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THE EFFECTS OF EXTERNAL REWARDS ON
CHILDREN"S INTRINSIC MOTIVATION USING
A DEVELOPMENTAL THEORETICAL ORIENTATION

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THE EFFECTS OF EXTERNAL REWARDS ON CHILDREN'S INTRINSIC MOTIVATION USING A DEVELOPMENTAL THEORETICAL ORIENTATION

By

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ABSTRACT

THE EFFECTS OF EXTERNAL REWARDS ON
CHILDREN'S INTRINSIC MOTIVATION USING
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The present study investigated the effects of two different types of external rewards on children's intrinsic motivation in performing a sport specific task using a developmental theoretical orientation. The hypotheses were (a) the levels of intrinsic motivation of preoperational subjects would differ from that of the concrete subjects depending on the type of reward given, (b) the certificate would affect the intrinsic motivation of preoperational subject's differently from preoperational subjects who received positive verbal feedback, and (c) the positive verbal feedback would affect the intrinsic motivation of concrete subject's differently from the concrete subjects who received a certificate. Subjects were 41 female children who were athletes and who were in the preoperational or the concrete stage of cognitive development. Tweny-one subjects (11 preoperational and 10 concrete) were assigned to the certificate treatment condition; and, twenty subjects (10 preoperational and 10 concrete) were assigned to the positive verbal feedback condition. Subjects were required to attend two sessions.

In each session, the amount of time the subjects spent jumping on the trampoline was measured. The first session served as a control condition and in the second session treatment was employed. In addition, a questionnaire was employed in both sessions to ascertain what activity was most enjoyable for the subjects. Statisitcal analyses failed to support the hypotheses identified in this investigation. However, it was supported statistically that the concrete children jumped longer than the preoperational children. Also, the time subjects jumped on the trampoline increased from the first session to the second session. The difference in the time on task for the concrete subjects was greater between the first and the second sessions compared to the time on task for the preoperational subjects. It was concluded that cognitive stage of development should be considered in future research in intrinsic motivation of children.

DEDICATION

This thesis is dedicated to my parents, Donald and Paula Hartwick, my husband, Douglas Reinsch, my sister and brother, Jill and Chad Hartwick for all their encouragement and love.

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CHAPTER I

INTRODUCTION

Gymnastics has emerged as a popular sport in the United States in the past fifteen years due to the success of the gymnastics teams in the 1976 and 1980 Olympics. Many children and adolescents have developed an interest in gymnastics in hopes of becoming another Nadia Comaneci or Mary Lou Retton. The gymnastic arena is no longer limited to the coach and gymnast, but other professionals, such as sport physiologists, nutritionists, athletic trainers and sports psychologists are becoming an imperative facet of the world of gymnastics. With the emergence and marked interest of sport scientists, it becomes pertinent to provide aspiring gymnasts, coaches, and professionals with scientific knowledge to facilitate the maximum growth of each gymnast.

Along with obtaining scientific knowledge, it is important for coaches to apply this scientific knowledge in order to maximize the growth of young gymnasts. For example, when working with children coaches should understand both the physical and cognitive development of children of different ages. To best understand children in sports and how scientific knowledge can be implemented in working with children, a developmental basis or orientation is useful. Because children start training in gymnastics at very young ages, it would be

beneficial to understand and study children using a developmental theoretical perspective. However, according to Bredemeier and Weiss (1983), the majority of studies addressing the psychosocial nature of the development of youth sport participants has lacked a theoretical framework or orientation. Also, it has been assumed that psychosocial processes and theories that have been based on research with adults automatically transfer to younger ages (Gould, 1982). However, to further our understanding of children in sports and to maximize their growth, sport psychologists must study children from a developmental perspective.

One of many areas where sport scientists have influenced the world of gymnastics has been in the area of motivation. In many sports including gymnastics, a significant amount of time is required to practice and perfect skills and techniques. Coaches must recognize the potential amotivational effect of monotonous practices and create an atmosphere which helps to encourage athletes to feel motivated to continue practicing and perfecting skills.

The intentions of this research into intrinsic motivation of youth gymnasts were three-fold. The first purpose of this study was to investigate the effects of positive verbal feedback and tangible external reward on the intrinsic motivation of young gymnasts using a developmental theoretical perspective. Secondly, it was the purpose of this research to assess the intrinsic motivation of youth gymnasts utilizing a sport specific task. Thirdly, this study addressed the cross-gender influence on intrinsic motivation by using subjects and an experimenter who were of the same gender, i.e. female.

Nature of the Problem

Motivation serves to energize, select, and direct performances and behaviors (Carron, 1984). There are an infinite number of reasons as to why people select and engage in certain behaviors. These reasons are sometimes categorized according to whether they are intrinsic or extrinsic to the task (Carron, 1984). Thus, an intrinsically motivated behavior is a behavior that occurs in the absence of any apparent extrinsic reward (Deci, 1977). Deci (1975) also referred to intrinsic motivation as a behavior people engage in to feel competent and self-determining in dealing with their environment. In this investigation, intrinsic motivation will be operationally defined as engaging in a behavior for rewards inherent in the task. Conversely, a person who is extrinsically motivated would engage in the same behavior for external rewards such as money or certificates.

There has been extensive research undertaken in the area of intrinsic motivation (Halliwell, 1978; Vallerand & Reid, 1984). A focus of such research has been on how rewards, particularly those extrinsic in nature, affect the intrinsic motivation of an individual (Deci, 1972, 1975; Greene & Lepper, 1974). Forms of external rewards include certificates, money and verbal feedback. Interestingly enough, these rewards affect intrinsic motivation differently. It has been illustrated that money and certificates (e.g., good player awards) decrease intrinsic motivation (Lepper & Greene, 1975). On the other hand, positive verbal feedback was found to increase

intrinsic motivation (Deci 1971). Anderson, Manoogian and Reznick (1976), Deci (1972, 1975), and Greene and Lepper (1974) reported that introducing external rewards (e.g., good player awards and money) decreased intrinsic interest and motivation in performing an intrinsically motivating task. The subjects in these investigations were females and males ranging in age from three and a half to five years of age or college undergraduates. The tasks used in these investigations included drawing with felt tip markers and completing a "Soma" puzzle.

Other research has focused on the effect that social reinforcement has on intrinsic motivation. It has been reported that positive reinforcement or verbal feedback on one's performance increases the individual's intrinsic motivation in performing a task (Anderson, Manoogian & Reznick, 1976; Deci, 1971, 1972; Deci, Casio & Krusel, 1973; Vallerand, Reid & Marisi, 1979; Vallerand, 1983; Pittman, Davey, Alafat, Wetherhill, Kramer, (1980); Swamm & Pittman, 1977; Weinberg & Jackson, 1979). Most of these investigations included subjects who were college undergraduates or children of young ages. The tasks were novel such as balancing on a stabilometer, solving puzzles and drawing with felt tip markers.

Vallerand's (1983) investigation was unique from the stand point that the task he used in measuring intrinsic motivation was a sport related task involving hockey players. Thus, this investigation attempted to assess the effects of positive feedback on intrinsic motivation in an athletic setting. The subjects in this investigation were male hockey players between 13 and 16 years of

age. Vallerand reported that positive feedback does increase an athlete's intrinsic motivation and feelings of competence.

Deci, Cascio and Krusel (1973) and Vallerand, Reid and Marisi (1979) also highlighted the interrelationship between information feedback and intrinsic motivation. However, Deci et al. (1973) and Deci (1971, 1972, 1975) found that positive feedback increased intrinsic motivation for male subjects only. Deci (1972) and Deci et al (1973) reported that female subjects who did not receive positive feedback were intrinsically motivated. It was suggested by Deci (1972) that this gender difference was a result of the interaction between the investigator and the subjects. The reinforcer for both groups of subjects was a male. It was hypothesized that the female subjects who did not receive positive reinforcement became intrinsically motivated because they experienced positive interpersonal reinforcement with the experimenter who was of the opposite sex. This served to increase the female subjects' intrinsic motivation.

Additional studies have been undertaken with children of various ages in hopes of identifying the effects of external rewards on intrinsic motivation. The findings of these investigations were different from those presented previously. For instance, Halliwell (1978), Karinol and Ross (1976), Thomas and Tennant (1978) and Smith (1975) found that young children who are given an external reward when engaging in an activity that is intrinsically motivating will perceive the reward as a bonus. On the other hand, children who are older than seven years of age and who are also given an external

reward when they engage in an intrinsically motivating activity will perceive the reward as a bribe. Thomas and Tennant expanded this explanation of external rewards on children's intrinsic motivation when they reported that older children feel a loss in control of their environment when external rewards are associated with their performance. This could be plausible when considering children want to feel mastery over their environment as suggested by White (1959).

Halliwell's (1978) experiment involved showing boys who were in kindergarten, first, second, third, fourth, fifth and tenth grades a video tape of other boys receiving monetary external rewards for jumping on the trampoline, an intrinsically motivating task. Halliwell found that kindergartners and first grade children perceived that other children who were receiving monetary rewards were more intrinsically motivated to jump on the trampoline than children who did not receive money. Children who were in the second grade and older perceived the boy that was not being rewarded as the most intrinsically motivated.

Bredemeier and Weiss (1983) reported that, in general, most research investigating the psychosocial processes of children has lacked a developmental theoretical basis. Gould (1982) stated that too often researchers assume that psychosocial processes and theories that have been based on research with adults automatically transfer to younger age groups. These are interesting assumptions considering the differences that are prevalent between the developmental systems (e.g., cognitive, psychological and physiological) of children, youth and adults. With these differences in mind it seems most beneficial

to base research and investigations on a developmental theoretical orientation.

The theoretical orientation that will be used in this investigation is based on Piaget's (cited in Ault, 1977) Cognitive Theory of Development. Although Piaget has not written extensively about intrinsic motivation, his work in cognitive development could help in understanding children's thoughts and their way of thinking. White (1959) reported that a concern of children is mastery over their environment. Piaget's theory supports White's assertion. Implicit in Piaget's work is the fact that children are constantly faced with disequilibrium between the cognitive structures they have developed and environmental information. Children's mastery over their environment begins with their attempt to eliminate the disequilibrium that exists between their cognitive structures or thoughts and their environment.

Piaget's Cognitive Development Theory (cited in Ault, 1977) suggested that there are four stages of cognitive development; namely, sensorimotor (from birth to two years of age); preoperational (from two to seven years of age); concrete operational (from seven to eleven years of age) and formal operations (from eleven years of age to adulthood). The concrete operational stage of development will be referred to as the concrete stage of development in this paper. Because the purpose of this research was to investigate the effects of external rewards on the intrinsic motivation of children and youth, the preoperational and concrete stages of development were included in this study and will be discussed further.

The preoperational period of cognitive development is characterized by egocentrism and centration (Ault, 1977). Egocentrism refers to perceiving the world as it looks to an individual and not having the ability to see another individual's perspective. Centration refers to focusing attention on one detail of an event at a time. In other words, an individual is unable to process information from other aspects of a given situation. However, there is an increase in mobility of thoughts in the concrete operational period which permits an individual to shift back and forth between their own viewpoint and another person's point of view (Ault, 1977). Also in the concrete stage of development, an individual is also capable of establishing cause and effect relations.

Before discussing the developmental differences of the preoperational and the concrete child and how these differences affect the child's responses to external rewards, it is pertinent to discuss the nature of external rewards. It is believed that children in the various cognitive stages of development respond differently to external rewards. Deci (1975) has attempted to explain the different effects of various external rewards on intrinsic motivation by suggesting that there are two aspects of rewards: a controlling aspect and an informational aspect. Rewards are often given to people when they perform well and act in a certain way. The aim of these rewards is to control behavior. The second aspect of rewards is the information that the reward provides to the individual about his or her effectiveness in a certain situation (Deci, 1975). The

controlling aspect is more salient when external rewards such as money and certificates are given. The informational aspect of the reward is more prominent when external rewards such as positive feedback are given.

Taking developmental characteristics of the preoperational and concrete stages into consideration, it is understandable why an external reward influences the intrinsic motivation of a preoperational child differently from that of a child in the concrete stage of development. To be more specific, because a preoperational child is egocentric and is unable to establish a cause and effect relationship, she or he perceives an external reward that is tangible (certificates or money) as a bonus. The controlling aspect of the tangible reward does not seem to be salient to the preoperational child because the child is unable to establish cause and effect relationships. In addition, based on experiential evidence, when a preoperational child is given positive verbal feedback, there does not seem to be any change in the child's behavior or motivational level. The excitement and marked interest when receiving a tangible reward is not evident when receiving positive verbal feedback. Consequently, the preoperational child's intrinsic motivation should increase when he or she is given an external tangible reward.

The concrete child is able to see another person's viewpoint and establish a cause and effect relationship. Due to these abilities, the concrete child perceives a tangible reward as controlling his or her behavior. Children will feel that they are not in control of their environment which according to Deci (1975) is

necessary for intrinsically motivated behavior to occur. Thus, an external tangible reward will be viewed as a bribe. When positive feedback is given to a child who is in the concrete stage of development, the informational aspect of the reward is salient. Positive verbal feedback ensures the concrete child that his or her behavior is effective in his or her environment without appearing to control the child's behavior. Consequently, a concrete child's intrinsic motivation will decrease when she or he is given an external tangible reward and increase when she or he is given positive verbal feedback.

The instruments used in measuring intrinsic motivation in previous literature are diverse. Vallerand (1983) and Vallerand and Reid (1984) utilized the Mayo Task Reaction Questionnaire, which measures intrinsic motivation. Anderson, Manoogian and Reznick (1976), Deci (1971, 1975) and Greene and Lepper (1974) used time on task in measuring intrinsic motivation. Time on task included pre-assessing the time a subject spends on the target activity, implementing the experimental treatment conditions and recording a post-assessment of the time a subject spends on the target activity after receiving the experimental treatment.

Although there have been vast amounts of research undertaken in the area of intrinsic motivation and external rewards, there are a few inherent limitations to these investigations. Past research has focused on preschool children or adolescent children rather than children ranging from seven to eleven years of age. Also, subjects have not included child elite athletes. With very few exceptions

research has not been performed utilizing sport specific tasks. Lastly, a majority of the research using children as subjects has not implemented a developmental theoretical orientation as a foundation for the investigations.

In summary, the results of how various external rewards affect intrinsic motivation are contradictory. Researchers i.e., Lepper & Greene, 1975; Deci, 1972 support both notions that various external rewards increase and decrease intrinsic motivation depending on the age and gender of subjects and type of reward. As mentioned previously, researchers (Deci, 1971, 1972; Vallerand, 1983) claim that positive verbal feedback increases a subject's intrinsic motivation in performing a task. Likewise, researchers (Deci, 1975; Anderson, Manoogian & Reznick, 1976) report that tangible external rewards decrease a subject's intrinsic motivation in performing a task. The subjects that have been used in past research have included children ranging in age from three and a half to six years of age and/or college undergraduates. Also, for the most part, the tasks in the research have consisted of solving a puzzle, balancing on a stabilometer and coloring with felt tip markers. In addition, the experimenters in past research have been males working with children of both genders. Interestingly enough, just a few studies (Deci, 1972) have looked at the possible influence this gender difference between the male experimenter and the female subjects could have on the subject's intrinsic motivation.

Statement of the Problem

The purpose of this study was to investigate the effects of various external rewards on intrinsic motivation to perform a sport specific task. The goals of this research were to investigate the effects of positive verbal feedback and tangible external rewards on intrinsic motivation using a developmental theoretical basis and, secondly, to include child athletes as subjects utilizing a sport specific task.

The hypotheses underlying this inquiry were as follows:

1) Subjects who are in the preoperational stage of cognitive development who receive tangible rewards will have an increase in intrinsic motivation compared to those subjects who are in the concrete stage of cognitive development who also receive tangible rewards.

2) Subjects who are in the concrete stage of cognitive development who receive positive verbal feedback will have an increase in intrinsic motivation compared to subjects who are in the preoperational stage of cognitive development who also receive verbal positive feedback.

3) Subjects who are in the preoperational stage of cognitive development who receive tangible rewards will have an increase in intrinsic motivation compared to subjects of the same cognitive stage who receive positive verbal feedback.

4) Subjects who are in the concrete stage of development who receive positive verbal feedback will have an increase in intrinsic

motivation compared to subjects of the same cognitive stage who receive tangible rewards.

Basic Assumptions

Underlying the execution of this investigation are two assumptions. Parental cooperation was assumed to be inherent in this study. After receiving an introductory letter containing the purposes of the investigation and after being requested not to lend specific information about the study to their child, it was an assumption that the parents would not communicate specific information about the study to their child.

Definition of Terms

To facilitate the comprehension of this study, the following constructs have been defined.

Positive Verbal Feedback. A form of reinforcement that includes verbal praise consisting of comments that encourage and praise an individual for the skills performed correctly, as well as yielding information concerning technical instructions.

Intrinsic Motivation. Engaging in a behavior for the rewards inherent in the task.

Extrinsic Motivation. Engaging in a behavior for external rewards.

Athletes. Children who take part in a gymnastics class for at least one hour per week.

Tangible External Rewards. An external reward that includes a piece of paper which acknowledges a good performance.

Time on Task. The time an individual spends standing and/or jumping on the trampoline.

Delimitations

This study was delimited to youth gymnasts who are in the preoperational and concrete stages of cognitive development. In addition, this study is delimited to the female gender and to athletes who participate in organized gymnastics classes. Thus, the results may not be applicable to male athletes and to athletes who are participating competitively in gymnastics or to gymnasts at other stages of cognitive development.

Limitations

A number of factors may threaten the internal validity of this investigation. For example, the task at hand, jumping on the trampoline, may exhaust the subjects thus affecting the amount of time they spend jumping on the trampoline during their free time. Also, an intrinsic motivation questionnaire was not used in measuring the subject's intrinsic motivation. However, the method that was used, recording time spent on the task, has been used previously in other studies investigating intrinsic motivation. The basis for determining the type of technique used in measuring intrinsic motivation was the subject's age. Half of the subjects were seven

years of age and younger. Thus, their comprehension and ability to respond accurately to a questionnaire may be limited.

The trampoline is used as a tool to teach skills in gymnastics classes. It is an instrument that is used for teaching progressions leading to new skills as well as enhancing skills that have been learned and performed already. Thus, previous experience with jumping on the trampoline and instructions the subject may have received could pose limitations to this investigation. Specifically, the type or amount of instructions these subjects received in previous experiences was unknown. In addition, it is unknown what kind of previous experiences these subjects have encountered with external rewards. Finally, the amount of time a subject has previously spent on the task could also influence her behavior and response in the study.

CHAPTER II

REVIEW OF LITERATURE

In the past ten years there has been a marked increase in children's participation in sports. Along with this, there has been substantial interest in studying children's psychosocial development (Bredemeier & Weiss, 1983). This interest can be exemplified through the increasing growth of the research literature pertaining to youth sports and the number of coaching effectiveness programs and conferences. These programs and seminars are designed to provide the coaches in youth sports with information pertaining to the physical and psychological development of growing youngsters (Bredemeier & Weiss, 1983). It has been widely recognized that early experiences in life provide an individual with a basis of knowledge for future life experiences. Experiences also aid in forming the individual's developmental systems such as cognitive and physical growth. With an increase in sport involvement and these developmental issues in mind, it becomes imperative for coaches to be abreast of literature and knowledge concerning the physical and psychological growth in order for the sporting arena to maximize a youth's development.

As alluded to above, early experiences are pertinent to a child's development. When these early experiences involve participation in sports, it is important for the coach and

significant others to aid in making these experiences most beneficial to the child's growth. One way of doing this includes recognizing concepts from the domain of sports psychology. These psychological concepts are not limited to facilitating child development. They can also be used to answer questions such as the most effective ways to motivate athletes, and, the effect rewards have on an athlete's motivation and confidence level. These are common questions facing coaches involved in youth sports programs (Gould, 1980). These two questions are also of interest to the author and they will be addressed from a motivational approach.

The following review of literature is organized so that motivation as a general concept is introduced first. Intrinsic motivation and cognitive structures pertaining to intrinsic motivation will then be discussed. Research concerning intrinsic motivation and how external rewards influence intrinsic motivation will be addressed along with limitations of prior research in this area. Lastly, the use of a developmental theoretical orientation for investigating the psychosocial processes of children will be presented.

Intrinsic Motivation

Motivation serves to energize, select and direct performance and behaviors (Carron, 1984). There are an infinite number of reasons why people select certain behaviors or tasks as well as why they engage in these behaviors or tasks. These reasons are sometimes categorized according to whether they are intrinsic (internal) or

extrinsic (external) to the task (Carron, 1984). Thus, an intrinsically motivated behavior is a behavior that occurs in the absence of any apparent extrinsic reward (Deci, 1977). A person who is intrinsically motivated would engage in a behavior for the rewards inherent in the task. However, an extrinsically motivated individual would engage in behavior for external rewards.

Specifically, intrinsic motivation refers to behaviors people engage in to feel competent and self-determining in dealing with their environment (Deci, 1975). This need to feel competent and self-determining provides energy for goal-directed behavior and raises an important question, "What is the reward for this behavior?" According to Deci (1975), the reward is the internal state which is brought about by the behavior, the feeling of competence and self-determination. Similarly, Vallerand and Reid (1984) reported that individuals are motivated to experience the internal rewards of feeling competent and self-determining. Activities yielding feelings of competence and self-determination become intrinsically motivating. On the other hand, activities that are performed for the purpose of receiving an external reward are extrinsically motivating. Rewards for extrinsically motivated behavior could include money, trophies, ribbons, candy and clothing.

Interestingly, the nature and structure of the sporting arena provides athletes with numerous external rewards. For instance, when children participate in athletics they sometimes receive t-shirts or other attire solely for participating. When children compete in sports they receive trophies and ribbons based on their performance.

What effect do these external rewards have on the child's intrinsic motivation? This question and others will be addressed. However, before doing so, it is important to look at the development of intrinsic motivation in the individual.

According to Deci (1975), intrinsic motivation is innate and all humans are born with the need to feel competent and self-determining. Thus, regardless of age, all individuals have a need to interact effectively with their environment and feel that they are the determining force in their behavior. This is especially true for children. White (1959) reported that a concern of children is mastery over their environment. A possible explanation as to how growing children master their environment and feel competent can best be illustrated by looking at Piaget's work in the cognitive development of children. Although Piaget has not written extensively about intrinsic motivation (Deci, 1975), it is implicit in his work that children are constantly faced with a disequilibrium between the cognitive structures they have developed and environmental information.

An important concept in Piaget's theory is that human organisms by nature are motivated to develop accurate cognitive structures (Deci, 1975). The need to develop accurate cognitive structures is successful via the intrinsic motivation of the assimilation schema (Deci, 1975). The assimilation schema process involves two functions, accommodation and assimilation. Accommodation refers to incorporating new information into existing cognitive structures. The latter refers to adapting existing cognitive structures to new

environmental information. Rather than experience disequilibrium and discrepancy between existing cognitive structures and environmental information, children are continually utilizing the assimilation schema process to effectively function and interact with their environment. Consequently, through the assimilation schema process they are intrinsically motivated to feel competent and self-determining in relation to their environment (Deci, 1975; White, 1959). Now that the concept of intrinsic motivation has been introduced and the developmental issues and cognitive structures pertaining to intrinsic motivation have been addressed, the research that has taken place in this area will be discussed.

External Rewards and Intrinsic Motivation

There has been extensive research undertaken in the area of intrinsic motivation. Such research has looked at how rewards, particularly rewards which are extrinsic in nature, affect the intrinsic motivation of an individual. Anderson, Manoogian and Reznick (1976), Deci (1971, 1972, 975), Greene and Lepper (1974), Lepper and Greene (1975), and Lepper, Greene and Nesbitt (1973) all reported that introducing external rewards (good player awards and money) decreased intrinsic interest and motivation in performing an intrinsically motivating task. The subjects in these investigations were both female and male and were either children ranging in age from three and a half to five years of age or college undergraduates. The tasks used in these investigations included drawing with felt tip markers and performing a "Soma" puzzle respectively.

Other research has focused on the effect that social reinforcement has on intrinsic motivation. Carron (1984) defined social reinforcement as a neutral term referring to one of the operations that will increase the strength of a response. Moreover, Martens (1975) defined positive and negative reinforcement as follows: a positive reinforcer is any stimulus following a response that will increase the strength or maintain the occurrence of that response; a negative reinforcer is the removal of any stimulus that increases the strength of a response. Negative and positive reinforcements both have the potential of being rewards and punishments. Table 1 is an adaptation of Martens (1975) model by Carron (1984).

Table 1

The type of reinforcement and its consequence.

TYPE OF REINFORCEMENT	MANIPULATION	CONSEQUENCES
POSITIVE	PRESENTED	REWARD
	WITHDRAWN	PUNISHMENT
NEGATIVE	PRESENTED	PUNISHMENT
	WITHDRAWN	REWARD

A common research design using social reinforcement as an independent measure has included positive and negative verbal feedback. Anderson, Manoogian and Reznick (1976), Deci (1971, 1972), Deci, Cascio and Krusel (1973), Vallerand (1983), Vallerand and Reid (1984), Vallerand, Reid and Marisi (1979), Pittman, Davey, Alafat, Wetherhill, Kramer (1980), Swann and Pittman (1977), and Weinberg and Jackson (1979) reported that positive reinforcement or verbal feedback on one's performance increases the individual's intrinsic motivation in performing a task. Most of these investigations included subjects who were college undergraduates or children of young ages. The tasks were novel, such as balancing on the stabilometer, solving puzzles and drawing with felt tip markers.

Vallerand's (1983) investigation was unique from the stand point that he used hockey players as subjects. Also, rather than using novel tasks, Vallerand used a sport task related to hockey. Thus, this investigation attempted to assess the effects of positive verbal feedback on intrinsic motivation in an athletic setting. The subjects in this investigation were male hockey players between 13 and 16 years of age and were assigned to one of four groups. In each group the subjects performed twenty-four trials of the task. Vallerand's purpose was to assess the effect of various amounts of feedback on intrinsic motivation. He provided task related feedback depending on four conditions: (1) positive verbal feedback after every four trials, (2) feedback after every two trials, (3) feedback after every third trial, and (4) feedback after every trial. Although results indicated that positive feedback does increase an

athlete's intrinsic motivation and feelings of competence regardless of the amount of feedback, Vallerand concluded that it is not the quantity of feedback that is important but, rather, it is the quality of the feedback that is crucial. Vallerand suggested that intrinsic motivation is not affected by reinforcement per se. It is the perception of the reinforcement that influences intrinsic motivation.

As mentioned earlier, there are many forms of external rewards. Certificates, money and verbal feedback are just a few. Interestingly enough, these rewards affect intrinsic motivation differently. It has been illustrated that money and certificates of good player awards decrease intrinsic motivation (Lepper & Greene, 1975). On the other hand, positive reinforcement seems to increase intrinsic motivation. Deci (1975) has attempted to explain these differences by suggesting that there are two aspects of rewards: a controlling aspect and an informational aspect. Rewards are often given to people when they perform well and act in a certain way. The aim of these rewards is to control behavior. The second aspect of rewards is the information that the reward provides to the individual about his or her effectiveness in a certain situation (Deci, 1975). The controlling aspect is more salient when external rewards like money and certificates are given. The informational aspect is more prominent when an external reward like positive feedback is given.

The connection between different types of rewards and their effects on intrinsic motivation can be further explained by the Cognitive Evaluation Theory proposed by Deci (1975). This theory focuses on the psychological processes underlying changes in

intrinsic motivation (Vallerand & Reid, 1984). Deci proposes that there are two processes that can be responsible for changes in intrinsic motivation. They are the perceived locus of causality process and the perceived locus of competence. According to Vallerand and Reid, it is the relative salience of these two processes that determine which process will be operative. Also, it is the prominence of these aspects that will yield information as to the changes in intrinsic motivation.

Rewards in the form of positive feedback serve to strengthen feelings of competence and self-determination because the informational aspect of the reward is salient. This increase in competence seems to be related to increases in intrinsic motivation. Similarly, Vallerand (1983) reported that when individuals interpret positive feedback as an indication of performance, high levels of feelings of competence and intrinsic motivation are experienced. Also, Roberts, Kleiber and Duda (1981) suggested that perceived competence in skills influence participation and motivation such that, as perceived competence increases, so does persistence and intrinsic motivation. Thus, when positive reinforcement is given as an external reward, intrinsic motivation increases and this change in intrinsic motivation is mediated by perceived competence (Vallerand & Reid, 1983). Deci, Cascio and Krusel (1973) and Vallerand, Reid and Marisi (1979) also highlighted the interrelationship between information feedback, perceptions of competence and intrinsic motivation. However, Deci et al. (1973) and Deci (1971, 1972, 1975) found that positive feedback increased intrinsic motivation for male

subjects only. Deci (1972) and Deci et al. (1973) reported that female subjects who did not receive positive reinforcement were intrinsically motivated. It was suggested by Deci (1972) that this gender difference was a result of the interaction between the investigator and the subjects. The reinforcer for both groups of subjects was a man. It was hypothesized that women who did not receive positive reinforcement became more intrinsically motivated because they experienced positive interpersonal reinforcement with the experimenter who was of the opposite sex. This served to increase intrinsic motivation. Deci et al. (1973) explained this gender difference by attributing it to different salient aspects of the reward. In other words, they suggested that for the women, a change in perceived locus of causality was initiated, thus, the controlling aspect of the reward was salient. With the male subjects, feelings of competence were initiated influencing the prominence of the informational aspect. When socialization practices of women and men are considered, this explanation is certainly plausible. Women are taught to be more dependent than men, and women are defined in terms of what men are not (Deci et al., 1973).

When external rewards in the form of money, candy and certificates are given intrinsic motivation decreases. It has been suggested that this change in intrinsic motivation is a result of the controlling aspect of the reward becoming salient. This saliency influences the perception of locus of causality. The locus of causality is the second aspect according to the Cognitive Evaluation Theory that underlies changes in intrinsic motivation. When a person

is intrinsically motivated, the locus of causality for their behavior is internal (Deci, 1975). In other words, if an individual perceives they are the locus of causality or in control of their behavior, they will be intrinsically motivated (deCharms, 1968).

However, when one perceives the reward as the reason he or she is engaged in a behavior, the locus of causality will change from internal to external (Deci, 1975). When the locus of causality is perceived as external, an individual becomes relatively dependent upon the source of rewards (deCharms 1968). Consequently, intrinsic motivation will decrease. Similarly, Deci (1972) also suggested that if individuals perceive their behavior to be controlled by external sources, rewards particularly, intrinsic motivation will decrease. De Charms (1968) and Festinger (1967) both reported that external rewards decrease intrinsic motivation because they cause people to lose their feelings of causality and in turn, lead them to believe that they are working for the rewards. Likewise, Carron (1984) reported that external rewards convey information to an individual that he or she does not have control over personal behavior and this perception decreases intrinsic motivation. Anderson, Manoogian and Reznick (1976) found in their investigation that money and awards proved to be sufficient to justify one's performance which reduced intrinsic motivation. Moreover, money, awards and certificates decrease intrinsic motivation because the controlling aspect of the reward is operating which influences one's perception of locus of causality.

Although the Cognitive Evaluation Theory has been used to explain the different affects of external rewards on intrinsic motivation in research investigations using children, there does seem to be a limitation to the theory. The Cognitive Evaluation Theory does not specify whether this theory is applicable to children. Inherent in Deci's theory is that an individual is capable of performing complex cognitive functions and attributions for behavior. In order for this theory to hold, it is assumed that the individual is capable of perceiving his/her and other people's behaviors along with, making attributions about their behaviors. These cognitive functions may be difficult for young children who are unable to establish cause and effect relationships or to see another person's point of view, or children who are just beginning to understand their own behavior.

Another explanation attempting to clarify the different effects of positive feedback and rewards on intrinsic motivation is provided by the Overjustification Hypothesis. This hypothesis suggests that the addition of external rewards shifts the attribution about performance from being intrinsically motivating to extrinsically motivating by overjustifying performance (Anderson, Manoogian & Reznick, 1976). This hypothesis does have a few limitations. First, it holds for rewards that are expectant and contingent upon performance, and rewards that are salient. Secondly, this hypothesis does not hold for external rewards in the form of positive verbal reinforcement. Deci (1972) and Deci, Cascio and Krusel (1975) reported that positive verbal reinforcement increased intrinsic

motivation. This type of external reward does not support the overjustification hypothesis. However, several investigators have supported the overjustification effect. Kruglanski, Alon and Lewis (1972) and Ross (1975) supported the overjustification effect with the use of prizes as rewards. Lepper, Greene and Nesbitt (1973) supported the hypothesis underlying the overjustification effect using awards. Finally, Calder and Straw (1975), Deci (1971, 1972) and Kruglanski, Riter, Amitai, Margolin, Shabtai and Zaksh (1975) supported the overjustification hypothesis with the use of money as rewards. Kruglanski et al (1975) reported that the overjustification effect occurs because the reinforcement procedure leads individuals to view their behavior as a means to an end, not an end in itself. Consequently, the activity is less likely to be chosen in a free-choice situation where rewards are not offered (Kruglanski, 1975).

Bem (1967) attempted to explain the effects of verbal reinforcement and rewards on the overjustification hypothesis by using a mand-tact distinction. According to this distinction, external rewards may lead to the perception that the reward is payment for the behavior and the activity is being controlled or "manded" by that reward (Bem, 1967). Also, Bem suggested that verbal reinforcement has more tact properties because it is not perceived as controlling one's behavior. This lends the activity to additional positive association thereby increasing intrinsic motivation because the perception of the task is a pleasant one. Thomas and Tennant (1978) expanded this explanation of external rewards to children. Thomas and Tennant reported that children feel a loss in control of

their environment when external rewards are associated with their performance. This could be plausible when considering children want to feel mastery over their environment as suggested by White (1959).

As alluded to above, there seems to be a vast body of work that investigates the effects of different types of rewards on intrinsic motivation. For example, the research suggesting that positive feedback increases intrinsic motivation has included subjects from 13 years of age to college age undergraduates. The research suggesting that other external rewards such as money and awards decrease intrinsic motivation has consisted of subjects from 3 to 21 years of age.

More investigations have been undertaken in hopes of identifying the effects of external rewards on intrinsic motivation. Contrary to the body of knowledge recently discussed, the investigators have not reported similar findings. Halliwell (1978), Karinol and Ross (1976), Thomas and Tennant (1978) and Smith (1975) all found that young children who were given an external reward when engaging in an activity that was intrinsically motivating would perceive the reward as a bonus. On the other hand, older children after the age of 7 who were also given an external reward when they engaged in an intrinsically motivating activity perceived the reward as a bribe. Halliwell's (1978) experiment involved showing boys who were in kindergarten, first, second, third, fourth, fifth and tenth grades a video tape of other boys receiving rewards for jumping on the trampoline, an intrinsically motivating task. Halliwell (1978) found that kindergartners and first grade children perceived other

children who were receiving rewards more intrinsically motivated to jump on the trampoline than children who did not receive an external reward. Children who were in the second grade and older perceived the boy that was not being rewarded as the most intrinsically motivated.

This developmental trend in causal inferences was found to be attributed to the use of different cognitive capabilities among subjects of different ages. Karinol and Ross (1976) found that children under the age of seven used an additive principle and older children used a discounting principle to decide whether certain individuals were intrinsically motivated when they received external rewards. Before discussing these principles, it is important to address attribution theory because these principles are associated with this theory.

Attribution theory proposes that attributions of behavior are guided by causal schemata which are conceptions of how various kinds of causes interact to produce effects or behavior (Kelley, 1967). Attribution theory postulates that receiving external rewards consist of the multiple sufficient cause schema (MSC) (Heider, 1958; Kelley, 1967, 1973). In general, there is more than one possible sufficient cause for most behavior. When one cause of behavior is present, attributions of that behavior are certain, whereas, when more than one cause of behavior is present, uncertainty of what causes the behavior increases (Smith, 1975). According to Smith (1975), MSC is the conception of how two sufficient causes of behavior interact in

relation to a given effect or behavior. The additive and discounting principles are types of multiple sufficient cause schemas.

As mentioned above, Karinol and Ross (1976) found that children under the age of 7 used the additive principle in choosing the cause of behavior. In other words, external rewards (sometimes parental commands) and intrinsic motivation were perceived as added incentives to perform the intrinsically motivating activity. It was the combination of external rewards (sometimes parental feedback) and intrinsic motivation that lead the subjects in these experiments to identify why children performed the desired task. In contrast, children older than 7 years of age used the discounting principle in identifying the cause of behavior. When two causes of behavior are present, in this case, internal and external causes, older children perceive external rewards as a bribe to execute a task. These subjects discounted intrinsic motivation as a cause of behavior and attributed the cause of behavior to the external rewards that were given. Kelley (1973) reported that when there are internal and external reasons for engaging in a behavior, intrinsic factors are discounted because the external cause is more verifiable and salient. Although the above mentioned suggests the discounting principle is employed in the perception of others, it can also be employed in self-perception (Calder & Straw, 1975; Deci, 1971).

Smith (1975) and Baldwin and Baldwin (1970) suggested that the use of MSC would be rare and possibly non-existent among children of kindergarten age. They also reported that the ability to use this schema would increase with age because as children become older their

cognitive capabilities increase. Smith found this to be true in that kindergartners were unable to use MSC in making attributions. As children became older (by fourth grade) they developed the ability to use MSC in making attributions. Halliwell (1978) suggested that children are not able to execute the ability to make attributions until they reach the age of seven. This is certainly understandable when cognitive development is considered. Interestingly enough, according to Thomas and Tennant (1978) this area has been overlooked in studies dealing with rewards, particularly the negative effects of rewards.

Developmental Theoretical Orientation

Bredemeier and Weiss (1983) report that in general most research investigating the psychosocial processes of children has lacked a developmental theoretical basis. Gould (1982) stated that too often researchers assume that psychosocial processes and theories that have been based on research with adults automatically transfer to younger age groups. These are interesting assumptions considering the differences that are prevalent between the developmental systems of children, youth and adults. With these differences in mind it seems most beneficial to base research and investigations on a developmental theoretical approach. Using a developmental theoretical orientation when studying children and youth could more accurately describe the psychosocial processes of the child in a sporting arena than previously used methodology. Also, this orientation could possibly explain accurately the interaction

between the child and the sporting environment. In light of this, the cognitive development of children will be discussed due to the importance it has in understanding why children of various ages have certain cognitive capabilities such as the discounting and the additive principles.

According to Piaget (cited in Ault, 1977), there are four stages of cognitive development. These stages are sensorimotor (birth-2 years old), preoperational (2-7 years old), concrete (7-11 years old) and formal operations (11 years old-adulthood). For the purpose of this study only the preoperational and concrete stages of development will be discussed. According to Phillips (1981), the preoperational period is characterized by egocentrism and centration. Egocentrism refers to perceiving the world as it looks to an individual and not having the ability to see another individual's viewpoint. Centration or centering refers to focusing attention on one detail of an event at a time. An individual is unable to process information from other aspects of a given situation. On the other hand, Phillips reports that in the concrete operation stage there is an increase in mobility of thought which permits an individual to shift back and forth between their own viewpoint and another person's viewpoint. In this stage of development, an individual is also capable of establishing cause and effect relations.

As noted earlier, external rewards influence the intrinsic motivation of children of various ages differently. Taking the developmental characteristics of the preoperational and the concrete stages of cognitive development into consideration, it is

understandable why external rewards affect intrinsic motivation of children differently. The preoperational child is egocentric and is unable to establish a cause and effect relationship, she or he perceives an external reward that is tangible as a bonus. The controlling aspect of the tangible reward does not seem to be salient to the preoperational child because the child is unable to establish cause and effect relationships. Also, based on experiential evidence, when a preoperational child is given positive verbal feedback, there does not seem to be any change in the child's behavior or motivational level. The excitement when receiving a tangible reward is not evident when receiving positive verbal feedback. Thus, a preoperational child's intrinsic motivation should increase when they are given an external tangible reward.

The child who is in the concrete stage of cognitive development is capable of seeing another person's view point. In addition, they are capable of establishing a cause and effect relationship. Thus, a concrete child could perceive a tangible reward as controlling his or her behavior. The child will feel that he or she is not in control of their environment which according to Deci (1975) is necessary for intrinsically motivated behavior to occur. The tangible reward could be viewed as a bribe. However, when positive verbal feedback is given, the informational aspect of the reward becomes salient. Positive verbal feedback ensures the concrete child that his or her behavior is effective in their environment without appearing to control the child's behavior. Consequently, the concrete child's

intrinsic motivation should increase when they are given positive verbal feedback rather than a tangible reward.

As mentioned previously, most research investigating the psychological processes of children has lacked a developmental, theoretical basis (Bredemeier & Weiss, 1983). Consequently, there is no research available that looks at psychological processes of children based on a developmental theoretical foundation. Moreover, developmental theories have not been implemented in research concerning sports psychology or more specifically, intrinsic motivation.

Conclusion

In summary, it has been supported by research that external rewards influence intrinsic motivation. Most of this research has included children ranging in age from three and a half to six years of age and/or, college undergraduates as subjects. Children ranging from seven to eleven years of age have not been included. Also, subjects have not included athletes. For the most part, the tasks in the research have consisted of puzzle solving, balancing on the stabilometer and coloring with felt tip markers. Research has not been performed utilizing sport specific tasks. Also, most of the research in this area using children as subjects has not used a developmental theoretical orientation.

In addition to the limitations of the intrinsic motivation research mentioned above, the results of how various external rewards affect intrinsic motivation are contradictory. Research supports

both notions that various external rewards may both increase and decrease intrinsic motivation depending on the type of reward and age of the subjects. As mentioned previously, research claims that positive verbal feedback increases and decreases a subject's intrinsic motivation in performing a task. Likewise, research reports that external rewards increase and decrease a subject's intrinsic motivation in executing a task. With this in mind, the intentions of the author are threefold: (1) to investigate the effects of positive verbal feedback and tangible external rewards on intrinsic motivation using a developmental theoretical orientation; (2) to include subjects who are children and athletes and to include a task that is sport-specific; and, (3) to control for gender effects by using subjects and an experimenter who are of the same gender, i.e., female.

CHAPTER III

METHOD

The intentions of this study were designed to challenge research flaws identified in previous research on intrinsic motivation. This study investigated the effects of positive verbal feedback and tangible external rewards on intrinsic motivation using a developmental theoretical basis. In previous research on intrinsic motivation of children a developmental theoretical orientation had not been implemented in research designs. Secondly, subjects in this investigation were children who were athletes and the task that was utilized was a sport specific task. Methodology in previous studies has included young adults, teenagers and children who have not been athletes. Also, the tasks included in other investigations have been novel activities that are not sport specific. The third intention of this study was to control for gender effects by using subjects and an experimenter who were of the same gender, i.e., female.

Subjects

Participants in this study were 41 female children between the ages of 5 and 11 years of age (based on the child's age on June 1, 1991). The mean age for the 5-year-olds was 64 months and the mean age for the 9-year-olds was 107 months. The subjects were athletes

from a private gymnastics club team located in Lansing, Michigan. Twenty-one of the subjects were in the preoperational stage of cognitive development. The other 20 subjects were in the concrete stage of cognitive development. Each subject was randomly assigned to one of two treatment groups: positive verbal feedback or tangible external rewards. In summary, there were 10 subjects who were in the preoperational stage of cognitive development who received positive verbal feedback, 10 subjects who were in the concrete stage of cognitive development who received positive verbal feedback, 10 subjects who were in the concrete stage of cognitive development who received tangible external rewards and 11 subjects who were in the preoperational stage of cognitive development who received tangible external rewards. Table 2 contains a breakdown of the number of subjects in each treatment group.

Table 2

Number of subjects for each treatment condition.

Stage of Cognitive Development	Type of External Reward	
	Positive Verbal	Certificate
Preoperational	10	11
Concrete	10	10

Design

A 2 (feedback group) x 2 (cognitive stage) within subjects factorial design was employed in testing the four hypotheses. The first factor represented the treatment condition. The two levels of this factor represented random assignment to one of two treatment conditions: positive verbal feedback or tangible external rewards. The second factor represented the cognitive stage of each subject: preoperational stage or concrete stage of cognitive development. Each of the subjects served as her own control. The rationale behind using this form of control treatment was based on the limited number of available subjects.

Procedure

Experimental assistants. This study necessitated the training of two assistants. These assistants' responsibilities included observing and recording the amount of time a subject spent on the target activity. The experimenter explained to the two assistants that they were to start the timer whenever the subject was standing or jumping on the trampoline. They were also instructed to stop the timer whenever the subject stepped off the trampoline. As mentioned, time on task was defined as the time spent standing or jumping on the trampoline. It is important to note that jumping on the trampoline could be a tiring activity. Thus, the operational definition of time on task must take this possibility into account. Consequently, the two assistants independently measured time on task as noted above. The times these assistants recorded would be averaged later to create

one score time on task for each subject. The averaging of the assistants recorded times was done for cross reliability purposes.

One of the two assistants was responsible for timing the entire free time period which was a 5 minute interval. It was explained to one of the assistants that she would start the timer at the beginning of the free time period which would be indicated by the experimenter. This assistant was also told to stop the timer when 5 minutes had passed and to notify the other assistant so he/she could stop timing. Responsibilities and instructions were provided to the two assistants in an introductory meeting with the experimenter.

Prior to the beginning of the actual study, the assistants who were timing met with the experimenter. At this time, the assistants received supplies (stopwatches, pencils and clipboards) that they would need to execute their duties. The assistants who were recording time on task had sheets of paper with corresponding subject numbers. Also, the cognitive stage of the subjects and the treatment condition that would be employed were secretly coded on the sheets of paper. The purpose of this coding was so that the experimenter was the only one who knew which treatment conditions were being employed and the cognitive stages of the subjects.

The experimenter served as a safety deacon during the free choice period. During the free time period, the experimenter did not communicate with the subjects at any time. The subjects were told that if they needed help to perform a skill to ask the experimenter who would be sitting in the middle of the room. When assistance was requested only physical "spotting" was provided. A tape recorder was

used to record the activity in the room during the free choice time to ensure there was not confounding communication between the subject and the experimenter.

The experimenter was United States Gymnastics Federation Safety Certified and was familiar with the equipment the subjects were permitted to utilize during the free choice period. Also, the experimenter was familiar with various gymnastics skills the subjects were able to perform and was able to "spot" or physically assist the subjects if necessary.

Preinvestigation preparations. Following the approval from the university's human subjects review committee (Appendix A), the execution of the present study was dependent upon receiving consent from a series of persons. The first consent was sought from the owner/business manager of a private club of which the subjects were members.

In order to randomly select subjects of the appropriate cognitive stages, a compiled list of enrollees at the club whose ages were representative of the preoperational and concrete stages of cognitive development was obtained. This list consisted of all of the names, ages and gymnastic levels of each child enrolled at the club. From the information on this list, twenty-two 9-year-olds and twenty-two 5-year-olds were randomly selected as prospective subjects. Two 9-year-olds were eliminated from the study because of time commitment dilemmas. One 5-year-old was eliminated from the study because she was not in the preoperational stage of cognitive development. This subject did not answer a cognitive testing task

the way a preoperational thinker should answer as defined by Piaget An introductory letter, a child consent form and a parental consent form were sent to each prospective subject and her parents (see Appendices B, C and D). The parents of each child received a introductory letter and consent form which was returned to the investigator. The parents were requested to ask the child if she wanted to participate in the study thereby obtaining the child's consent. Also, the investigator's home phone number and work number were included in the introductory letter so the investigator could be reached if parents had any questions or concerns.

Consent forms, level in gymnastics and age were not the only determining factors in randomly selecting prospective subjects. The level of gymnastics refers to the type of class in which the subjects were enrolled. All prospective subjects were selected from recreational gymnastics classes which include classes for beginners and classes for athletes that were more advanced. Also, due to the fact that this investigation was utilizing a developmental theoretical basis and this basis was used in defining subjects, it was necessary to test the stage of cognitive development of each subject.

In order to determine this, several tasks which measure abilities representative of the preoperational and concrete stages were used. The tasks that were tasks identified by Piaget as a way to differentiate levels of cognitive development. First, conservation tasks of liquid and mass were employed. Both of these tasks included a child watching an experimenter change a feature of

an object. The child was asked to decide if some other feature of the object had changed. In this case, the density of the liquid and mass were the features that were to be changed. The tester poured the same amount of liquid into two different containers, one that was tall and one that was short. The subject was asked which container had more liquid. Likewise, the experimenter placed two balls of clay that were of the same size in front of the subject. The experimenter then flattened one ball and asked the subject which object was bigger.

Secondly, a multiple classification task was used in determining cognitive stages of the subjects. Multiple classification requires an understanding of how to sort objects according to various classes. Pink and yellow circles and squares were utilized to measure the multiple classification ability. The subject was asked simply to sort these objects.

Thirdly, ordinal relations was another measure of cognitive ability. This ability requires an individual to put elements in a series according to one quantifiable dimension. Sticks of various lengths were used and the subjects were asked to place them in order from tallest to shortest.

Subjects were considered to be in the preoperational stage of development if they demonstrated the multiple classification ability but were not able to demonstrate conservation of tasks or ordinal relation tasks correctly. Subjects who performed conservation tasks and ordinal relations tasks correctly were considered to be in the concrete stage of cognitive development. These decisions were based

on the characteristics representative of the preoperational and the concrete stages of cognitive development identified by Ault (1977).

Lastly, if the subjects demonstrated abilities that were representative of the concrete stage, they were asked to respond to one additional task. The subjects were presented with a hypothetical situation (see Appendix E). They were asked to answer the questions about the hypothetical situations. The purpose of this task was to determine if the subjects were actually in the formal operational stage of development which is the next stage beyond the concrete stage.

The testing of cognitive stages took place before or after the subject's regular gymnastics class. The subject's answers and responses to the four tasks were recorded by the experimenter. The subject's cognitive stage of development was identified as preoperational or concrete depending on the subject's response to all four of the tasks. If the subjects were able to respond correctly to the hypothetical question, they were eliminated from the investigation. Similarly, if the subjects did not demonstrate the multiple classification ability, they were also eliminated from this investigation.

The tasks mentioned above for testing Piaget's stages of cognitive development have been used in previous experimental settings. Renner and Stafford (1976) utilized six conservation tasks developed by Piaget that allows a child to demonstrate his or her ability to use conservation reasoning. Among these six tasks were conservation of liquid and conservation of mass. Stafford and

Renner's results indicated that children do not develop the ability to understand conservation of liquid until 6 or 7 years of age. The ability to understand conservation of mass does not emerge until 7 or 8 years of age. Renner and Stafford's findings supported Piaget's assertion that the ability to use conservation reasoning usually develops around 6 to 8 years of age.

The ordinal relations task has also been used in an experimental setting. Dodwell (1971) used conservation tasks and the ordinal relations task to determine if children of 7 and 8 years of age demonstrated the ability to use conservation reasoning, and the ability to put elements in a series according to one quantifiable dimension. Once again, Piaget's assertion that children 7 or 8 years of age begin to arrange objects in some order relative to each other was supported by Dodwell's findings.

Multiple classification tasks and hypothetical situations have not been used in experimental settings to test for cognitive stages of development. However, these tasks can be justified in testing cognitive stages from a logical perspective. The preoperational child begins to develop the ability to understand basic properties of classes. The preoperational child demonstrates this ability by sorting objects according to various classes (Ault, 1977). The multiple classification task requires a child to do just that. In this task, a child is asked to sort objects such as cards that are pink and yellow, large and small, square and circular. The subject could select how she wanted to sort the objects. The way the objects were sorted was not of concern as long as the subjects were

consistent with the way the objects were sorted. For instance, if a subject began to sort the objects according to color and then began sorting them according to size, the subject was eliminated from the study. There was one subject who was eliminated from the study for this reason.

The concrete child applies what he or she knows to concrete objects or events. The concrete child cannot divorce himself or herself from the object world and think about purely hypothetical propositions (Ault, 1977). Thus, asking children to respond to hypothetical questions and or situations will lend information about the child's cognitive stage of development. No subjects were eliminated for this reason.

Procedures. In hopes of clarifying the general methodological procedures of this investigation, Table 3 presents a breakdown of procedures.

After all necessary consents were obtained, each subject was scheduled a time to appear at the facility for the first session. During this session treatment was not implemented. After arriving, the subject was met by the experimenter and introduced to the two assistants. The experimenter was female to control for possible gender effects. The subject was told that the assistants were doing work for the business manager and would not be participating in the study except for helping me time the free time period. These assistants were seated in the gymnasium so that they could see the subject at all times but also, in such a position that it was clear they were doing paperwork. The subject was then asked to warm

Table 3

Breakdown of Methodological Procedures

Order of Events

1. Selection of the subjects.

2. Cognitive testing of the subjects.

3. First session
   a. Mandatory 5 minutes jumping on the trampoline.
   b. Break and rest period for 3 minutes.
   c. Free time period for 5 minutes.

4. Second session
   a. Mandatory 5 minutes jumping on the trampoline.
   b. Treatment implemented.
   c. Break and rest period for 3 minutes.
   d. Free time period for 5 minutes.

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up/stretch out so she would be able to do gymnastics. The subject was introduced to the target activity, jumping on the trampoline. It was explained to the subject that the experimenter was interested in seeing how the subject jumped on the trampoline and what skills she could do. The subject was then asked to jump on the trampoline and demonstrate what she could do on the trampoline. Each subject was allotted a 5 minute interval to jump on the trampoline. The subject was told that she could jump on the trampoline for 5 minutes and if she got tired, she could rest and sit down.

When the 5 minute interval was completed, the subject was told that the experimenter had to record the many different skills she performed and that it would take a few minutes. During this time,

the subject was told she could get some water and rest a few minutes. When the experimenter returned, the child was asked about her favorite gymnastics activity (Appendix F). The subject was then told that it was now free time and she could practice on any of the four pieces of apparatus that had a white balloon attached to it: the uneven bars, balance beam, tumble strip or the trampoline.

The experimenter then notified the assistants who were serving as timers to begin timing the free time period and the subject's time on each task. The experimenter told the subject that the experimenter would be sitting in a chair in the middle of the gymnastics area and if she needed assistance to ask. In addition, the experimenter wore a belt with a tape recorder hidden inside. When the free time period began, the experimenter pushed the record button. The purpose of recording the free time period was to ensure there was not any verbal interaction between the experimenter and the subject. If for some reason there was dialogue, it would have been recorded and analyzed to determine if the subject was encouraged to perform a specific task. No subjects were eliminated for this reason. When the 5 minute interval was completed, the "free time" timer said stop, the two assistants stopped timing and recorded the amount of time the subject spent on the target activity on the sheets of paper given to them prior to the investigation. At this time, the subject was thanked for participating and left the facility.

After the first session took place, each subject selected a time to come back for the second session. The purpose of the first session was to establish a control condition. The treatment was

implemented in the second session. The time difference between the first and second sessions were two or three days. The procedures during the second session were the same as those in the first session with one exception. After the subject jumped on the trampoline the first time, the experimenter employed one of two treatment conditions depending on which condition the subject had been assigned. If the subject was assigned to the positive verbal feedback group, the experimenter made comments such as 'you are very good at jumping on the trampoline.' 'You can do a lot of things on the trampoline.' 'Some of the things you did were pretty hard, you did a good job.' If the subject was assigned to the certificate group, she received a certificate (Appendix G) after jumping on the trampoline but did not receive any verbal feedback. The resting and free choice period procedures in the second session were identical to those procedures exercised during the first session.

Instruments or Dependent Measures

Intrinsic Motivation. The assessment of intrinsic motivation that was utilized was time on task. In other words, the amount of time a subject spent on the target task (i.e., jumping on the trampoline) during free time after the treatment condition was measured and recorded. In addition, a questionnaire was implemented during both sessions. The questionnaire required the subject to report which activity was most enjoyable to practice.

Analysis of Data

Descriptive statistics were performed for several reasons. Firstly, to check for errors in the coded data. Secondly, to receive general statistic information such as means and standard deviations for each group. The next statistical procedure that was performed were 3 t-tests. The first t-test tested the statistical difference between the preoperational subject's and the concrete subject's time on the trampoline during the free time in the first session. The second and third t-tests tested the difference between the preoperational subject's and the concrete subject's mandatory time spent on the trampoline during the first and session sessions respectively. The final statistical technique that was employed to test the hypotheses was a 2 x 2 MANOVA. The two independent variables were the form of treatment and the cognitive developmental stage. The dependent variable was time spent on the trampoline during free time.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The results of this study will be organized into two sections. The first section presents descriptive data. Included in this section are results of surveys in the form of percentages and behavioral patterns of the subjects. The second section presents results of the experimental data analyses.

Descriptive Data. To confirm whether the trampoline is an intrinsically motivating task, a questionnaire was employed in the first and second sessions that asked subjects which of four activities were most enjoyable. Table 4 shows the percentage of the subjects who reported each activity as being most enjoyable for the first and second sessions. These percentages are also broken down into percentages for each cognitive stage. The trampoline was the most enjoyable activity in both sessions compared to the other three activities.

To assess self-report responses concerning what activities were most enjoyable between the preoperational and the concrete subjects, a Chi-square procedure was performed. Results showed no difference in response rates between the subjects for the first session, X^2 (3)= 7.08, $p > .05$. However, results did show a significant difference in

response rates for the second session, X^2 (3)=9.4, p <.05. In other words, the difference between the preoperational and the concrete subject's responses concerning what activity was most enjoyable was not statistically different in the first session but was in the second session. More concrete subjects reported that the trampoline and tumbling were most enjoyable than did the preoperational subjects. Also, preoperational subjects reported that the beam and the bars were most enjoyable compared to the concrete subjects.

Table 4

The percentage of the subjects who reported the trampoline, balance beam, uneven bars and tumble strip as being most enjoyable.

	Percentage of Subjects			
	First Session		Second Session	
	N	%	N	%
Trampoline	19	46	16	39
Preoperational	9	47	7	44
Concrete	10	53	9	56
Uneven Bars	9	22	10	24
Preoperational	7	78	6	60
Concrete	2	22	4	40
Balance Beam	2	5	6	15
Preoperational	2	100	6	100
Concrete	0	0	0	0
Tumble Strip	11	27	9	22
Preoperational	3	27	2	22
Concrete	8	73	7	78

Although the percentage of subjects that reported the trampoline as being the most enjoyable activity was lower in the second session compared to the first session when behavioral data were assessed, more subjects went to the trampoline in the second session compared to the first session. Fifty percent of all subjects spent time on the trampoline in the second session and forty-five percent spent time on the trampoline in the first session. In addition, the average time spent on the trampoline in the free time period during the first session was 23.7 seconds (SD=31.2). The average time spent on the trampoline in the second session was 50.8 seconds (SD=74.4).

In general, the subject's behavior was not congruent with their self-report concerning their most enjoyable activity. Overall, fewer subjects reported the trampoline as being the most enjoyable activity in the second session but more subjects jumped on the trampoline in the second session than they did in the first session. Also, the average time spent on the trampoline was twice as long in the second session compared to the first session.

During the free time in both sessions, subjects waited to go to the trampoline after going to other activities first. A possible explanation for this is that these subjects are rarely given the opportunity during their class to practice any activity they select without supervision of an instructor. Consequently because of this rarity, subjects could have found it interesting to do the other activities following the mandatory jumping time. However, it should be recognized that in the first session sixteen of the subjects went

back to the trampoline after doing three other activities first. In the second session, sixteen of the subjects went back to the trampoline after only going to one other activity first.

In conclusion, it would seem that the trampoline was intrinsically motivating to the subjects. In both sessions, it was the activity that was reported as being the more enjoyable activity. Also, the subjects' behavior (going back to the trampoline) during the two free time periods confirms that the trampoline was an intrinsically motivating task.

Three t-tests were performed to test for initial difference between the preoperational and the concrete stages during the free time in the first session, and, mandatory time spent on task during the first and the second sessions. The t-test between the preoperational and concrete stages during free time in the first session found no significant difference, t (39)= -1.38, $p > .05$. Moreover, there was no difference between the amount of time the preoperational and the concrete subjects spent on the trampoline in the first session. The t-test between the two cognitive stages of development on the mandatory time spent on the trampoline in the first session found no statistically significant difference, t (39)= =.83, $p > .05$. Also, the t-test between the two cognitive stages on the mandatory time spent on trampoline in the second session found no statistical difference, t (39)= .80, $p > .05$. In other words, there was no difference between the time the preoperational and the concrete subjects spent on the trampoline in the mandatory time in

the first session or the second session. The means and standard deviations for all three t-tests are displayed in Table 5.

Table 5

The means and standard deviations for the t-tests between the two cognitive stages in; time spent on tramp in 1st session, mandatory time on tramp in 1st session and, mandatory time on tramp in 2nd session in seconds.

t-Test	N	M	SD
Time spent on tramp in 1st session by cognitive stage.			
Preoperational subjects	21	17.2	21.8
Concrete subjects	20	30.6	38.2
Time spent on tramp during mandatory time period in 1st session by cognitive stage.			
Preoperational subjects	21	241.5	62.3
Concrete subjects	20	256.1	48.9
Time spent on tramp during mandatory time period in 2nd session by cognitive stage.			
Preoperational subjects	21	259.1	54.8
Concrete subjects	20	271.2	39.9

Experimental Data. To test the hypotheses, a 2 (cognitive stage) by 2 (treatment) MANOVA with repeated measures was performed.

The results revealed a significant difference for cognitive stage, $F(1,36) = 6.6$, $p < .05$. Thus, the subject's cognitive stage does influence the time spent jumping on the trampoline in that the concrete subjects jumped longer than did the preoperational subjects. The difference between the time all subjects spent on the trampoline during free time in the first session and free time in the second session following a reward condition was found also to be significant, $F(1,36) = 8.39$, $p < .05$. All subjects jumped longer on the trampoline in the second session than they did in the first session. This finding lends statistical support to previous research that external rewards influence intrinsic motivation. There was also statistical significance for the stage by trial interaction, $F(1,37) = 5.2$, $p < .05$. The concrete subjects jumped longer in the second session than in the first session compared to the preoperational subjects. For the concrete subjects, the mean difference between time on task in the first and the second sessions was 49.4 seconds (80-30.6). The preoperational subjects' mean difference between time on task in the first and in the second free time sessions was 5.8 seconds (23-17.2). Figure 1 presents the means in seconds for the amount of time the preoperational and the concrete subjects spent on the trampoline in the first and second sessions.

The treatment effect (i.e., certificate or positive verbal feedback) was found to be non-significant, $F(1,36) = 1.04$, $p > .05$, as was the interaction between cognitive stage and treatment, $F(1,36) = 2.66$, $p > .05$. Consequently, the type of treatment and the interaction between the type of treatment and cognitive stages did

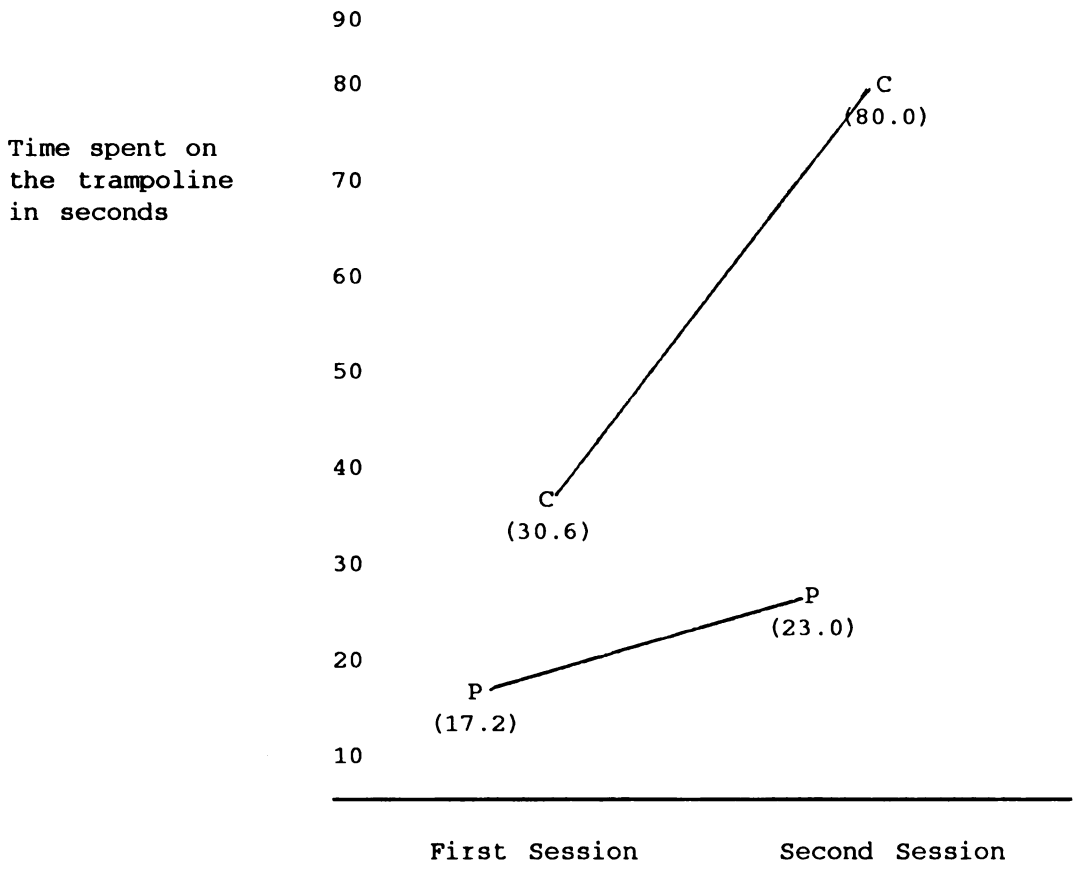


Figure 1 The means in seconds for the amount of time the preoperational and the concrete subjects spent on the trampoline in the first and second sessions (P=preoperational, C=concrete).

not influence time spent jumping on the trampoline. Likewise, the treatment by trial interaction was non-significant, $F(1,36) = .48$, $p > .05$. The subjects receiving the certificate did not jump longer in the second session than they did in the first session compared to the subjects who received positive verbal feedback. Lastly, the

Table 6

The means and standard deviations for the amount of time in seconds the subjects spent on the trampoline during the free time period in the second session.

Independent Measures	N	1st Session M	1st Session SD	2nd Session M	2nd Session SD
Cognitive Stage					
Preoperational	21			23.0[a]	33.9
Concrete	20			80.0[a]	93.3
Treatment					
Certificate	21			59.8	89.2
Positive Verbal Feedback	20			41.4	55.7
Trial					
All subjects	41	23.92[a]	30.02	51.5[a]	63.58
Cognitive Stage by Trial					
Preoperational	21	17.24[a]	21.83	23.0[a]	33.85
Concrete	20	30.6[a]	38.21	80.0[a]	93.32
Treatment by Trial					
Certificate	21	27.0	35.43	59.76	89.23
Positive Verbal Feedback	20	20.35	26.7	41.4	55.73
Cognitive Stage by Treatment by Trial					
Preoperational and Certificate	11	14.45	20.45	17.8	28.1
Preoperational and Positive Verbal Feedback	10	20.3	23.98	28.7	39.9
Concrete and Certificate	10	40.8	43.83	105.9	110.9
Concrete and Positive Verbal Feedback	10	20.4	30.49	54.1	67.8

a= significant at .05

treatment by cognitive stage by trial interaction was found to be non-significant, $F(1,36) = .91$, $p > .05$. In other words, no group differences were found (the preoperational certificate group, preoperational positive verbal feedback group, concrete certificate group or the concrete positive verbal feedback group) with respect to time spent jumping in the second session or in the first session. Thus the hypotheses identified in this investigation were not supported. The means and standard deviations for the amount of time the subjects spent on the trampoline during the free time period in the second session are presented in Table 6.

Although there was statistical support for a main effect of cognitive stage in the second free time session (the older subjects spent more time on the target activity), the interaction between cognitive stage and treatment was not statistically supported. Moreover, the difference between the time spent on the target activity of the preoperational and the concrete subjects who received the same treatment, a certificate, was found to be non-significant. More specifically, the mean for jumping on the trampoline in the second session for the preoperational subjects who received a certificate was 17.8 seconds compared to the mean for the concrete subjects, 105.9 seconds. These means and the standard deviations are reported in Table 6.

Discussion

There are two possible explanations as to why the subject's cognitive stage influenced the time spent on the trampoline. First,

an individual's perception of the nature of the reward influenced intrinsic motivation. This notion may still hold. However, the individual's ability to attend to one task for a period of time could also influence intrinsic motivation. Developmentally, younger children may not have the same ability to stay focused on a task as long as an older child. The older child's cognitive growth and attentional abilities are more mature than a younger child's which may not allow the younger child to attend to one task for a longer period of time, when given other choices.

The second possible explanation deals with the subject's physical capacity to perform a task for a period of time. The trampoline is an activity that requires physical endurance and could potentially be exhausting. Children may have become tired after jumping on the trampoline even though it was an enjoyable or intrinsically motivating activity. This is especially true for younger children. The younger child's developmental systems (physiological and biological) may not be as mature or developed as older children. Moreover younger children may not have the physical capabilities to jump on the trampoline as long as older children.

The above explanations attempted to address the significant difference in intrinsic motivation for cognitive stage. These explanations could also hold for the interaction effect between trial and cognitive stage that was found to be significant. The concrete subjects were able to establish cause and effect relationships. This supports Vallerand and Reid's (1983) notion that the saliency of the locus of causality and the locus of competence mediates intrinsic

motivation. It was suggested by Vallerand and Reid that when one perceives the cause of his or her behavior as being external, the locus of causality decreases intrinsic motivation. However, the nature of the relationship between the source who is controlling the behavior of the individual should be considered. For example, in an athletic setting athletes are accustomed to viewing an instructor/coach as the controlling aspect of the athlete's behavior. The instructor's role is to guide and teach the child sport skills and to control the child's behavior. The instructor controls behavior through reinforcement and punishment. Thus, to an athlete the external locus of causality of his or her behavior may not decrease intrinsic motivation rather it may cause an increase in intrinsic motivation. When an instructor provides an external reward, the concrete athlete understands the relationship between his or her behavior (cause) and the reward (effect). This ability serves to increase the competence level of the athlete which increases intrinsic motivation. Consequently, the influence of external rewards on intrinsic motivation is a function of both loci; locus of causality and locus of competence. In summary, the increases in the level of intrinsic motivation could be partly due to external rewards which influence the locus of competence and undermines the controlling aspect of the instructor. Underlying these influences are the individual's cognitive ability to establish cause and effect relationships and attributions of behavior. Most individuals do not acquire this cognitive ability until 7 years of age which is the beginning of the concrete stage of cognitive development. Thus,

cognitive ability may serve as an explanation as to why the concrete subjects were more intrinsically motivated than the preoperational subjects.

In attempting to understand why the hypotheses of this investigation were not supported statistically, several issues should be addressed. Firstly, there were a few methodological procedures that could have influenced the results of this study. The mandatory time the subjects had to spend on the trampoline (5 minutes) before having free time could have been too long. Although time on task was identified as standing or jumping on the trampoline, the majority of the subjects spent close to the 5 minutes jumping. Subjects, particularly the younger ones who were in the preoperational stage of development, could have felt tired but continued jumping because they rarely have the opportunity to jump on the trampoline without waiting their turn in class or without supervision from an instructor. Thus, when given free time following a short rest, subjects looked to other activities as a way to extend the rest interlude.

Another methodological procedure that could have influenced the results of this study was the nature of the certificate and the positive verbal feedback. Both of the treatment conditions were contingent on the task but were not contingent upon the subject's performance. All subjects, regardless of their ability or performance, were given either a certificate or positive verbal feedback. The subject's perception of her performance and the reward could have influenced the subject's intrinsic motivation. As an athlete with some knowledge of performance, if the subject felt that

she did not perform well on the trampoline, positive verbal feedback or a certificate could have influenced the subject's behavior in the free time period. The reward could have increased the subject's confidence level which in turn could have increased the subject's intrinsic motivation or activity on the trampoline. On the other hand, the reward may not have influenced the subject's intrinsic motivation because the subject perceived the reward as not being warranted. If the subject felt that she did perform well on the trampoline, a certificate or positive verbal feedback could have influenced the subject's behavior during the free time period. The reward could have enhanced the subject's confidence level increasing the subject's intrinsic motivation. Another possibility is that the subject could have perceived the reward as not worthy of her performance which could have decreased her intrinsic motivation or activity on the trampoline.

A third issue that could have affected the subject's responses in the free time period was the subject's competence relative to the task at hand. Deci referred to intrinsic motivation as behaviors people engage in to feel competent and self-determining in dealing with their environment. It is possible that some subjects did not feel competent at jumping on the trampoline, and thus, found jumping on the trampoline not intrinsically motivating. Although this could have been the case, all subjects were asked to jump on the trampoline during the mandatory time period. If subjects did not feel competent in the task at hand and did not find the task as intrinsically motivating, then implementation of a reward whether it be a

certificate or positive verbal feedback would not have influenced the subject's behavior. Alternatively, if all of the subjects were intrinsically motivated and felt competent in performing on the trampoline, how would external rewards influence the subject's behavior and intrinsic motivation? Would the subjects of one cognitive stage of development have an increase in intrinsic motivation compared to subjects of the other cognitive stage? From the results revealed in this study and that of previous research, it would seem that all subjects regardless of their cognitive stage would have an increase in intrinsic motivation. Consequently, the subject's confidence and competence level as well as her perception of her performance and ability are issues that could have impacted the results of this investigation.

The last methodological procedure that possibly could have affected the results of this study were the number of subjects in the study as well as the cell number for each group. Three cells contained 10 subjects and one cell contained 11 subjects bringing the total number of subjects to 41. Due to the population size at the facility where the investigation took place, a larger sample size was not possible. If more subjects were used in the investigation, a larger sample size could change the results of this study.

Other possible reasons for the lack of statistical support for the hypotheses include the type of classes the subjects were enrolled in and the different type of subjects and task that were used in this study. Firstly, the instructors of the classes these subjects were enrolled in are trained to provide as much feedback to the children

as possible. The feedback includes technical corrections as well as encouragement and praise. For the most part, positive verbal feedback is given very often throughout the class time. Along with positive verbal feedback, the subjects also participate in games and contests in which stickers, certificates, ribbons and food are often rewards for their performances. Given this situation positive verbal feedback and certificates are not novelties. Thus, the treatment conditions in this investigation could have been unimportant to the subjects.

Secondly, the task itself, jumping on the trampoline, is not a novel task. The subjects in this investigation are given the opportunity to practice on the trampoline during their regular class time. However, the situation in which they were given the opportunity to jump on the trampoline was a novelty. As mentioned, it was a rarity that the subjects were able to do anything they wanted in the gym without waiting in line and without instructions. Moreover, the fact that jumping on the trampoline was not novel could have influenced the subjects' intrinsic motivation regardless of the nature of the situation.

Thirdly, the hypotheses of this study were based on results of previous literature in the area of intrinsic motivation, external rewards and a developmental theoretical orientation. The subjects in previous research have not included athletes representative of the preoperational and concrete stages of development. Also, tasks in previous research have not been sport related tasks. The hypotheses of this study were based on results of previous literature utilizing

novel tasks, subjects who were adults and children and research that did not implement a developmental framework. Although the hypotheses of this study were not supported, the results in this study did specify a cognitive stage main effect and did lend support to previous literature that external rewards do influence intrinsic motivation. It seems that the cognitive stage of children is an important issue to consider when looking at the child's intrinsic motivation.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The intentions of this investigation were to study the effects of external rewards on intrinsic motivation utilizing a developmental theoretical orientation. In addition, the subjects of this study were athletes who were representative of the preoperational and the concrete stage of cognitive development. Finally, the task included in this study was a sport specific task.

It was hypothesized that the level of intrinsic motivation for preoperational subjects would differ from the concrete subject's level of intrinsic motivation. Also, it was hypothesized that the certificate and the positive verbal feedback would affect the preoperational subjects' intrinsic motivation differently. Likewise, positive verbal feedback and a certificate would affect the concrete subjects' intrinsic motivation differently.

There were twenty-one subjects in the preoperational stage of cognitive development and twenty subjects in the concrete stage. Ten subjects from each cognitive stage were assigned to one of two treatment conditions, positive verbal feedback or certificate. There were eleven subjects who were in the preoperational stage of development who were assigned to the certificate condition. The

other three cells consisted of ten subjects each. Moreover, the design of this study was a 2 (cognitive stage) by 2 (treatment condition) design with repeated measures.

Subjects were required to attend two different sessions during the study. During the first session, the subjects were asked to jump on the trampoline for 5 minutes. After this interval they had a 3 minute rest. During this time, the subjects were given the favorite activity questionnaire. Upon completion, the subjects were told they had free time and could go to any activity they wanted providing there was a white balloon attached to the apparatus. After the 5 minute free time interval, the investigator thanked the subjects for participating.

The procedures for the second session were identical to those executed in the first session with one exception. After the subjects jumped on the trampoline for the 5 minute interval, they were either given positive verbal feedback or a certificate depending on the group to which they were assigned. The subjects were given the favorite activity questionnaire and then were told they had free time and could go anywhere there was a white balloon.

Time spent standing or jumping on the trampoline during the free time periods served as the measure of intrinsic motivation. In addition, a questionnaire asking which activity was most enjoyable was employed. These questionnaires were given to all subjects in both sessions.

Conclusions

Results revealed a main effect for cognitive stage. In other words, the concrete subjects spent more time on the trampoline than did the preoperational subjects. Also, there was a trial main effect which indicated that the amount of time the subjects jumped on the trampoline during the free time increased from the first session to the second session. With this in mind, external rewards appeared to influence intrinsic motivation which lends support to previous research. The interaction between cognitive stage and trial was found to be significant. Specifically, the amount of time the concrete subjects spent on the trampoline increased from the first session to the second session more than the preoperational subjects' time.

The main effect for the treatment condition was found to be non significant. Also, the interactions between cognitive stage and treatment conditions were found to be non significant. It was not statistically supported that the type of external reward (positive verbal feedback or certificate) influenced intrinsic motivation; and, it was not supported that the interactions between cognitive stage and the type of treatment influenced intrinsic motivation. In addition, the interaction between the type of treatment and trial was found to be non-significant. Moreover, the three way interaction between cognitive stage, treatment and trial was also found to be non-significant. Consequently, the hypotheses identified in this investigation were not supported.

Several possible issues could have affected the results of this investigation. Some of these issues were methodological procedures. The first one related to the nature of the task. The task was an activity that the subjects were familiar with and had prior experience practicing. Thus, the task was not a novelty to the subjects as has been the case frequently in previous research. Secondly, the subjects involved in this study were athletes who receive some form of external rewards on a regular basis during their class time. With this in mind, the importance of the treatment conditions could have been undermined. Thirdly, the 5 minute mandatory time the subjects had to perform on the trampoline could have been too long resulting in tiring the subject. Lastly, the rewards given in this study were not contingent on specific performances of the subjects but rather, contingent solely on the task.

The fact that competence or confidence was not looked at could also have been important in trying to understand why the hypotheses were not supported. It was been noted that confidence and competence are both related to levels of intrinsic motivation. Moreover, by looking at confidence and competence levels of the individual, it may help in understanding intrinsic motivation, particularly for athletes.

The last issue that could have influenced the results was the previous research upon which the hypotheses of this study were based. The research used to formulate the hypotheses of this study did not include the same type of specialized subjects or tasks that were

included in this study. Also, this research investigation extended the research in intrinsic motivation with children by implementing a developmental theoretical orientation as a basis for selecting and studying children.

Issues For Coaches

The results of this study indicated that both positive verbal feedback and certificates influenced intrinsic motivation similarly for youth athletes. However, certain factors should be considered before applying this notion to working with children. First, the cognitive stage of the child is very important in looking at the influences of external rewards on intrinsic motivation. There was a significant difference between children of different cognitive stages and the time spent jumping on the trampoline. Along with cognitive stage, certain cognitive processes of the child such as perception of the situation and his or her performance, and the child's attribution of behavior are also important to consider. Thirdly, psychological processes such as competence and confidence are also believed to underly levels of intrinsic motivation. It was suggested that competence levels of the child mediate the influence of external rewards on intrinsic motivation (Vallerand & Reid, 1983). Moreover, competence and confidence levels of the child could have been partly responsible for the results of this study. Lastly, the nature of the task (novelty) and familiarity of the task could be indicators of how external rewards influence intrinsic motivation. The issues mentioned above are pertinent to the understanding of the influence

external rewards have on intrinsic motivation and it is suggested that they be considered when working with children.

Recommendations

In conclusion, taking the issues that could have influenced the results of this study into consideration, future research suggestions can be addressed. Future recommendations are as follows:

1) More research should include tasks that subjects are familiar with and tasks on which subjects have prior experiences performing to eliminate novelty effects.

2) More research should include tasks that are commensurate with subject's physical and cognitive ability so as to eliminate such factors as fatigue and lack of attentional focus.

3) The confidence and/or competence levels of subjects should be considered and measured when looking at how external rewards influence intrinsic motivation.

4) More research should include a developmental theoretical basis as a means for selecting and studying children.

5) Other stages of cognitive development should be included in research looking at how external rewards influence intrinsic motivation.

6) Research implementing a developmental theoretical basis as a means for selecting and studying children should use a longitudinal approach.

APPENDICES

APPENDIX A

UNIVERSITY HUMAN SUBJECTS COMMITTEE APPROVAL

UNIVERSITY HUMAN SUBJECTS COMMITTEE APPROVAL

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

May 15, 1991

Kimberly Hartwick-Reinsch
1302 H University Village

RE: THE EFFECTS OF EXTERNAL REWARDS ON THE INTRINSIC MOTIVATION OF CHILDREN WHO ARE AT A CONCRETE, OR PREOPERATIONAL STAGE OF DEVELOPMENT WHEN PERFORMING A GYMNASTICS TASK, IRB#91-242

Dear Ms. Hartwick-Reinsch:

The above project is exempt from full UCRIHS review. The proposed research protocol has been reviewed by another committee member.. The rights and welfare of human subjects appear to be protected and you have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to May 14, 1992.

Any changes in procedures involving human subjects must be reviewed by UCRIHS prior to initiation of the change. UCRIHS must also be notifed promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to my attention. If I can be of any future help, please do not hesitate to let me know.

Sincerely,

David E. Wright

David E. Wright, Ph.D., Chair
University Committee on Research Involving
Human Subjects (UCRIHS)

DEW/deo

cc: Dr. Marty Ewing

APPENDIX B

INTRODUCTORY LETTER

INTRODUCTORY LETTER

Dear Parents and Gymnasts:

I am a graduate student in the department of Physical Education and Exercise Science at Michigan State University. I am asking for your help, and your daughters in order to complete a research project for my masters degree.

The investigation's purpose is to observe the effects of external rewards on children's intrinsic motivation. This is an important topic to study because of it's wide implications to instructors and coaches who are working with children in a physical setting such as gymnastics. Consequently, any information which helps coaches and instructors work with children more effectively can only be of benefit to the child.

The investigation will require you to bring your child to Great Lakes Gymnastics Club for two sessions. The first session will take approximately twenty five minutes. At this time, I will seek your child's consent. If consent is obtained, your child will be asked to answer six questions about six different tasks to determine how well your child understands spatial relationships plus a questionnaire to determine what gymnastics events are the most fun. Finally, the subjects will be asked to jump on the trampoline. After the child shows the investigator what she can do on the trampoline, they will asked to rest. After resting time, the child will be given free time on four pieces of apparatus for five minutes. I will be with the child during this entire time.

Your daughter will be asked to come back to the gym for a second session for the experiment. This session will take approximately fifteen minutes. The child will be asked to jump on the trampoline and then rest for five minutes. After resting takes place, then the child will be given free time on four pieces of apparatus for five minutes. Once again, the investigator will be the child through this entire time.

It be must stressed that participation in this study is totally voluntary. Your daughter is free to withdraw from the study at any time. All results will be treated with complete confidence, and confidentiality is guaranteed. Only group data will be reported and all subjects will be assigned a code to ensure anonymity.

There is not any forseeable risk to the subjects physically or psychologically. The four apparatus' they will be allowed to work on are apparatus' they have worked on in their regular gymnastics classes. Also, I am the a safety certified gymnastics instructor at Great Lakes Gymnastics Club and will be with the child at all times.

In order for your daughter to participate in the study, consent forms must be signed by you. After discussing the study with your daughter, please sign the enclosed consent form and return it to me in the enclosed self-addressed stamped envelope. Child's consent will be sought during the first session. Once I have received parental consent, I will contact you to set up a time to meet for the first session.

If you have any questions concerning the study you may contact me, Kim Hartwick at Home:355-6071 or at Great Lakes:485-4852 any time. Thank you for your support and time with this study.

Sincerely,

Kim Hartwick Reinsch

APPENDIX C

PARENTAL CONSENT FORM

PARENTAL CONSENT FORM

_____ has my permission, as legal parent to volunteer for the study being conducted by Kim Hartwick-Reinsch. I have received and understand the following information concerning this study:

1. I have read the information contained in the accompanying letter concerning the proposed project which is being conducted with children from Great Lakes Gymnastics Club Incorporated.

2. I understand the explanation of the study and I understand what my child's participation will involve.

3. I understand that, at my request, I can receive an additional explanation of the study from the principal investigator.

4. I understand that I am free to withdraw my consent and discontinue my child's particpation at any time.

5. I understand that my child's participation is completely voluntary and that she is free to discontinue participation at any time.

6. I understand that the results of this study will be treated in strick confidence and that confidentiality of my daughter is guarenteed.

_____
Signature of Parent

_____
Name of Parent (please print)

_____
Date

I do not give my consent as a legal guardian for my child to participate in the investigation.

_____

Signature of Parent

_____

Name of Parent (please print)

_____

Date

APPENDIX D

CHILD CONSENT FORM

CHILD CONSENT FORM

I would like to show Kim what I can do on the trampoline.

_____
Signature of child

_____
Name of child

_____
Date

I do not want to show Kim what I can do on the trampoline.

_____
Signature of child

_____
Name of child

_____
Date

APPENDIX E

TASKS USED IN COGNITIVE TESTING

TASKS USED IN COGNITIVE TESTING

1. Conservation of liquid -- The experimenter places two containers of different sizes in front of the subject (a short and a tall container). Next to these containers are two glasses of equal size. These glasses are filled with the same amount of liquid. The subject is asked if there is the same amount of water in each glass. The experimenter then pours the liquid into the tall and short containers in front of the subject. The subject is then asked what container has the most liquid.

2. Conservation of mass -- The experimenter places two balls of clay of equal sizes in front of the subject. The experimenter asks if the balls are of equal size. The experimenter then presses one of the balls into a sausage like patty in front of the subject. The subject is then asked which piece of clay is bigger.

3. Multiple Classification -- Two pink squares, two pink circles, two yellow circles and two yellow squares are placed in front of the subject. The subject is asked to sort the objects in front of her.

4. Ordinal Relations -- Six sticks of various lengths were placed in front of the subject. The subject was asked to place the sticks in order from tallest to shortest.

5. Hypothetical Situation -- The subject was asked to answer the following question, "If all dogs are pink, and I have a dog what color is my dog?"

APPENDIX F

FAVORITE ACTIVITY QUESTIONNAIRE

QUESTIONNAIRE: WHAT ACTIVITY IS THE MOST FUN?

Subject Number_____

PLace an "x" in front of the gymnastics task that you think is the most fun to do.

The activity that I think is the most fun is the:

_____ Trampoline

_____ Beam

_____ Bars

_____ Tumble Strip or Obstacle course

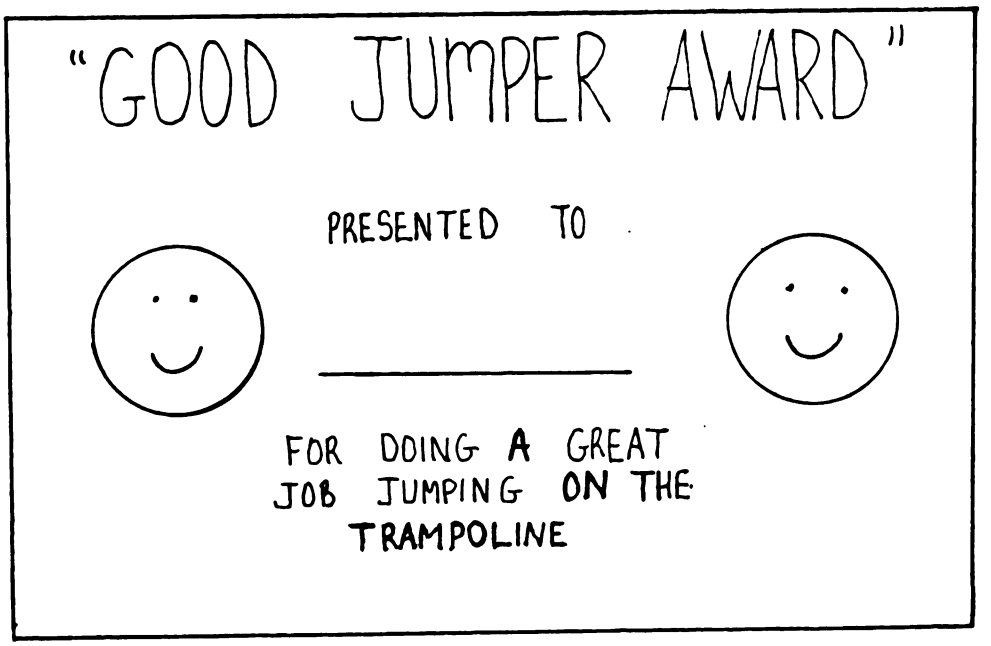
APPENDIX G

CERTIFICATE GIVEN DURING THE EXPERIMENT

APPENDIX H

DATA DICTIONARY

CERTIFICATE GIVEN DURING THE EXPERIMENT



DATA DICTIONARY

Variable Name	Variable Label	Value Label	Column
ID	Subject number	---	1-3
AGE	Cognitive stage	1=preoperational 2=concrete	4
TX	Treatment	1=certificate 2=positive fdbk	5
ACT1	Pre-activity first session	1=trampoline 2=bars 3=beam 4=tumble	6
ACT2	Post-activity second session	Same as above	7
CTRAMPT	Mandatory time jumping in first session	---	8-10
TTRAMPT	Mandatory time jumping in second session	---	11-13
CFTTR	First session free time tramp	---	14-16
TFTTR	Second session free time tramp	---	17-19

CACT1	1 activity free time, fs	1=tramp 2=bars 3=beam 4=tumble	20
CACT2	2 activity free time, fs	same	21
CACT3	3 activity free time, fs	same	22
CACT4	4 activity free time, fs	same	23
CACT5	5 activity free time, fs	same	24
CACT6	6 activity free time, fs	same	25
CACT7	7 activity free time, fs	same	26
CACT8	8 activity free time, fs	same	27
CACT9	9 activity free time, fs	same	28
CACT10	10 activity free time, fs	same	29
CACT11	11 activity free time, fs	same	30

TACT1	1 activity free time, ss	same	31
TACT2	2 activity free time, ss	same	32
TACT3	3 activity free time, ss	1=tramp 2=bars 3=beam 4=tumble	33
TACT4	4 activity free time, ss	same	34
TACT5	5 activity free time, ss	same	35
TACT6	6 activity free time, ss	same	36
TACT7	7 activity free time, ss	same	37
TACT8	8 activity free time, ss	same	38
TACT9	9 activity free time, ss	same	39
TACT10	10 activity free time, ss	same	40
TACT11	11 activity free time, ss	same	41

CTRAMP	Fs free time tramp	1=yes 2=no	42
CBARS	Fs free time bars	same	43
CBEAM	Fs free time beam	same	44
CTUMBLE	Fs free time tumble	same	45
TTRAMP	Ss free time tramp	same	46
TBARS	Ss free time bars	same	47
TBEAM	Ss free time beam	same	48
TTUMBLE	Ss free time tumble	same	49

APPENDIX I

RAW DATA

RAW DATA

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REFERENCES

REFERENCES

Anderson, R., Manoogian, S. & Reznick J. (1976). The undermining and enhancing of intrinsic motivation in preschool children. Journal of Personality and Social Psychology, 34, 915-922.

Ault, R. (1977). Children's cognitive development. New York: Oxford University Press.

Baldwin, C. & Baldwin, A. (1970). Children's judgement of kindness. Child Development, 41, 29-47.

Bem, D. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 74, 183-200.

Bredemeier, B. & Weiss, M. (1983). Developmental sports psychology: A theoretical perspective for studying children in sport. Journal of Sport Psychology, 5, 216-230.

Calder, B. & Straw, B. (1975). Self perception of intrinsic and extrinsic motivation. Journal of Personality and Social Psychology, 31, 599-605.

Carron, A. (1984). Motivation...Implications for coaching and teaching. London: Sports Dynamic.

deCharms, R. (1968). Personal causation. New York: Academic Press.

Deci, E. (1971). Effect of externally mediated rewards on intrinsic motivation. Journal of Personality and Social Psychology, 18, 105-115.

Deci, E. (1972). Intrinsic motivation, extrinsic reinforcement and equity. Journal of Personality and Social Psychology, 22, 113-120.

Deci, E., Cascio, W. & Krusell, J. (1973). Sex differences verbal reinforcement and intrinsic motivation. Paper presented at the meeting of the Eastern Psychological association, Washington D.C., May.

Deci, E. (1975). Intrinsic motivation. New York: Plenum Press.

Deci, E., Cascio, W. & Krusell, J. (1975). Cognitive evaluation theory and some comments on the Calder & Staw critique. Journal of Personality and Social Psychology, 31, 81-85.

Deci, E. (1977). Intrinsic motivation: Theory and application. Paper presented at the North American Society for the Psychology of Sport and Physical Activity, New York, May.

Dodwell, P. (1971). Intellectual development. In P. Sears (Ed.) New York: John Wiley & Sons, Inc.

Festinger, L. (1967). The effect of compensation on cognitive processes. Paper presented at the McKinney Foundation Conference on Managerial Compenstion, New York, March.

Gould, D. (1980). Motivating young athletes. Institute for the Study of Youth Sports, Michigan State University, East Lansing, Michigan.

Gould, D. (1982). Sport psychology in the 1980's: Status, direction and challenge in youth sports research. Journal of Sport Psychology, 4, 203-218.

Greene, D. & Lepper, M. (1974). Effects of external reward on children's subsequent intrinsic interest. Child Development, 45, 1141-1145.

Halliwell, W. (1978). The effect of cognitive development on children's perceptions on intrinsically and extrinsically motivated behavior. In D. Landers & R. Christina (Eds.) Psychology of Motor Behavior and Sport 1977. Champaign, IL: Human Kinetics.

Heider, F. (1958). The psychology of interpersonal relations. New York: Wiley.

Karinol, R. & Ross, M. (1976). The development of causal attributions in social perception. Journal of Personality and Social Psychology, 34, 455-464.

Kelley, H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), Nebraska Symposium on Motivation, vol. 15, Lincolin, NE: University of Nebraska Press.

Kelley, H. (1973). The process of causal attribution. American Psychologists, 28, 107-128.

Kruglanski, A., Alon,S. & Lewis, T. (1972). Retrospective misattribution and task enjoyment. Journal of Experimental Social Psychology, 8, 493-501.

Kruglanski, A. (1975). The endogenous-exogenous partition in attribution theory. Psychological Review, 82, 387-406.

Kruglanski, A., Riter, A., Amitai, A., Margolin, B., Shabtai, L. & Zaksh, D. (1975). Can money enhance intrinsic motivation?: A test of content-consequence hypothesis. Journal of Personality and Social Psychology, 31, 744-750.

Lepper, M. & Greene, D. (1975). Turning play into work: Effects of adult surveillance and extrinsic rewards on children's intrinsic motivation. Journal of Personality and Social Psychology, 31, 479-486.

Lepper, M., Greene, D. & Nesbitt, R. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the overjusification hypothesis. Journal of Personality and Social Psychology, 28, 129-137.

Martens, R. (1975). Social psychology and physical activity. New York: Harper & Row.

Phillips, J. (1981). Piaget's theory: A primer. San Fransisco: W.H. Freeman & Co.

Pittman, T., Davey, M., Alafat, K., Wetherhill, R. & Kramer, N. (1980). Informational verses controlling rewards, levels of surveillance and intrinsic motivation. Personality and Social Psychology Bulletin, 6, 228-233.

Renner, J. & Stafford, D. (1976). Development of cognitive reasoning through experience. In J. Renner, D. Stafford, A. Lawson, J. McKinnon, F. Friot and D. Kellogg (Eds.) Research, teaching and learning with Piaget model. Norman, OK: University of Oklahoma Press.

Roberts, G., Kleiber, D. & Duda, J. (1981). An analysis of motivation in children's sport: The role of perceived competence in participation. Journal of Sport Psychology, 3, 206-216.

Ross, M. (1975). Salience of reward and intrinsic motivation. Journal of Personality and Social Psychology, 32, 245-254.

Smith, M. (1975). Children's use of multiple sufficient cause schema in social perception, Journal of Personality and Social Psychology, 32, 737-744.

Swann, W. & Pittman, T. (1977). Initiating play activity of children: The moderating influence of verbal cues on intrinsic motivation. Child Development, 48, 1128-1132

Thomas, J. & Tennant, L. (1978). Effects of rewards on changes in children's motivation for an athletic task. In F. Smoll & R. Smith (Eds.) Psychological perspectives in youth sports. New York: Wiley Press.

Vallerand, R., Reid, G., Marisi, D. (1979). Effects de reinforcements verbaux et materiels sur la motivation intrinseque face a une tache motrice. In C. Nadeau, W. Halliwell, K. Newell & G. Roberts (Eds.). Psychology of Motor Behavior and Sport-1979. Champaign, IL: Human Kinetics.

Vallerand, R. (1983). The effect of differential amounts of positive verbal feedback on intrinsic motivation of male hockey players. Journal of Sport Psychology, 5, 100-107.

Vallerand, R. & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of Cognitive Evaluation Theory. Journal of Sport Psychology, 6, 94-102.

Weinberg, R. & Jackson, A. (1979). Competition and external rewards: Effects on intrinsic motivation and attribution. Research Quarterly, 50, 494-502.

White, R. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, 297-33.