This is to certify that the

thesis entitled

Informational Value of EVALUATIVE BEHAVIOR INFLUENCES OF PRAISE AND BLAME ON PERCEPTIONS OF ABILITY IN THE SPORT SETTING

presented by

GARY WILLIAMSON

has been accepted towards fulfillment
of the requirements for

MS degree in EDUCATION

Martha E. Ewing
Major professor

Date 2-26-88

INFORMATIONAL VALUE OF EVALUATIVE BEHAVIOR INFLUENCES OF PRAISE AND BLAME ON PERCEPTIONS OF ABILITY IN THE SPORT SETTING

by

Gary Williamson

Thesis

Submitted to

Michigan State University

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

School of Health Education, Counseling Psychology, and Human Performance

1987

ABSTRACT

INFORMATIONAL VALUE OF EVALUATIVE BEHAVIOR
OF PRAISE AND BLAME ON PERCEPTIONS
OF ABILITY IN THE SPORT SETTING

By Gary Williamson

This study investigated the degree to which praise and blame provide information and affect childrens self-perceptions of ability. The purpose of this study was to replicate a previous experiment conducted by Meyer, Bachmann, Biermann, Hempelmann, Ploger and Spiller (1979) and to extend their experiment number three to include (a) a hypothetical sport task and (b) children aged 9 to 15 years. One hundred and forty subjects were given descriptions of two students, one of which they had to imagine was themselves, who obtained identical results in performing easy and difficult motor tasks. One of the students received neutral feedback and the other student was praised for success or criticized for failure. The results failed to replicate the findings of Meyer et al. (1979). Specifically, the results of this study found that praise after success led to the conclusion that the acting person's ability was viewed as high. Blame after failure led to the perception that the acting person's ability was low. However, support was found for Meyer et al.'s (1979) findings in experiments number one and two which reported differences in childrens' self-perceptions of ability with increasing age. The present study found that children aged 9, 10 and 11 years tended to rely on outcome and teacher feedback in judging self-perceived ability. Older children aged 12, 13, 14 and 15 years tended to rely more on outcome and task difficulty in assessing perceived ability. These differences in the ratings of perceived ability with age are discussed in terms of Nicholls' (1978) developmental theory of perceived ability.

Informational Value of Evaluative Behavior
Influences of Praise and Blame on Perceptions
of Ability in the Sport Setting

by

Gary Williamson

We approve the thesis of Gary Williamson

Date of Signature:

12/9/87

Martha E. Ewing

Martha E. Ewing, Ph.D.
Thesis Adviser, Committee Chair
Assistant Professor
School of Health Education,
Counseling Psychology and
Human Performance
Michigan State University

12/9/87

Deborah L. Feltz

Deborah L. Feltz, Ph.D.
Committee Member
Associate Professor
School of Health Education,
Counseling Psychology and
Human Performance
Michigan State University

12/9/87

Vern Seefeldt

Vern Seefeldt, Ph.D.
Committee Member
Professor
Director, Youth Sports Institute
Michigan State University

ACKNOWLEDGEMENTS

I wish to thank my advisor, Dr. Marty Ewing for her conscientious support in this project. I appreciate the time she has spent on the constant reviewing of each chapter. Marty was always available and ready to offer help and advice despite my constant interruptions. Most of all I would like to thank Marty for her infectious enthusiasm for sport psychology and making it possible for me to persue my masters degree in this country.

I also wish to thank Dr. Vern Seefeldt, Director of the Institute for the Study of Youth Sports located at Michigan State University, for providing me with a research assistantship which enabled me to pursue my graduate education.

I wish to thank my other committee member, Dr. Deborah Feltz for her guidance in the research process and valuable feedback.

I am also grateful to Mr. Richard Smith, the principal at Augres Simms School, and teachers who gave their time and went out of their way to assist me in the data collection. I especially want to thank all of the students for their cooperation in filling out the questionnaires.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Participation in competitive sport has the potential to exert either a positive or negative effect on the psychological development of the young child depending on the quality of the program itself (Alley, 1974; Martens, 1978; Smoll & Smith, 1979). A key factor in determining whether sport participation will be a positive or negative experience is the quality of the adult leadership. Both Martens (1978) and Gould (1980) have emphasized the role which coaches can play in influencing young athletes' cognitive perceptions and attitudes towards athletic participation. Gould (1980) further recommended that coaches should actively plan and initiate coaching strategies designed to facilitate children's perceptions of competence and self-worth in athletic endeavors.

Research in the area of developmental psychology has indicated that the behaviors of parents, teachers and other significant adults influence the development of such attributes as achievement motivation and self-concept in young children (Harter, 1978). Several studies in the athletic setting have highlighted that coaches can, and do, influence the psychosocial development of their young athletes (Horn, 1985; Smith, Smoll & Hunt, 1977). From a practical standpoint, there exists a need to identify which coaching behaviors are most facilitative of the child's growth. Theoretically, it is necessary to ascertain how these particular coaching behaviors influence the child's development.

One category of instructional behavior which has been examined in relation to its effect on students' attitudes and affective responses involves teachers' reinforcement. In an academic setting, Flanders (1970) and Rosenshine (1973), for example, reported on the association between teachers' feedback and students' attitudes. They found that teachers'praise is significantly related to students' positive attitudes and that critical statements by teachers are negatively correlated with such attitudes.

A series of studies conducted by Smith and Smoll and their associates has provided evidence that coaching behaviors influence the cognitions and attitudes of young male athletes (Smith, Smoll & Hunt, 1977; Smoll & Smith, 1979). The results of these studies revealed that those coaches who exhibited the highest frequencies of behaviors categorized as "technical instruction," "reinforcement," and "mistake-contingent reinforcement" were evaluated more positively by their players than those coaches who scored low in these categories. Furthermore, players of these highly reinforcing and instructive coaches attained significantly higher scores on tests of post-season self-esteem and had more positive attitudes toward participation than did players of coaches who did not consistently exhibit these behaviors (Smith et al., al.,1977).

The delivery of feedback has powerful evaluative implications. Neither the delivery nor the reception of feedback is simply an objective transfer of information; both arouse strong emotions. The quality of the feedback may vary depending on a teacher's relationship with a pupil. Furthermore, strong emotions aroused in the recipients of feedback have the potential of interfering with or facilitating the reception of feedback. Thus, information communicated by a teacher to a child may directly or indirectly tell each child what the teacher thinks of him/her.

Feedback from a teacher has the potential to influence a child's perception of his/her ability as it relates to actual ability. Although perceptions of one's ability appear to be based on years of self-evaluation and comparison, several studies (Dweck & Repucci, 1973; Haas & Maehr, 1965; Maehr, Mensing & Nafzger, 1962) have demonstrated that the accuracy of self-perceptions for children of the fifth grade level and older may be signifcantly affected by feedback from others, at least temporarily. In these studies, subjects received positive or negative feedback from significant others on a short term basis. Results indicated that a significant change in perceptions of ability could be affected, both positively and negatively, depending on the type of feedback given.

In an athletic setting a number of studies have highlighted that there are considerable individual differences in the way in which children interpret self-perceptions of ability based on the feedback provided by adults (Horn & Hasbrook, 1984; Weiss, Bredemeier & Schewchuk, 1981). Moreover, such individual differences have been found, in an academic environment, to indicate a developmental trend (Harter, 1978; Nichols & Miller, 1984). To date very little research has been conducted to examine whether there are developmental differences in childrens' perceptions of ability, as indicated by their interpretation of positive and negative feedback, in the athletic setting.

NATURE OF THE PROBLEM

A considerable amount of research has been conducted in the academic classroom for the purpose of identifying the teaching behaviors that are most conducive to children's academic achievement. Based on the classic study by

Rosenthal and Jacobson (1968), the 'pygmalion' effect predicts that a teacher's expectancy of student ability triggers a series of verbal and non-verbal interactions which inadvertently control the student's subsequent achievement behavior. Research supporting the 'pygmalion' effect suggests that high-expectancy students (compared to low-expectancy students) are provided with a warmer emotional climate and given more praise (Cooper & Baron, 1977; Meichenbaum, Bowers & Ross 1969), less criticism and have more opportunity to learn novel material (Brophy & Good, 1974).

In contrast, considerably less information has been acquired concerning teaching effectivness in regard to childrens' psychosocial development in the athletic setting. Both Martinek and Johnson (1979) and Rejeski, Darracott and Hutslar (1979) found that physical education teachers gave more reinforcement and praise to high-expectancy students. However, a number of studies have observed that low-expectancy students received more reinforcement (Horn, 1985; Kleinfeld, 1975; Weinstein, 1979). Despite this contradiction in the literature, positive social reinforcement is believed to be more beneficial to children than negative social reinforcement, as it may foster interpersonal relations between teacher and pupil (Martens, 1975), create an enjoyable climate (Smith et al., 1977) and simply be more credible than negative feedback (Jacobs, Jacobs, Feldman & Caviar, 1973).

Continuous positive reinforcement, however, may distort the perceptions of ability attributions made by students. For example, low-expectancy students may be receiving indiscriminate reinforcement for success at a very easy task. If this is the case, these students might perceive from the teacher's feedback, because it is given indiscriminatly, that they are indeed viewed as a low-expectancy student. In support of this, Kirschenbaum and Smith (1983) found that continuous negative or positive feedback led to decrements in performing an underhand free throw compared to mixed feedback and control conditions.

Indiscriminate use of social reinforcement and its possible effects on children has been detailed by Harter (1981) in her theory of competence motivation. Harter (1981) specified that the evaluation of a child's performance attempts by significant adults, contributes to the child's perceptions of internalization of control. Perceptions of performance control in a particular achievement situation directly, and causally, influence a child's perceived competence (Harter, 1981). If a child has been given clear, consistent and realistic evaluation about his or her performance, then the child will develop consistent and realistic internalization structures and will perceive an internal source of performance control. Inconsistent or unclear evaluation of performance will lead the child to perceive that control for his or her performance lies with powerful others.

Are adults solely responsible for determining childrens' self-perceptions of competence or ability? Harter's (1981) model of competence motivation argues that evaluative information provided by adults determines a child's perceived competence. However, another developmental model has been proposed by Nichols (1978) which postulates that children are actively involved, and cognitively process information in forming self-perceptions of ability.

The way in which children cognitively process information is believed to develop with age. Nicholls (1978) reasons that to perceive ability and effort as distinct causal factors should lead to a more accurate assessment of one's own competence. He discovered that children below the age of 12 were unable to make perceptive inferences of their ability because they were unable to distinguish between ability and effort in relation to task difficulty. After the age of 12 Nicholls (1978) reported that children were able to distinguish between effort and ability.

In the educational setting teachers have an important role to play in shaping a child's self-perceptions. Research reported in the educational psychology literature (Meyer, Bachman, Biermann, Hempelmann, Ploger & Spiller, 1979) suggest that it is possible to perceive estimates of one's ability from the informational value of evaluative behavior provided by a teacher. This group of researchers reported that a person who is praised or blamed is provided with information about how the teacher who is praising or blaming perceives his/her ability.

The study by Meyer et al. (1979) involved a series of six experiments which demonstrated that differential feedback given by teachers to two performers for the same level of performance provides information to subjects concerning the performers' ability. Ability is judged according to the expenditure of effort. For example, if two people obtained identical successes and one of them was praised more for it than the other, it is assumed that this individual was perceived to have expended more effort on the task and, is thus judged to have less ability. Conversely, if two people both experience identical failures and one of them is blamed for it more than the other, it could be concluded that this person was perceived to have expended less effort on the task and consequently has the most ability (Meyer et al., 1979).

A second theoretical assumption of the Meyer et al. (1979) study relates to the amount of effort necessary for obtaining a solution to a task, with ability and task difficulty taken into account. If the task is perceived to be very easy and the ability is perceived to be high, then little effort is considered necessary for the solution. If task difficulty is very high, then in the case of high ability, high effort is thought to be necessary to obtain success; in the case of low ability even maximal effort is thought to be pointless (Meyer et al., 1979).

Hence, if praise and blame allow us to draw conclusions about the extent to which an obtained outcome was ascribed to effort expenditure, and if the difficulty level of the task is known, then a person's "cognitive evaluative structure" formulates conclusions about how the person's ability was estimated.

However, Nicholls and Miller's (1984) model of perceived ability further demonstrates that the cognitive processes associated with perceptions of ability, as it relates to effort expenditure and task difficulty, develop with age. Children below the age of 12 find it difficult cognitively to distinguish between effort and ability. Related to this, the first experiment conducted by Meyer et al. (1979) found that there were developmental divergencies in the cognitive processing of identically perceived information of children aged eleven to thirteen years compared to high school pupils and adults. The younger age groups of children perceived that for two pupils who achieved the same performance the one who received the most praise by the teacher was the one whom the teacher ranked higher in ability. Children below the age of 12 who were possibly not capable of distinguishing between effort and ability properly, perceived that a pupil who was praised, compared to a pupil receiving neutral feedback for the same performance, was the more able student. However, older students and adults perceived the exact opposite of the above situation.

Perhaps the younger subjects in Meyer et al.'s (1979) experiment number one did not realize that both students were said to have obtained identical results. The possibility that the older and younger subjects interpreted the instructions differently was tested by Meyer et al. (1979) in experiment number two. Furthermore, additional children aged eight, nine and ten were included in the study. Similar to the first experiment, experiment number two found developmental divergencies when comparing the young and older subjects.

Specifically, with decreasing age students indicated that the teacher thought the student whom he prasied was the brighter one, whereas neutral feedback was rated higher than praise by the majority of students from age fourteen to nineteen.

These results may be explained in terms of Nicholls and Miller's (1984) model of perceived ability. Subjects aged twelve and over who were cognitively mature enough to understand the effort/ability distinction, together with an appreciation of task difficulty, concluded that praise compared to neutral feedback, in this case, was indicative of low ability. Here the informational value of the evaluative behavior indicated that the student receiving the neutral feedback was perceived the more able because this student did not need to exert as much effort to achieve the same performance as the student who was praised.

Using adult subjects in their third experiment, Meyer et al. (1979) looked specifically at praise and blame compared to neutral feedback together with two levels of outcome (success, failure) and two levels of task difficulty (easy, difficult). For both levels of task difficulty, the results indicated that the student who was praised after success was rated lower in ability than the student who received neutral feedback. In the failure condition, the student receiving neutral feedback was rated lower in ability than the student who was blamed.

Meyer et al. (1979) chose not to investigate further the observed developmental divergencies among the ability ratings found in experiment two. In their third study this group of researchers continued their series of experiments with adult subjects only. Moreover, the age differences in the ratings of perceived ability were left unexplained. Thus, this study failed to address the issue of why developmental differences occur in perceptions and interpretation of feedback.

In light of these findings, the present study was designed to replicate the third study of Meyer et al. (1979) and extend it to the context of sport, to see further if these results are applicable to children. Social reinforcement theory encourages the use of praise or positive feedback, but fails to explain how such teaching behavior may affect childrens' self-perceptions of ability. Nicholls and Miller's (1984) developmental model of perceived ability may provide such an understanding. By knowing the interrelationships of these variables, teachers will be in a better position to interpolate their criticisms with their praise to maximize its impact and acceptance.

STATEMENT OF THE PROBLEM

The purpose of this investigation was to partially replicate and extend the third experiment conducted by Meyer et al. (1979) by looking at the effects of teacher evaluative behavior on young children's perceived ability, as it relates to sport. This study investigated developmental differences in perceptions of ability of identically perceived information across four dimensions: age of subjects (9 to 15 years); outcome (success, failure); task difficulty (easy, difficult); and evaluation (praise or blame versus neutral). A secondary aim of this study was to link the findings above to test Nicholls and Miller's (1984) developmental model of perceived ability for children 9 to 15 years.

HYPOTHESES

The following hypothesis will be investigated in this study.

1. For success and failure at an easy and difficult sport task, children aged 9, 10, and 11 years will give higher ratings of ability for a child who is praised and lower ratings of ability for a child they see blamed than children aged 12, 13, 14 and 15 years.
2. For both an easy and difficult sport task, children aged 12 and above will give lower ratings of ability than children aged 9, 10, and 11 years when they see a child praised after success and themselves receiving neutral feedback after failure.
3. For both an easy and difficult sport task, children aged 12 and above will give higher ratings of ability than children aged 9, 10 and 11 years when they see a child blamed after failure and themselves receiving neutral feedback after success.

Definitions

Definitions of the following variables will aid in understanding the design of this study.

1. Blame: For this variable the teacher's response to a subject's performance on the test item was read aloud as: "What have you done there? I am displeased. That is not a proper forward roll/somersault."
2. Difficult task: This variable was defined as a somersault in the air in the hypothetical situation on the test item.
3. Easy task: This variable was defined as a forward roll on the floor in the hypothetical situation on the test item.
4. Neutral: For this variable the teacher's response on the test item was read aloud as: "Good" for success at the easy and difficult tasks and "No, that is not the correct way to perform the skill" for failure at the easy and difficult task.
5. Praise: For this variable the teacher's response on the test item was read aloud as: "You have done very fine; I am very pleased."
6. Perceived Ability in Motor Ability: This variable denoted children's perceptions of another persons's ability, or their own ability, to perform gross motor tasks as reflected in their responses to test items.

Limitations

This study will be limited to boys ages 9 to 15 years attending Augres Elementary/Middle High School in the State of Michigan.

IMPLICATIONS OF THE STUDY

In view of the research presented to date, the use of praise as an appropriate or inappropriate instructional behavior in physical education or the athletic setting needs to be examined. Feedback in these settings is given to a child in front of his/her peers and may result in different ratings of ability than feedback given to a child in the absence of his/her peers. Research suggests that children of varying ages differ in their cognitive abilities to process and perceive evaluative information. Thus, effective teaching skills require knowledge of optimal instructional strategies for children of different age levels. However, very little of the research in the sport psychology literature has not examined the effects of adult feedback on children's perceptions of their sport ability. Research of this nature will help identify the teaching behaviors that are most conducive to children's psychosocial development in the athletic setting.

CHAPTER 2

REVIEW OF LITERATURE

Effective Social Reinforcement

One of the primary objectives of physical education is to facilitate the acquisition of motor skills through effective instruction. Related to this a coach or teacher has a major influence in shaping a pupil's psychosocial development. Both skill acquisition and attributions of self-worth are shaped by the information or feedback a teacher provides to a child after performance. Social reinforcement is one form of feedback which is under the control of significant others (Martens, 1975). In sport and physical activity, social reinforcement can be viewed as all the positive and negative comments or reactions made by coaches, teachers, parents and peers. This information can be transmitted overtly or covertly through praise, encouragement, favorable gestures, smiles, frowns, reproof, sarcastic comments, direct criticism or disinterest. Adults continually use social reinforcers, both reward and punishment, to change children's behavior (Carron, 1984; Martens, 1975)

It is presumed that social reinforcement may function in a number of ways by providing information, motivation, and/or reinforcement (Ammons, 1956). Thus, social reinforcement may inform individuals about what they should or should not do, it may motivate individuals, it may reward individuals for correct performance, or punish them for incorrect performance. The nature of the interaction of these variables is not clearly known.

The effects of social reinforcement may differ depending on the task complexity. For simple motor responses, it appears that the reinforcement is motivational in that reinforcement increases the rate of responding on many simple motor tasks (Zajonc, 1965). For complex motor tasks Martens (1975)

contends that when knowledge of results and kinesthetic feedback are available, information provided via social reinforcement will be redundant.

From a different perspective, social reinforcement may play a more important role in shaping a childs' psychosocial development. Social reinforcement may encourage good interpersonal relations between the teacher and child, which may indirectly facilitate learning (Martens, 1975). Conversely, neither the delivery nor the reception of social reinforcement is simply an objective transfer of information, both are capable of arousing strong emotions. Moreover, strong emotions aroused in the recipients may interfere or facilitate reception of the response provided.

A considerable body of research has evolved which has investigated the specific effects of the interpersonal behaviors of teachers and the differential forms of reinforcement given. For example, in the classroom setting it is generally accepted that praise is significantly related to positive student attitudes and that critical statements by teachers are negatively correlated with such attitudes (Flanders, 1970; Rosenshine, 1973).

In the physical education instructional setting Martens (1975), on the basis of previous research, contended that punishments tend to be a more effective short-term reinforcer than rewards, especially for very simple tasks. For more complex tasks, reward is viewed as more beneficial. Martens (1975) concluded that giving only punishment or reward may be detrimental over a long period of time.

Both positive and aversive social reinforcement underlie what has been termed the positive approach and the negative approach to coaching (Smoll & Smith, 1979). The positive approach is designed to strengthen desired

behaviors by motivating players to perform by rewarding them when desirable behaviors occur. The negative approach involves attempts to eliminate unwanted behaviors through punishment and criticism (Smith & Smoll, 1979). Observational studies of coaches indicate that most coaches use a combination of positive and aversive control (Horn, 1982; Smith & Smoll, 1979). The limited research, which examines this particular issue, has produced conflicting results, providing support for both these styles of coaching philosophy.

To understand more fully the effects of social reinforcement on childrens' psychosocial development, Smith et al. (1977) devised the Coaching Behavior Assessment System (CBAS) to measure the behaviors of coaches toward their players in both contest and practice situations. The CBAS consists of a number of behavioral categories which were derived on the basis of empirical observation of coaches, as well as on theoretical principles identified in the sport psychological and social psychological literature.

Following the development and validation of the CBAS, Smith, Smoll and Curtis (1979) conducted a two-phase investigation examining the relationship between coaching behaviors and players' attitudes and self-concept. In the project's first phase, the researchers observed and categorized the coaching behaviors of 51 little league coaches over the course of an entire playing season. At the end of the season, the 542 male players, ages 8 to 15, were interviewed and their attitudes toward their teammates, the sport, and their coaches were measured. In addition, measures of both general and athletic self-concept were taken. Data analyses revealed that those coaches who exhibited the highest frequencies of behaviors categorized as "technical

instruction," "reinforcement," and "mistake-contingent reinforcement" were evaluated more positively by their players than those coaches who scored low in these categories. Furthermore, players of these highly reinforcing and instructive coaches had more positive attitudes toward participation than did players of coaches who did not consistently exhibit these behaviors (Smith et al., 1979).

Based on the results of their systematic research, Smoll and Smith (1979) advocated a positive approach to coaching, because this would make the sports experience for children more enjoyable. This research provided very persuasive evidence encouraging the frequent use of positive feedback and the near elimination of negative feedback.

Other investigators, however, have cautioned against an over emphasis on positive social reinforcement. In a classroom setting, Kennedy and Willicutt (1964) noted that for young children frequent social reinforcement facilitates a humanistic environment, but there is loss of an incentive value because children receive no information on performance effectiveness. Moreover, Dunkin and Biddle (1974) caution that teachers' praise is not indiscriminately associated with positive affect, but that the use of discriminatory, performance-contingent, positive instructional reinforcement may be influential in increasing students' attitudes.

In contrast to the positive approach to coaching advocated by Smoll and Smith (1979), a unique study on teaching effectiveness was conducted by Tharp and Gallimore (1976). Identifying then U.C.L.A. basketball coach, John Wooden, as one of the most successful coach-teachers in the history of college athletics, Tharp and Gallimore (1976) attempted to identify the teaching behaviors commonly employed by this "master teacher." Coding and analyzing

behaviors exhibited by Wooden during practice sessions, Tharp and Gallimore recorded more than 2,000 acts of teaching over the course of 30 hours of observation. Data analyses revealed that the teaching behaviors coded as "instructions" accounted for 50% of the total exhibited behaviors. In addition, it was found that at least 75% of Wooden's teaching acts carried information relating to skill development-information that tended to be highly repetitive.

These researchers (Tharp & Gallimore, 1976) also found that praise as a teaching behavior was rarely given by Wooden. In fact, he was coded to give twice as many "scolds" as "praise." However, the majority of Wooden's scolds were accompanied by remarks containing additional instruction and were not equally distributed to the various athletes.

Although the results of Tharp and Gallimore (1976) are based on the observation of only one teacher-coach, descriptive evidence is provided concerning specific instructional behaviors which have been associated with consistent gains in player's performance. However, Tharp and Gallimore (1976) emphasize that the generalizability of this information is certainly limited by the case study approach, as well as by the use of elite, college-level athletes who are both highly motivated and highly skilled.

In summary, although the effects of positive or negative social reinforcement are not fully understood, if used frequently and/or indiscirminately they may lose their informational and/or motivational impact (Martens, 1975). Carron (1984) advises that coaches and teachers have to assess the extent to which they want to use social reinforcement for performance purposes and/or social psychological purposes. The study by Tharp and Gallimore (1976) suggests that positive social reinforcement provided

sparingly may facilitate performance benefits. While positive reinforcement provided liberally, as advocated by Smoll and Smith (1979), would be more beneficial to social psychological development, a mixture of both positive and negative reinforcement is likely to produce the best results (Martens, 1975; Kirschenbaum & Smith, 1983). Brophy and Evertson (1976) indicated that the effectiveness of a teacher's reinforcement may be dependent on the teacher's intention in administering such reinforcement.

Teacher Expectations

Considerable research has been conducted in both the academic and athletic setting to determine whether teachers' reinforcement patterns (evaluative feedback) towards individual students are influenced by their expectations. These studies consistently show two major trends: a) differential teacher student interactions are related to the level of expectation a teacher has for a particular child, and b) teacher perceptions of students' ability can ultimately affect students' self-perceptions, which in turn influence behavior (Cooper, 1979; Horn, 1985).

In the classroom, several studies have shown that teachers form expectations concerning the academic abilities of pupils and that these expectations influence the behavior and interactions that teachers have with individual students (Brophy & Good, 1974; Cooper, 1979; Good, 1981). For example, teachers' reinforcement patterns (or evaluative feedback) towards individual students is one cateogry of instructional behavior which has been found to be influenced by their expectations. Generally, these studies have reported that teachers tend to provide more praise per correct response for high expectancy students and more criticism per incorrect response for low

expectancy students (Brophy & Good, 1970; Cooper & Baron, 1977; Meichenbaum, Bowers, & Ross, 1969). Hence, this evidence suggests that the evaluative feedback that teachers provide to students may be dependent on their expectations concerning the students' ability.

The same processes would appear to be operating in the physical education and athletic setting. A study by Crowe (1977) and another by Martinek and Johnson (1979), after observing student/teacher interactions, both reported that physical education instructors gave more praise and encouragement to high expectancy students in the elementary schools studied.

Expectancy effects have been studied further in the athletic setting. Rejeski et al. (1979), after observing individual coach-athlete interactions in practice and game settings, compared high and low expectancy athletes and the type of feedback received. From the results, high expectancy athletes received more reinforcement from their coaches than low expectancy athletes. Secondly, coaches also showed a significant tendency to provide more general technical instruction to low expectancy athletes compared to their high expectancy peers. However, a study by Horn and Hasbrook (1984) reported conflicting findings to the study by Rejeski et al. (1979). Here, athletes who were perceived by the coach to be low in ability were given a higher proportion of reinforcement and mistake contingent criticism than players considered to be high in ability.

Teacher expectations, apart from influencing the type and quality of reinforcement, are predicted also to determine students' self-perceptions and behavior. Differential communication, transmitted by the teacher and observed by students, has the potential of informing students just how competent the teacher thinks they are. This may have adverse effects. For example, low expectancy students who percieve the teacher's lower perceptions of their

potential based on the quality of the feedback given in relation to others, may exert less effort, accept failure more quickly, and subsequently aspire to lower achievement standards than their high expectancy classmates. This phenomenom has been labeled the 'Self Fulfilling Prophecy' or 'Pygmalion Effect' and has been found to operate in the classroom (Rosenthal & Jacobson, 1968) and the physical education setting (Horn, 1985). Horn (1985) describes a sequence of events whereby teacher expectations may indeed become reality in shaping childrens' self-perceptions and behavior in sport. This model consists of four sequential steps outlined in Table 1.

Table 1

Teacher expectations and their influence on children in a sport setting

Step 1. The coach develops an expectation for each athlete.
Step 2. The coach's expectations influence his or her treatment of individual athletes.
Step 3. Differential communication tells each athlete how competent the coach thinks he or she is. This information affects the athlete's performance and self-concept, achievement motivation, and level of aspiration.
Step 4. The athlete's behavior and performance conform to the coach's expectations. This behavioral conformity reinforces the coach's original expectations and the process continues.

This model highlights that information communicated by a teacher to a child directly or indirectly informs the child what the teacher thinks. A child's self-perceptions are shaped by a sequence of cognitive appraisals, triggered by the instructional interchange between teacher and child. First, a teacher's perceptions of a child's ability are based on observation and previous knowledge.

Secondly, children are given information about the teacher's perceptions of their abilities. Thirdly, this in turn influences a child's actual self-perceptions of ability--which may affect future behavior. Hence, the feedback that a teacher provides may have a major influence in shaping a pupil's perceptions of ability, self-image and self-confidence.

Phase 2 of the research project conducted by Smith et al. (1979), although not direct support of this model, does provide evidence that coaching behavior can affect the psychosocial development of young athletes. This group of researchers utilized an experimental approach by manipulating the behavior of some of the coaches and then measuring the subsequent effects of this manipulation on players' attitudes and perceptions. An educational program, administered to the experimental group of coaches, utilized three behavior-modification techniques, and was designed to teach coaches to exhibit the effective coaching behaviors identified in the previous study. Following this instruction period, behavioral data were collected.

Data analyses revealed that significant differences were evident between the coaching behaviors of the experimental and the control groups, with the experimental coaches exhibiting more of the desired behaviors (encouragement, reinforcement, technical instruction). The athletes who played for the experimental coaches also rated their coaches significantly higher in knowledge and teaching technique and expressed a greater degree of enjoyment than did players of control group coaches. Finally, children who played for the trained coaches evidenced significant increases in self-esteem scores over the course of the playing season, while players of control coaches did not show comparable changes. Thus, in this study the level of the athletes' self-concept was found to be influenced by specific types of behaviors exhibited by the coaches (Smith et al., 1979).

Although the results of the Smith et al. (1979) multi-year research project did contribute valuable information concerning the relation between coaches' behavior and athletes' self-perceptions, the focus in these studies was on the team as a group. However, recent research conducted in the athletic setting has demonstrated that there is considerable within team variation in the frequency and quality of coaches' communications directed to individual players (Horn, 1985; Rejeski, et al., 1979). In view of obtaining a more complete assessment of coaching effectiveness, Horn (1985) used the individual player as the observational unit by recording coaches' behaviors to individual athletes.

Horn (1985) provided further support for the contention that changes in players' perceptions of competence were influenced by their coaches' feedback. However, Horn (1985) also discovered that this influence varied depending on the contextual situation in which the feedback was administered. Differences were noted between practice and game behaviors. And secondly, contrary to the findings and philosophy advocated by Smith and Smoll (1979), the data revealed that coaches' responses to players' successful performance (positive reinforcement) were identified as negative contributors to players' development of perceived competence. Criticism, quite surprisingly, was associated with gains in perceived competence (Horn, 1985).

In attempting to explain these controversial findings, Horn (1985) suggested that low coaching expectations of players' performance resulted in non-contingent praise which in turn induced negative self-perceptions in regards to the skill competence of young athletes. Meyer et al. (1979) has previously reported how differential feedback can affect estimates of perceived

ability. These researchers consistently demonstrated that differential feedback given by teachers to two performers for the same level of performance provided information to subjects concerning the performers' ability. Excessive praise given to a performer for success at an easy academic task (in contrast to the neutral feedback given to a co-performer who exhibits an identical level of performance) led to perceptions of lower ability for the praised performer. Criticism given after failure at an academic task (in comparison to a co-performer who received neutral feedback for the same performance) induced higher perceptions of ability for the criticized performer.

Hence, the differential feedback patterns reported by Horn (1985) are consistent with the theory and research discussed by Meyer et al. (1979). That is, athletes whom coaches perceived to be of lower ability were given a higher proportion of reinforcement and a lower frequency of mistake-contingent criticism (punishment) than were their perceived high-ability teammates. These results raise the question: Why should self-perceptions of ability, which in part are influenced by differential feedback, be so important to the child?

Perceived Ability - A Developmental Model

A number of researchers have provided evidence to support the contention that the perception of ability is the most important determinant of achievement behavior (Covington & Omelich, 1981; Nicholls, 1978; Roberts & Pascuzzi, 1979; Spink & Roberts, 1980). Several investigators have theorized that attributions of ability and the self-concept of ability play the central role in mediating motivation (Bandura, 1977; Griffin & Keogh, 1982; Harter, 1981; Kukla, 1978; White, 1959).

What is the exact role of perceived ability in mediating motivation? In relation to sport, Roberts (1985) argued that in order to understand the motivation and subsequent achievement behavior of individuals, it is necessary to understand the subjective meaning of achievement to the achiever that is, the achievement goal of the athlete. Related to this, Nicholls, (1984) postulated that the achievement goal of individuals is to demonstrate and/or develop high ability and to avoid demonstrating low ability.

In sport, there is a growing body of evidence to support Nicholls' (1984) contention that perceptions of ability are the essential mediating construct of achievement behavior. This has been found with attributions to ability by winners and losers (Roberts & Pascuzzi, 1979), sport participation (Roberts, Kleiber & Duda, 1981), sport dropouts (Feltz & Petlichkoff, 1983) outcome of success and failure (Spink & Roberts, 1980) and, demonstration of high versus low ability (Roberts, Kleiber & Duda, 1981).

Nicholls' model (1984) also makes specific predictions about the theoretical antecedents and consequences of perceived ability and how they affect task choice. If participation enhances the perceived ability of young athletes they should continue to have positive expectancies about future success and place greater value on continued participation. However, as soon as participation threatens young athletes' perceived ability, they should develop negative future expectancies and devalue participation. Thus, this theoretical approach suggests that inadequacies in the sport experience turn young athletes off and prompt them to search elsewhere for activities that fulfill their achievement needs (Burton & Martens, 1986). In addition to this, perceptions of ability are believed to mature and change with age (Nicholls & Miller, 1984).

From a developmental viewpoint Nicholls and Miller (1984) view the concept of ability being differentiated as a function of age. Younger children use different criteria to judge whether they have demonstrated and developed ability compared to older children. Perceptions of control of ability involve a complex interaction of inferences which relate to the performance of others, the amount of effort employed and the constraints of one's own actual capacity to perform the task in question. In the youth sports setting this social comparison process involves three assessments: 1) the ability of the opponent in relation to all other opponents, 2) own ability compared to that of the opponent's, and 3) amount of effort applied by self and/or opponent (Roberts, 1985). This developmental notion of the differentiation of ability matures through three levels of ability related to difficulty and four levels of ability related to effort (Nicholls & Miller, 1984). (See Table 2)

The three levels of the differentiation of the concepts of difficulty and ability proposed by Nicholls and Miller (1983) are egocentric, objective and normative. This differentiation between ability and difficulty develops with age, from a subjective appraisal or certainty of task completion, to a focus on task characteristics from simple to difficult, and finally to a social comparison of performance norms. Nicholls and Miller (1983) viewed this development of perceived ability to be sequential in nature because mastery of later levels incorporates mastery of the previous levels.

Table 2

Levels of differentiation of the concept of ability from those of difficulty and effort

Age	Difficulty	Effort
2-4	Egocentric: Own expectations of success the basis for judging task difficulty and the level of ability by task outcomes.	
4/5-6	Objective: Perceptions of task difficulty based on properties of task (complexity) and the level of ability indicated by task outcomes.	
6-7	Normative: Task difficulty and ability judged in relation to the performance of others. Task that few can do are hard, and success on those indicates high ability.	
7-9		Effort is the cause of outcomes. Equal effort is expected to lead to equal outcomes.
9-10		Ability is partially differentiated (as a cause of outcomes) from effort.
10/11-12		Complete differentiation: Ability conceived as capacity which limits the effect of effort on performance.

Another progression, in terms of development, is the distinction between the perception of effort and ability. Here ability is inferred from social comparison, that is, judged relative to the effort and performance of others. The four levels progress from: level 1, effort is indicative of ability; level 2, effort equals outcome; level 3, effort and ability are partially differentiated; and level 4, ability is the amount of individual capacity. Nicholls (1978) suggested that higher levels of congnitive development include lower levels in the form of hierarchical integrations.

This developmental notion of perceived ability and its relationship to effort and difficulty, within the context of social comparison, has important implications for children taking part in sport. Significantly with increasing age, level 2 (being more able, dependent on effort) and normative conception (social comparison), integrate and develop simultaneously (Nicholls & Miller, 1984). By the age of 12 children realize that higher effort implies lower ability (Nicholls & Miller, 1984). In other words, one has to work harder to do as well as others which implies that one has less ability than others. This developmental change in the concepts of effort and ability is accompanied by changes in perceptions of the relative importance of effort and ability for performance. This could provide a possible explanation for why a large proportion of children drop out of sport at the age of 12 (Seefeldt, Blievernicht, Bruce & Gilliam, 1978).

The proposition that children below the age of 12 do not understand the distinction between effort and ability in competitive-oriented environments has been investigated in the youth sports setting. Ewing, Roberts and Pemberton

(1984) studied the developmental achievement orientations of children, aged 9 to 14 years, in the sports of baseball and softball. The results were consistent with those reported by Nicholls and Miller (1984), because children only demonstrated a full understanding of the effort/ability differentiation in these sports after the age of 11.

This shift in a child's perception of ability, which evolves around the age of 12, is especially applicable to competence motivation for children taking part in sport. A child with low perceptions of ability realizes that to compensate for lack of ability he/she will need to exert more effort. This, in turn, will indicate to others that they lack ability, which may lead to "social embarassment" and result in the child dropping out of sport (Ewing et al., 1984).

Once an individual has acquired differentiated conceptions of ability after 12 years of age, situational factors will determine whether an individual will rely more or less on differentiated conceptions of ability (Nicholls & Miller, 1984). The type of reinforcement a child receives from the teacher is one such situational factor which informs a child of the differentiation between effort and ability.

Informative Function of Evaluative Feedback

Children formulate their self-perceptions of ability from a number of sources. Theory and research from the psychological literature suggest that the susceptibility of children to a particular information source is age-dependent (Veroff, 1969). In early childhood, for example, children tend to base their judgements of competence on autonomous performance standards (i.e., successful completion of a task) in combination with the feedback of significant adults (Stipek, 1981). During the elementary school years however,

children show an increasing tendency to use peer performance as a means of judging their own competence (Cook & Stingle, 1974). The saliency of information pertaining to social comparison appears to reach its highest intensity during the late childhood and early adolescent years (Cook & Stingle, 1974). Finally, some researchers have speculated that the maturational changes in cognitive or intellectual functioning which occur during the adolescent years may be reflected in the expansion of judgements of competence, from simple comparison with peers to an integrated use of many systems of information and the establishment of self-determined or internal standards of performance (Harter, 1978; Veroff, 1969).

In the sport setting the dependence on adult feedback has been found to decline with age, while the use of peer comparison increases. Using the statistical technique of exploratory factor analysis, Horn and Hasbrook (1984) were able to highlight six information sources that children use to assess their competence. Factor 1 reflected social comparison (i.e., using the performance of teammates and opponents to judge their own ability). Factor 2 included evaluative information from coaches, peers and spectators. Factor 3 referred to internal sources of information indicating that young athletes may be using such cues as a) the amount of effort they exert, b) the degree of improvement in their skill performance, and c) the ease with which they acquire new skills to judge their ability. Factor 4 included evaluation provided by parents and spectators. Factor 5 suggested that game outcome is important while factor 6 typified a reliance on affect (i.e., degree of liking for the sport) as a basis for judgements of ability. The results of this study clearly indicate that the cognitive processes underlying the competence judgements of younger children are qualitatively different from those of older children in sport.

In order to understand how children use the evaluative information, it is helpful to apply Nicholls' (1978) cognitive developmental model of perceived ability. According to Nicholls (1978) adolescents and older children begin to judge their past performances relative to peer performance. If this comparison leaves them lower than average, they expect to demonstrate low ability. If perceptions indicate that their own abilities are higher than similar others, positive outcomes are expected from performance. Thus, the individual's assessment of the probability of the outcome influences subsequent behavior.

As well as the influence of outcome, Nicholls and Miller (1983, 1984) drew further links on self-perceptions of ability to effort and task difficulty. For example, high effort which results in failure to perform an easy task clearly exposes a basic lack of ability resulting in low perceptions of ability. For a person with low perceived ability, high effort, which results in failure, clearly exposes a basic lack of ability. Conversely, for a person with high ability, failure at an easy task typifies a lack of effort. Hence, Nicholls' (1978) postulated that the interaction of outcome, effort and task difficulty shape self-perceptions of ability.

In addition to this, the preceding discussion has emphasized that a relationship exists between differential evaluative feedback and perceived estimates of ability. A series of laboratory studies by Meyer (1979, 1982) has consistently demonstrated that differential feedback given by teachers to two performers for the same level of performance provides information to subjects concerning the performer's ability. Meyer et al. (1979) specifically studied the effects of praise and blame on perceived ability estimates investigating

the variables of outcome, effort and task difficulty, as Nicholls (1978) did to explain his findings. The difference being that Meyer et al. (1979) used these variables to account for the psychological structures and processes that mediate the linkages between praise or blame as estimates of ability.

Based on the results of several studies Meyer (1982) argued that perceived effort expenditure is among the main determinants of administered reward and punishment. Moreover, praise and blame are maximized when an outcome is ascribed to high or low effort. For example, success is especially rewarded when a recipient is perceived as low in ability and as having expended high effort, whereas failure is especially punished, given high ability and low effort.

Meyer's (1982) contentions are based on the premise that linkages between praise-blame and estimates of perceived ability relate to the amount of effort necessary or sufficient for success at a task. Furthermore, praise and blame enables a person to draw inferences on how the acting person's ability is estimated.

These assumptions were tested by Meyer and his associates (1979) in a series of experiements. The research varied in that some of the studies had teachers making judgements while others analyzed the judgements of students of varying ages. Some investigations directly assessed estimates of ability, whereas others assessed more indirect indexes, such as effort expenditure, classifying differential evaluative feedback and the familiarity/non-familiarity of a teacher to the students (Meyer et al., 1979; Meyer, 1982). In spite of these variations, the general pattern of data was quite similar for adult subjects. In one of these studies (Meyer et al., 1979) teachers served as subjects. Each subject received one of four versions of a short

questionnaire. In the questionnaires, two students were described as solving an arithmetic problem that was characterized as very easy or very difficult. It was also conveyed that both students either succeeded or failed at the task. The evaluative feedback given by the teacher was portrayed as different for both students although their performance was identical. Given success, the teacher's neutral reaction to one of the students was "Yes, 32 is the correct number"; his praise for the other student was "You have done very well; I'm very pleased." Given failure, the teacher's neutral reaction was described as "No, 35 is not correct"; his blaming response was "What have you done there! 35 is wrong." After reading the scenario, subjects indicated for the two students on separate scales how the teacher would estimate their abilities. The results revealed that the student praised for success was rated lower in ability than the student receiving neutral feedback. In the failure condition, the student receiving neutral feedback was rated lower in ability than the student who was blamed. These effects were present at both levels of task difficulty.

In another study Meyer et al. (1979) had each subject imagine himself to be a student who, together with a fellow student, received evaluative reactions from a teacher. Moreover, the teacher was described as familiar or unfamiliar with the students. The reasoning behind this variation in familiarity between teacher and student was that praise and blame were not expected to influence the ability ratings unless the person distributing feedback was ascribed as having knowledge about the recipient's ability. Therefore, only praise and blame from the familiar teacher were expected to influence estimates of ability. These expectations were supported; the results revealed that praise and blame from an unfamiliar teacher did not influence perceptions of ability as greatly as they did from a teacher who was familiar with the students' ability.

To date no research has been conducted in the athletic setting to test these assumptions concerning the informative function of evaluative behavior. Moreover, while the above findings were typical of adults, the study of Meyer et al. (1979) reported that children differ in their interpretation of teacher feedback. These developmental differences need to be tested in a sporting context, so that teachers can devise optimum teaching strategies based on the age of the children, the complexity of the task and the outcome of performance.

CHAPTER 3

METHODOLOGY

Subjects

Males were chosen as the subjects for this study. The sample was comprised of 140 boys divided into seven groups by age. The ages of the boys ranged from 9 through 15 years with the mean age being 12 years. The rationale for choosing seven age groups was based on the assumption that there would be more extreme ability ratings the greater the age difference. This assumption was based on Nicholls and Miller's (1984) developmental theory of perceived ability. There were 20 boys in each of the seven age groups. The children were drawn from Augres Elementary/Middle/High School located in Central Michigan. Permission was obtained from the director of the school to invite participation in the study. A consent form was signed by the parent/guardian of all of the boys in the school who indicated a willingness to participate in the study.

Design

This study employed a 7x2x2x2 (age by task difficulty by feedback by outcome) factorial design, and similar to Meyer et al. (1979), with repeated measures on the final three factors. There were seven levels of age (9 - 15), two levels of task difficulty (easy, difficult), two levels of teacher feedback (praise or blame versus neutral), and two levels of outcome (pass or fail). The last three factors were combined to produce eight experimental conditions. All children experienced all experimental conditions in the same order. The order in which the questionnaires were answered was easy success. easy failure, difficult success, difficult failure.

Instrumentation

The instrument used was a modified version of the questionnaires in the Meyer et. al. (1979) study. The modification involved responses to a

hypothetical sport situation. Each of the four questionnaires (see Appendix A) was distributed to every subject and read aloud in turn, followed by the subjects marking their responses on a 9-point scale. The 9-point scale was ordered at odd numbers with the following labels: 1=very low ability, 3=low ability, 5-average ability, 7=high ability, and 9=very high ability.

The use of two additional instruments, Harter's Perceived Physical Competence Scale (1979) and a demographic questionnaire, had to be eliminated from the study. The director of the school and the classroom teachers believed that too much time was required to complete the other questionnaires.

Procedure

Boys enrolled at Augres Elementary/ Middle/High School, between the ages of 9 and 15 years, were selected for this study. Contact with the director of the school was arranged to discuss the nature of the school's involvement and purpose of the study. Following this meeting, the director agreed to provide his cooperation to allow the boys in his school to serve as subjects and to contact the parents of the children to inform them that this study met with his approval. Printed materials describing the nature of the study were presented and time and facility commitments were discussed. A letter explaining the study, and a parental permission form (see Appendix B) were sent to parents of each child. The teachers randomly selected 20 boys within an age group, whose parents had given permission to participate in the study. Children selected for the study gave their assent to participate.

Data Collection

The questionnaires were distributed by the teacher during classroom time. The subjects were seated opposite the teacher while testing took place. The study was held in the classroom for each of the seven age bands (i.e., 9, 10, 11, 12, 13, 14 and 15 years). Each subject received a questionnaire containing four situations (easy/success, easy/failure, difficult/success,

difficult/failure). The teacher read aloud each situation waiting for all the children to finish answering their questionnaire before reading the next questionnaire. The four situations involved a description of two students who performed a gross motor skill. The task was presented as very easy (or very difficult), and subjects were told that both students had performed the skill correctly (or incorrectly). For each of the four conditions the subjects who participated in this study had to imagine they, themselves, were performing the skill described in the hypothetical sport situation. Moreover, for each of the conditions the subjects received neutral feedback. For success at an easy and difficult task, teacher feedback was praise and neutral. For failure of an easy and difficult task, feedback was blame and neutral.

Following presentation of each situation, subjects were asked to circle the name of the child the teacher thought had higher ability, and also how the teacher would rate each child's ability on a 9-point scale. Administration time was approximately 20 minutes per group of children. After completing the test, children were thanked for their participation.

Limitations

A limitation of this study was a possible order effect in answering the questionnaires in the sequence easy success, easy failure, difficult success and difficult failure. An additional limitation was that the subjects only experienced receiving neutral feedback from the teacher.

CHAPTER 4

RESULTS

This study was designed to address two issues in relation to childrens' self-perceptions of ability in the sport setting. First, a replication of Meyer et al.'s (1979) third experiment which studied, specifically, the effects of outcome, task difficulty and feedback on childrens' self-perceptions of ability. Secondly, an extension of this replication involved investigating the additional factor of age to discover if any developmental trends were evident. Hence, do the factors of outcome, task difficulty and feedback affect childrens' self-perceptions of ability differently depending on their age? The results of the replication and the extension will be discussed separately.

Analysis 1: Replication and Extension

The first part of this study was concerned with replicating Meyer et al.'s (1979) third experiment. However, this study deviated from the original study in several ways. Firstly, the subjects chosen were children as opposed to adults. This study also had a much larger sample size, i.e., 140 compared to 17 subjects in Meyer et al.'s orginal study. Thirdly, unlike the Meyer et al. (1979) study, boys only were tested. Fourthly, subjects were asked to imagine themselves as one of the students in each of the four hypothetical situations. And finally, the scenarios read by each subject were related to the context of sport.

Ratings of perceived ability on the four questionnaires were analyzed within a 2x2x2 (outcome x feedback x task difficulty) ANOVA with repeated measures on each factor. This analysis revealed a significant main effect for the factors of outcome, task difficulty and feedback. None of the two way interactions were significant. There was, however, a significant three way interaction for outcome by feedback by task difficulty. A summary of all the main effects and interactions are reported in Table 3.

Table 3

Summary of Analysis of Variance for Perceived Ability by Outcome, Task Difficulty and Feedback

Source	df	MS	F
Outcome	1	5.86	4.44*
Task Difficulty	1	67.52	22.26**
Feedback	1	2644.50	266.83**
Outcome x Task Difficulty	1	2.51	1.85
Outcome x Feedback	1	1.22	0.95
Task Difficulty x Feedback	1	6.15	2.40
Outcome x Task Difficulty x Feedback	1	92.00	22.95**
Error	139	6.37	

* $p < .05$

** $p < .001$

In order to interpret the results of the three-way interaction, eight groups were created. These groups were easy failure blame, easy success praise, difficult failure neutral, difficult success neutral, easy failure neutral, easy success neutral, difficult failure blame and difficult success praise. A follow-up Scheffe' test on the eight groups yielded a significant result, $F(7,1112)=107.9378$, $p<.001$. The means and standard deviations for the three-way interaction are presented in Table 4. A diagramatic view of the three-way interaction compared to Meyer et al. (1979) is presented in Figure 1.

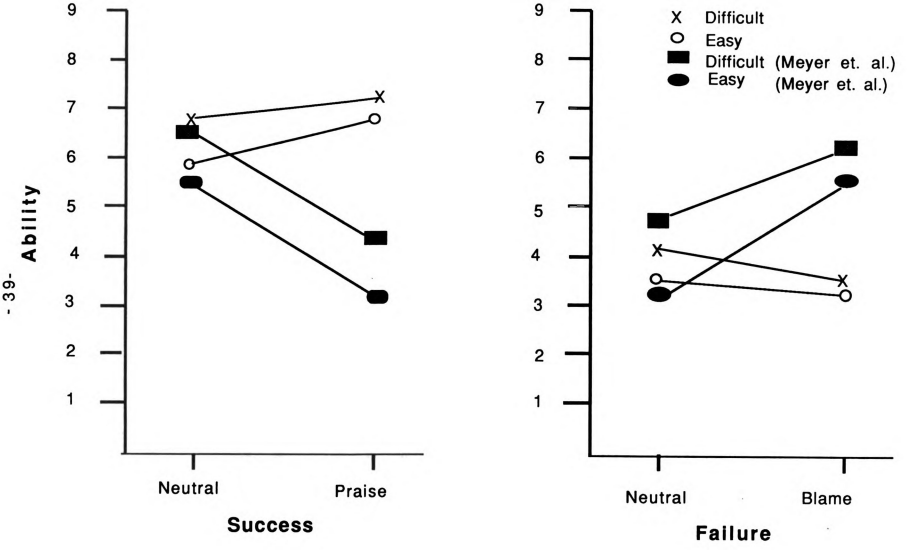

Figure 1. **Ratings of ability for outcome by feedback by task difficulty**

A closer examination of the three way interaction revealed that all the easy and difficult success conditions were rated significantly higher from all the easy and difficult failure conditions. Furthermore, the easy and difficult/success/praise groups differed significantly from the easy/success / neutral group.

Groups which did not differ significantly from one another included all the easy and difficult failure conditions with accompanying feedback, with means ranging from 3.26 to 4.09. There was no significant difference between the easy and difficult/success/neutral groups with means of 5.95 and 6.80 respectively. Furthermore, the difficult/success/neutral group and easy and difficult/success/praise group did not differ significantly, with means of 6.83, 7.26 and 7.23 respectively.

Table 4

Means and Standard Deviations for the Perceived Ability Ratings

Task Difficulty	Success				Failure			
	Neutral		Praise		Neutral		Blame	
	M	SD	M	SD	M	SD	M	SD
EASY	5.95	(1.65)	6.83	(1.87)	3.66	(1.70)	3.26	(2.26)
(Meyer et al.)	5.53	(-)	2.59	(-)	3.18	(-)	5.65	(-)
DIFFICULT	6.80	(1.57)	7.26	(1.88)	4.09	(1.95)	3.53	(2.42)
(Meyer et al.)	6.65	(-)	4.47	(-)	4.77	(-)	6.24	(-)

The surface means and standard deviations for the two-way interactions are reported in Tables 5, 6 and 7.

Table 5

Surface Means and Standard Deviations for Perceived Ability by Task Difficulty and Outcome

	Success		Failure	
	M	SD	M	SD
Easy	6.39	(1.82)	3.81	(2.21)
Difficult	7.03	(1.74)	3.46	(2.01)

Table 6

Surface Means and Standard Deviations for Perceived Ability by Outcome and Feedback

	Success		Failure	
	M	SD	M	SD
Praise	7.04	(1.88)	--	--
Neutral	6.38	(1.66)	3.40	(2.34)
Blame	--	--	3.88	(1.84)

Table 7

Surface Means and Standard Deviations for Perceived Ability by Task Difficulty and Feedback

	Easy		Difficult	
	M	SD	M	SD
Praise/Blame	5.05	(2.73)	5.39	(2.86)
Neutral	5.44	(2.23)	4.81	(2.03)

The significant main effects indicated that subjects rated students who were successful higher in ability than students who failed. Subjects rated students working on a difficult task as higher in ability than students working on an easy task. And students who were praised or blamed were perceived bu the subjects as having greater ability than students who received neutral feedback. The means and standard deviations for the main effects are reported in Table 8.

Table 8

Means and Standard Deviations for Perceived Ability for the Variables of Outcome, Task Difficulty and Feedback

Group		M	SD
Outcome	Success	6.71	1.81
	Failure	3.64	2.12
Task Difficulty	Easy	4.93	2.41
	Difficult	5.42	2.56
Feedback	Praise/Blame	5.22	2.80
	Neutral	5.13	2.15

Looking at the means for the main effects, it is evident that for outcome there was a significant difference between the conditions of success and failure. Overall success had a mean of 6.71 while failure had a mean of 3.64. Hence, subjects rated students who were successful as having higher ability than students who failed.

For task difficulty there was not as great a difference between the easy and difficult groups. Performance on an easy task yielded a mean perceived ability rating of 4.93 whereas the mean perceived ability rating on a difficult task was 5.42 Thus, perceived ability was rated higher on the difficult tasks than the easy tasks.

The feedback conditions had a mean rating of 5.22 for praise or blame and a mean of 5.13 for neutral. This was not surprising because subjects rated the student who was praised as being more able than the student who received neutral feedback. In contrast, the student who was blamed was rated lower in ability compared to the recipient of neutral feedback in the same condition. When viewed as a main effect this contrast in ratings of perceived ability was neutralized.

Discussion

The results of this anlaysis failed to replicate the findings of Meyer et al. (1979). In their original study Meyer et al. reported no significant main effects for outcome or feedback but they did report significant two way interactions between outcome and feedback as well as outcome and task difficulty. Moreover, Meyer et al. (1979) did not find the three way interaction of outcome by feedback by task difficulty to be significant. The only result which was replicated was the main effect for the factor of task difficulty. The means and standard deviations reported in the Meyer et al. (1979) study are included in Table 4 for comparison with the present findings.

Under the easy and difficult success conditions the neutral ratings did not differ very much from the Meyer et al. (1979) ratings. However, the easy and difficult success praise ratings were considerably higher than those

reported by Meyer et al. (1979). The mean rating for easy success praise was 6.83 (1.87) compared to Meyer et al.'s. rating of 2.59 (-). The difficult success praise had a mean rating of 7.26 (1.88) while Meyer et al. reported a rating of 4.47 (-).

For the easy and difficult/failure conditions, again the neutral ratings did not differ greatly from Meyer et al.'s (1979) findings with the means for both studies ranging from 3.66 to 4.77. However, for easy failure/blame this study reported a lower mean of 3.26 (2.22) compared to Meyer et al.'s (1979) 5.65 (-) rating. For the difficult/failure/blame rating, this study reported a mean of 3.53 (2.42) while Meyer et al. (1979) reported a mean rating of 6.24 (-). Unfortunately, Meyer et al. (1979) did not give any standard deviation for each of the conditions, which would indicate how much each group varied compared to the present findings.

In sum, the present study reported similar ratings of perceived ability to Meyer et al. (1979) for the easy and difficult/success and failure/neutral conditions. However, subjects in this study had higher mean ratings for the easy and difficult/success/praise conditons and lower ratings for easy and difficult/failure/blame conditions, than the mean ratings of the subjects in the Meyer et al. (1979) study. Perhaps one explanation for the failure to replicate Meyer et al.'s study was the age of this study's subjects.

Analysis 2: Developmental Differences

The main purpose of this second analysis was to extend the third experiment of Meyer et al. (1979) by studying the additional factor of age on the factors of outcome, task difficulty and feedback. The rationale for investigating possible developmental differences was twofold. First, Meyer et al. (1979) reported that children differed in their interpretation of teacher feedback. However, these differences were not explored in relation to outcome, task difficulty and type of feedback. Secondly, Nicholl's (1978)

cognitive developmental model of perceived ability posits that children's perceptions of their own ability may be influenced by outcome, effort and task difficulty. By including age as another variable in the original design, it should be possible to detect when developmental differences in perceptions of ability occurred and what factors were most influential in each age group's rating of ability.

The influence of age was investigated by means of a 2x2x2x7 (outcome x task difficulty x feedback x age) ANOVA. Results of this analysis replicated the main effects found in the previous three-way ANOVA for the factors outcome, task difficulty and feedback. However, this analysis did reveal three important results. Firstly, there was no significant main effect for age. Secondly, there were significant interaction effects for age by task difficulty as well as age by feedback but age by outcome was not significant. And thirdly, a four-way interaction was evident for age by outcome by task difficulty by feedback. A summary of all the main effects and interactions are reported in Table 9 on the following page.

The significant four-way interaction, while unanticipated, supercedes interpretation of significant main effects and two- and three-way interactions. The means and standard deviations of the perceived ability ratings by the seven age groups across each condition are presented in Table 10. (See page 47). The follow-up Scheffee' test for the four-way interaction required the comparison of 56 group means. Unfortunately, the SPSS statistical package places a limit of 50 on the number of cells it can accomodate in a post hoc analysis. To facilitate the interpretation of the data relative to the hypotheses, it was necessary to combine subjects by age into younger (9, 10 and 11 years) and older (12, 13, 14 and 15 years) groups. Because meaningful information was potentially lost, the significant two-way interactions will be presented first followed by the revised testing of the four-way interaction.

Table 9

Analysis of Variance for Perceived Ability by Age, Outcome, Task Difficulty and Type of Feedback

Source	df	MS	F
Age	6	8.23	1.31
Outcome	1	5.86	4.50*
Task Difficulty	1	67.52	27.37**
Feedback	1	2644.50	278.25**
Age x Outcome	6	1.71	1.31
Age x Task Difficulty	6	15.57	6.31**
Age x Feedback	6	18.93	1.99*
Outcome x Task Difficulty	1	2.51	1.87
Outcome x Feedback	1	1.22	0.92
Task Difficulty x Feedback	1	6.15	2.40
Age x Outcome x Task Difficulty	6	1.69	1.26
Age x Outcome x Feedback	6	0.40	0.30
Age x Task Difficulty x Feedback	6	2.72	1.06
Outcome x Task Difficulty x Feedback	6	92.00	25.79**
Age x Outcome x Task Difficulty x Feedback	6	13.79	3.87*
Error	133	6.29	

* $p < .05$

** $p < .01$

Table 10

Means and Standard Deviations for the Seven Ages by Outcome, Task Difficulty and Feedback

AGE	EASY SUCCESS				DIFFICULT SUCCESS				EASY FAILURE				DIFFICULT FAILURE			
	Praise		Neutral		Praise		Neutral		Blame		Neutral		Blame		Neutral	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
9	7.90	(1.94)	5.60	(1.46)	7.95	(1.67)	6.45	(1.82)	2.80	(2.26)	3.85	(1.95)	2.05	(1.50)	3.65	(1.90)
10	6.70	(2.20)	5.55	(1.50)	6.80	(2.71)	6.20	(1.67)	4.20	(2.48)	4.45	(1.73)	4.25	(2.75)	4.60	(2.14)
11	7.50	(1.36)	6.80	(1.36)	7.60	(1.43)	6.50	(1.54)	3.20	(1.88)	3.85	(2.01)	3.25	(2.05)	4.20	(1.68)
12	7.35	(1.35)	6.30	(1.30)	7.05	(1.50)	6.85	(1.76)	2.75	(1.94)	3.45	(1.67)	2.75	(1.10)	4.00	(2.10)
13	6.10	(1.89)	5.60	(1.73)	7.10	(1.55)	7.45	(1.23)	3.70	(2.49)	3.15	(1.27)	4.15	(2.37)	4.10	(2.27)
14	6.95	(1.61)	7.00	(1.30)	6.95	(1.99)	7.30	(1.38)	3.50	(2.69)	3.80	(1.77)	4.00	(2.77)	4.10	(2.08)
15	5.30	(1.42)	4.80	(1.85)	7.35	(2.03)	6.85	(1.29)	2.70	(1.84)	3.10	(1.21)	4.25	(2.57)	4.05	(1.57)

A Scheffe' post hoc test was conducted for the significant two-way interaction for age by feedback, $F(13,1106) = .7643$, $p<.05$. The results of this analysis failed to produce a significant difference between any two groups. The reason why no two groups differed may be explained in that praise and blame were coded the same in the original data. This procedure was followed in order to replicate the Meyer et al. (1979) study. The means and standard deviations for the perceived ability ratings in the feedback conditions are reported in Table 11.

Table 11

Means and Standard Deviations for Age by Feedback

AGE	PRAISE/BLAME		NEUTRAL	
	M	SD	M	SD
9	5.18	3.33	4.89	2.12
10	5.49	2.80	5.20	1.88
11	5.39	2.74	5.31	2.12
12	4.98	2.80	5.15	2.24
13	5.26	2.50	5.07	2.32
14	5.35	2.79	5.55	2.29
15	4.90	2.60	4.70	2.02

For both of the feedback groups the means and standard deviations did not differ greatly across age, with ratings ranging from 4.70 to 5.55. However, the 15 year old children had the lowest mean of all the age groups for praise/blame feedback and the neutral feedback conditions. Moreover, the 12 and 14 year old differed from the other age groups by rating students who

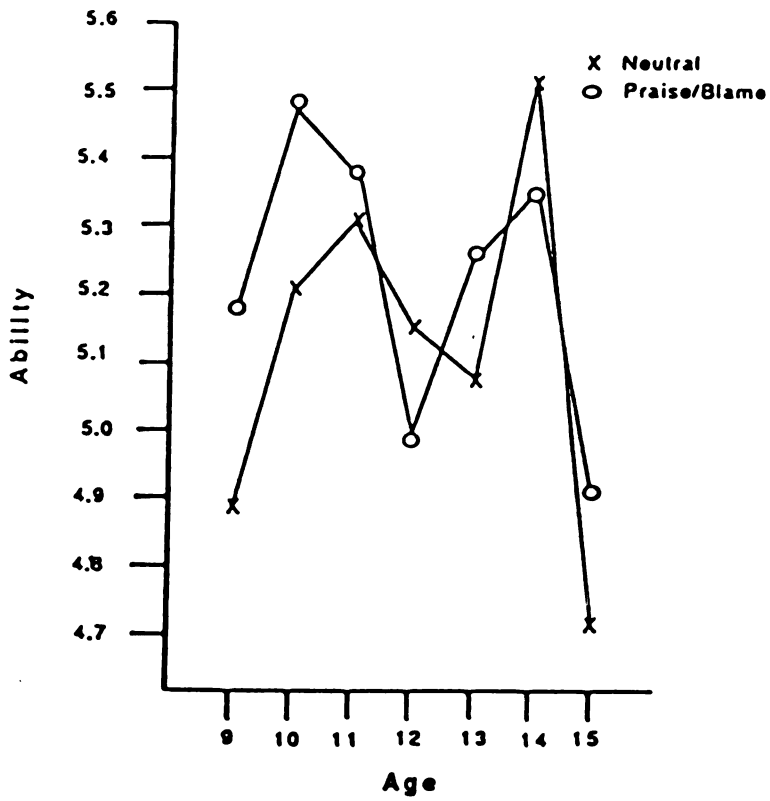

Figure 2. Ratings of ability for age by feedback.

received neutral feedback higher in perceived ability than students receiving praise and blame. The means for the two feedback conditions across age are plotted in Figure 2.

A Scheffe' post hoc test was conducted for the significant two-way interaction for age by task difficulty, $F(13,1100) = 2.6476$, $p<.01$. Although this follow-up test was significant, no two groups differed significantly from each other. The means and standard deviations are reported in Table 12.

Table 12

Means and Standard Deviations for Task Difficulty by Age

AGE	EASY		DIFFICULT	
	M	SD	M	SD
9	5.04	2.71	5.02	2.88
10	5.22	2.21	5.46	2.55
11	5.34	2.48	5.36	2.42
12	4.96	2.48	5.16	2.60
13	4.64	2.24	5.70	2.46
14	5.31	2.51	5.59	2.59
15	3.97	1.92	5.62	2.41

The results indicated that the 9 year old boys were the only group to rate the easy tasks higher than the difficult tasks. The rest of the age groups rated difficult tasks higher than easy tasks. The means for the 9, 10, and 11 year old boys were similar for both easy and difficult task conditions. After age 11 there was a notable split between the ratings of the easy tasks compared to the difficult tasks for the older children. This difference in the ratings of the older children is responsible for the two-way interaction. The means for the easy and difficult tasks are plotted in Figure 3.

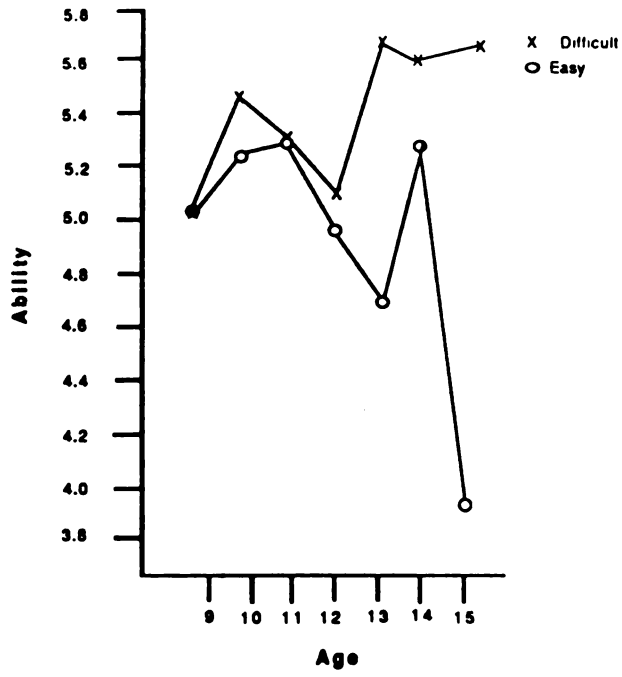

Figure 3. Ratings of ability for age by task difficulty.

The additional variable of age showed no significant main effect. The means and standard deviations of ability ratings for the seven ages across all conditions are reported in Table 13.

Table 13

Means and Standard Deviations of Ability Ratings

for each Age Across Questionnaires

	M	SD
9	2.80	2.26
10	4.20	2.48
11	3.20	1.88
12	2.75	1.94
13	3.70	2.49
14	3.50	2.69
15	2.70	1.84

Although these results do not support the hypothesis which posits developmental differences, age differences were apparent when combined with the other variables of outcome, task difficulty and feedback. No follow-up tests were necessary for the two-way interaction of age by outcome because there were no significant differences in the ratings of success and failure by age groups. The remaining two-way interactions of outcome by task difficulty, outcome by feedback and task difficulty by feedback were not significant. Furthermore, the three-way interactions of age by outcome by task difficulty, age by outcome by feedback and age by task difficulty by feedback were not significant. The means and standard deviations for all the non-significant findings are presented in Appendix C.

As stated previously, in order to test the proposed hypotheses it was necessary to conduct a more direct test. Hence, the seven ages were combined into younger and older groups. Nine, 10 and 11 year old boys were combined to form the younger group and 12, 13, 14 and 15 year old boys formed the older group. This yielded the two groups defined in the hypothesis. A discriminate analysis was chosen to test the proposed hypotheses because of the multivariate nature of the problem. The three independent sets of variables combined to form eight sets of conditions. In addition it was necessary to investigate this three-way relationship of the variables together because the hypotheses were stated in the form of an interaction.

The discriminant function analysis was significant, $\chi^2(8)=29.72$, $p < .001$, and accounted for 20% of the variance. All eight combined conditions were significant in discriminating the two age groups. The means and standard deviations for the ability ratings are presented in Table 14.

Table 14

Means and Standard Deviations for the Young and Old Children for each Situation

	Young		Old		SDC*
	M	SD	M	SD	
Difficult Failure Blame	3.18	(2.31)	3.79	(2.47)	-0.402
Easy Failure Blame	3.40	(2.26)	3.16	(2.27)	0.544
Easy Failure Neutral	4.05	(1.89)	3.38	(1.50)	0.382
Difficult Failure Neutral	4.12	(1.92)	4.06	(1.98)	-0.053
Easy Success Neutral	5.98	(1.54)	5.93	(1.74)	0.012
Difficult Success Neutral	6.38	(1.66)	7.11	(1.42)	-0.690
Easy Success Praise	7.37	(1.90)	6.43	(1.74)	0.562
Difficult Success Praise	7.45	(2.04)	7.11	(1.76)	0.376

* SDC - Standardized Discriminant Coefficients

Note: "-" Sign favors older children group.

The means for the younger and older children are plotted in Figures 4 and 5 on page 54. These plots highlight the points of interaction between the two groups on the variables investigated.

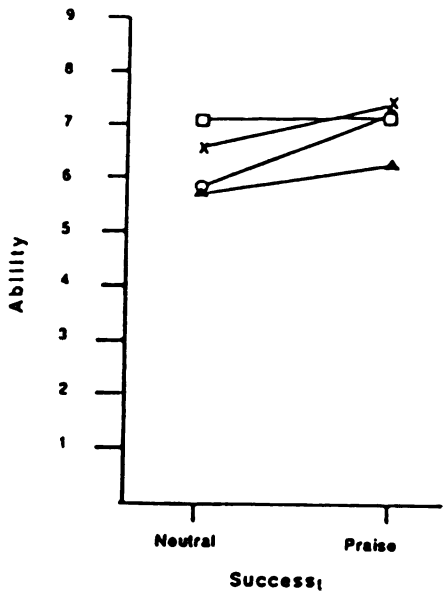

Figure 4

Ratings of ability for outcome by feedback by task difficulty for young and old children.

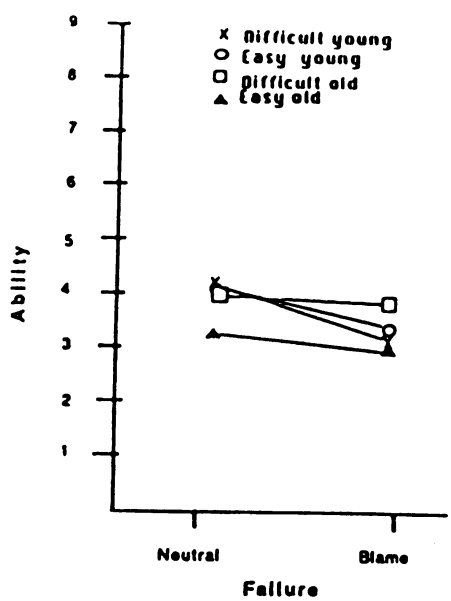

Figure 5.

Ratings of ability for outcome by feedback by task difficulty for young and old children.

In order to test the proposed hypotheses the mean perceived ability ratings of younger children were compared to the mean perceived ability ratings of the older childern on each set of conditions.

Hypothesis 1

The first hypothesis proposed that for both an easy and difficult task younger children, aged 9, 10 and 11 years, would have higher perceptions of ability than older children, aged 12, 13, 14 and 15 years, when receiving praise after success and have lower perceptions of ability when receiving blame after failure. Comparison of the means indicated that the younger children had higher perceptions of ability than the older children for the easy/success/praise and difficult/success/praise conditions. Moreover, the younger children had lower perceptions of ability than the older children for

the difficult/failure/blame condition. However, the younger children reported a higher rating for the easy/failure/blame condition compared to the older children's rating (see Table 14). Therefore, the first hypothesis was only partially supported.

Hypothesis 2

The second hypothesis predicted that for both an easy and difficult task older children aged 12 and above would have lower perceptions of ability than younger children when receiving praise after success and neutral feedback after failure. Comparison of the means indicated that the easy/success / praise, easy/failure/neutral and difficult/success/praise were rated lower by older children. Moreover, although the difficult/failure/neutral was rated slightly higher by the older children, this difference was only marginally significant (see Table 14). Partial support was therefore, provided for the second hypothesis.

Hypothesis 3

The third hypothesis stated that for both an easy and difficult task children aged 12 and above would have higher perceptions of ability than children aged 9, 10, and 11 years when receiving blame after failure and neutral feedback after success. The difficult/failure/blame and difficult / success/neutral situations resulted in higher ratings of ability by the older children compared to the younger children. However, the easy failure/blame and easy/success/neutral situations were rated lower by the older children compared to the younger children (see Table 14). Hence, the third hypothesis was only partially supported.

Analysis 3: Specific Age Groups

In order to understand the developmental sequence of the ability ratings it was necessary to look at each age group individually in greater detail. By combining the ages in Analysis 2 unique variations within an age group may have been disguised. Hence, it was necessary to look at each age separately in order to compare the different age groups to each other.

Nine year old subjects

For the 9 year old children there was a significant effect for the combined cell means, $F(7,152) = 30.89$, $p < .001$. Groups which differed significantly from each other were all the easy and difficult/success/praise conditions which were rated higher than the easy and difficult/failure/blame conditions. The two groups - difficult/failure/neutral and easy/failure/neutral - were rated significantly lower than both the easy and difficult/success/praise and the difficult/success/neutral groups. The easy/success/neutral group had a lower significant mean rating than both the easy and difficult/success/praise groups. See Figures 6 and 7 which illustrate the three-way interaction for the nine year old subjects.

Groups whose means did not differ significantly from each other include all the failure conditions; the easy and difficult/failure/neutral and easy success/neutral; both the easy and difficult/success/neutral groups; and the easy and difficult/success/praise and difficult/success/neutral groups.

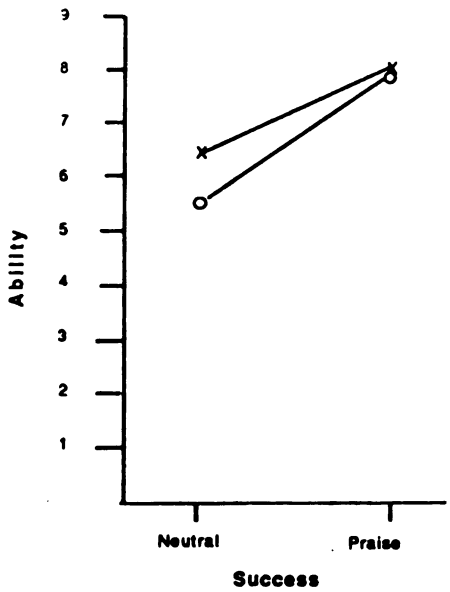

Figure 6.

Ratings of ability for success outcome by feedback by task difficulty for nine year old children

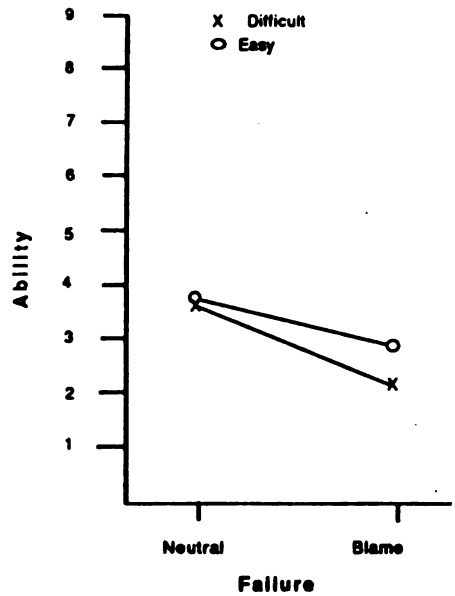

Figure 7.

Ratings of ability for failure outcome by feedback by task difficulty for nine year old children

With the exception of the easy/success/neutral condition, 9 year old children indicated a clear distinction for outcome with failure conditions resulting in lower ratings than success. In addition to outcome, 9 year old boys considered the type of feedback received in their rating of perceived ability. This group of children appeared especially sensitive to both praise and blame conditions. The mean ratings for perceived ability for successful praise conditions were the highest compared to the failure/blame conditions which have the lowest mean perceived ability rating. The neutral feedback conditions received more average ratings and were placed between the blame and praise feedback. Although not statistically meaningful, it is interesting to note the order of perceived ability ratings with regard to task difficulty. Specifically, easy/failure resulted in higher ratings than failure at

difficult tasks. However, under success conditions, difficult tasks resulted in higher ratings of ability. Apart from this contradiction on the reversal of ratings of task difficulty, successful praise resulted in high perceptions of ability whereas failure/blame resulted in very low perceptions of ability, for the 9 year old children.

In summary, nine year old children included all of the available information in their ratings of perceived ability. Praise from the teacher following success at either an easy or difficult task resulted in the highest ratings of perceived ability. Blame following failure of an easy or difficult task resulted in very low ratings of perceived ability. Finally, a success on an easy task to which a teacher gave neutral feedback resulted in a lower rating of ability than success on either an easy or difficult task followed by praise. Thus, the type of feedback a teacher provided may have an additive effect on a 9 year old subjects' rating of perceived ability. This was particularly apparent for children who failed and received blame, children who succeeded and were praised, and for children who succeeded on an easy task but received neutral feedback.

Ten year old subjects

For the 10 year old children the Scheffe' post hoc test produced a significant overall effect, $F(7,152) = 5.10$, $p < .001$. However, in contrast to the results for the 9 year old boys, no two groups were significantly different from each other across all conditions. The three-way interaction for nine year old boys' perceived ability ratings are presented in Figures 8 and 9.

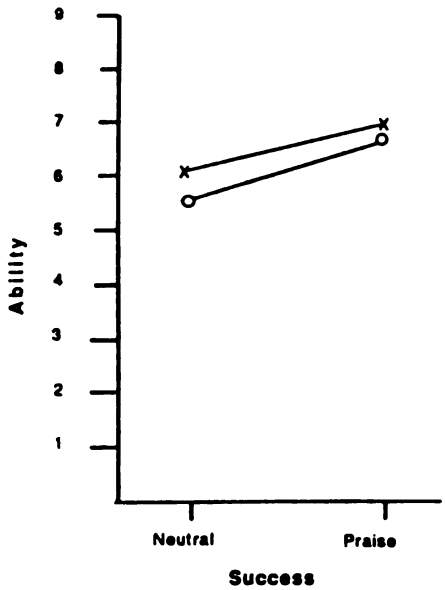

Figure 8

Ratings of ability for success outcome by feedback by task difficulty for ten year old children

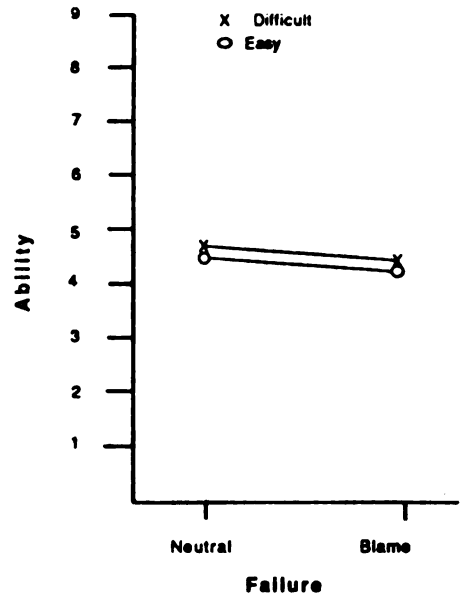

Figure 9

Ratings of ability for failure outcome by feedback by task difficulty for ten year old children

These results are puzzling. Although there were no significant differences statistically between the groups, the pattern established by the 9 year old subjects was followed. For the outcome factor, the success conditions were rated higher than the failure conditions. For feedback, blame conditions resulted in the lowest perceived ability ratings followed by neutral feedback, with praise rated the highest. The most notable difference, in ordering of perceived ability, occurred with task difficulty under failure conditions. The 9 year old children rated ability lowest for subjects in a difficult/failure/blame situation while the 10 year old boys rated subjects in the easy/failure/blame condition lowest. In contrast to 9 year old boys, 10 year old boys were less critical of ability following failure. Likewise, 10 year olds were more critical of ability given success. This may explain part of the overall four-way interaction.

In summary, the relationship between outcome, task difficulty, feedback and ratings of perceived ability by ten year old boys remains unclear. The fact that the overall Scheffe' test was significant but no two groups differed significantly was discouraging. However, in comparison to the 9 year old boys, these 10 year old children rated ability higher following failure and lower following success. For this group of 10 year old subjects, failure was not so terrible and success was not so great. This difference between 9 and 10 year old subjects may suggest some cognitive differences in the use of available information between the two age groups, as proposed by Nicholls and Miller (1984).

Eleven year old subjects

The Scheffe' post hoc test was significant across all conditions for the eleven year old children, $F(7,152) = 26.134$, $p < .001$. For this group of children all the success conditions differed from all the failure conditions. No other differences within the groups were evident and the ratings for the failure conditions were not significantly different from each other. Moreover, there were no differences within the success conditions. The three-way interaction for the 11 year old boys perceived ability ratings are plotted in Figures 10 and 11.

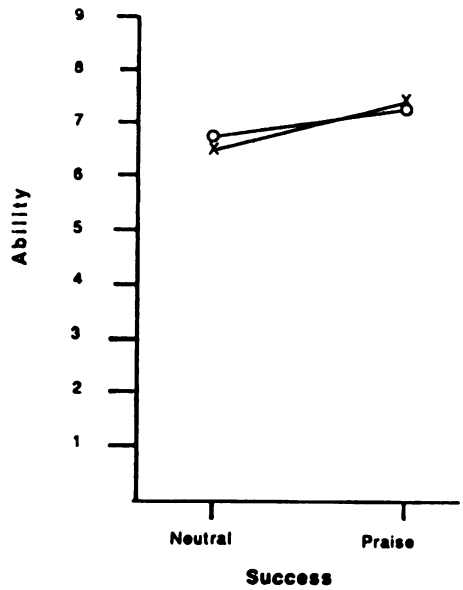

Figure 10

Ratings of ability for success outcome by feedback by task difficulty for eleven year old children

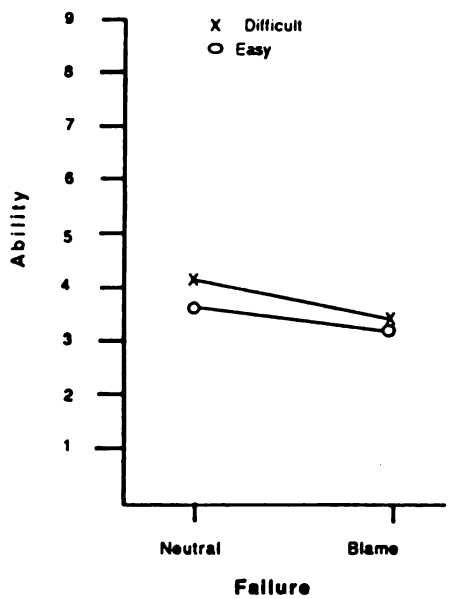

Figure 11

Ratings of ability for failure outcome by feedback by task difficulty for eleven year old children

The mean perceived ability ratings for the 11 year old boys are ranked similarly to those of the 9 and 10 year old boys for the factors Outcome and Feedback. That is, the failure conditions were rated lower than the success conditions. And for feedback, blame was ranked lowest followed by the neutral conditions, with praise rated the highest. The 11 year old subjects did differ from the 9 and 10 year old boys however, in their assessment of task difficulty.

Comparison of the 11 year boys' perceived ability ratings for task difficulty to that of the 9 and 10 year old subjects revealed differences in the way these children interpreted the situations presented. For instance, the 10 and 11 year old children rated the easy task accompanied with failure

and blame the lowest in contrast to the 9 year old boys who rated the difficult task together with failure and blame as the lowest perceived ability score. Moreover, whereas the 10 and 11 year old children rated the easy task under failure with neutral feedback below the difficult/failure/neutral condition the opposite was true for the 9 year old boys. However, the 11 year old boys ranked the easy task above the difficult task under success/neutral conditions whereas the reverse was reported for the 9 and 10 year old boys.

In sum these three age groups showed a similar pattern in the way the factors outcome and feedback were ordered. They were dissimilar in that task difficulty was evaluated differently by each age group. As the age group increased from 9 to 11 years, apart from the 10 year old boys, a difficult task was rated at some point below an easy task. This result was found in the failure blame conditions for the 9 year old boys and the success/neutral conditions for the 11 year old boys. Apart from these differenes in ratings of task difficulty, the younger age groups (9, 10, and 11 year old children) recorded high perceptions of ability for success/praise and low perceptions of ability for failure blame conditions. These results provide partial support for hypothesis 1.

Twelve year old subjects

For the 12 year old children the Scheffe' post hoc test produced a significant overall effect, $F(7,152) = 27.81$, $p < .001$. Similar to the eleven year old boys, this group of children rated all the success conditions significantly different from all of the failure conditions. No other differences were evident within the groups. Furthermore, none of the failure groups differed significantly from each other; neither did any of the groups in the success conditions differ significantly. The three-way interaction for the perceived ability ratings of the twelve year old children are plotted in Figures 12 and 13.

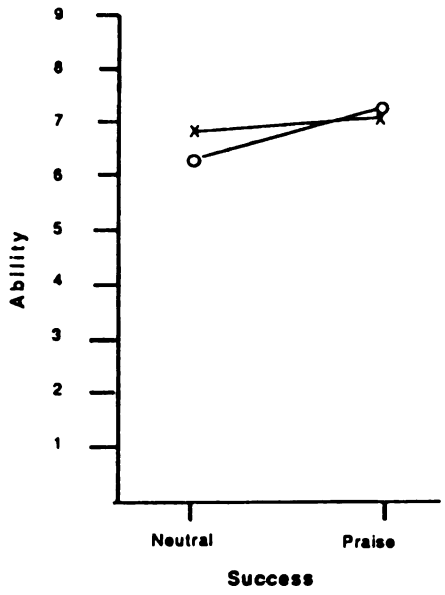

Figure 12

Ratings of ability for success outcome by feedback by task difficulty for twelve year old children

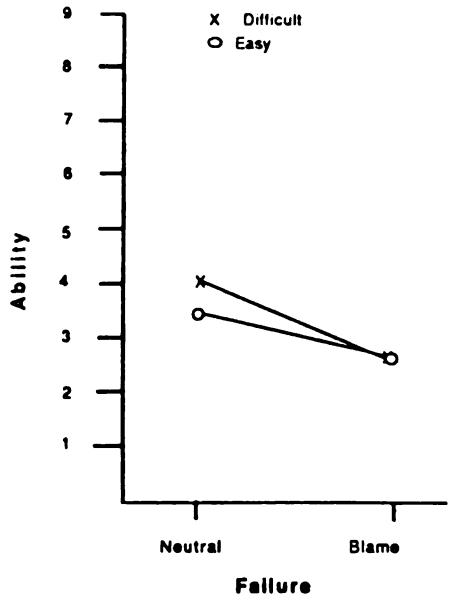

Figure 13

Ratings of ability for failure outcome by feedback by task difficulty for twelve year old children

Once again, the order in which the 12 year old children have rated perceived ability is very similar to those of the 9, 10 and 11 year old boys on the factors of outcome and feedback. Failure conditions are rated lower than success conditions. Feedback conditions were rated from low to high with blame, neutral and praise in that order. The ratings based on task difficulty however, indicated a few notable similarities and differences compared to the ratings for the previous age groups.

The 12 year old boys were similar to the 10 and 11 year old boys but different from the 9 year old boys in two respects. First, the easy task with failure and blame had the lowest perceived ability score. And secondly, the easy task with failure and neutral was rated below difficult/failure/neutral.

For the easy and difficult tasks combined with success and neutral conditions, the 12 year old children only differed from the 11 year old children. Similar to the 9 and 10 year old boys the 12 year old boys ranked easy/success/neutral below difficult/success/neutral in the order of ratings.

The 12 year old boys differed from all the younger age groups in regard to rating the easy task with success and praise above the difficult/success/praise task which would appear to be a contradictory finding. Apart from this the 12 year old boys, like the younger age levels, valued praise as an indicator of high ability; blame on the other hand was typical of low ability, and neutral teacher evaluative behavior reflected average ability.

In summary, 12 year old children used outcome as the basis for their rating of ability. Children who experienced success were perceived to have greater ability than children who experienced failure.

Thirteen year old subjects

For the thirteen year old children the Scheffe' post hoc test was significant, $F(7,152) = 14.464$, $p < .001$. Several groups differed significantly from each other for this age group. All the success conditions were rated significantly higher than the easy/failure/neutral condition. The easy and difficult/success/praise and difficult/success/neutral were rated significantly higher than the easy/failure/neutral and blame ratings. Both the difficult/success/praise and neutral ratings were also rated higher than the difficult/failure/neutral and blame conditions.

Several groups did not differ statistically from one another. All the failure group means were relatively close as were the success group means. The difficult/failure/blame, easy/success/neutral and difficult/failure/neutral were not significantly different. Furthermore, the difficult/failure

with neutral and blame were not different from the easy/success/neutral and praise, perceived ability ratings. The three-way interaction for the perceived ability ratings of the thirteen year old boys are plotted in Figures 14 and 15.

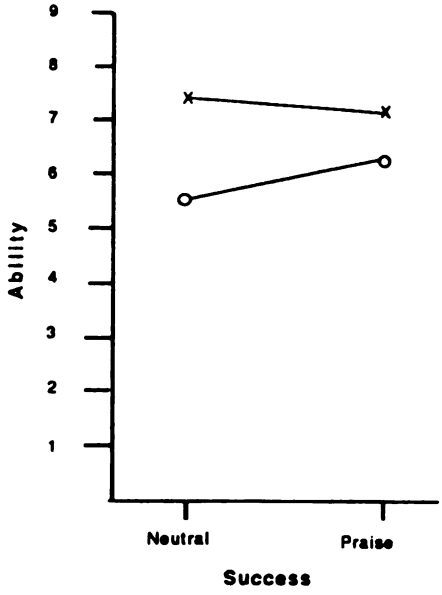

Figure 14

Ratings of ability for success outcome by feedback by task difficulty for thirteen year old children

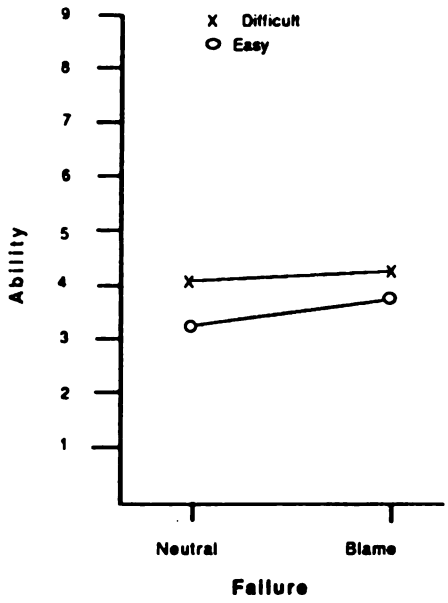

Figure 15

Ratings of ability for failure outcome by feedback by task difficulty for thirteen year old children

The means for the various conditions indicated that the easy/failure/neutral group had the lowest mean. For difficult situations success with its accompanying feedback was rated far higher than failure and its feedback. For thirteen year old children praise appeared to be more credible than blame. However, neutral feedback under a difficult success condition had the highest rating.

Comparison of the 13 year old children to the younger age groups revealed a similarity on the factor of outcome in that all the failure conditions were rated lower than the success conditions. However, notable differences were evident in the order of the ratings based on feedback and task difficulty.

For the factor task difficulty the 13 year old boys, in contrast to the 9, 10, 11 and 12 year old subjects, ordered the easy conditions close to each other and the difficult conditions close to each other, depending on the outcome. The order of the ratings had the two/easy failure conditions ranked lowest followed by the two difficult failure conditions; next were the two easy/success conditions and finally the two difficult/success conditions were rated the highest.

For the factor of feedback the 13 year old boys differed from the 9, 10, 11 and 12 year old subjects under several conditions. This age group had easy/failure/neutral as the lowest rating compared to easy/failure/blame for the 10, 11 and 12 year old boys and difficult/failure/blame for the 9 year old boys. Easy/failure/blame was ranked next by the 13 year old boys which was similar to the 9 year old boys rating but, different from the difficult/failure/blame of the 10, 11 and 12 year old boys. The third lowest rating was difficult/failure/neutral as it was for the 9 year old boys whereas the 10, 11 and 12 year old boys had easy/failure/neutral ordered third in the ratings. The 13 year old boys rated difficult/failure/blame higher than difficult/failure/neutral, yet lower than easy/success/neutral. This was in contrast to the perceived ability scores according to feedback of all the younger age groups. Finally, the difficult/success/neutral condition was rated highest, above the two difficult/praise conditions, which again was unique for this age group of children.

In summary, the difference in the results for the feedback condition for the 13 year old boys compared to the younger age groups may have contributed to the two way interaction between age and feedback. This factor does not follow the same pattern reported for the 9, 10, 11 and 12 year old boys. This older group of children began to show signs of lowering perceptions of

ability for easy and difficult/success/praise conditions and higher perceived ability rankings for the easy and difficult/success/neutral conditions and the difficult/failure/blame condition. This trend partially supports hypotheses 2 and 3.

Fourteen year old subjects

The Scheffe' post hoc test for the 14 year old children yielded a significant result, $F(7,152) = 14.64$, $p < .001$. Results for this age group were similar to the findings for the 11 and 12 year old boys. All of the success conditions differed significantly from all of the failure conditions. Groups which did not differ significantly from one another included all the failure conditions and all the success conditions. The three-way interaction for the fourteen year old boys are illustrated in Figure 16 and 17.

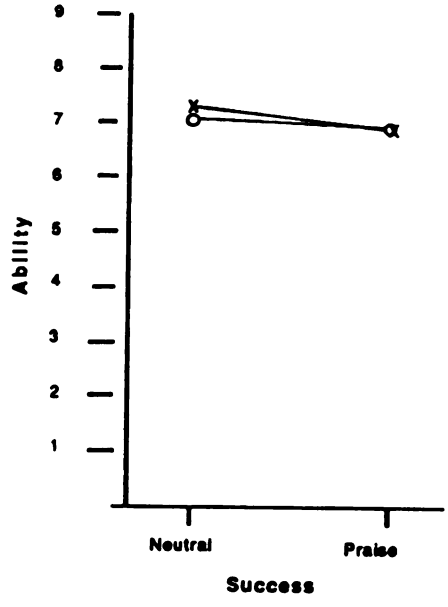

Figure 16

Ratings of ability for success outcome by feedback by task difficulty for fourteen year old children

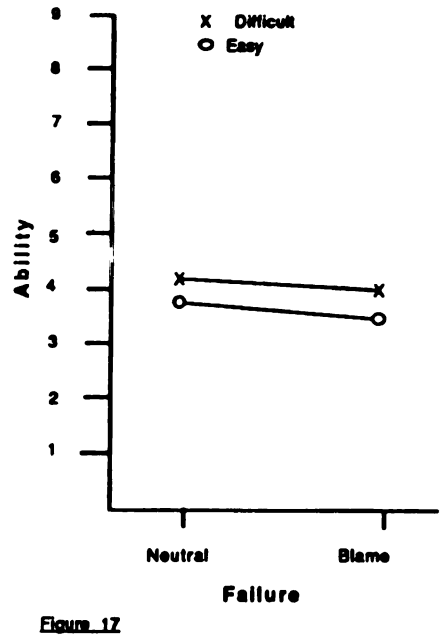

Figure 17

Ratings of ability for failure outcome by feedback by task difficulty for fourteen year old children

The 14 year old boys were similar to the younger age groups in rating failure outcome conditions lower than success outcome conditions. Certain similarities and differences were evident for the 14 year old boys' ratings compared to those of the 9, 10, 11, 12 and 13 year old boys on the factors task difficulty and feedback.

The success conditions were ordered difficult, easy, easy, difficult. However, for the 14 year old boys, neutral feedback resulted in higher perceived ability ratings than did praise in contrast to the 11 year old boys.

For the factor task difficulty the 14 year old boys, like the 13 year old boys, rated the two easy tasks under failure outcome as the lowest followed by the two difficult tasks under failure outcome. This was different from the results reported for the 9, 10, 11 and 12 year old subjects' perceived ability scores. Other similarities related to task difficulty for the 14 year old boys with the ratings for the 11 year old subjects, which together differed from those of the 9, 10, 12 and 13 year old subjects.

For the factor feedback no clear pattern was visible for the 14 year old boys. This age group rated easy /failure/blame as the lowest, similar to the 10, 11 and 12 year old boys but in contrast to the ratings of 9 and 13 year old children. Second in the ordering was easy/failure/neutral which was different from that of all the younger age groups, as was the third perceived ability rating of difficult/failure/blame . Difficult/failure/neutral was ranked fourth as it was for the 10, 11 and 12 year old boys. Both praise conditions were ranked next, which no other age group shares with the 14 year old boys. The two highest ratings were successful neutral conditions, which again was different from that of every age group except the 13 year old boys who had difficult/success/neutral rated highest, also.

Clearly the 14 year old boys have contributed to the four-way interaction of age by outcome by task difficulty by feedback as well as the two, two-way interactions of age by task difficulty and age by feedback. Similar to the 13 year old boys, in comparison with the younger age groups, the 14 year old boys had higher perceptions of ability for difficult/failure/blame and neutral as well as neutral being rated the highest under easy and difficult/success conditions. Praise was not ranked as highly by the 14 year old children. This evidence provides further partial support for hypotheses 2 and 3.

Fifteen year old subjects

The Scheffe' post hoc analysis for fifteen year old children resulted in a significant effect for the ability ratings, $F(7,152) = 17.40$, $p < .001$. Several groups were significantly different in their mean perceived ability ratings. The easy and difficult/success/praise and difficult/success/neutral groups were rated higher than both the easy/failure/blame and easy/failure/neutral groups. The difficult/success/ neutral and praise groups were rated significantly higher than the difficult/ failure/neutral and blame conditions. Finally, the difficult/success/praise group differed from the easy/success/neutral group which had a far lower rating.

The groups easy and difficult/failure with neutral and blame feedback along with easy/success/neutral indicated no differences between their mean ratings. There were no differences between the difficult/failure/neutral and blame and the easy/success/neutral and praise. Furthermore, the easy/success/neutral and praise together with the difficult/success/neutral did not differ from each other. Finally, the difficult/success/neutral and praise and the easy/success/praise indicated no difference in their mean ratings. The three-way interaction for the fifteen year old boys perceived ability ratings are plotted in Figures 18 and 19.

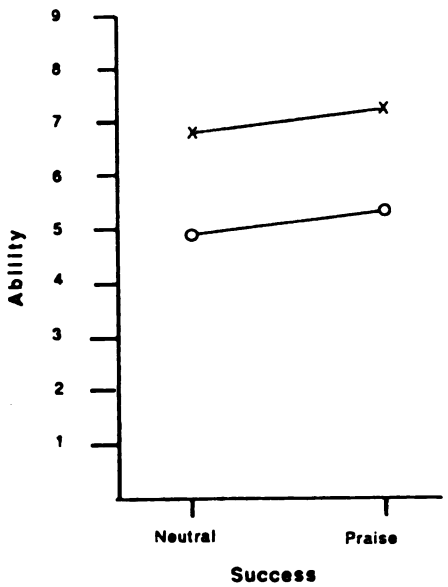

Figure 18.

Ratings of ability for success outcome by feedback by task difficulty for fifteen year old children

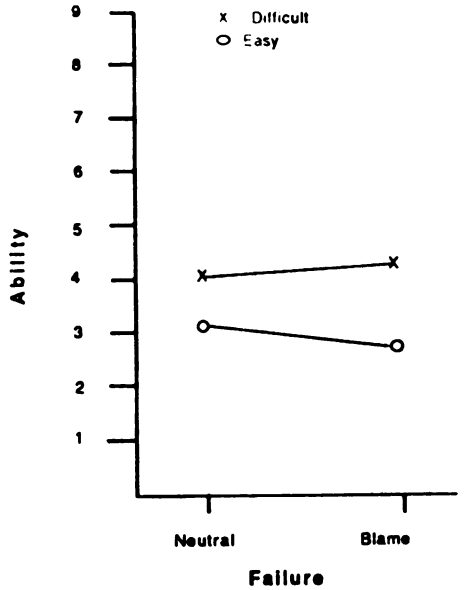

Figure 19

Ratings of ability for failure outcome by feedback by task difficulty for fifteen year old children

The results for the 15 year old children were similar to the findings for the 13 year old children. For difficult success, with praise or neutral feedback, higher ratings were given than for difficult failure conditions with neutral or blame feedback. Furthermore, easy tasks with a successful outcome were rated higher than for the easy tasks with teacher blame or neutral feedback. Once again for the 15 year old children, praise was valued more highly than blame in regard to teacher's responses.

Of the three factors, outcome, task difficulty and feedback, the 15 year old boys showed a similar trend to all the other age groups by rating failure outcomes lower than success outcomes. Notable similarities and differences to the other age groups again were apparent on the variables of task difficulty and feedback.

For task difficulty the 15 year old boys had exactly the same order as the 13 year old boys with two easy task difficulty ratings followed by two difficult task ratings for failure and success outcomes. The task difficulty ordering by 13 and 15 year old boys was different from that of all the other age groups.

There were several notable findings for the factor of feedback for this age group. Similar to the other ages, except for the 13 year old boys, blame feedback received the lowest rating for an easy task. Similar to the 14 year old boys and different from all the other age groups, the two neutral feedback under failure conditions were ranked next. The 15 year old boys also paralleled the order for blame under difficult/failure followed by neutral and then praise for easy/success conditions to that of the 13 year old boys. Moreover, unlike the other age groups, the 15 year old boys had neutral followed by praise feedback as the two highest ratings under difficult/success conditions.

These similarities and differences for the 15 year old boys clearly contributed to the interaction effects reported previously. A similar trend to the 13 and 14 year old boys was apparent for this age group with neutral feedback under success conditions and blame in the difficult failure condition being indicative of higher ability; however this group did rate difficult success praise very highly. These results provided partial support for hypotheses 2 and 3.

Summary

Three separate analyses were computed from the data collected in this study. Analysis 1 was a replication of a study done by Meyer et al. (1979). The results of this study produced three significant main effects for outcome, task difficulty and feedback, together with a significant three-way interaction between these variables. These results failed to replicate the findings reported by Meyer et al. (1979).

Analysis 2 was similar to analysis 1 with the additional variable of age being investigated. Here the results yielded no significant main effect for age, a significant four-way interaction for age by outcome by feedback by task difficulty, a two-way interaction for task difficulty by age, and a two-way interaction for feedback by Age. Analysis 3 involved detailed comparisons of each individual age group to understand more fully the four-way interaction. The most direct test of the hypotheses was accomplished via a discriminant analysis performed with the subjects grouped according to younger and older children. The discriminant analysis provided partial support for the hypotheses.

CHAPTER 5

DISCUSSION, SUMMARY AND RECOMMENDATIONS

One purpose of this investigation was to replicate a study conducted by Meyer et al. (1979) which was concerned with the question of whether, under certain conditions, a person who is praised or blamed is provided with information about how the person who is praising or blaming perceives their ability, which in turn will influence the self-perception of ability. This replication was specifically designed to determine the effects of praise and blame on self-perceptions of ability involving a sport task.

The question which guided this replication was to see if similar results would be found to those reported by Meyer et al. (1979), who studied adults in an academic setting, by further investigating children in a hypothetical sport setting. The present results revealed a different set of findings and failed to support the results of Meyer et al. (1979).

In their original study Meyer at al. (1979) reported that neutral evaluative behavior was superior to praise following successful mastery of both easy and difficult tasks in facilitating self-perceptions of ability. The present study found praise to be more conducive to formulating self-ability perceptions than neutral feedback. For failure at an easy and difficult task Meyer at al. (1979) posited blame feedback to result in higher self-perceptions of ability compared to neutral feedback. These results of Meyer et al. (1979) were found for adults who probably identified with the teacher. The present study, however, found the opposite to be true with children.

Both the present study and the Meyer et al. (1979) study reported conflicting results. One possible explanation for this discrepancy between the mean perceived ability ratings may be that this study had greater statistical power owing to the larger sample size of 140 compared to the 17

subjects in the study of Meyer et al. (1979). However, the results should still be in the same direction if power was the only reason. Moreover, the accessible population for this investigation was boys, whereas Meyer et al.'s (1979) sample was comprised of both male and female subjects. However, Meyer et al. (1979) reported that there were no significant differences between the answers of male and female subjects to the four types of questionnaires.

Another possible explanation for the obtained divergencies in the ability ratings could be an artifact of the experimental method. The questionnaires used in the third experiment by Meyer et al. (1979) provided information about three persons - two adult unknown performers who were evaluated and a teacher who provided differential feedback. Hence, the subjects were outsiders in this situation. In the present study each subject was asked to imagine himself to be a student who was one of the performers experiencing the differential feedback given by the teacher who was an adult. These situations may have been interpreted differently in the two studies owing to the personalized nature of the response.

The fact that this study involved a hypothetical sport situation, as opposed to an academic situation used in the Meyer et al. (1979) study, may also provide further insight into the divergent ratings of the two studies. There is a major difference between performing cognitive and physical tasks. This striking distinction may imply differences in the development of the concept of ability, based on the teacher's evaluative behavior in sport versus it's development in the classroom. In support of this proposition, Roberts and Pascuzzi (1979) argued that the nature of ability, effort, and task difficulty in sport are more revealing than in cognitive tasks. For example, in the present study it was probably easier for the subjects to visualize that the two performers were trying hard in the difficult success condition

involving the performance of a somersault. Compare this to the subjects in the Meyer et al. (1979) study who had to imagine that the two students were performing a difficult academic task. Hence, the demonstration of effort would appear much more apparent in the present study. The very natue of the performance process and outcome is more obvious in sport activities than academic tasks. It could be argued because of this that the subjects in the Meyer et al. (1979) study relied on the teacher's evaluation more than the subjects of the present study in the assessment of ability. Perhaps praise is valued more in sport compared to academic settings and blame is more indicative of low ability in classroom settings.

Related to this, Horn (1985) suggested that because children place a high value on their competence in sport activities, adult feedback may be especially influential in the athletic context in which children's motor competence is continually being evaluated. In the sport setting this relationship between coaches' feedback and children's psychological responses has been tested by Smith and Smoll and their associates (Smith et al., 1979; Smoll et al., 1978). Similar to the findings of the present study, these researchers found that positive coaching behaviors were more effective in facilitating childrens' self-perceptions than negative coaching behaviors.

A more plausable explanation for the different results reported by Meyer et al. (1979) contrasted to the present findings concerns the age of the subjects in each study. Meyer et al. (1979) tested adults who were second and third year undergraduate students, whereas the sample in this study consisted of children aged 9 to 15 years. In the first two experiments conducted by

by Meyer et al. (1979), in which these researchers were interested in the self-perceptions of children and adults to praise and neutral feedback, they found that younger and older subjects differed in their cognitive structures based on the way they processed identically perceived information. Young children (aged 9) indicated that the teacher thought the student whom he praised was the brighter one; children aged 10 to 14 choose the options praise and neutral in approximately equal numbers whereas subjects from 15 to 19 years of age predominantly thought that the teacher gave the neutral feedback to the student whom he considered brighter. These results support the findings of the present study in that praise feedback was associated with the more able student for the younger children (age 9, 10 and 11 years) whereas there was a trend with increasing age (12 to 15 years) for neutral feedback to indicate higher ability. Alternatively, this could mean that younger children use teacher feedback in formulating self-perceptions of ability whereas older children place greater emphasis on task difficulty.

In the third experiment by Meyer et al. (1979) however, the observed developmental divergencies among the ability ratings, reported in experiment one and two, are not investigated further. Instead this group of researchers choose to investigate the additional factors of outcome, task difficulty and the effects of evaluative feedback on adult subjects, only.

The second purpose of the present study was to replicate and extend the third experiment of Meyer and his colleagues (1979) by investigating further the reported developmental differences in perceptions of ability. The developmental theory of achievment motivation proposed by Nicholls (1984) and further refined by Roberts (1984) to the context of sport, provided a theoretical basis for studying the factors of outcome, task difficulty and perceived ability.

This theoretical model posits that young children compared to older children use different criteria to judge self-perceptions of ability. That is, a child's perception of personal competence relates to an assessment of outcome judged relative to the performance of peers, effort required and the level of task difficulty. This assumption is supported by the research of Meyer et al. (1979; 1982). Hence, the question guiding the second part of this study was whether developmental differences were apparent in self-perceptions of ability on the factors of outcome, task difficulty and feedback.

A discriminant analysis, which combined the younger age levels of 9, 10 and 11 years and the older age levels of 12, 13, 14 and 15 years, found support for developmental differences in self-perceptions of ability based on the factors of outcome, task difficulty and feedback. However, only partial support was provided for the proposed hypotheses because developmental differences were not evident across all conditions.

The first hypothesis stated that for success and failure at an easy and difficult task young children (age 9, 10 and 11 years) would have higher perceptions of ability for praise and lower perceptions of ability for blame than older children (age 12, 13, 14 and 15 years). This hypothesis was supported for the following conditions: easy/success/praise, difficult / success/praise and difficult/failure/blame. However, the condition of easy / failure/blame was not supported by these subjects.

These results indicated that the younger children appear to be very sensitive to positive and negative evaluation received from a teacher. Blame

in a failure situation was very detrimental, resulting in extremely low perceptions of ability. In contrast, praise following success was conducive to very high perceptions of ability. These results taken together lend support to the first two experiments by Meyer et al. (1979). The research of Smith and Smoll and their associates (1979, 1978) has also indicated that in a sport setting positive coaching behavior enhances young childrens' self-perceptions, while negative coaching behavior resulted in lowering childrens' self-perceptions.

For the young children these high and low perceptions of ability as a consequence of praise and blame can be explained in terms of Nicholls' (1984) developmental theoretical perspective on perceived ability. Up to the age of 12 children attribute performance outcomes to both ability and effort. Conceptions of ability and effort are only "partially differentiated." Unlike the older children, the younger children are not as capable of perceiving the antecedents of evaluative teacher feedback to imply certain inferences about ability. Teacher praise implies high ability when effort and ability are undifferentiated. The differentiation from effort appears necessary for the inference of low ability from higher praise (Nicholls & Miller, 1984).

For the performer who was praised in the success situation the young children may have perceived that the teacher thought this student had done well by trying hard. For these children high effort implied high ability. Hence, the high ability ratings for the student praised following performance. In the case of the student who was blamed for failure the younger children perceived that this student did not try hard enough as a result of the teacher's reaction who was annoyed by the lack of effort. Here, low effort implied low ability owing to the children's inability to separate the concepts of effort and ability.

It is not clear why the easy failure blame condition did not follow this line of reasoning. A tentative explanation for this non-support could be that the young children sympathized with the failing performer and it was wrong for the teacher to blame the student in this manner. However, Nicholls and Miller (1984) stressed that an inference of valid ability demands evidence that optimum effort was employed. That is, ability will not be revealed if effort is low. Hence, the teacher's blaming may have indicated to the younger children that the performer was not trying hard enough, causing the teacher to be upset. Moreover, the younger children's inability to perceive cues of ability and effort from the teacher's evaluative behavior may have interfered with their assessment of ability because maximum effort was not exerted by the performer of the easy task.

The second hypothesis claimed that for both an easy and difficult task, older children would experience lower perceptions of ability than younger children when receiving praise after success and neutral feedback after failure. This hypothesis was supported for the conditions easy success praise, difficult success praise and easy failure neutral. No support was provided for the difficult failure netural group. However, the mean difference was minute.

For the older children overt praise following successful mastery attempts and neutral evaluation by the teacher after failure on the easy task was detrimental to self-perceptions of ability. These results support the findings of Horn (1984) who indicated that coaches' responses to players' successful performance via praise were not facilitative of players' perceived competence. Horn (1984) reasoned that inappropriate or noncontingent praise may have established lower expectations for players' performance, thereby inducing negative self-perceptions in skill competence for the nineth grade children in her study.

Moreover, this negative consequence of praise has been found to occur in classroom settings (Kennedy & Willicutt, 1964; Dunkin & Biddle, 1974) and with elite athletes (Tharp & Gallimore, 1976).

The reason why praise should negatively influence self-perceptions of ability for children age 12 to 15 in this study can be explained in terms of Meyer's (1979; 1982) previous research and Nicholls' (1984) developmental model. Success of the performer who was praised was probably ascribed to effort expenditure. Supporting this notion, Meyer et al. (1979) reasoned that through cognitive appraisal we assume easy tasks require more effort when ability is lower. Similar conclusions about differing amounts of effort and ability are drawn in the case of a difficult task, although the abilities of both performers will be rated higher. Here again, cognitive appraisal would assume that success at a difficult task can only be obtained if the ability is comparatively high. Hence, the older subjects in this study were able to make such cognitive appraisals owing to their maturational capacity to differentiate between effort and ability, which develops at the age of 12 (Nicholls, 1984). These results support Nicholls and Miller's (1984) contentions and imply that with development it becomes increasingly difficult for teachers to use praise to raise perceived ability.

Support was found also for the easy failure neutral condition. That is, the older children were associated with lower ability ratings than the younger children. Adults have been found to react with sympathy or pity for lack of ability (Nicholls & Miller, 1984). Thus, for the older subjects failure at an easy task coupled with the neutral teacher response was indicative of low ability, their interpretation may have been that the teacher was sympathetic after failure of an easy task.

The difficult failure neutral group did not support the assumption of lower perceived ability ratings by the older children compared to the younger age groups. One possible explanation for this could be that for young children, with undifferentiated effort/ability conceptions, high ability is implied by sucess at a task they are uncertain of being able to complete (Nicholls & Miller, 1984). Hence, failure at the difficult task resulted in the lower ability ratings of the younger age groups compared to the older.

The third hypothesis stated that for both an easy and difficult task older children would have higher perceptions of ability than younger children when receiving blame after failure and neutral feedback after success. Support for this hypothesis was provided for the difficult failure blame and difficult success neutral conditions only. The easy failure blame and easy success neutral conditions did not support the hypothesis.

For the older children task difficulty and feedback were important factors in their appraisals of ability. These results can partly be explained by the assumptions proposed by Meyer et al. (1979). For the two performers who experienced identical failures, the one who was blamed for the outcome more than the other led the older subjects to conclude that the former was perceived to have expended less effort on the task. Through cognitive appraisal the higher the ability the more the result was ascribed to low effort expenditure, because very low ability will lead to failure no matter how much effort was expended (Meyer et al., 1979). Apparently this assumption was only true for the difficult failure blame condition and not the easy

failure blame condition. Perhaps the older subjects perceived the task of a forward roll to be so easy that in spite of the teacher's critical reaction to one performer, they were unable to convince themselves that this performer had high ability and was not expending enough effort to perform this simple task.

The notion that adults react with anger to perceived lack of effort is not supported by the older children's lower ratings of perceived ability compared to the higher ability ratings by the younger children for the easy failure blame condition. The results reported here suggest that task difficulty is a more valid predictor of ability than teacher's feedback for the older children.

The older children may have preferred high ability rather than high effort. A study by Harari and Covington (1981) found that up to thirteen years of age both high effort and high ability are valued. After thirteen years of age ability is valued more highly. In line with Nicholls and Miller's (1984) reasoning, older children would prefer ability more than effort because it implies a "capacity" to do well. The shift in emphasis after twelve years of age from teacher feedback to task difficulty, found in the present study, may support this notion. Again, a differentiated effort/ability capacity of the older children would result in the difficult failure blame condition being accounted as high effort, whereas the difficult success praise condition would occur as a consequence of high ability.

The difficult success neutral condition also received higher ratings of ability from the older children. One reason for this could be that the teacher response 'Good', which comprised neutral feedback, was not neutral but qualitatively evaluative. The success neutral condition was paired with difficult success praise on the questionnaire. Hence, another possible

explanation for this high rating again relates to perceived effort expenditure as it relates to ability. Because the two performers obtained identical successes and one was praised more for his outcome than the other, from the research of Meyer et al. (1979) and the theoretical postulations of Nicholls (1984), the success of the former was ascribed to effort-expenditure. Hence, the performer receiving neutral feedback was perceived as exerting less effort than his peer by the older respondants. And, on the basis of Nicholls' (1984) developmental theoretical postulations these older children were able to differentiate between effort and task difficulty in comparison of peers' via ability norms.

The easy success neutral condition did not support the third hypothesis. Perhaps one of the reasons why the older subjects did not rate this condition higher than the younger subject's ratings was that they perceived the teacher to favor the performer who was praised. In spite of the questionnaire condition stating that the teacher liked both students equally well, the older subjects may not have been convinced. Here again the qualitative wording of the neutral response 'Good' by the teacher, may have influenced the older subjects' response. Moreover, as discussed previously, task difficulty was a good predictor of ability for the older children because more ability was required for successful mastery of difficult tasks. And for older children ability is preferred to effort (Harari & Covington, 1981) because it implies an innate capacity to achieve (Nicholls & Miller, 1984).

The results of this study provide partial support for Nicholls' (1984) theoretical development model of perceived ability together with Meyer et al.'s (1979) predictions that a teacher's evaluative behavior may influence children's self-perceptions of ability. Based on these results, because young children judge performance outcomes with an undifferentiated conception of ability in successful situations, praise results in perceptions of high ability. To these children effort was indicative of ability; hence, effort should be rewarded positively. In failure situations blame, however, is indicative of low effort which is comparable to ability and should thus be avoided by teachers of young children. In line with Nicholls and Miller (1984), the younger children based their judgements of ability with reference to self rather than a social comparison. The personalized nature of the teacher's response resulted in an over-estimation of ability following praise and an under-estimation following blame.

For older children aged 12 to 15 years teachers and coaches should still strive to give support and encouragement through positive feedback. However, owing to the capacity of these children to differentiate between the conception of effort from ability, praise should be used with caution as it may imply low ability. Moreover, while blame may lead to increasing inferences about ability it should be used sparingly as it is not as facilitative as praise.

The older subjects may have relied more on social comparison of peers in judging their own ability in relation to performance norms. This may account for the two-way interaction for age by task difficulty. Ability was rated highly on tasks which were difficult and could only be performed by a few.

SUMMARY

This study investigated the degree to which teacher praise and blame may affect children's self-perceptions of ability in a sport setting. The present study had two specific purposes: (a) to replicate experiment number three conducted by Meyer et al. (1979), and (b) to investigate possible developmental differences in ability ratings of children (9 to 15 years of age) as a result of differential feedback provided by a teacher.

The results of this study failed to replicate Meyer et al. (1979). Specifically, praise after success led to the conclusion that the acting person's ability was perceived as high. Blame after failure led to the inference that the acting person's ability was low. However, developmental differences were apparent in the interpretation of teacher feedback based on the different ability ratings of the young compared to the older children. The present study found that children aged 9, 10 and 11 years tended to rely on outcome and teacher feedback in judging self-perceived ability. Older children aged 12, 13, 14 and 15 years tended to rely more on outcome and task difficulty in assessing perceived ability.

These developmental differences in childrens' interpretation of differential teacher feedback, as indicated by the ability ratings, provided support for Nicholls' (1978) developmental theory of perceived ability. With increasing age children were more capable of to differentiating the concepts of ability/effort and ability/task difficulty and were thus less likely to rely solely on the teacher's evaluation in formulating their ability appraisals.

RECOMMENDATIONS

This study has provided partial support for Nicholls' (1978; 1984) developmental theory of perceived ability. Age related changes in evaluative responses, when combining the variables of outcome, task difficulty and feedback were noted. However, the complex nature of the interaction between these variables has perhaps raised more questions than answers. Further replications are needed to test Meyer et al.'s (1979) study in classroom settings as well as the present study in sport contexts.

The results of this study should be treated with caution as the differences between mean perceived ability ratings of the older and younger children did not differ by a great amount. More research is needed on the effects of evaluative behavior in the sport setting. In addition to the complex interaction of the various factors involved, specific contests in which evaluative behavior is administered needs to be investigated. It is difficult to determine conclusively from the findings reported here which factors are the best predictors of perceived ability estimates. These results suggest outcome may be the best predictor for all age groups with both task difficulty and feedback serving as additive factors for younger children. For older children, task difficulty may be more useful in determining perceptions of ability.

Future investigators would be advised to employ Harter's (1981) Perceived Physical Competence Scale. This may highlight further what type of child is prone to high or low perceptions of ability on the factors investigated in this study. Methodologically, future studies should test for any possible order effects in (a) the order in which the questionnaires are answered and (b) whether the subjects should receive neutral or praise/blame feedback.

Moreover, due to the complexity of the design in the present study, the additional factor of gender was not investigated. Further research should look at possible gender differences, in perceived ability ratings, as this may have important implications for instruction.

Additional studies which test the theoretical link between evaluative behavior and Nicholls' (1978; 1984) developmental theory of perceived ability will help identify the teaching behaviors that are most conducive to children's psychological development.

REFERENCES

REFERENCES

Alley, S. E. (1974). Athletics in education: The double-edged sword. Phi Delta Kappan, 56, 102-105.

Ammons, R. B. (1956). Effects of knowledge of performance: A survey and tentative theoretical formulation. The Journal of General Psychology, 54, 279-299.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral chaNge. Psychological Review, 84. 191-215.

Brophy, J. & Evertson, C. (1976). Learning from teaching: A developmental perspective. Boston: Allyn & Bacon, Inc.

Brophy, J. & Good, T. (1974). Teacher student relationships: Causes and consequences. New York: Holt, Rinehart & Winston.

Brophy, J. & Good, T. (1970). Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. Journal of Educational Psychology, 61, 365-374.

Burton, D. & Martens, R. (1986). Pinned by their own goals: An exploratory investigation into why kids drop out of wrestling. Journal of Sport Psychology, 8, 183-197

Carron, A.V. (1984). Motivation: Implications for coaching and teaching. London, Ontario, Canada: Sports Dynamics.

Cook, H. & Stingle, S. (1974). Cooperative behavior in children. Psychological Bulletin, 81, 918-933.

Cooper, H. M. (1979). Pygmalion grows up: A model for teacher expectation communication and performance influence. Review of Educational Research, 49, 389-410.

Cooper, H. M. & Baron, R. M. (1977). Academic expectations and attributed responsibility as predictors of professional teachers' reinforcement behavior. Journal of Educational Psychology, 69, 409-418.

Covington, M. V. & Omelich, C. L. (1981). As failures mount: Affective and cognitive consequences of ability demotion in the classroom. Journal of Educational Psychology, 73, 796-808.

Crowe, P. (1977). An observational study of expectancy effects and their mediating mechanisms on students of physical educational activity classes. Unpublished doctoral dissertation, University of North Carolina at Greensboro.

Dunkin, M., & Biddle, B. (1974). The study of teaching. New York: Holt, Rinehart & Winston.

Dweck, C. S. & Repucci, N. D. (1973). Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 25, 109-116.

Ewing, M. E., Roberts, G. C., & Pemberton, C. L. (1984). A developmental look at children's goals for participating in sport. University of Illinois at Urbana Champaign. Unpublished manuscript.

Feltz, D. L. & Peklichkoff, L. (1983). Perceived competence among interscholastic sport participants and dropouts. Canadian Journal of Applied Sport Sciences, 8, 231-235.

Flanders, M. A. (1970). Analyzing teacher behavior. Reading, Mass: Addison Wesley.

Good, T. (1981). Teacher expectations and student perceptions: A decade of research. Educational Leadership, 38, 415-422.

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

Griffin, N.S., & Keogh, J. F. (1982). A model for movement confidence. In J.A.S. Kelso & J. E. Clark (Eds.), The development of movement control and co-ordination. New York: John Wiley. pp. 213-238.

Haas, H., & Maehr, M. (1965). Two experiments on the concept of self and the reaction of others. Journal of Personality and Social Psychology, 1, 100-105.

Harari, O. & Covington, M. V. (1981). Reactions to achievement behavior from a teacher and student perspective. A developmental and student perspective. A developmental analysis. American Educational Research Journal, 18, 15-28.

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

Harter, S. (1979). Perceived Competence Scale for Children. Manual. Denver, CO.: University of Denver.

Harter, S. (1981). The development of competence motivation in the mastery of cognitive and physical skills: Is there still a place for joy? In G. C. Roberts & D. M. Landers (Eds.) Psychology of Motor Behavior and Sport - 1980. Champaign, Illinois: Human Kinetics.

Horn, T. S. (1982). The influence of coaching behaviors on young athletes' perceptions of competence and control. Unpublished doctoral dissertation. Michigan State University.

Horn, T. S. (1985). Coaches feedback and changes in children's perceptions of their physical competence. Journal of Educational Psychology, 77 (2), 174-186.

Horn, T. S. & Hasbrook, C. (1984). Information components influencing children's perceptions of their physical competence. Unpublished Manuscript. University of Wisconsin - Milwaukee.

Jacobs, M., Jacobs, A., Feldman, G., & Cavor, N. (1973). Feedback II - The "Credibility Gap": Delivery of positive and negative and emotional and behavioral feedback in groups. Journal of Consulting and Clinical Psychology, 41, 215-223.

Kennedy, W. A., & Willcutt, H.C. (1964). Praise and blame as incentives. Psychological Bulletin, 62, No.(5) 323-332.

Kirschenbaum, D. S., & Smith, R. J. (1983). A preliminary study of sequencing effects in simulated coach feedback. Journal of Sport Psychology, 5, 332-342.

Kleinfeld, J. (1957). Effective teachers of Eskimo and Indian students. School Review, 83, 301-344.

Kuckla, A. (1978). An attribution theory of choice. In L. Berkowitz (Ed.), Advances in experimental social psychology (vol. 2). New York: Academic Press.

Maehr, M., Mensing, J., & Nafzger, S. (1962). Concept of self and the reaction of others. Sociometry, 25, 352-357.

Martens, R. (1978). Joy and sadness in children's sports. Champaign, Illinois: Human Kinetics Publishers.

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

Martinek, T. & Johnson, S. (1979). Teacher expectations: Effects on dyadic interactions and self-concept in elementary age children. Research Quarterly, 50, 60-70.

Meichenbaum, C., Bowers, K., & Ross, R. (1969). A behavioral analysis of teacher expectancy effects. Journal of Personality and Social Psychology, 13, 306-316.

Meyer, W. U. (1982). Indirect communications about perceived ability estimates. Journal of Educational Psychology. 74,(6), 888-897.

Meyer, W. U., Bachman, M., Biermann, U., Hempelmann, M., Ploger, & F. O. Spiller, H. (1979). The informational value of evaluative behavior: Influences of praise and blame on perceptions of ability. Journal of Educational Psychology, 68, 342-346.

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of own attainment, and the understanding that difficult tasks require more ability. Child Development, 49, 800-814.

Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. Psychological Review, 91, 328-346.

Nicholls, J. G., & Miller, A. T. (1983). The differentiation of concepts of difficulty and ability. Child Development, 54, 951-959.

Nicholls, J. G. & Miller, A. T. (1984). Development and its discontents: The differentiation of the concepts and ability. In J. G. Nicholls (Ed.) Advances in Motivation and Achievement, 3, Greenwich, CT: JAI, pp. 185-218.

Rejeski, W., Darracott, C., & Hutslar, S. (1979). Pygmalion in youth sport: A field study. Journal of Sport Psychology, 1, 311-319.

Roberts, G. C. (1985). Toward a new theory of motivation in sport: The role of perceived ability. In J. M. Silva and R. S. Weinburg (Eds.), Psychological Foundations of Sport. Champaign, IL: Human Kinetics, 1985.

Roberts, G. C., Kleiber, D. A., & Duda, J. L. (1984). Motivation in sport: The mediating role of perceived ability. Journal of Sport Psychology, 6, 312-324.

Roberts, G. C. & Pascuzzi, D. (1979). Causal attribution in sport: Some theoretical implications. Journal of Sport Psychology, 1, 203-211.

Rosenshine, B. (1973). Teacher behavior and student attitudes revisted. Journal of Educational Psychology, 65, 177-180.

Rosenthal, R. & Jacobson, L. (1968). Pygmalion in the classroom: Teacher expectations and pupil's intellectual development. New York: Holt, Rinehart, & Winston.

Seefeldt, V., Blievernicht, D., Bruce, R., & Gilliam, T. (1978). Joint legislative study on youth sports programs, phase II. East Lansing, MI: Youth Sports Institute.

Smith, R. E. Smoll, F. L., & Curtis, B. (1979). Coach Effectiveness Training: A cognitive-behavioral approach to enchancing relationship skills in youth sport coaches. Journal of Sport Psychology, 1, 59-75.

Smith, R. E., Smoll, F. L., & Hunt, E. (1977). A system for the behavioral assessment of athletic coaches. Research Quarterly, 48, 401-407.

Smoll, F. L. & Smith, R. E. (1979). Improving relationship skills in youth sport coaches. East Lansing, Michigan: Institute for the Study of Youth Sports.

Spink, K. S. & Roberts, G. C. (1980). Ambiguity of outcome and causal attributions. Journal of Sport Psychology, 2, 237-244.

Stipek, D. J. (1981). Children's perceptions of their own and their classmate's ability. Journal of Educational Psychology, 73, 404-410.

Tharp, R. G., & Gallimore, R. (1976). What a coach can teach a teacher. Psychology Today, 9, 74-78.

Veroff, J. (1969). Social comparison and the development of achievement motivation. In C. P. Smith (Ed.), Achievement-related motives in children, New York: Russell Sage Foundation.

Weinstein, R. (1979). Reading group membership in first grade: Teacher behaviors and pupil experience over time. Journal of Education Psychology, 71, 3-25.

Weiss, M. R., Bredemeir, B. J. & Shewchuck, R. M. (1981). The dynamics of perceived competence, perceived control, and motivational orientation in youth sports: A casual analysis. Paper presented at the Olympic Scientific Congress, July 19-26, 1984, Eugene, Oregon.

White, W. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, 297.333.

Zajonc, R. (1965). Social facilitation. Science, 149, 269-274.

APPENDICES

APPENDIX A

QUESTIONNAIRES

Difficult/Success Questionnaires

Imagine the following situation: During a physical education class on gymnastics, the teacher asks the children to perform a somersault in the air. The skill is very difficult and only a few children are able to do it. The children are given two minutes time to practice doing somersaults into a landing area. While the children perform somersaults, the teacher watches carefully two children (whome the teacher particularly likes). Both students, You and Gary, can do a somersault quite well even though it is a difficult task to perform. The teacher says to You, "Good." The teacher says to Gary, "You have done very fine. I am very pleased." Which of the two pupils does the teacher consider to have higher ability, You or Gary? How would the teacher rate You and Gary on the scales below.

You	Gary
1- very low ability	1 - very low ability
2	2
3- low ability	3- low ability
4	4
5- average ability	5- average ability
6	6
7- high ability	7- high ability
8	8
9- very high ability	9- very high ability

APPENDIX B

Parental Consent Form

MICHIGAN STATE UNIVERSITY
Health Education, Counseling Psychology and Human Performance

Parental Consent Form

Dear Parents:

I am a graduate student with the Michigan Youth Sports Institute, established in 1978, which is dedicated to helping parents, coaches and adult leaders provide positive and beneficial sport experiences for children. One of the ways in which we have attempted to accomplish this objective is through continuing research programs designed to provide us with information about young athletes and the effects of sport participation on their physical and psychological development.

I am currently working on a study entitled "Informational Value of Evaluative Behavior: Influences of Praise and Blame on Perceptions of Ability in the Sport Setting". This study is being conducted under the supervision of Dr. Marty Ewing, on the staff of the Youth Sports Institute. This study involves written responses, of children (9-13), to demographic questions, questions measuring perceived competence and responding to four short stories based on a hypothetical sport situation, to assess children's self-perception of ability. Measurements will be taken by means of paper and pencil, and are not intended to trick or deceive in any way. Each questionnaire will take approximately five to seven minutes (15 to 10 total minutes) to complete. In this regard, You should understand that there are no right or wrong answers and that the questions should be answered as honestly as possible. You should further understand that your child's participation in this study will be treated with strict confidence and anonymity in any reports or publications dealing with this project.

In order to obtain useful information I need the cooperation of children (9-13 yrs.) to fill out the survey questionnaire. Children will not be required to put their names on the questionnaire. All information received is strictly confidential. If you approve of the study's objectives and would kindly give permission for your child to participate, it would help my research efforts tremendously. Let me stress that the children do not have to participate, that there is no penalty for not participating or for discontinuing participation, and their verbal permission will be sought before questionnaires are handed out. If you consent to have me ask your child if they would like to participate, please sign your name where it reads "Parent's signature". If you have any further questions, please feel free to call.

I am grateful for your help!

Thank you,

Gary Williamson
Youth Sports Institute
I.M. Sports Circle, Room 105
Michigan State University
East Lansing, MI 48824
(517) 355-3858

.....

I give permission for my child (_____) to participate in this study under the
(first name)
conditions stated in the above letter.

_____
Parent's Signature

APPENDIX C

Analysis 2: Means and Standard Deviations for Non-Significant Three and Two-way Interactions

Means and Standard Deviations for

Perceived Ability by Age by Outcome by Feedback

Age	Success Praise		Failure Blame		Success Neutral		Failure Neutral	
	X	SD	X	SD	X	SD	X	SD
9	7.93	1.79	2.43	1.93	7.03	1.69	3.75	1.91
10	6.75	2.44	4.23	2.59	5.88	1.60	4.53	1.92
11	7.55	1.38	3.23	1.94	6.65	1.44	3.98	1.83
12	7.20	1.42	2.75	1.95	6.58	1.55	3.73	1.90
13	6.60	1.78	3.93	2.41	6.53	1.75	3.63	1.88
14	6.95	1.78	3.75	2.71	7.15	1.33	3.95	1.91
15	6.33	2.02	3.48	2.34	5.83	1.88	3.58	1.47

Means and Standard Deviations for

Perceived Ability by Age by Outcome by Task Difficulty

Age	Easy Success		Easy Failure		Difficult Success		Difficult Failure	
	X	SD	X	SD	X	SD	X	SD
9	6.75	2.06	3.33	2.15	7.20	1.88	2.85	1.87
10	6.13	1.95	4.33	2.12	6.50	2.24	4.43	2.44
11	7.15	1.39	3.53	1.95	7.05	1.57	3.68	1.90
12	6.83	1.41	3.10	1.82	6.95	1.62	3.38	2.12
13	5.85	1.81	3.43	1.97	7.28	1.40	4.13	2.29
14	6.98	1.44	3.65	2.25	7.13	1.70	4.05	2.42
15	5.05	1.65	2.90	1.55	7.10	1.69	4.15	2.11

Means and Standard Deviations for

Perceived Ability Ratings by Age by Task Difficult by Feedback

Age	Easy	Praise or Blame	Easy	Neutral	Difficult	Praise or Blame	Difficult	Neutral
	X	SD	X	SD	X	SD	X	SD
9	5.35	3.32	4.73	1.92	5.00	3.37	5.05	2.32
10	5.45	2.64	5.00	1.70	5.53	2.99	5.40	2.06
11	5.35	2.71	5.33	2.26	5.43	2.81	5.30	2.00
12	5.05	2.86	4.88	2.07	4.90	2.79	5.43	2.40
13	4.90	2.50	4.38	1.94	5.63	2.48	5.78	2.48
14	5.23	2.80	5.40	2.23	5.48	2.81	5.70	2.38
15	4.00	2.09	3.95	1.77	5.80	2.78	5.45	1.10

Means and Standard Deviations for

Perceived Ability by Age

by Outcome

Age	Success		Failure	
	M	SD	M	SD
9	6.98	1.97	3.09	2.02
10	6.31	2.10	4.38	2.67
11	7.10	1.47	3.60	1.91
12	6.89	1.51	3.24	1.97
13	6.56	1.76	3.78	2.15
14	7.05	1.57	3.85	2.33
15	6.08	1.95	3.53	2.50

APPENDIX D

Data Coding

RAW DATA

DATA DIRECTORY

COLUMN	VARIABLE	CODE
1-3	Subject ID	01-20
4-5	Age	Age in Years
6	Outcome	1 Success
		2 Failure
7	Task Difficulty	1 Easy
		2 Difficult
9	Feedback	1 Praise or Blame
		2 Neutral
10	Perceived Ability	1 No Ability
		2 Very Low Ability
		3 Low Ability
		4 Below Average Ability
		5 Average Ability
		6 Above Average Ability
		7 High Ability
		8 Very High Ability
		9 Exceptional ability

APPENDIX E

Raw Data

1 921 13	1 921 24	1 911 18	1 911 27	1 922 23	1 922 12	1 912 25	1 912 16
2 921 11	2 921 23	2 911 19	2 911 25	2 922 23	2 922 11	2 912 25	2 912 19
3 921 13	3 921 21	3 911 19	3 911 27	3 922 21	3 922 13	3 912 21	3 912 13
4 921 11	4 921 23	4 911 19	4 911 27	4 922 23	4 922 11	4 912 27	4 912 19
5 921 11	5 921 23	5 911 19	5 911 27	5 922 25	5 922 13	5 912 27	5 912 19
6 921 13	6 921 21	6 911 19	6 911 27	6 922 23	6 922 11	6 912 25	6 912 17
7 921 19	7 921 27	7 911 11	7 911 23	7 922 23	7 922 11	7 912 27	7 912 18
8 921 11	8 921 23	8 911 19	8 911 27	8 922 21	8 922 13	8 912 28	8 912 19
9 921 11	9 921 27	9 911 19	9 911 25	9 922 25	9 922 13	9 912 25	9 912 17
10 921 11	10 921 25	10 911 19	10 911 25	10 922 25	10 922 11	10 912 25	10 912 19
11 921 11	11 921 22	11 911 19	11 911 25	11 922 22	11 922 11	11 912 29	11 912 15
12 921 17	12 921 21	12 911 19	12 911 25	12 922 23	12 922 11	12 912 27	12 912 19
13 921 11	13 921 23	13 911 19	13 911 27	13 922 23	13 922 11	13 912 27	13 912 19
14 921 15	14 921 25	14 911 18	14 911 27	14 922 25	14 922 15	14 912 28	14 912 18
15 921 13	15 921 25	15 911 17	15 911 25	15 922 23	15 922 11	15 912 25	15 912 17
16 921 12	16 921 23	16 911 16	16 911 25	16 922 23	16 922 11	16 912 28	16 912 19
17 921 11	17 921 23	17 911 17	17 911 23	17 922 23	17 922 11	17 912 27	17 912 19
18 921 13	18 921 25	18 911 19	18 911 27	18 922 23	18 922 11	18 912 27	18 912 19
19 921 14	19 921 26	19 911 16	19 911 23	19 922 27	19 922 15	19 912 28	19 912 19
20 921 15	20 921 27	20 911 17	20 911 25	20 922 29	20 922 15	20 912 28	20 912 19
11021 13	11021 21	11011 17	11011 28	11022 21	11022 12	11012 28	11012 19
21021 12	21021 23	21011 16	21011 25	21022 24	21022 13	21012 26	21012 17
31021 13	31021 25	31011 17	31011 25	31022 23	31022 11	31012 27	31012 19
41021 15	41021 23	41011 17	41011 25	41022 25	41022 15	41012 27	41012 15
51021 15	51021 26	51011 19	51011 25	51022 25	51022 13	51012 28	51012 15
61021 13	61021 26	61011 19	61011 27	61022 25	61022 13	61012 27	61012 19
71021 15	71021 24	71011 19	71011 28	71022 26	71022 14	71012 28	71012 19
81021 14	81021 26	81011 18	81011 26	81022 26	81022 14	81012 26	81012 18
91021 19	91021 25	91011 17	91011 25	91022 25	91022 19	91012 25	91012 19
101021 12	101021 23	101011 18	101011 27	101022 23	101022 12	101012 27	101012 19
111021 11	111021 23	111011 17	111011 25	111022 23	111022 11	111012 25	111012 17
121021 13	121021 29	121011 19	121011 25	121022 23	121022 11	121012 25	121012 17
131021 11	131021 25	131011 16	131011 25	131022 21	131022 13	131012 28	131012 18
141021 12	141021 24	141011 17	141011 26	141022 23	141022 14	141012 25	141012 13
151021 12	151021 23	151011 17	151011 26	151022 24	151022 13	151012 27	151012 19
161021 14	161021 24	161011 17	161011 27	161022 24	161022 14	161012 29	161012 19
171021 19	171021 25	171011 11	171011 23	171022 27	171022 19	171012 23	171012 11
181021 17	181021 23	181011 16	181011 23	181022 28	181022 16	181012 25	181012 18
191021 17	191021 26	191011 16	191011 27	191022 29	191022 19	191012 25	191012 14
201021 17	201021 25	201011 11	201011 23	201022 27	201022 19	201012 23	201012 11
11121 13	11121 24	11111 16	11111 25	11122 24	11122 13	11112 26	11112 17
21121 13	21121 24	21111 17	21111 26	21122 26	21122 15	21112 24	21112 17
31121 13	31121 25	31111 19	31111 27	31122 25	31122 13	31112 25	31112 17
41121 13	41121 22	41111 16	41111 27	41122 25	41122 15	41112 27	41112 16
51121 13	51121 22	51111 16	51111 27	51122 23	51122 12	51112 27	51112 16
61121 11	61121 23	61111 19	61111 26	61122 23	61122 11	61112 27	61112 19
71121 13	71121 21	71111 19	71111 25	71122 23	71122 11	71112 25	71112 19
81121 13	81121 25	81111 17	81111 25	81122 23	81122 15	81112 23	81112 15
91121 11	91121 21	91111 15	91111 29	91122 25	91122 13	91112 27	91112 19
101121 16	101121 28	101111 16	101111 27	101122 25	101122 16	101112 27	101112 15
111121 15	111121 27	111111 17	111111 25	111122 25	111122 13	111112 25	111112 17
121121 12	121121 22	121111 19	121111 29	121122 21	121122 12	121112 28	121112 19
131121 12	131121 23	131111 17	131111 28	131122 23	131122 12	131112 28	131112 19
141121 13	141121 25	141111 19	141111 27	141122 23	141122 11	141112 27	141112 19
151121 12	151121 23	151111 17	151111 29	151122 23	151122 12	151112 28	151112 19

161121 11	161121 23	161111 19	161111 27	161122 23	161122 11	161112 27	161112 19
171121 17	171121 26	171111 17	171111 27	171122 25	171122 15	171112 26	171112 17
181121 11	181121 23	181111 19	181111 27	181122 23	181122 11	181112 27	181112 19
191121 15	191121 27	191111 17	191111 25	191122 29	191122 17	191112 25	191112 17
201121 17	201121 23	201111 19	201111 28	201122 25	201122 17	201112 29	201112 17
11221 11	11221 25	11211 17	11211 27	11222223	11222211	11212 27	11212 17
21221 12	21221 23	21211 18	21211 26	21222 23	21222 11	21212 26	21212 17
31221 11	31221 23	31211 18	31211 26	31222 23	31222 11	31212 25	31212 17
41221 13	41221 24	41211 17	41211 25	41222 25	41222 13	41212 26	41212 17
51221 13	51221 25	51211 17	51211 25	51222 25	51222 13	51212 23	51212 15
61221 11	61221 23	61211 19	61211 28	61222 23	61222 12	61212 27	61212 19
71221 11	71221 23	71211 17	71211 25	71222 23	71222 11	71212 25	71212 17
81221 13	81221 25	81211 18	81211 27	81222 25	81222 13	81212 27	81212 18
91221 11	91221 21	91211 19	91211 25	91222 23	91222 11	91212 29	91212 17
101221 12	101221 22	101211 15	101211 25	101222 25	101222 15	101212 27	101212 17
111221 12	111221 21	111211 19	111211 29	111222 21	111222 12	111212 29	111212 19
121221 11	121221 23	121211 16	121211 26	121222 23	121222 11	121212 27	121212 18
131221 13	131221 21	131211 17	131211 27	131222 23	131222 11	131212 27	131212 15
141221 13	141221 24	141211 19	141211 27	141222 23	141222 14	141212 29	141212 19
151221 17	151221 25	151211 15	151211 27	151222 25	151222 17	151212 29	151212 17
161221 16	161221 24	161211 15	161211 25	161222 25	161222 14	161212 25	161212 16
171221 13	171221 27	171211 17	171211 25	171222 23	171222 11	171212 25	171212 19
181221 11	181221 21	181211 18	181211 26	181222 21	181222 12	181212 26	181212 13
191221 17	191221 25	191211 19	191211 29	191222 29	191222 17	191212 29	191212 17
201221 14	201221 24	201211 17	201211 26	201222 29	201222 15	201212 29	201212 17
11321 17	11321 25	11311 15	11311 27	11322 25	11322 17	11312 29	11312 17
21321 11	21321 23	21311 17	21311 25	21322 22	21322 11	21312 27	21312 15
31321 11	31321 23	31311 15	31311 25	31322 21	31322 13	31312 27	31312 19
41321 13	41321 23	41311 17	41311 25	41322 27	41322 15	41312 27	41312 19
51321 13	51321 25	51311 17	51311 29	51322 21	51322 13	51312 26	51312 17
61321 13	61321 21	61311 16	61311 27	61322 21	61322 13	61312 29	61312 18
71321 13	71321 24	71311 18	71311 29	71322 21	71322 12	71312 29	71312 18
81321 12	81321 21	81311 11	81311 23	81322 23	81322 11	81312 27	81312 19
91321 17	91321 23	91311 19	91311 25	91322 27	91322 15	91312 25	91312 17
101321 17	101321 23	101311 19	101311 25	101322 27	101322 15	101312 25	101312 13
111321 11	111321 23	111311 17	111311 27	111322 27	111322 17	111312 27	111312 17
121321 17	121321 23	121311 15	121311 27	121322 25	121322 13	121312 29	121312 17
131321 11	131321 22	131311 18	131311 26	131322 22	131322 11	131312 27	131312 18
141321 12	141321 21	141311 16	141311 25	141322 24	141322 15	141312 28	141312 19
151321 17	151321 25	151311 17	151311 23	151322 25	151322 17	151312 29	151312 17
161321 16	161321 25	161311 14	161311 26	161322 24	161322 18	161312 28	161312 16
171321 11	171321 23	171311 16	171311 24	171322 23	171322 12	171312 27	171312 18
181321 15	181321 23	181311 14	181311 23	181322 27	181322 15	181312 27	181312 15
191321 11	191321 23	191311 16	191311 25	191322 24	191322 12	191312 28	191312 17
201321 16	201321 24	201311 15	201311 26	201322 26	201322 18	201312 28	201312 16
11421 11	11421 23	11411 17	11411 25	11422 23	11422 11	11412 27	11412 19
21421 17	21421 25	21411 17	21411 29	21422 29	21422 17	21412 27	21412 19
31421 11	31421 23	31411 19	31411 27	31422 25	31422 17	31412 28	31412 19
41421 12	41421 21	41411 17	41411 28	41422 21	41422 12	41412 28	41412 16
51421 17	51421 28	51411 18	51411 27	51422 27	51422 16	51412 28	51412 19
61421 11	61421 23	61411 19	61411 27	61422 21	61422 13	61412 27	61412 19
71421 13	71421 22	71411 19	71411 26	71422 22	71422 13	71412 26	71412 18
81421 13	81421 25	81411 17	81411 25	81422 23	81422 11	81412 29	81412 17
91421 13	91421 22	91411 17	91411 29	91422 22	91422 13	91412 29	91412 18
101421 19	101421 27	101411 17	101411 29	101422 27	101422 19	101412 29	101412 17

111421 14	111421 23	111411 18	111411 27	111422 24	111422 16	111412 24	111412 12
121421 17	121421 26	121411 14	121411 27	121422 26	121422 18	121412 27	121412 15
131421 15	131421 23	131411 17	131411 26	131422 24	131422 12	131412 26	131412 17
141421 15	141421 23	141411 17	141411 29	141422 25	141422 17	141412 29	141412 17
151421 11	151421 23	151411 19	151411 27	151422 23	151422 11	151412 27	151412 19
161421 11	161421 25	161411 17	161411 26	161422 24	161422 12	161412 27	161412 16
171421 17	171421 25	171411 15	171411 27	171422 25	171422 17	171412 29	171412 17
181421 11	181421 23	181411 14	181411 27	181422 23	181422 11	181412 27	181412 14
191421 11	191421 23	191411 14	191411 27	191422 23	191422 11	191412 27	191412 14
201421 11	201421 23	201411 17	201411 25	201422 25	201422 13	201412 25	201412 17
11521 17	11521 23	11511 13	11511 26	11522 23	11522 17	11512 27	11512 13
21521 11	21521 22	21511 17	21511 23	21522 25	21522 17	21512 28	21512 19
31521 15	31521 23	31511 15	31511 23	31522 26	31522 15	31512 29	31512 18
41521 13	41521 21	41511 15	41511 23	41522 26	41522 18	41512 27	41512 19
51521 11	51521 23	51511 15	51511 22	51522 23	51522 11	51512 27	51512 19
61521 13	61521 25	61511 15	61511 27	61522 25	61522 17	61512 27	61512 19
71521 11	71521 22	71511 17	71511 25	71522 23	71522 12	71512 27	71512 18
81521 11	81521 23	81511 16	81511 25	81522 24	81522 13	81512 27	81512 18
91521 11	91521 25	91511 11	91511 25	91522 27	91522 12	91512 25	91512 19
101521 13	101521 24	101511 15	101511 23	101522 24	101522 17	101512 26	101512 13
111521 13	111521 21	111511 15	111511 27	111522 21	111522 13	111512 27	111512 15
121521 14	121521 23	121511 15	121511 26	121522 25	121522 13	121512 23	121512 17
131521 11	131521 23	131511 16	131511 22	131522 23	131522 11	131512 27	131512 19
141521 14	141521 25	141511 17	141511 26	141522 21	141522 12	141512 26	141512 15
151521 15	151521 23	151511 15	151511 27	151522 25	151522 17	151512 29	151512 17
161521 11	161521 23	161511 17	161511 25	161522 25	161522 17	161512 27	161512 15
171521 15	171521 23	171511 16	171511 25	171522 24	171522 13	171512 27	171512 18
181521 11	181521 22	181511 15	181511 27	181522 23	181522 12	181512 27	181512 18
191521 13	191521 25	191511 15	191511 27	191522 25	191522 17	191512 27	191512 19
201521 11	201521 23	201511 16	201511 22	201522 23	201522 11	201512 27	201512 19