical educator answered the

rating scale for each single individual.

The PPMS was readministered one week later, following the initial testing to establish temporal stability of the PPMS. The testing took place in the same room with twenty-one subjects, selected randomly from the ability groups. The same protocol as in the first testing was followed for all the tests.

Treatment of the Data

The present study used descriptive and inferential statistics. The data were analyzed to assess: (1) subject's characteristics; (2) the temporal and internal reliability; (3) the study's validity.

It was important to determine if academic characteristics of subjects had to be considered. Three analyses of variance were performed to analyse effects among groups according to age and academic ability. Two, one-way analyses of variance were performed to determine differences among the three age groups related to the motivational orientation measured by the PPMS and to determine differences among the three academic ability groups on the PPMS. A two-way analysis of variance was performed to determine any interaction among age and ability levels related to PPMS, but only with two age and ability levels since there were some cells of too few subjects in the complete 3 x 3 design. A t-test was also performed to compare gender differences.

Two measures of reliability were assessed. The temporal

stability of the PPMS was determined by a test-retest intraclass correlation formula. Secondly, Cronbach alpha was determined to establish the PPMS's internal consistency reliability (Cronbach, 1951).

To validate the PPMS, Pearson-Product moment correlations were calculated among the four subscales of the PPMS to determine if the results obtained corresponded with the Cognitive Evaluation Theory and other scales (Brière, 1991; Vallerand & O'Connor, 1990; Vallerand, et al., 1989). Also Spearman correlation analyses was used to determine the construct validity of the PPMS by correlating the consequence of Harter's questionnaire, the Physical Educator's and the Teachers' questionnaire related with the PPMS. Spearman correlation analyses were used in this phase because the data were ordinal.

Chapter 4

Results and Discussions

The purpose of this research was to develop and validate a pictorial motivational scale in physical activity for individuals having a mild intellectual disability. Of particular interest was the measurement of different motivational aspects such as intrinsic (IM), extrinsic\self-determined (EMSD), extrinsic\ non self-determined (EMSD), amotivation (AM). This chapter will be divided into three sections (1) Subjects' characteristics (2) Reliability (3) Validation.

Subjects' Characteristics:

Two one-way analyses of variance with post hoc tests (Scheffé) were conducted to determine if there were differences between age and academic ability. Individuals with an intellectual disability must not be considered as an homogenious group and may display differences among mental ability levels (Hoover & Wade, 1985; Silon & Harter, 1985). Even though the school was designed for a relatively narrow range of persons with an intellectual disability, the youngsters were designated as low, average or high in academic ability. Furthermore, older individuals should be more

aware of their self-perception than younger individuals (Harter, 1978). According to Haywood and Switzky (1985) intrinsic motivational orientation is a function of both chronological age and increasing mental age. Also, according to Harter (1978), the tendency of individuals with an intellectual disability to give socially desirable responses decreases with age.

In their school, the subjects were divided according to grade and academic ability. To facilitate analyses, subjects were regrouped by age (12-13, 14-15, 16-18) and three basic academic abilities. They original consisted of one group of secondary one, lower skilled; one group of secondary one, higher skilled; one group of secondary two; one group of secondary three, lower skilled; one group of secondary three, moderately skilled; one group of secondary three, highly skilled.

The first one-way analysis of variance, determined effects among age groups according to each of the four variables of the PPMS, Harter's test, Physical Educator rating and the Teachers' questionnaire. The results described in Table 1 revealed that there were no significance difference among age groups at a .05 level related to the PPMS and other scales, except for Harter's scale which revealed a significant main effect across age. However, the Scheffé post hoc analyses indicated no significant difference.

The second one-way anova evaluated differences among the three academic ability groups for the various motivational variables.

Results revealed no significant differences between academic ability levels related to the PPMS motivational variables but a significant difference occured with the Physical Educator's rating scale (Table 2). Scheffé post hoc analyses indicated no signicant difference. For further analysis all different groups will be taken as a homogenous group.

The third analysis was a two-way analysis of variance to determine effects among age and ability related to the various motivational variables. Due to the limited number of subjects in the second age category and the mixture of academic ability levels in one of the school's age groups, the age level was recoded in two groups of 12-13 or 16-18 and the academic ability levels were restricted to two groups, low and high.

The results revealed in Tables 15 to 23 (Appendix F) show a significant differences among some motivational variables. The first motivational variable reported to have a significant main effect with students'age group was EMSD $F(1,36)= 5.82$, $p < .05$ is shown in Table 16. These results supported the results from Silon and Harter (1985) that younger children with a mental age of eight and less do not have the cognitive ability to make judgements about their self-worth. One can hypothesize that the younger students from this study, were on the bordeline of having a mental age of eight.

The second significant difference from the two-way anova (ability x age) with the Physical Educator's rating as the

Table 1

Comparison of age and motivational variables: one-way analyses of variance.

Motivational variables	Age (years) 12-13		14-15		16-18		F	P
	M	S.D.	M	S.D	M	S.D.		
IM	5.85	1.53	6.90	2.87	6.96	3.03	1.20	.307
EMSD	6.00	1.21	7.81	3.21	7.74	3.01	3.07	.053
EMNSD	8.70	3.27	8.36	2.87	9.19	3.22	0.32	.723
AM	11.00	1.97	10.72	1.73	10.19	1.81	1.21	.305
Harter	12.10	2.46	11.72	2.14	10.45	2.27	3.40	.040*
Phy.Ed.	12.55	4.68	14.00	4.71	13.83	3.44	0.71	.492
Qset1	15.20	4.08	16.63	5.23	14.51	4.17	0.97	.384
Qset2	18.78	3.02	19.68	2.57	20.00	2.16	0.86	.428
Qset3	15.15	3.23	17.46	4.69	14.58	4.80	1.78	.176

* Denotes age groups significantly different at the .05 level.

IM: intrinsic motivation, EMSD: extrinsic motivation/self-determined EMSD: extrinsic motivation/non self-determined, AM: amotivation, Phy.ED.: Physical Educator's rating, Qset1: Teachers'questionnaire set one, Qset2: Teachers' questionnaire set two, Qset3: Teachers'questionnaire set three.

Table 2

Comparison of ability and motivational variables: one-way analyses of variance.

Motivational variables	Academic ability levels						F	P
	Low		Average		High			
	M	SD	M	SD	M	SD		
IM	6.31	2.98	6.38	2.15	7.18	2.78	0.43	.649
EMSD	6.94	3.22	6.90	1.84	7.54	2.80	0.24	.787
EMNSD	8.15	3.13	9.80	3.18	8.90	3.36	1.33	.273
AM	8.00	1.66	8.85	1.74	7.90	1.44	1.79	.176
Harter	10.68	3.16	11.90	2.09	10.27	1.10	2.09	.134
Phy.Ed.	11.52	4.36	14.38	3.90	14.45	2.16	3.41	.040*
Qset1	14.47	4.65	15.14	4.05	14.63	3.50	0.13	.873
Qset2	18.78	3.02	19.47	2.37	20.36	2.50	1.22	.302
Qset3	14.00	4.26	15.76	4.21	14.36	4.22	0.93	.398

* Denotes ability of groups significantly different at the .05 level.

dependent variable is shown in Table 20 (Appendix F) and depicted in Figure 1. There was a significant main effect for ability $F(1,36) = 5.55$, $p < .05$, a two-way interactions between age and academic ability level was significant, $F(1,36) = 6.40$, $p < .05$. Scheffé post hoc analyses (Table 3) indicated a significant difference between group 3 (lower, 16-18) and group 4 (higher, 16-18) related to the Physical Educator's rating. This interaction revealed that the younger lower functioning students were more highly perceived by the physical educator than were the older lower functioning students yet the opposite was true for the higher functioning students. One can hypothesize that these results may be due to the number of years the physical educator knew the students, the longer someone knows a person, more accurate a rating can be. These results revealed and supported Silon and Harter (1985) statement, that the factor age makes a difference within this population.

Thirdly, results of the two-way anova (ability x age) with the Teacher's questionnaire set one as the dependent variable is shown in Table 21 and depicted in Figure 2. A two-way interaction was significant at $F(1,36) = 9.59$, $p < .01$. Scheffé post hoc analyses (Table 3) did not reported any significant difference within the interaction, due to the wider range in the standard deviations. The significant differences reported in the interaction related to the Teacher's questionnaire set one indicates that the younger lower functioning students were more highly perceived by the teachers than the lower functioning older

students, yet the opposite was true for the higher functioning students. The results of the Teachers' questionnaire set one are based on the teacher's perception of a particular student's feeling toward physical activity classes.

The results indicated a fourth interaction with Teachers' questionnaire set three as the dependent variable F (1.36)= 11.51, at p <.01, and the age x academic ability level see Table 23 and Figure 3. Scheffé post hoc analyses (Table 3) indicated a significant difference between group 3 (lower, 16-18) and group 4 (higher, 16-18) related to the Teachers' questionnaire set three. This interaction indicates that the younger lower functioning students were more highly perceived than the lower older students, yet the opposite is true for the higher functioning students.

Table 3

Post hoc analyses regarding interactions from 2 X 2 analyses of variance using Scheffe test.

Motivational variables	Main effect Age x Ability								F	P
	group1 12-13,low		group2 12-13,high		group3 16-18,low		group4 16-18,high			
	M	SD	M	SD	M	SD	M	SD	M	SD
Phy.Ed.	12.66	5.567	12.45	4.107	10.50	2.838	16.50	2.368	4.207	.0119
Qset 1	17.00	4.000	13.72	3.690	12.20	4.131	16.70	4.029	3.402	.0279
Qset 3	16.44	2.793	14.09	3.333	11.80	3.289	17.60	4.477	4.586	.0081

Figure 1

Interactions between age and academic ability level related to the scores means of the Physical Educator's rating.

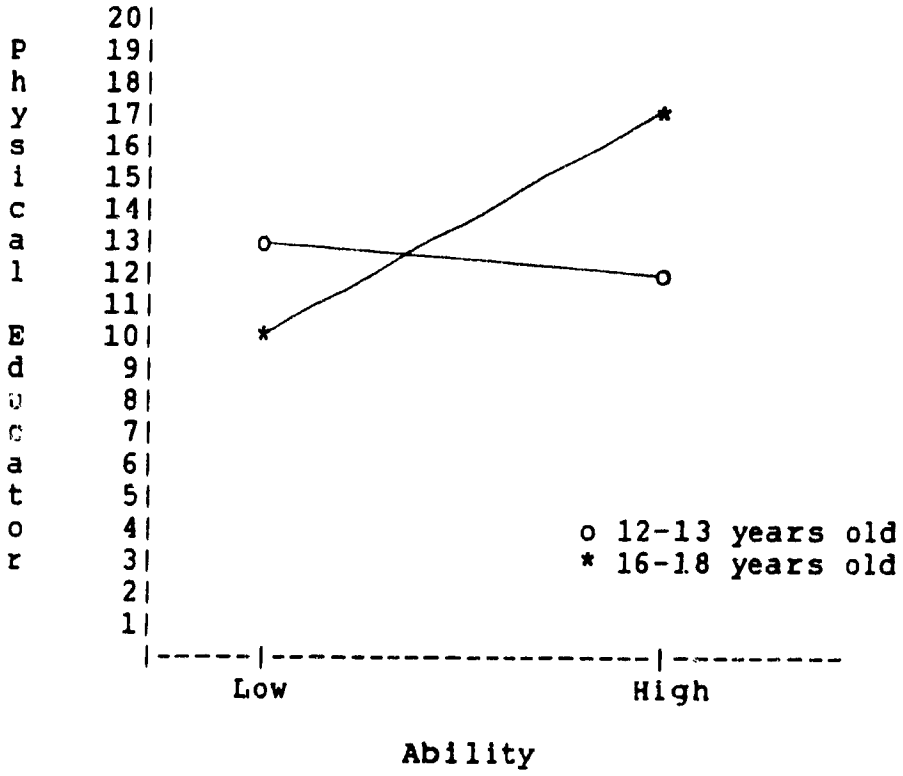


Figure 2

Interactions between student's age and academic ability level related to the Teachers' questionnaire set one.

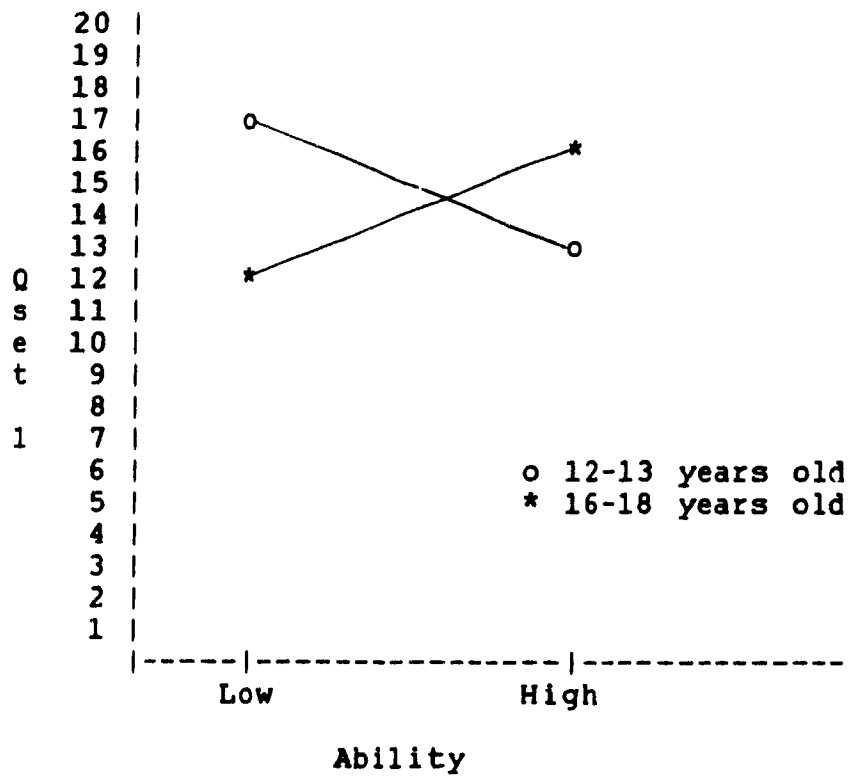
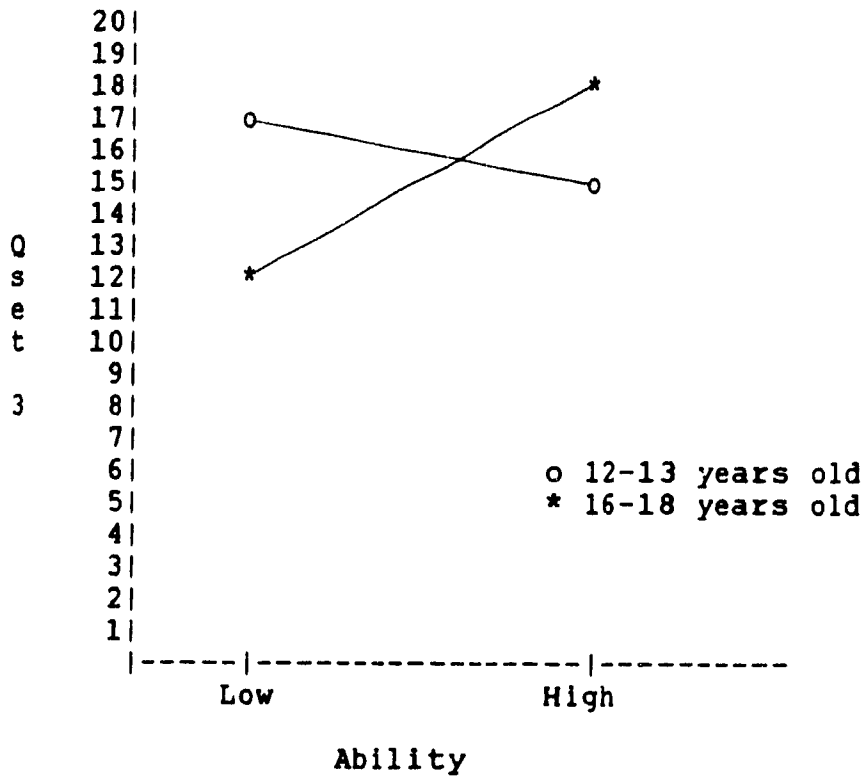


Figure 3

Interaction between students'age and academic ability level related to the Teacher's questionnaire set three.



A t-test was conducted to compare differences between genders. Previous research regarding individuals with an intellectual disability (Vallerand & Reid, 1988; Deci & Ryan, 1985; Vallerand, Deci & Ryan, 1987) demonstrated that females appear to be more intrinsically oriented and feel more controlled by positive feedback while males are more extrinsically oriented and are more likely to interpret verbal feedback as informational. Researchers in the field of persons with an intellectual disability have also argued that gender is an important variable to consider since males are more intrinsically oriented and females need more peer approval to be motivated (Alexander, Huganir & Zigler, 1985; Harter, 1978). Therefore, a t-test was conducted to see if there were any differences between genders. Table 4 shows no significant differences between genders on the PPMS motivational scale but shows a difference with Harter's scale. The significant difference in the Harter scale is probably due to the fact it has specific skills (dribbling, running, throwing and climbing) which are perceived as male rather than female activities. Due to their limited past experience, females with an intellectual disability may not have developed these skills as proficiently as did their male counterparts.

Due to the significant difference reported with Harter's scale between genders, they were considered separately in correlations analyses between Harter's scale and the other variables (Table 5). Spearmar correlations were used for the analysis because the study had ordinal data.

Table 4

Comparing differences between genders related to the motivational variables using T-test analysis.

Motivational variables	Genders				T value	P value
	Male (32)		Female (30)			
	M	S.D	M	S.D		
IM	6.18	2.02	7.03	3.12	-1.26	.215
EMSD	6.78	2.31	7.63	3.04	-1.24	.222
EMNSD	8.21	3.14	9.60	3.04	-1.76	.084
AM	10.78	1.79	10.30	1.93	1.02	.314
Harter	12.25	1.96	10.10	2.36	3.87	.000*
Phy.Ed.	13.68	4.35	13.20	3.83	0.47	.641
Qset1	16.06	4.21	14.10	4.32	1.81	.076
Qset2	19.21	2.75	19.46	2.92	- .34	.733
Qset3	15.93	3.99	14.56	4.75	1.22	.226

* Denotes groups significantly different at the .05 level.

Table 5

Correlations analyses between Harter's scale and motivational variables using Spearman correlational coefficients.

	Harter	
	Males	Females
IM	.3845*	.0458
EMSD	.4948*	.1630
EMNSD	.4014	.0112
AM	-.1105	-.3489
Phy.Ed.	-.1370	-.2637
Qset1	-.1181	-.2545
Qset2	-.0133	-.2135
Qset3	-.0210	-.1000

* Significant at .05

The results from Table 5 showed that relationships with Harter's scale and PPMS's subscales, IM and EMSD, were greater for males than females.

Reliability

The reliability of the Poulin Pictorial Motivational Scale was determined with a test-retest to see its temporal stability and with the Cronbach alpha coefficient to see its internal consistency.

It was part of the hypothesis to construct an instrument that was stable over time. An intraclass correlation coefficient was determined with an analysis of variance using the formula:

$$R = \frac{\text{MS subjects} - \text{MS interaction}}{\text{MS subjects}}$$

The values of each scale are for the 21 subjects included in the retest and are shown in Table 6. These results revealed temporal stability correlations ranging from .60 to .94.

The PPMS's internal consistency was assessed by Cronbach alpha. The values of each scale are represented in Table 7. Three of the subscales of the PPMS are very high, between .77 and .85. The AM subscale was .53. The other measurements scales showed very high values, between .96 to .66. In general the values are very satisfactory.

Table 6

Reliability tests for the PPMS

temporal stability, test-retest.

	Intraclass
IM	.777
EMSD	.875
EMNSD	.944
AM	.608
Harter	.893
Qset1	.869
Qset2	.862
Qset3	.808

To improve the PPMS internal consistency, reliability analyses were done to determine how a specific picture contributed to the consistency.

Table 7

Cronbach alpha reliability test for PPMS internal consistency

Scales	Alpha
IM	.85
EMSD	.77
EMNSD	.78
AM	.53 (.57)*
Harter	.66
Phy.Ed.	.90
Qset1	.89
Qset2	.75
Qset3	.96

* Alpha with 4 pictures

Table 8 shows the alphas when particular pictures are removed within each subscale. Because three of the subscales demonstrated a very high alpha the main concern in this analysis, was to see whether the amotivation subscale could be improved.

Table 8

Cronbach alpha reliability analyses of each pictures

Picture set	all	-#1	-#2	-#3	-#4	-#5
IM	.85	.82	.79	.84	.85	.80
EMSD	.77	.71	.71	.69	.75	.77
EMNSD	.78	.75	.74	.72	.75	.73
AM	.53	.48	.41	.57	.34	.53

By eliminating number three (which corresponded to number twelve in the scale setting) one can increase the internal consistency of the amotivation scale. Therefore, in subsequent analyses in this study, the amotivation subscale will include four pictures instead of five. In fact all amotivation scores previously tabulated represented a score with four pictures instead of five. This last step simply describes the decision process of eliminating a picture.

The internal consistency of the other measurements was also assessed by the same principle of elimination. The results for the Harter's scale and the Teachers' questionnaire are shown in Tables 9 and 10 respectively.

Table 9

Cronbach alpha reliability analysis for Harter's pictures.

Picture set	all	-#1	-#2	-#3	-#4
Harter	.66	.61	.52	.54	.68

Table 10

Cronbach alpha reliability analyses of the Teachers' questionnaire.

Questions set	all	-#1	-#2	-#3	-#4	-#5
Qset1	.89	.86	.85	.86	.89	.85
Qset2	.75	.67	.82	.70	.66	.68
Qset3	.96	.95	.95	.96	.96	.96

While the reliability of Qset2 shows a high alpha but the elimination of question improves it. Therefore, for further study, question number two of the Qset2 should be eliminated. However, it was not the purpose of this study to validate other instruments, thus no changes were made to these questions.

Validation

The PPMS's validity was determined by correlational analyses. Since Cognitive Evaluation Theory conceptualizes the four types of motivation to fall along a line of self-determination, one would expect that correlations are highest between adjacent types (e.g. AM and EMNSD) and lowest between the most extreme scores of the continuum (i.e. IM and AM). The results are in Table 11. The highest correlations were obtained between EMSD and EMNSD r=.63; and between IM and EMSD r=.47. Furthermore the lowest correlations were obtained with IM and AM, r= -.21. Therefore, in general, the correlation patterns supported the self-determined continuum going from IM to AM for this particular clientele in physical activity obtained in other domains (Vallerand & O'Connor, 1991; Vallerand, et al., 1989; Brière, 1991). Several reasons may explain these results. One, this particular clientele learn to respond quite early to extrinsic rather than intrinsic stimuli (Cohen, 1986), therefore being more attracted to the extrinsic pictures. Second, no previous research done with individuals having an intellectual disability has detailed motivation along

four types of motivation. In previous research (Haywood & Switzky, 1986) where the motivational orientation of these particular individuals is at issue, no one has delimitated their questionnaire in such detail that perhaps, what one calls EMSD is in reality used as IM in other research. Another factor may be that intellectually disabled individuals do not see much difference between the two types of extrinsic motivation. It is for this reason that the results revealed a higher correlation between the subscales of EMSD and EMNSD than between IM and EMSD.

Table 11

Relationship among subscales of the PPMS with a Pearson-Product moment correlation

Subscales	IM	EMSD	EMNSD	AM
IM	--	.47	.35	-.21
EMSD	--	--	.63	-.20
EMNSD	--	--	--	.02
AM				--

* p <.05

The results of the other correlations were moderate (i.e. IM and EMNSD, r= .35). Therefore in general the correlation pattern follows the continuum of self-determination. These results support the Cognitive Evaluation Theory of Deci and Ryan (1985a) in relation of the self-determination role within human motivation in addition to supporting the validity of this motivational scale.

Theoretically, the results of this thesis agreed with the Cognitive Evaluation Theory's hypothesis (Deci & Ryan, 1985a) regarding the implications of different types of motivation. According to Deci and Ryan, one's motivation toward an activity will vary as a function of feelings of self-determination and self-competence experienced during a particular activity. Events which can produce an increase or a decrease of one of these feelings, will lead to changes regarding intrinsic motivation, extrinsic motivation and amotivation. Results obtained between the perception obtained between the perception of self-determination and self-competence measured by three other scales and the different forms of motivation measured by the PPMS supported this hypothesis.

The correlations between the subscales of the PPMS and the Harter's scale were measures of construct validity. According to the Cognitive Evaluation Theory, events enhancing feelings of self-competence in a self-determined context should increase IM and EMSD. Results (Table 12) from the Harter's scale revealed that perceptions of self-competence were more positively correlated with IM and EMSD (r=.33) and negatively correlated with AM

(r=-.39) which means a high level of competency corresponds to a low level of AM. These results revealed that educable intellectually disabled individuals can determine their level of competency as well as non disabled individuals. Similarly, in the results of EMSD and EMNSD (r-.33) and (r=.30) these two results indicated that individuals with an intellectual disability do not make a strong distinction between the two types of extrinsic motivation (Vallerand, personal communication, September, 1991).

The correlations between the subscales of the PPMS and the Physical Educator's rating scale were also measures of construct validity. According to the Cognitive Evaluation Theory, persons high in ability are likely to be particularly motivated toward physical activity. As noted in Table 12, results are very similar among correlations and indicates that there is an agreement between perceptions of self-determination and self-competence of the subjects and the physical educator. In addition, these results bring more support in the PPMS validity, because the four motivational subscales of the PPMS are sensitive enough to be perceived similarly by the subject and the physical educator.

The correlations between the subscales of the PPMS and the Teachers' questionnaire was also a measure of construct validity. The results (Table 13) indicated similarity among the three sets and showed agreement between perceptions of the self-determination and self-competence of the subjects and the teachers. Positive correlations are related with IM and EMSD while negative

correlations are related to AM. These results bring additional support in the PPMS validity because the PPMS's four motivational subscales are sensitive enough to be perceived similarly by the subjects and the teachers.

Table 12

Relationship between Harter's scale and the PPMS and relationship between Physical Educator's rating and the PPMS: Pearson-Product moment correlation.

Subscales	Harter	Phy.Ed.
IM	.22	.07
EMSD	.33	-.01
EMNSD	.30	-.26
AM	-.39	-.34

The results obtained in this thesis in general, also support relationships between the functional aspect of an event and one's motivation (Deci & Ryan, 1985a). The results revealed that the perception of a controlling event is related positively with extrinsic motivation and the informational event is related

positively with intrinsic motivation and the amotivational event is related positively with amotivation. These results do not clearly define extrinsic motivations. More research has to be conducted with individuals having an intellectual disability to obtain more distinction among subscales.

Table 13

Relationship between the Teachers' questionnaire related to the PPMS and other scales: Pearson-Product moment correlation.

Subscales	Qset1	Qset2	Qset3
IM	.21	.15	.22
EMSD	.29	.15	.24
EMNSD	.18	.01	.11
AM	-.53	-.31	-.57
HARTER	-.25	-.03	-.12
Phy.Ed.	-.48	-.56	-.51
QSET1	--	-.67	-.84
QSET2	--	--	-.68
QSET3	--	--	--

Further analysis was done to see the number of subjects scoring high in IM (Table 14). Thirty four subjects scored a

perfect five in IM as compared to twenty one in EMSD, twelve in EMNSD, and zero for AM. These results support the Cognitive Evaluation Theory as whether individuals can demonstrate more than one type of motivation accordiny to the event referred to (Deci & Ryan, 1985a).

Table 14

Students' scoring on the PPMS.

Scores	PPMS subscales			
	IM	EMSD	EMNSD	AM
5.0	34	21	12	0
4.5	14	9	9	0
4.0	5	9	8	4
3.5	3	7	4	2
3.0	0	4	5	9
2.5	5	5	8	14
2.0	0	4	8	15
1.5	2	0	2	7
1.0	1	1	4	7
0.5	2	2	3	3
0.0	1	2	4	6

These results also supported Haywood and Switzky (1986) statement that individuals with an intellectual disability can be intrinsically oriented as well as individuals with no intellectual disability. They indicate, that individuals with an intellectual disability can determine very well their self-perception towards a particular subject.

Based on a strong theoretical background, results of this thesis illustrated the practicality of PPMS to study motivational orientation of exceptional individuals in physical activity. Even though individuals with a mild intellectual disability do not discriminate as well among extrinsic motivations as do individuals with no intellectual disability, with the PPMS these special individuals demonstrated that they can be knowledgeable about their self-competence and self-determination in a physical activity setting. To acquire further knowledge, the assessment of the PPMS should be promoted to achieve greater understanding of these people's motivation.

Chapter 5

Summary and Conclusions

The purpose of this research was to develop and validate a pictorial motivational scale in physical activity for people having a mild intellectual disability. To validate the motivational scale, correlations were conducted between the PPMS and Harter's pictures from a pictorial competency scale for young children (Silon & Harter, 1985), the Physical Educator's rating scale and by a Teachers' questionnaire. The results of these correlations support the validity of the PPMS. Also demonstrated was the internal consistency and the temporal reliability of the PPMS. This chapter is divided into five sections: 1) Summary of the methodology, 2) Summary of the findings, 3) Conclusions, 4) Implications/ Applications of this research, 5) Recommendations for further studies.

Summary of the methodology:

There are published scales to assess intrinsic motivation in sport (Weiss et al., 1985; McAuley et al., 1989) and related motivational constructs for intellectually disabled individuals (Kunca & Haywood, 1969; Silon & Harter, 1985). However, there are no motivational scales of persons with an intellectual disability in

a sports setting which considers intrinsic motivation, extrinsic motivation and amotivation. The Poulin Pictorial Motivational Scale was designed to fill this void. The PPMS measures four types of motivation (intrinsic motivation (IM), extrinsic motivation/self-determined (EMSD), extrinsic motivation/non self-determined (EMNSD) and amotivation (AM)) and it is composed of twenty randomly, ordered pictures from which five questions were designed for each motivational type.

In the PPMS's development, seven parts were necessary to create the final product. Part one consisted of familiarization with the Cognitive Evaluaion Theory of Deci and Ryan (1985a) and some of the scales used in sports, with children and with individuals having an intellectual disability. The second part consisted of gathering information on scale format used to assess individuals with an intellectual disability. Part three was used to formulate statements in sport for each motivational type regarding a person having an intellectual disability. The next step, part four, was the elaboration of the drawings by an artist based on specific criteria. From a pool of sixty-four pictures and sentences, part five refered to the selection of the thirty mixed best pictures and sentences as best representing the theoretical constructs of the Cognitive Evaluation Theory. The sixth phase was to finalize the twenty most suitable pictures based on an elderly scale (Vallerand & O'Connor, 1990) and to add a second questionnaire (Harter & Pike, 1984) for students to measure their perception of self-competence in some physical skills. To assure consistency in

the study, translation to English to French and French to English by professionals was done. Finally, after a thorough presentation the last part, seven, included moderate changes to improve the PPMS. Such changes included adding a fourth picture to Harter's scale, improving the format of the Teachers' questionnaire and some of the PPMS's picture.

The Cognitive Evaluation Theory explains changes in intrinsic motivation and is formulated in terms of the functional significance of events for one's intrinsic need for competence and self-determination (Vallerand, Deci & Ryan, 1987). It suggests that two processes can be responsible for changes in IM, the perceived locus of causality process and the perceived competence process.

According to Cognitive Evaluation Theory, IM varies as a function of perceptions and feelings of self-determination, therefore persons high in ability are likely to be particularly intrinsically motivated in that particular area. To see if the results obtained from another scale support the self-determination theory of Deci and Ryan (1985a), three other scales were added to assess the validity of the PPMS.

Sixty-two students from the Thérèse-Martin high school in Joliette answered the twenty questions of the PPMS and the Harter's scale. A physical educator and two teachers answered their questionnaire. Twenty-one subjects participated a week later for a retest of PPMS and Harter's scale. In addition, the physical educator and the teachers followed the same procedures with regard to the twenty-one students.

Summary of the findings

The data of the present study were analyzed to assess the subject's characteristics, the scale's temporal and internal reliability and its validity.

Analyses of variance were performed to analyse any effects among groups according to age and academic ability. Two one-way analyses of variance with post hoc tests (Scheffé) were conducted to determine any differences between age and academic ability. Results revealed no significant difference among groups. Therefore, for subsequent analysis all different groups were regarded as a homogenous group. A two-way anova was performed to determine interaction effects among age and ability related to the various motivational variables. Results revealed some significant differences among various motivational variables. EMSD was the first motivational variable to have a significant main effect with students' age group. These results supported the results from Silon and Harter's study (1985) that younger children with a mental age less than eight, do not have the cognitive ability to make self-worth judgements. From the perspective of this study, one can hypothesize that the younger subjects were on the bordeline of having a mental age of eight whereas older subjects demonstrated more knowledge about their self-worth.

The second significant difference appeared with the Physical Educator's rating as the dependent variable. Results showed a significant main effect for ability and a two-way interaction

between age and academic ability level. Post hoc analyses indicated a significant difference between older lower functioning subjects and older higher functioning. The physical educator's perception was higher toward the older higher functioning subjects than the older lower functioning ones, and the opposite was true with the younger subject groups.

A third significant interaction was reported from the two-way anova (ability x age) with the Teachers' questionnaire set one as the dependent variable. This interaction indicated that younger lower functioning were more highly perceived by the teacher than the lower functioning older student, yet the opposite was true for the higher functioning subjects.

The results indicated a fourth interaction of the two-way anova (ability x age) with Teacher's questionnaire set three as the dependent variable. Post hoc analyses indicated a significant difference between older lower functioning subject and the older higher functioning. The results revealed that perceived the younger lower functioning students were more highly perceived than the lower older students.

A t-test was conducted to compare differences between genders. Results revealed no significant differences between gender on the PPMS but showed a significant difference with Harter's scale. Spearman correlations were used to conduct further analysis. Results supported previous literature as whether males displayed a higher IM orientation than did females subjects.

To determine the PPMS reliability, a test-retest was used to analyse its temporal stability and Cronbach alpha coefficient to analyse its internal consistency. Results revealed that the PPMS had a high temporal stability and internal consistency. Other reliability analyses were done to determine how a specific picture contributed to the scale's consistency and particularly whether the amotivation subscale could be improved.

The PPMS's validity was determined by Pearson Product moment correlations. Since Cognitive Evaluation Theory conceptualize the four types of motivation to fall along a line of self-determination, one would expect that correlation are highest between adjacent types and lowest between the most extreme scores of the continuum. Results revealed that the highest correlations were obtained between EMSD and EMNSD, and between IM and EMSD. Furthermore the lowest correlations were obtained with IM and AM.

Several correlations between the subscales of the PPMS and the three other scales used in this study were measures of construct validity. Results from the Harter's scale revealed a positive correlation with IM and EMSD and a negative correlation with AM. This indicates a high level of competency corresponds to a low level of AM which confirms that these special individuals can determine their level of competency. Results from the Physical Educator's rating scale and the PPMS's subscales indicated an agreement between the subject's self-perception/ self-competence and the physical educator's perception. Further results obtained with the Teachers' questionnaire indicated similarity among the three sets and showed

agreement between subjects and teachers' perceptions. In general, the correlation patterns supported the self-determined continuum going from IM to AM for this particular clientele.

Theoretically, the results of this thesis agreed with the Cognitive Evaluation Theory regarding the implications of different types of motivation and events which enhanced feelings of self-competence in a self-determined context and the functional aspect of an event with one's motivation. Furthermore, these results demonstrated that individuals with an intellectual disability can be intrinsically oriented and can determine their self-perception toward a particular subject and can demonstrate different kinds of motivation toward a same domain.

Conclusion:

The purpose of this study was to develop and validate a pictorial motivational scale which measured the intrinsic, extrinsic and amotivation in physical activity for people having a mild intellectual disability. The Poulin Pictorial Motivational Scale (PPMS) was determined to be reliable and valid.

The results gathered with this study suggested that it is possible to study motivation in physical activity for individuals having a mild intellectual disability. However, because the results obtained with this scale must be considered as the beginning of the work to validate this instrument. Further research must follow

Implication/application:

Based upon the findings of this study and within the limitations of the design, the Poulin Pictorial Motivational Scale is a good instrument to improve assessment in physical activity with this population. The main implication is that professionals now have an instrument that may facilitate greater understanding of persons with an intellectual disability. In this manner one can provide programs that better meet their needs. Also professionals want to increase IM to facilitate the development of autonomy and the necessary motivation to help them go through failure experiences with renewed energy to grow and to develop.

Recommendations for further studies:

1. The pictorial motivational scale could be repeated with other subjects who vary more widely on measures of IQ, or from other backgrounds to see if results are consistant.

2. The amotivation subscale might be improved by reviewing the pictures or the sentences separately.

3. The same study could be done without the use of pictures to see how strongly the pictures contribute to the understanding of the scale by individuals having a mild intellectual disability.

4. Some of the sentences in the PPMS had socially desirable responses which might not reflect the true opinion or belief, for example, I participate in physical activity to be in shape. Therefore another study which eliminated such question would be interesting.

5. The PPMS permits a researcher to determine the primary motivational orientation toward physical activity for individual with an intellectual disability. Future research can now evaluate the myriad of potential factors which influence and cause this orientation to emerge.

6. Since the PPMS has been validated with individuals with an intellectual disability, it would be desirable to assess its validity with other groups, for example, those with cerebral palsy.

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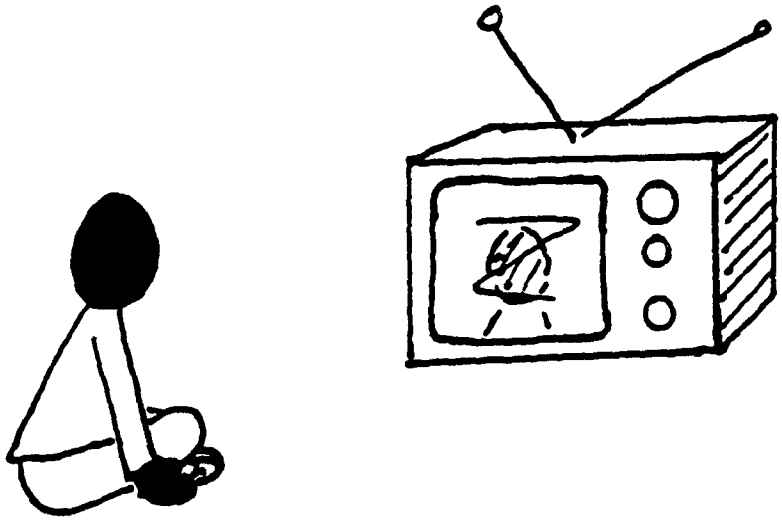
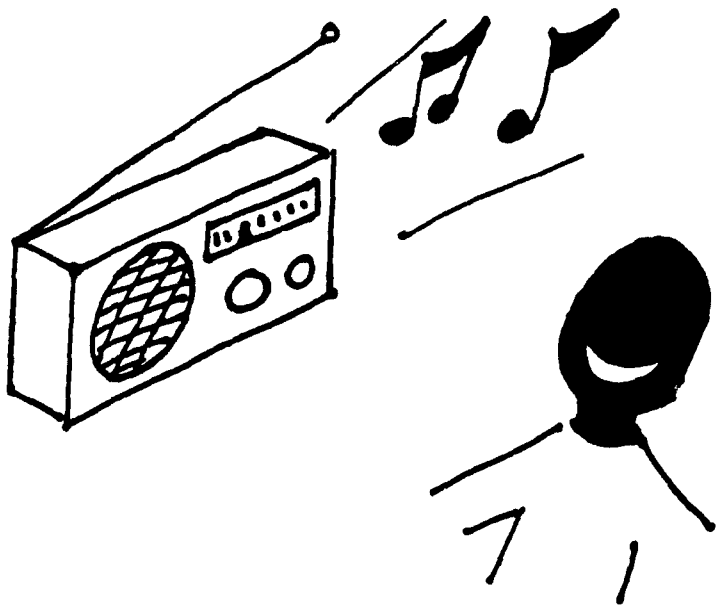
Appendix A

Page

Pictures for practice



JE REGARDE LA TÉLÉVISION
APRÈS L'ÉCOLE.



J'ÉCOUTE SOUVENT LA RADIO.

Choices of answers

COMME MOI

UN PEU
COMME MOI

PAS COMME MOI

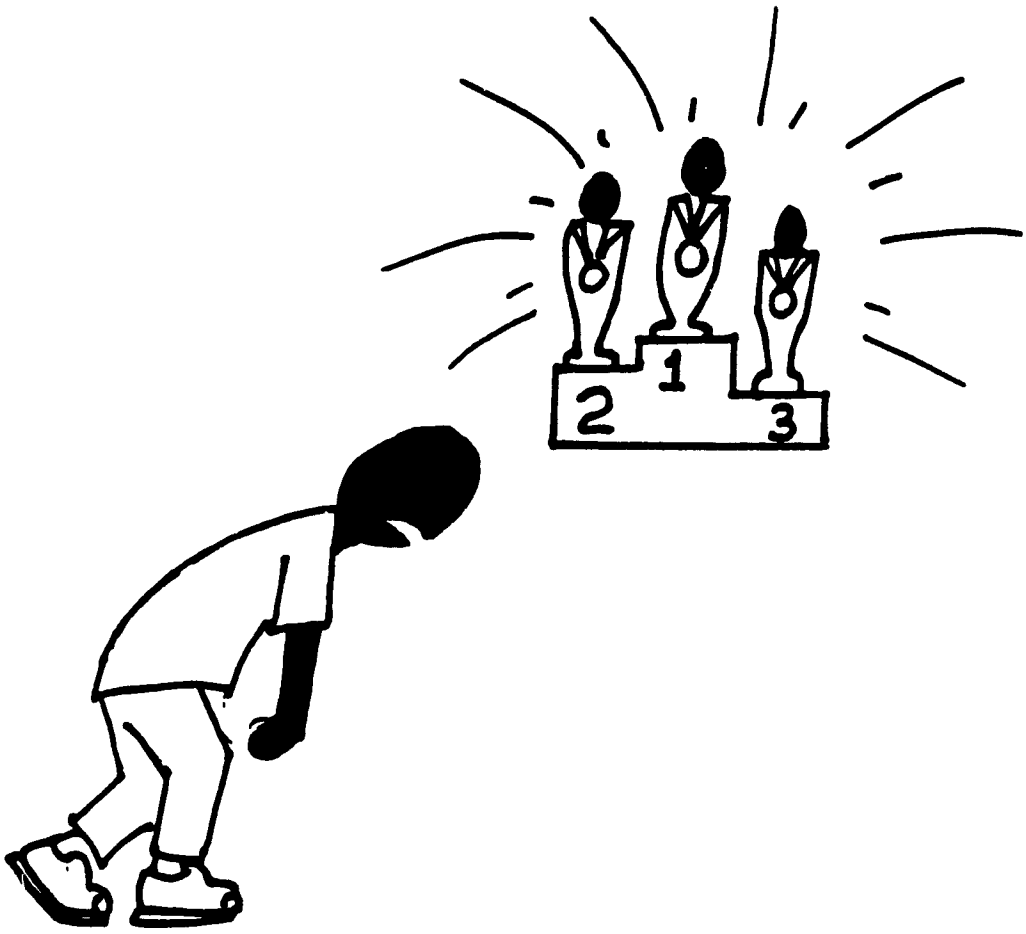
Beginning sentence

JE FAIS DU SPORT

The French version of the PPMS

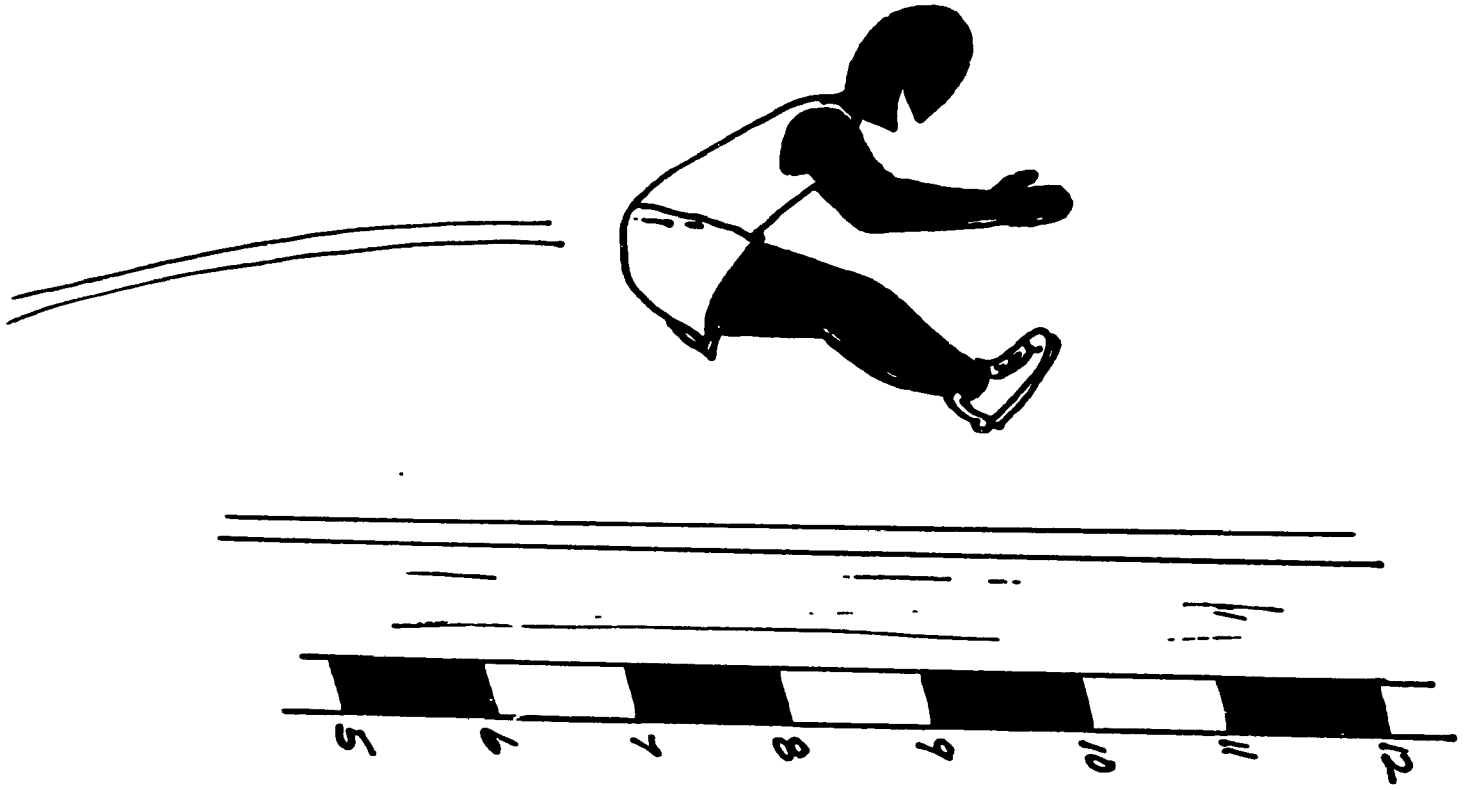
in testing order

POUR ÊTRE POPULAIRE AVEC MES AMIS.



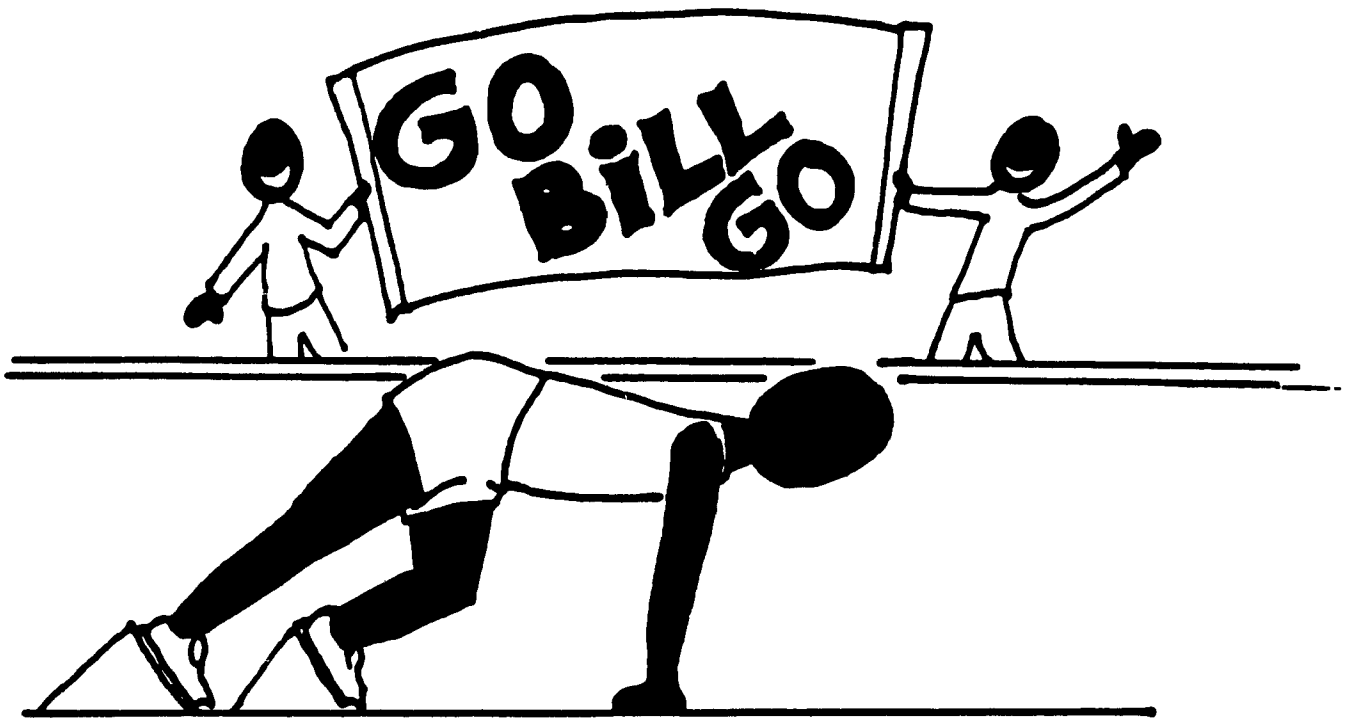
JE ME DEMANDE SI JE DOIS QUITTER.

PARCE QUE LE SPORT FAIT PARTIE DE MOI-MÊME.



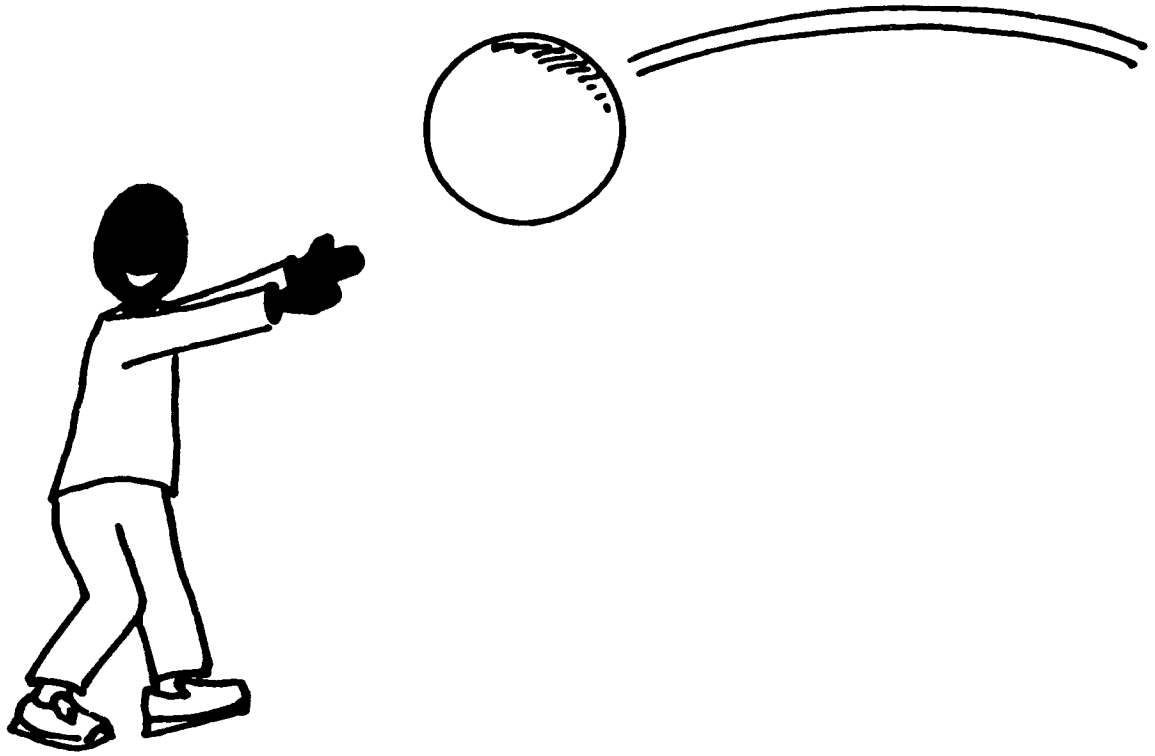
PARCE QUE C'EST AMUSANT.

MAIS, JE NE RÉUSSIS PAS TRÈS BIEN

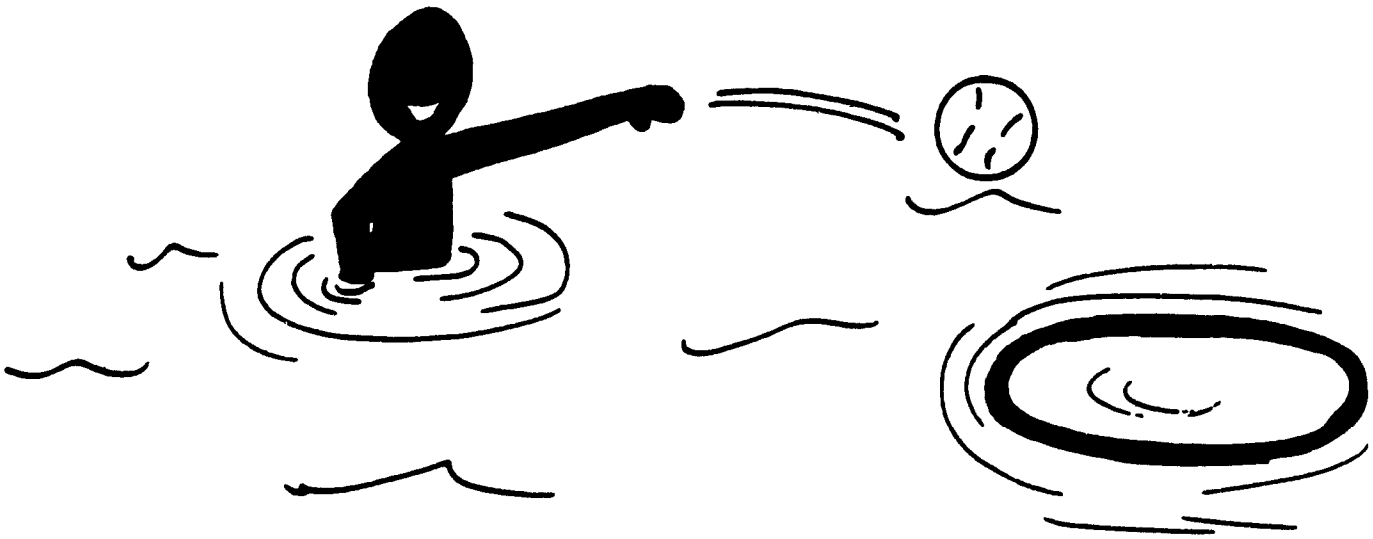


POUR FAIRE PLAISIR À MES PARENTS OU MON ENTRAÎNEUR.

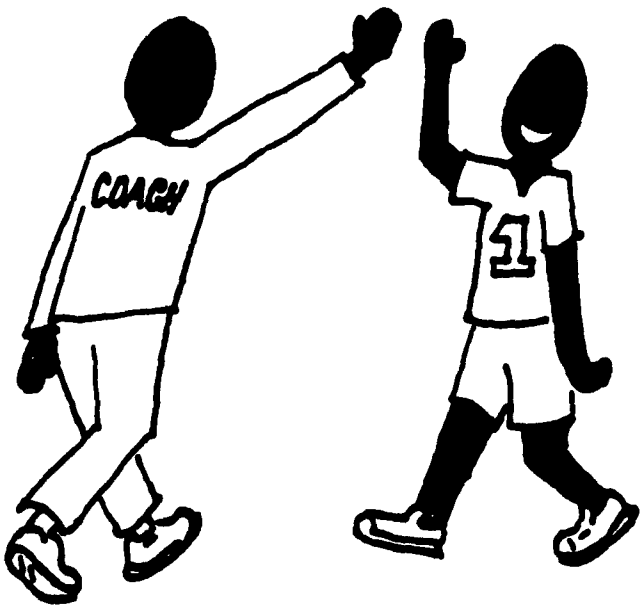
PARCE QUE J'AI DÉCIDÉ DE ME METTRE EN FORME.



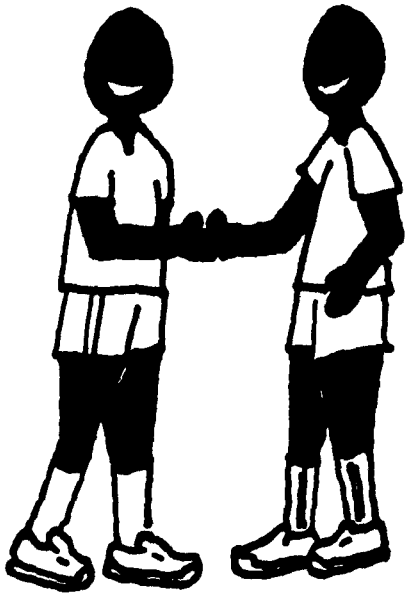
PARCE QUE C'EST PLAISANT.



PARCE QUE C'EST L'FUN.

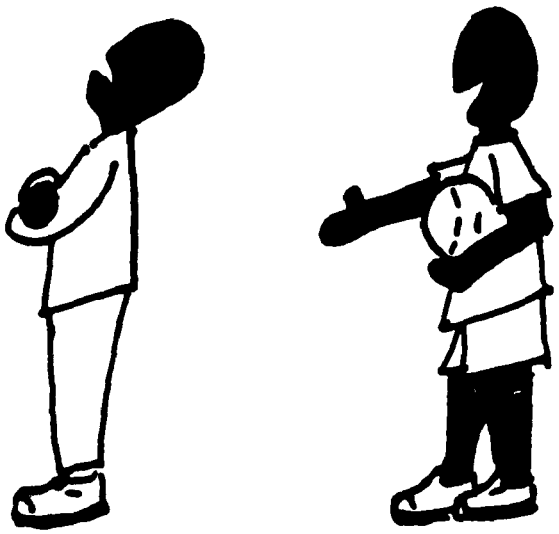


POUR RECEVOIR DE L'ATTENTION DE LA PART DE MON PROF-FESSEUR.

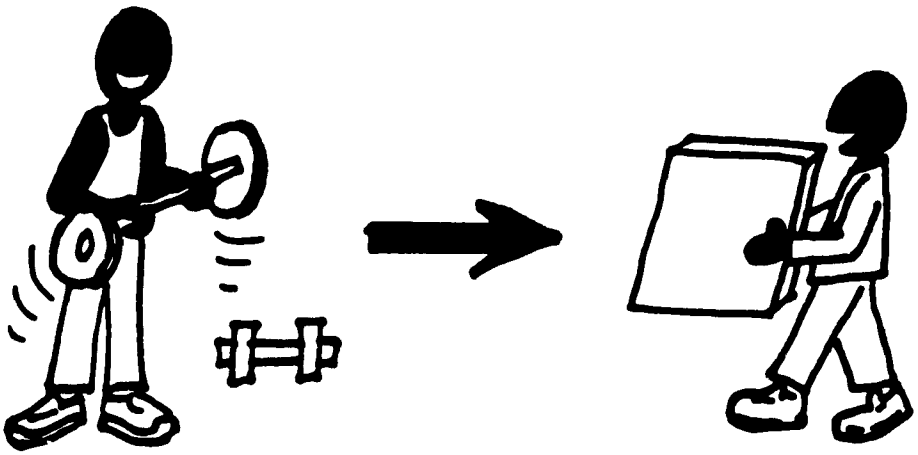


PARCE QUE C'EST UNE BONNE MANIÈRE DE RENCONTRER DES GENS.

JE ME DEMANDE SI ÇA VAUT LA PEINE DE CONTINUER.



MAIS, C'EST ENNUYANT.

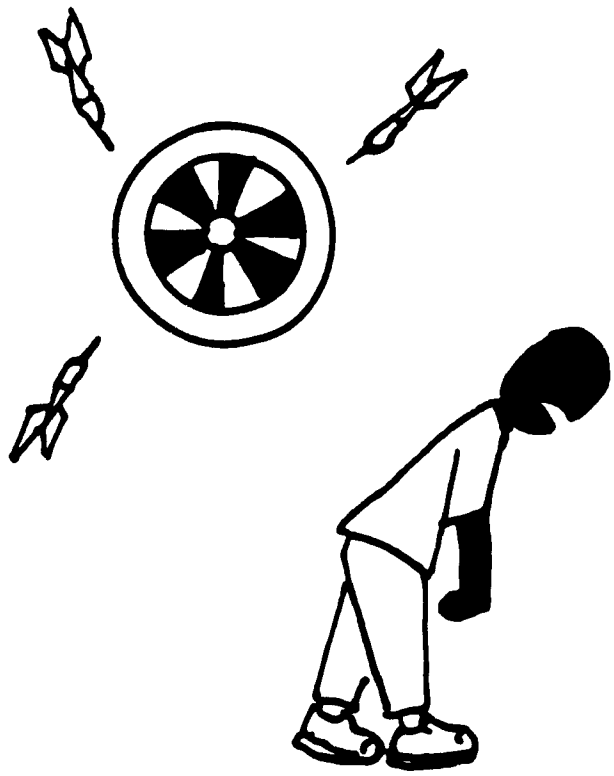


PARCE QUE JE PENSE QUE C'EST UNE BONNE FAÇON D'APPRENDRE DIFFÉRENTES CHOSES QUI PEUVENT ÊTRE UTILES DANS LA VIE.

POUR DÉMONTRER AUX AUTRES

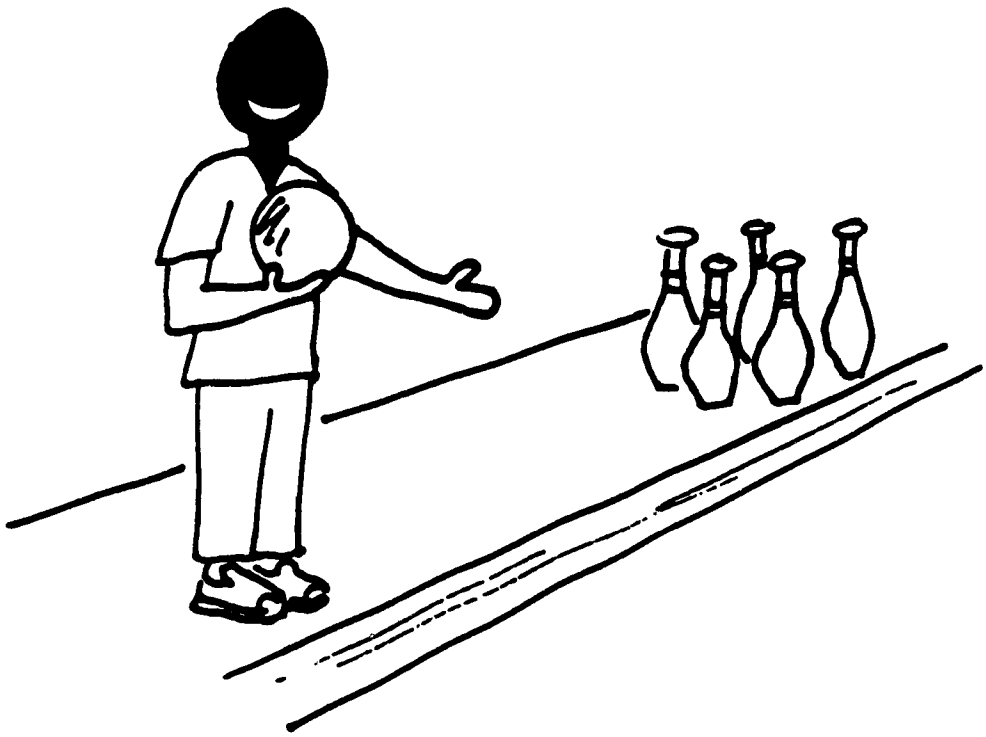
QUE J'EXCELLE DANS LES SPORTS.

PARCE QUE J'Y PRENDS PLAISIR.

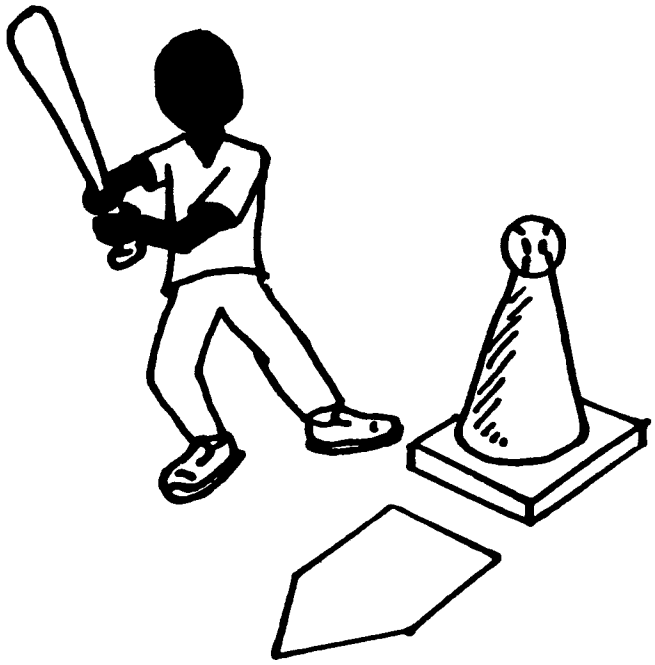


MAIS, JE NE SUIS PAS BON.

POUR RECEVOIR DES RÉCOMPENSES COMME DES MÉDAILLES ET DES DES TROPHÉS.



PARCE QUE J'AI DÉCIDÉ DE DEVENIR UN ATHLÈTE.



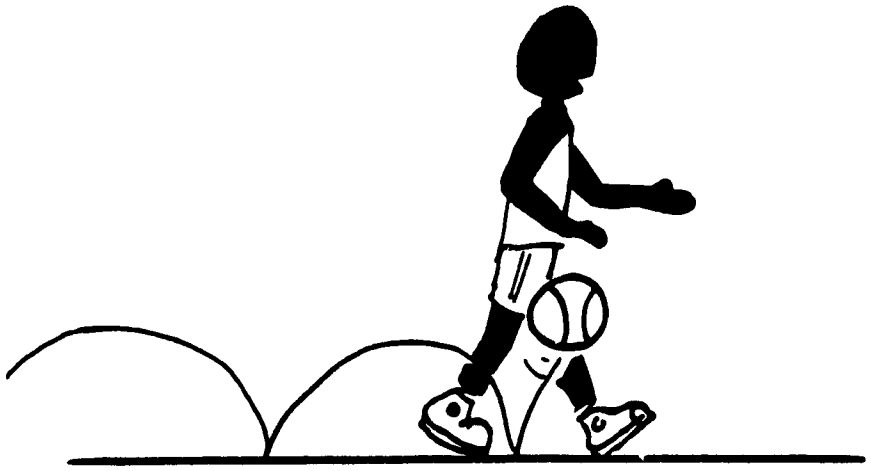
PARCE QUE C'EST INTÉRESSANT.

Appendix B

The French Version of Harter Scale in Testing Order.

CETTE PERSONNE EST TRÈS BONNE À FAIRE REBONDIR LE BALLON.

ÊTES-VOUS?



TRÈS TRÈS BON(NE)

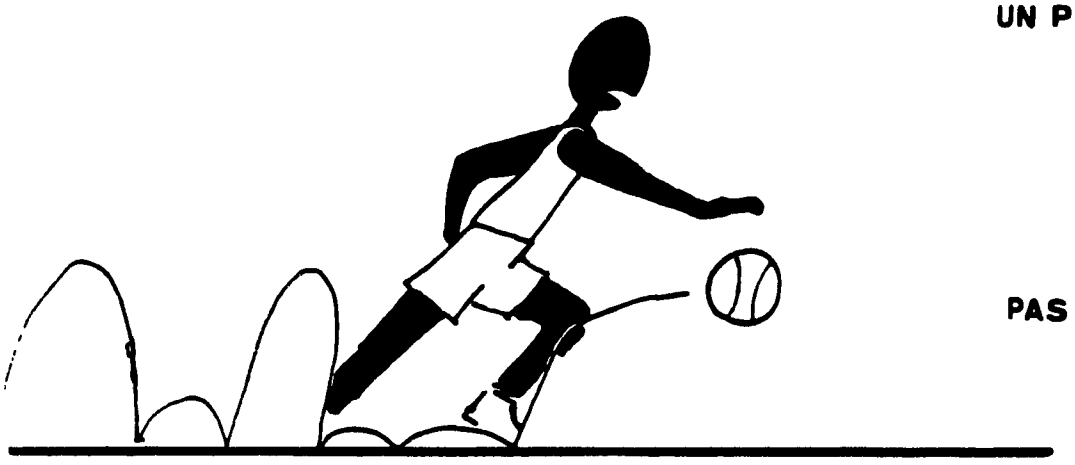
4

OU

TRÈS BON(NE)

3

CETTE PERSONNE N'EST PAS TRÈS BONNE À FAIRE REBONDIR LE BALLON



UN PEU BON(NE)

2

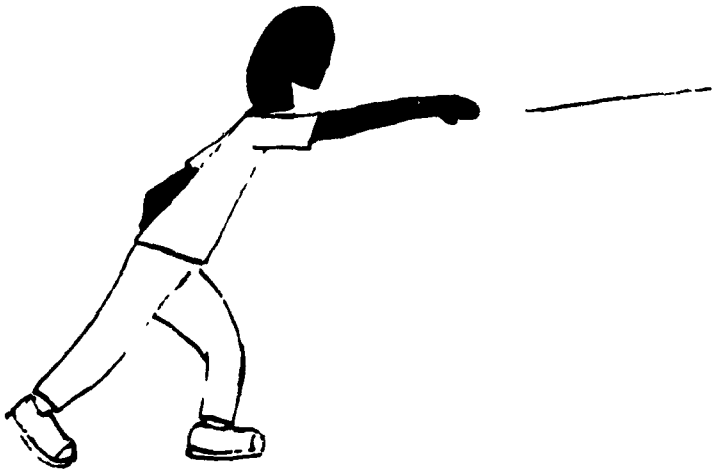
OU

PAS TRÈS BON(NE)

1

CETTE PERSONNE EST TRÈS BONNE À LANCER UNE BALLE.

ÊTES-VOUS?



TRÈS TRÈS BON(NE)

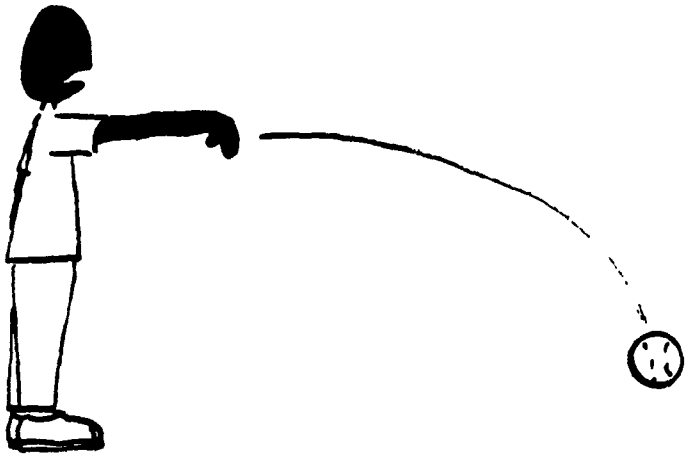
4

OU

TRÈS BON(NE)

3

CETTE PERSONNE N'EST PAS TRÈS BONNE À LANCER UNE BALLE.



UN PEU BON(NE)

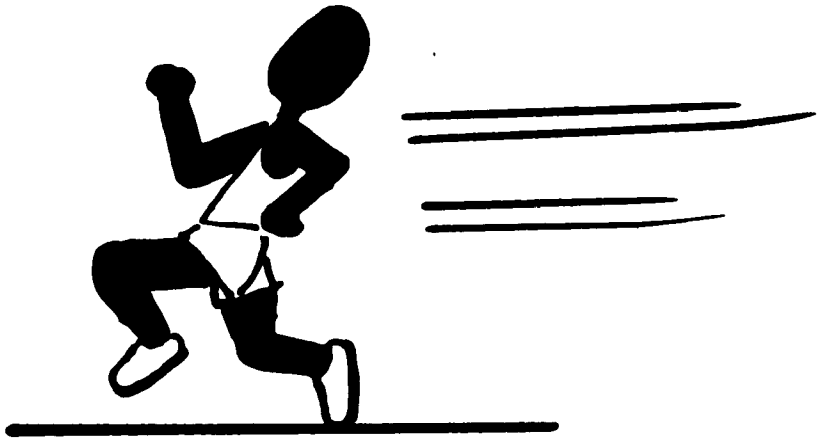
2

OU

PAS TRÈS BON(NE)

1

CETTE PERSONNE PEUT COURIR TRÈS VITE.



CETTE PERSONNE NE PEUT PAS COURIR VITE.

ÊTES-VOUS ?

TRÈS TRÈS VITE OU TRÈS VITE

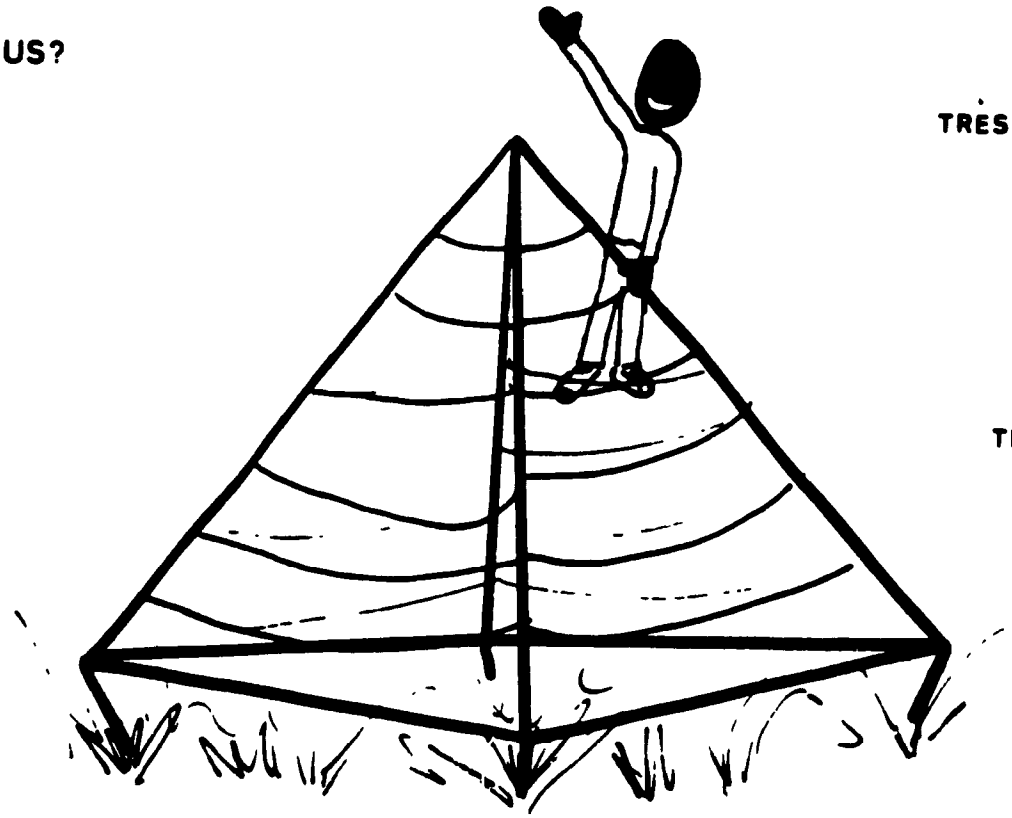
4 3

UN PEU VITE OU PAS TRÈS VITE

2 1

CETTE PERSONNE EST TRÈS BONNE À GRIMPER.

ÊTES-VOUS?



TRÈS TRÈS BON(NE)

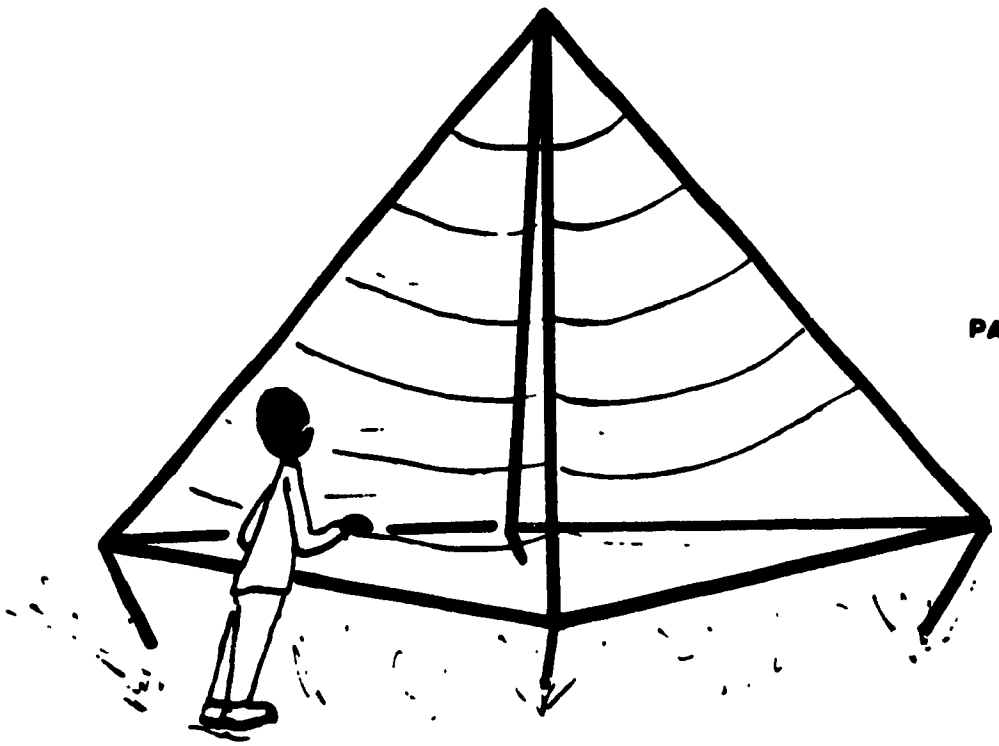
4

OU

TRÈS BON(NE)

3

CETTE PERSONNE N'EST PAS TRÈS BONNE À GRIMPER.



UN PEU BON(NE)

2

OU

PAS TRÈS BON(NE)

Appendix C

Teachers' questionnaire

de l'etudiant_____

Questionnaire de l'enseignant

S.V.P. répondez aux questions en vous référant à un etudiant. Vous devez l'évaluer avec une echelle continue de 1 à 5. Vous devez encercler le chiffre conrespondant à la bonne réponse. La signification des chiffres se definit comme ceci:
1= pas du tout, 2= rarement, 3= des fois/un peu, 4= bien/ la plupart du temps, 5= très bien/ tout le temps.

-L'étudiant trouve l'activité physique...:

.l'fun.	1	2	3	4	5
.sa matière favorite.	1	2	3	4	5
.intéressante.	1	2	3	4	5
.son principal passe-temps.	1	2	3	4	5
.plaisant.	1	2	3	4	5

-L'étudiant en éducation physique...:

.écoute bien le professeur.	1	2	3	4	5
.est souvent dans la lune.	1	2	3	4	5
.arrive à temps.	1	2	3	4	5
.participe bien.	1	2	3	4	5
.ne suit pas les ordres.	1	2	3	4	5

-L'étudiant face à l'activité physique est...:

.joyeux.	1	2	3	4	5
.heureux.	1	2	3	4	5
.content.	1	2	3	4	5
.enthousiaste.	1	2	3	4	5
.ravi.	1	2	3	4	5

Appendix D

The Physical Educator's rating scale

Echelle de mesure

S.V.P., mesurez l'habileté de l'étudiant en activité physique en le comparant avec des gens du même âge et de la même déficience.

1.....très, très, pauvre

2

3

4

5.....pauvre

6

7

8

9

10.....moyen

11

12

13

14

15.....bon

16

17

18

19

20.....exceptionelle

le numero de l'étudiant_____ réponse_____

Appendix E

Procedural Statement

Procedural Statement

Bonjour, comment ça va ? (donne une poignée de main)... Mon nom est Carole et toi?..., Merci de bien vouloir m'aider avec mon projet d'école. S.V.P. viens t'asseoir ici, à côté de moi (j'indique la chaise avec ma main). Est-ce que quelqu'un t'a expliqué en quoi consiste mon projet?...OK, donc je vais te décrire brièvement en quoi consiste mon projet. Je fais un projet concernant la la participation des étudiants dans le sport. Je veux savoir, pourquoi les étudiants sont intéressés à faire du sport. C'est intéressant n'est-ce pas?

Ceci est le questionnaire. Il est composé de vingt photos, toutes sur le sport. Moi, je te lis la phrase sur la photo et toi tu dois me répondre "comme moi", ou un peu comme moi", ou "pas comme moi" ou si tu préfères réponds "oui" ou "des fois", ou "non". Il n'y a pas de bonnes ou de mauvaises réponses, ça dépend de la personalité de chacun...

Avant de commencer, je vais te présenter deux photos qui ont aucun rapport avec le sport, pour te montrer comment ça fonctionne puis après répondre à tes questions. Moi je vais inscrire ta réponse sur une feuille. Je ne prends pas ton nom en note, ça reste anonyme. C'est juste pour être capable de voir si les étudiants aime le sport ou pas. Es-tu prêt(e)?...

Donc voici la première photo: Je regarde la télévision après l'école. "Comme moi", "un peu comme moi" ou "pas comme moi"... C'est vrai, tu regardes la T.V. souvent?... Que regardes-tu?...

OK, Ça va?...Des questions?... La deuxieme photo: J'écoute souvent la radio....(même type de réponses). L'idée principale du questionnaire est de savoir pourquoi fais-tu du sport? Es-tu prêt(e)?... N'oublie pas, il n'y a pas de mauvaises réponses. La première photo: "Tu fais du sport pour être populaire avec tes amis"...

Après la vingtième..., j'ai quatre autres cartons avec deux photos sur chacune d'elles, je vais te demander une question et tu m'indiques la réponse qui te convient. Voici la première photo. Laquelle de ces deux personnes est comme toi? Cette personne est très bonne à faire rebondir le ballon et cette personne n'est pas très bonne à faire rebondir le ballon. OK, (dépendamment du choix de la personne, je montre seulement les deux réponses correspondantes à la photo et la personne doit choisir parmi les deux). Four times liked that, the presentation of these pictures were done in two phases.

Après les deux questionnaires: C'est terminé, as-tu aimé cela?... Merci de m'avoir aider dans mon projet. Bonjour, à la prochaine...

Appendix F

Tables of Two-Way Anova

Table 15

Comparison of age and ability on intrinsic motivation (PPMS): 2 X 2 analysis of variance.

IM
by Age
Ability

Source of Variation	SS	DF	MS	F	P
Age	11.118	1	11.118	1.721	.198
Ability	.145	1	.145	.022	.882
Age x Ability	10.366	1	10.366	1.604	.213
Explained	20.499	3	6.833	1.058	.379
Residual	232.601	36	6.461		

Table 16

Comparison of age and ability on extrinsic motivation/self-determined (PPMS): 2 X 2 analysis of variance.

EMSD

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	35.178	1	35.178	5.82	.021*
Ability	.028	1	.028	.005	.946
Age x Ability	3.043	1	3.043	.504	.482
Explained	37.293	3	12.431	2.058	.123
Residual	217.482	36	6.041		

* Denotes pairs of groups significantly different at the .05 level.

Table 17

Comparison of age and ability on extrinsic motivation/non self-determined (PPMS): 2 X 2 analysis of variance.

EMNSD

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	4.510	1	4.510	.451	.506
Ability	28.160	1	28.160	2.819	.102
Age x Ability	14.753	1	14.753	1.477	.232
Explained	47.344	3	15.781	1.580	.211
Residual	359.631	36	9.990		

Table 18

Comparison of age and ability on amotivation (PPMS): 2 X 2 analysis of variance.

AM

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	1.371	1	1.371	.454	.505
Ability	6.985	1	6.985	2.315	.137
Age x Ability	.684	1	.684	.227	.637
Explained	9.291	3	3.097	1.027	.392
Residual	108.609	36	3.017		

Table 19

Comparison of age and ability on Harter's scale:

2 x 2 analysis of variance.

Harter

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	21.803	1	21.803	3.203	.082
Ability	13.089	1	13.089	1.923	.174
Age x Ability	.607	1	.607	.083	.767
Explained	37.693	3	12.564	1.846	.156
Residual	245.082	36	6.808		

Table 20

Comparison of age and ability on Physical Educator's rating scale: 2 X 2 analysis of variance.

Phy.Ed.
by Age
Ability

Source of Variation	SS	DF	MS	F	P
Age	8.780	1	8.780	.586	.449
Ability	83.328	1	83.328	5.558	.024*
Age x Ability	95.991	1	95.991	6.403	.016*
Explained	189.248	3	63.083	4.208	.012
Residual	539.727	36	14.992		

* Denotes pairs of groups significantly different at the .05 level.

Table 21

Comparison of age and ability on Teachers' questionnaire set 1: 2 X 2 analysis of variance.

Qset 1

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	8.305	1	8.305	.530	.471
Ability	3.747	1	3.747	.239	.628
Age x Ability	150.279	1	150.279	9.594	.004**
Explained	159.893	3	53.298	3.403	.028
Residual	563.882	36	15.663		

** Denotes pairs of groups significantly different at the .01 level.

Table 22

Comparison of age and ability on Teachers' questionnaire set 2: 2 X 2 analysis of variance.

Qset 2

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	1.106	1	1.106	.153	.698
Ability	4.422	1	4.422	.612	.439
Age x Ability	17.688	1	17.688	2.449	.126
Explained	23.100	3	7.700	1.066	.376
Residual	260.000	36	7.222		

Table 23

Comparison of age and ability on Teachers' questionnaire set 3: 2 X 2 analysis of variance.

Qset 3

by Age

Ability

Source of Variation	SS	DF	MS	F	P
Age	3.206	1	3.206	.223	.639
Ability	29.546	1	29.546	2.057	.160
Age x Ability	165.365	1	165.365	11.512	.002**
Explained	197.644	3	65.881	4.586	.008
Residual	517.131	36	14.365		

** Denotes pairs of groups significantly different at the .01 level.