

THE EFFECTS OF REWARDING ON FIRST AND SECOND GRADE  
CHILDREN'S COMPUTER TASK PERFORMANCE ACCORDING TO  
CLASSROOM REWARDING EXPERIENCES

by

Marilyn Gadomski

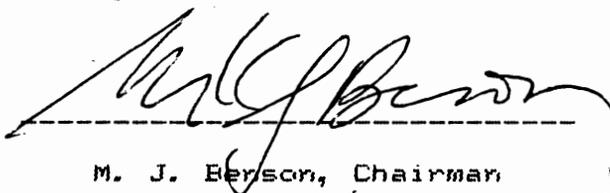
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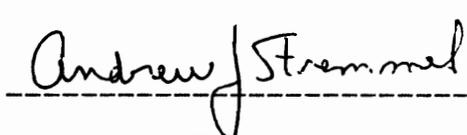


M. J. Berson, Chairman



C. S. Rogers

V. Fu



A. Stremmel



D. Strickland

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Blacksburg, Virginia

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Committee Chair: Mark J. Benson

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(ABSTRACT)

Intrinsic motivation, the preferred facilitator of performance, may be a relatively stable trait or specific to a given task. This study compared the computer task performances of 207 children in two schools, on the basis of their teachers' reward practices and the experimental reward conditions. Parents' reward practices, teachers' reward practices, and children's trait intrinsic motivation were measured. Baseline task performance scores and the chosen level of difficulty were statistically higher for children who were higher in the Judgment subscale of trait motivation than for those who scored lower on the Judgment subscale. The trait measure was positively related to most of the game scores and difficulty levels of the task motivation. Higher parent reward usage was related to lower SES and to

lower achievement. Higher teacher reward usage was positively related to Grade 1 and to higher levels of difficulty. Children who had usually received rewards or who had not usually received rewards, according to a teacher survey of rewarding attitudes and behaviors, were given a challenging task with (a) no mention of rewards or (b) the promise of a reward. Experimental reward conditions consonant with reward experiences related to higher game scores, especially in Grade 1. Experimental reward conditions which differed from reward experiences related to lower game scores after the experimental condition. All scores were higher for Grade 2, except the number of minutes played. The subjects' choice of level of difficulty tended to increase throughout the three trials. The number of minutes played tended to increase during trials in Grade 1 and to decrease in Grade 2. Affect for the task was higher for Grade 2, higher for girls, and higher for Grade 2 children who were lower on the internal Judgment subscale of trait intrinsic motivation.

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I am a better person to have been through this dissertation process and to be through with it.

Table of Contents

Introduction . . . . . 1

    Intrinsic Motivation. . . . . 1

        Hypothesis one . . . . . 4

Context of Rewarding. . . . . 4

    The Effects of Rewarding in Home and School on

    Trait and Task Motivation . . . . . 5

        Hypothesis two . . . . . 6

    Reward Experiences and Reward Conditions. . . . . 6

        Hypothesis three . . . . . 10

    Task Selection. . . . . 10

    Summary . . . . . 11

Literature Review. . . . . 12

    Intrinsic Motivation. . . . . 12

    Trait or task-specific. . . . . 15

        Age-related developmental change . . . . . 17

    Rewards and Motivation. . . . . 17

        Attribution of success . . . . . 18

    Reward Conditions . . . . . 19

        Material and social rewards. . . . . 21

        Controlling and informational rewards. . . . . 21

        Contingent and non-contingent rewards. . . . . 24

        Exogenous and endogenous rewards . . . . . 25

        Reward offered before task engagement. . . . . 27

Summary of rewarding and motivation. . . . .	28
Detrimental Effects of Rewards . . . . .	29
Attributions. . . . .	29
Trait or task effects . . . . .	32
Experience with Rewards. . . . .	33
Parents and teachers as socializing agents. .	35
Expectation of reward . . . . .	37
Trait and task intrinsic motivation related to reward experience . . . . .	38
Detrimental rewards for experience effect. .	41
Performance differences according to rewarding experience . . . . .	41
Summary of rewards and experience. . . . .	46
Tasks for Reward Conditions . . . . .	47
Optimally challenging. . . . .	48
Computer task. . . . .	49
Summary of Intrinsic Motivation and Rewarding .	50
Statement of Purposes and Hypotheses. . . . .	51
Methods. . . . .	54
Subjects. . . . .	54
Materials . . . . .	55
Teacher rewarding attitudes and behavior survey . . . . .	56
Demographic information. . . . .	57

Parent rewarding attitudes and behavior survey	58
Scale of intrinsic versus extrinsic orientation in the classroom . . . . .	.59
Survey of affect . . . . .	.61
Task performance scores. . . . .	.62
Procedure for Subject Identification. . . . .	.63
Administration . . . . .	.63
Teachers . . . . .	.63
Parents. . . . .	.64
Children . . . . .	.65
Experimental Procedure. . . . .	.65
Baseline . . . . .	.65
Experiment . . . . .	.66
Follow-up. . . . .	.67
Task reward. . . . .	.69
Results. . . . .	.70
Background Variables and Motivation Scales. . . . .	.70
Measures, variables, scales. . . . .	.70
Matching procedure . . . . .	.70
Background variables and task motivation . . . . .	.71
Background variables and trait motivation. . . . .	.72
Background variables . . . . .	.73
Interrelationships Across Trait and Task Motivation Scales . . . . .	.74

Hypothesis one . . . . .	.75
Effects of Parent and Teacher Rewards on Task	
Motivation. . . . .	.77
Hypothesis two . . . . .	.77
Reward History in Mediating the Effects of	
Rewards . . . . .	.78
Hypothesis three . . . . .	.82
Discussion . . . . .	.84
Trait and Task Motivation . . . . .	.84
Hypothesis one . . . . .	.84
Effects of Parent and Teacher Rewards on Task	
Motivation. . . . .	.87
Hypothesis two . . . . .	.87
Reward history in Mediating the Effects of	
Rewards . . . . .	.88
Hypothesis three . . . . .	.88
Study Confounds . . . . .	.90
Findings. . . . .	.93
References . . . . .	.95
Appendixes . . . . .	109
Appendix A. . . . .	109
Appendix B. . . . .	110
Appendix C. . . . .	111
Appendix D. . . . .	114

Appendix E. . . . .	117
Appendix F. . . . .	120
Appendix G. . . . .	123
Appendix H. . . . .	126
Tables. . . . .	127
Figures . . . . .	136

Intrinsic Motivation

Intrinsic motivation involves inherent pleasure in performing some activity (Hunt, 1971; Harter, 1981b; Deci, 1975; Lepper, Greene, & Nisbett, 1973; Fabes, Fultz, Eisenberg, May-Plumlee, & Christopher, 1989). Despite unanimity about this global definition, investigators have further specified their conceptualization of intrinsic motivation in two ways. One conceptualization defines intrinsic motivation as a generalized tendency to obtain inherent pleasure from activities (Harter, 1978; Harter, 1981a). Another conceptualization defines intrinsic motivation as a task-specific tendency to engage in a task without external inducement (Danner & Lonky, 1981; Fabes, 1987; Ryan, Mims, & Koestner, 1983). Research by several investigators has implied, but not specifically stated, the generalized trait and task-specific approaches. Deci and Ryan (1985b), for example, have conducted research on the conditions of specific rewarding events. However, they also refer to relatively stable factors within the individual that influence responses to situations. Similarly, Notz (1975) investigated motivational variation as a function of tasks and across task environments, but he

also emphasized the importance of personality factors. Finally, Reeve's (1989) view of intrinsic motivation included the concept of interest, which refers to an individual's general approach to tasks, and the concept of enjoyment, which maintains involvement in a specific task.

Some researchers have focused their attention on either the generalized trait or the task-specific aspects of intrinsic motivation. Harter's (1981b) Scale of Intrinsic and Extrinsic Orientation in the Classroom, for example, assessed the generalized trait approach to motivation. In contrast, research by Lepper et al. (1973) focused on performance and persistence, and research by Fabes, McCullers, and Horn (1986) focused on interest in response to specific contingencies in task-specific experimental situations.

Task motivation has been operationally defined in three ways. First, some researchers have recorded a score or assessed a level or quality of task performance (Danner & Lonky, 1981; Lepper et al., 1973; Loveland & Olley, 1979;). Second, persistence, voluntary time spent at the task within the given limits of the research design, has been used to

measure intrinsic motivation (Boggiano, Harackiewicz, Bessette, & Main, 1985; Danner & Lonky, 1981; Lepper et al., 1973). Third, task affect, a subject's self-reported liking for, or interest in, the task, has been used as an indication of intrinsic motivation (Fabes, 1987; Fabes, Eisenberg, Fultz, & Miller, 1988). These behavioral measures of task motivation give an index of short-term, task-specific intrinsic motivation (McCullers, Fabes, & Moran, 1987).

There is a lack of systematic research to compare motivation as a generalized trait to motivation as a task-specific behavior. Deci and Ryan's (1985b) research on Deci's Cognitive Evaluation Theory found that the internalization from specific tasks was modestly associated with more generalized internal control. They found that intrapersonal and interpersonal factors determine how rewards are perceived by an individual. The intrapersonal factors, such as locus of control and motivational orientation, seemed to be related to the personality, and the interpersonal factors seemed to be specific to each task situation. In the present study, a more specific test of the relationship between trait and task-specific intrinsic motivation was conducted.

Hypothesis\_One. Trait and task motivation research suggests that the general trait of intrinsic motivation should be related to initial task-specific intrinsic motivation. Subjects with a higher measure of trait intrinsic motivation should have higher baseline task motivation scores.

#### Context\_of\_Rewarding

Exernal rewards have been shown to have detrimental effects on intrinsic motivation (Kassin & Ellis, 1988; Lepper, 1981; McCullers et al., 1987; Pallak, Costomiris, Sroka, & Pittman, 1982; Rummel & Feinberg, 1988). These studies have found that material rewards promised before the task and contingent only on task engagement, rather than performance, inhibit performance (Boggiano et al., 1985; Sharpley, 1985, 1988). A classic study by Lepper et al. (1973) exemplified that effect. In the Lepper study, nursery school children who were interested in drawing with markers on white paper became less interested and made lower quality drawings when they were promised a certificate for making more drawings.

Parents and teachers, who are two major agents in the socialization of young children, may unwittingly

contribute to detrimental effects on motivation through their use of rewards (Fabes et al., 1989; Pallak et al., 1982). Often in schools, children who already have sufficient interest to perform the task are offered the same rewards as are the children who are more hesitant to approach new challenges (Pallak et al., 1982). A reward, which may be an appropriate justification for more hesitant children to perform a task, may be an over-justification for children eager to engage in a task performance (Boggiano & Main, 1986). The children with the over-justification to perform (inherent interest in addition to an external incentive) may become less interested in the task (Fabes et al., 1989; Lepper et al., 1973).

#### The Effects of Rewards in Home and School on Trait and Task Motivation

In the early school years, the rewards given in a child's home and school environments by parents and teachers are primary vehicles for socialization. Children in a study by Pallak et al. (1982) responded to rewards for task performances on the basis of their experiences with rewarding in schools. Children in a study of maternal rewarding by Fabes et al. (1989) responded to rewards for prosocial actions on the

basis of their mothers' reward patterns; children who were rewarded more by their mothers needed more rewards to perform prosocial behaviors. If the trait of intrinsic motivation is formed from an accumulation of task and rewarding experiences, then each new task performance may be both a result of the existing intrinsic motivation trait and a partial determinant of the further development of the trait. Each immediate experience interacts with all past experiences. A difference in parent and teacher reward effects is that the parent effect has been continuous while the teacher effect has been shorter and specific to school tasks.

Hypothesis Two. Parental use of external rewards (as measured by self-reported parent pro-reward attitudes) is hypothesized to be negatively related to trait intrinsic motivation. Rewards for tasks in school should be negatively related to measures of task intrinsic motivation (performance score, level of difficulty, persistence time, and affect for the task).

#### Reward Experiences and Reward Conditions

As indicated above, both the home and school environments provide a history of experiences with

rewards. Recent research suggests that the reward histories of children may undermine their internalization of norms for appropriate behavior (Fabes et al., 1989; Pallak et al., 1982). Fabes et al. (1989) found that mothers who felt positive about using rewards reported their children to be less prosocial than did mothers who had less positive attitudes about rewards. Just as the history of rewarding may reduce children's internalization of prosocial norms, the history of rewarding for academic tasks may reduce children's subsequent academic motivation. In a novel condition where no rewards are present, therefore, children whose teachers or parents had positive attitudes toward rewarding would be expected to have lower task performance, lower task persistence, and decreased positive affect.

What happens, however, when rewards are added to situations involving a novel academic task? One effect would be that promised rewards increase the desired behavior (Hull, 1975; Mook, 1987; Skinner, 1975). The research reported above by Fabes et al. (1989) demonstrated this predictable effect. Children who were promised a reward for helping sick children by sorting papers were found to sort more papers than

those who were not promised a reward. These authors did not report, however, the separate helping scores within subgroups of children whose mothers felt positive or negative about rewards. Consequently, there is little to guide hypotheses about the interaction of rewards and reward history.

Some speculative ideas can be advanced, however. It might be expected, for example, that children exposed to a history of contingent rewarding in schools or home would react favorably when a reward was promised. Children lacking in such a history of external inducement, however, may be less responsive to rewards. In fact, for children with less experience in external inducement, promised rewards may interfere with their intrinsic motivation to perform a task (Bem, 1975; Festinger, 1975) or with their ability to feel competent and self-determining (Deci & Ryan, 1985a). Thus, children whose teachers or parents felt positive about rewards might be expected to increase in performance, persistence, and positive affect when rewards are present; conversely, children whose teachers or parents were less positive about the value of external rewards might be expected to show decreases when rewards are present.

A final, and perhaps most central, question is the effect of external rewards on performance, persistence, and affect on subsequent tasks. The findings from previous research clearly show decrements in performance and persistence following rewards (Danner & Lonky, 1981; Fabes, 1987; Fabes et al., 1986; Hennessey, Amabile, & Martinage, 1989; Kassin & Ellis, 1988; Lepper, 1981; McCullers et al., 1987; Morgan, 1982; Rummel & Feinberg, 1988; Sarafino, 1984).

Since the subjects in the studies cited above were already intrinsically motivated, they may reflect the detrimental effects of rewards for the subgroup of children with high intrinsic motivation more accurately than for those with low intrinsic motivation. For example, Lepper et al. (1973, p. 135) selected subjects "on the basis of their relatively great initial interest in the drawing activity." Whether these decrements are similar for children with low intrinsic motivation or for children with histories of external inducement through rewards is not clear. It is plausible that the performance, persistence, or affect of these children is not substantially different from their baseline performance before rewards are offered.

Hypothesis\_Three. The history of external rewards in the classroom and the experimental reward conditions should affect task motivation. Children who are rewarded consistent with their experience (usually rewarded and receive a reward or usually not rewarded and do not receive a reward) should have higher task motivation. Children whose current reward is not consistent with their reward experience (usually rewarded but receive no reward or usually not rewarded but receive a reward) should have lower task motivation.

#### Task\_Selection

The task selected for motivation studies should be optimally challenging and intrinsically interesting to children (Lepper et al., 1973). A computer task was used in this study to provide some challenge without frustration. There were several levels of the game and the base level was appropriate for children one year younger than the youngest subjects in this sample. Children were free to choose a more difficult level. An interesting computer task that is optimally challenging, with control of the level of difficulty, was chosen to examine possible detrimental effects of rewards on intrinsic motivation (cf. Lepper et al.,

1973; Lepper & Gurtner, 1989). It also provided the opportunity for accurate and objective records of subject responses.

### Summary

The purposes of this study are to examine the relationships between (a) trait versus task intrinsic motivation, (b) parent or teacher reward patterns and trait and task motivation, and (c) teacher reward experience and an experimental reward condition for task motivation. The three hypotheses delineate these relationships. The generalized trait of intrinsic motivation is hypothesized to be positively associated with initial task performance, task persistence, and positive task affect. Trait intrinsic motivation is hypothesized to be negatively related to parental use of external rewards and task-specific intrinsic motivation is hypothesized to be negatively related to teachers' use of external rewards. Task-specific motivation is hypothesized to be related to the interaction of prior experiences with external rewards and the experimental use of rewards.

## Literature Review

Intrinsic Motivation

Motivation, the facilitator of task performance, may come from some external source or from internal pleasure derived from the performance of the task (Deci & Ryan, 1981). Deci and Ryan (1985b) described motivation as the energization and direction of behavior.

An extrinsically motivated behavior is one that will not occur except when an external reward is present (Deci & Ryan, 1985a). Since the behavior occurs only in the presence of the reward, it is presumed that the behavior occurs because of the reward. Deci (1975) felt that a reward for a behavior both produced the behavior and met some physical or psychological need in the actor.

Intrinsically motivated behavior is the tendency to perform tasks without an external reward (Deci & Ryan, 1985a). Deci (1975) defined intrinsically motivated behavior as that which has only itself as a reward. The performance of the task seems to have met some need in the individual, such as the need to be accepted or acceptable according to the socialization experiences.

Intrinsic motivation has also been referred to as a process by which actions that were originally overt are transformed to an internal cognitive model (Aronfreed, 1968; Deci & Ryan, 1985b). The concept was refined (Aronfreed, 1969; Deci & Ryan, 1985b) as behavior being governed by internal monitors which gradually replace the external controls that originally established the behavior. Harter (1978) described intrinsic motivation as pleasure in the performance of a task for its own sake, the task having become an internalized reinforcer.

Internalization seems to be the result of socialization experiences, including the receipt of rewards. The feeling of positive affect associated with perceived competence is at first connected with some external source, such as adult approval or a material object. Possibly through cognitive scripts that repeatedly pair positive affect with the performance of a task, the positive affect becomes connected to the performance of the task and to the performance of a variety of tasks. The pleasure associated with the performance of the task becomes sufficient to elicit the task performance behavior. The pleasure, originally from the reward, is then

internalized. Harter (1978) postulated that self-rewards could contribute to intrinsic motivation. This makes the individual in control of internalized rewards, which exemplifies Deci and Ryan's (1985b) theory of self-determination.

Aronfreed (1968) advanced the notion of a continuum of internal versus external orientation to understand motivation for behaviors. In behaviors resulting from intrinsic motivation, Reeve and Loper (1983) described intrinsically motivated children as those who are curious, enjoy challenge, attack problems independently, consider their opinions to be important, learn actively, and evaluate their own performance. Flexer (1987) monitored an intrinsically motivated child who could produce a variety of approaches to problem solutions, displaying competence and confidence in the methods and solutions. Flexer's (1987) extrinsically motivated child searched for known rules to apply for correct answers, along with seeking outside verification, but was productive in finding several approaches to problem solution if there were no known rule. In contrast, Deci and Ryan (1981) described extrinsically motivated children as those who may become either compliant or rebellious if

they sense that they are being controlled by external rewards.

Trait or task-specific. Intrinsic motivation may be a generalized personality trait (Deci & Ryan, 1985b; Notz, 1975) or may be specific to a task situation (Connell, 1985; Gottfried, in press). Trait intrinsic motivation is relatively stable over time, having developed from the socialization experiences with or without external sources of motivation. Task-specific intrinsic motivation may change with each task that is presented and may be affected by conditions of external sources of motivation. An accumulation of task-specific motivational experiences forms the basis for the development of the trait of intrinsic motivation.

A child who functions at a higher level in the trait of intrinsic motivation may be more likely to attempt novel or challenging tasks (Reeve, 1989). Children who use internal criteria may reach higher levels of task performance (Scott & Miller, 1985). Internalized motivation may involve feelings of higher competence and more positive affect for the task. The trait approach to intrinsic motivation may be measured by a self-report questionnaire, as developed by Harter

(1980) in her model which was developed to revise White's (1959) concept of effectance motivation.

Task-specific intrinsic motivation may influence the actual performance level and persistence on a task after initial task engagement (Reeve, 1989). A task may be interesting according to its characteristics (cognitive novelty and level of challenge), or according to previous task performances, with or without external rewards. Interest in the task may result in more efficient task performance since the performance will be maintained by an internalized interest in the task. Task-specific intrinsic motivation has traditionally been measured by performance and persistence behaviors. The level of task-specific intrinsic motivation displayed by children in a study concerning the negative effects of rewards (Lepper et al., 1973) was measured by the time the children spent engaged in the activity during a period of free choice. Thus, the more stable trait intrinsic motivation may enhance novel task engagement while task-specific intrinsic motivation may enhance task performance after engagement. Trait intrinsic motivation may affect more general approach behaviors of task performance and current environmental

conditions may have more specific temporary effects on performance behaviors.

Age-related developmental change. Blumenfeld, Pintrich, and Hamilton (1987) found evidence of some movement toward intrinsic motivation with maturation. Fifth graders gave more intrinsic reasons for adhering to classroom rules than did first graders in terms of consequences to others and self-affirmation.

#### Rewards and Motivation

Rewards, external reinforcements to perform a task, are often given to children in connection with the performance of a task. To fit the definition of a reinforcer, the reward must be desirable enough to the child to elicit the desired behavior. According to a review of motivation and rewarding by Mook (1987), the behaviorist notion of learning as practiced by Watson and Skinner and their followers involved controlling performance behaviors by schedules of external reinforcement to produce the desired results. These external sources of motivation were given for predetermined task performances and were seen as the only necessary condition for the task performance.

Later, Berlyne (Mook, 1987) became aware of the importance of the cognitive responses of the

individual to the presentation of stimuli for task performances. He noticed that certain collative stimuli (those with characteristics of novelty and challenge) could elicit performances without external reinforcers. Optimal levels of novelty and challenge of the stimuli and of the task itself were sufficient to elicit performance behavior. Stimuli that were optimally discrepant but not frustrating could elicit task performances.

White (1959) developed his theory of effectance motivation, the organism's desire to effectively interact with the environment, by building on the behaviorist animal and human studies. Behaviorist studies dealt with drives and their reduction while effectance motivation dealt with the individual's perceptions.

Attribution of success. When a reward is promised for a successful task performance, the success is often attributed to the reward instead of to interest in the task or to competence. Children who were initially interested in drawing were offered a certificate for completing a set of drawings (Lepper et al., 1973). The rewarded products were of lower quality and the children subsequently engaged in less

drawing time. When attention was focused on the reward, intrinsic motivation was lessened. The researchers surmised that the children's interest in the activity was attributed to the reward rather than to the original activity. Later interest in the activity was decreased. If a reward is expected because of past experience with rewards, interest is likely to be attributed to the reward. Rewards often hinder subsequent interest in a task for children who were intrinsically motivated to perform the task (Danner & Lonky, 1981).

#### Reward Conditions

Several types of rewards may be given in a variety of conditions. They may vary according to the quality of the reward (material or social), the reward's function (controlling or informational), the reward's dependence on the task performance (contingent or non-contingent), or the relationship of the reward to the task (exogenous or endogenous). Although each of the reward conditions has an effect on intrinsic motivation, Deci and Ryan (1985b) stressed the importance of the controlling/informational aspect as giving the enhancing or hindering value to each of the other types. Thus, each member of the

material/social, contingent/non-contingent, and exogenous/endogenous reward types affects intrinsic motivation as it either controls behavior or gives information about the performance.

In Figure 1 the detrimental effects of rewards are traced from motivation through the reward conditions to the detrimental effect. All solid lines represent likely connections from one reward condition to the next one. Dotted lines represent connections which are unlikely but may not be impossible. The discussion of reward types will investigate the possibility of a reward being exclusively one type or of simultaneously being two or more types. It is possible that, if a reward falls into only one of the more detrimental types, its overall effect will be detrimental to intrinsic motivation, even if it also falls into one or more of the less detrimental types. The heavy lines trace the path of the most likely detrimental effects of rewarding on intrinsic motivation.

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Insert Figure 1 about here  
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Material and social rewards. Rewards may be in the form of material objects or of a social/symbolic nature. Material rewards for children have often taken the form of edibles, toys, stickers, and money. Social rewards have taken the forms of praise and certificates (Condry & Koslowski, 1979); these social/symbolic rewards give the child some form of increased social status with the adults or their peers in the environment.

Social rewards (Pallak et al., 1982) do not decrease intrinsic motivation if the reward is seen as informational. Material rewards, as opposed to social rewards, seem to draw more attention to the reward itself than to the interest in the activity and may promote extrinsic motivation (Deci & Ryan, 1981). Material rewards possess more incentive value than do social rewards (Sharma, 1986) and may undermine intrinsic motivation by being salient and controlling.

Controlling and informational rewards.

Controlling rewards are those which control the behavior of the child through the child's feelings about performance of a task; the results of a task performance may be important to the child's feelings of self-determination (Deci & Ryan, 1985b) and of self-

esteem (Harter, 1983; Harter, 1985). However, informational rewards give competence information without involving self-determination and self-esteem. Social rewards in the form of praise and certificates or stickers tend to give information on level of performance. However, both material and social rewards can be either controlling or informational. If candy (material) or praise (informational) is given as the reason for engaging in the task ("Do this task so that you may get the reward" or "You are a good kid if you will do this task and get this reward"), then the reward is controlling. But the candy (material) or praise (social) that is given at a specified level of achievement can be informational in giving competence information ("You will receive the reward when you have completed the set with 80% correct responses."). Even though a material reward is more likely to be controlling than a social reward, either reward can be controlling through its emphasis on the individual or on the reward rather than on the performance of the task.

A controlling reward may give feedback that is not inherently related to the task but is concerned with the child's overall behavior or personality

(Butler, 1989). Therefore, a controlling reward focuses attention on the child rather than on the task performance. Since the attention is not on the task, the child is subsequently less interested in the task than in more global personal acceptance for success. An informational reward, however, may provide straightforward information concerning the quality or the level of task performance (Ryan & Deci, 1989). This information gives feedback which may help a child to maintain or to adjust the desired level of challenge for success and feelings of efficacy. These feelings of success and effectance have been shown to be important for intrinsic motivation. In Csikszentmihalyi and Csikszentmihalyi's (1988) work, necessary conditions for intrinsic motivation included being able to adjust the level of challenge. White (1959) describes the feeling of effectance in interacting with the environment.

Controlling rewards are associated with the tendency to attribute success to the reward, thereby promoting extrinsic motivation by focusing interest on the outcome (Deci & Ryan, 1981). The reward, rather than interest in the task, controls performance. If there is no external reward present, children tend to

attribute their performance success to their own intrinsic interest, according to their experiences with rewarding (Dalenberg, Bierman, & Furman, 1984).

Controlling rewards tend to depress future intrinsic motivation to perform a task, including the initiation and maintenance of task engagement (Lepper, 1981). Informational rewards tend to maintain intrinsic motivation and may influence both feelings of competence (Vallerand & Reid, 1984) and the desire for greater challenge (Csikszentmihalyi, 1988). For example, since social rewards tend to be informational, they do not hinder intrinsic motivation if they focus on competence information rather than on the child's behavior.

Contingent and non-contingent rewards. Rewards may depend upon a specified level of task performance (a toy or a certificate when ten sentences can be done correctly); these are considered to be performance-contingent rewards. Task-contingent rewards depend upon task engagement (a toy or certificate for engaging in a task). Both performance-contingent and task-contingent rewards are contingent rewards. Others are not specifically tied to a particular task; these rewards are non-contingent to the task (a toy or

praise given at a particular time regardless of engagement in a task). Either a material reward (toy) or a social reward ("Good Player Certificate") may or may not depend on any particular task.

A task-contingent reward may be seen as controlling the behavior by inducing performance of that task. Task-contingent rewards focus attention on the need for performance rather than on competence (in a performance-contingent reward) or on the inherent pleasure in performing the task (in a non-contingent reward or with no reward). A child may attribute success or interest to the reward instead of the activity if attention is directed to a task-contingent reward. However, a reward that is contingent on task performance is more likely to be reinforcing (Pallak et al., 1982). Performance-contingent rewards, then, give competence information. Sharpley (1988) found that non-contingent rewards were not detrimental to intrinsic motivation. A non-contingent reward seems unable to control a task performance or to give competence information since it is unrelated to the task.

Exogenous and endogenous rewards. Rewards which are exogenous to a task (money or praise for a memory

task) are fundamentally unrelated to the content or performance demands of the task (Eisenstein, 1985). Rewards which are endogenous to a task have some relationship to the task (keep the money in a penny pitching game); the reward may be some natural or logical extension of the performance of the task. An endogenous reward may be thought of as a part of the task performance. Exogenous rewards may be material or social. They are controlling since they cannot give competence information without being related to the task, and they are non-contingent since they are unrelated to the performance of the task. Endogenous rewards may be material or social according to experience with the task (marbles are earned as expected by game rules or cheering is expected in a race), are more likely to be informational in some specific relationship to the task (get the marbles or cheering for competence). They are more likely to be contingent to the task since they are related to performance. A non-contingent reward can only be exogenous since it is not specifically tied to a particular task. A contingent reward may be exogenous if its receipt is based on task performance but it is not related to the task in content. A contingent

reward may be endogenous if its receipt is based on task performance and it is related to the task in content (Jagacinski, 1981).

An exogenous reward tends to draw attention to the reward rather than to the task; success on the task may be attributed to the reward rather than to the effort or competence for the task performance (Kruglanski et al., 1975). An exogenous reward is more likely to inhibit intrinsic motivation since it is more likely to be controlling while an endogenous reward is less likely to inhibit intrinsic motivation since it is more likely to be informational. When children played a coin toss game, in which the subjects viewed a reward (coins) as a part of the normal operating procedures (Kruglanski et al., 1975), intrinsic motivation was not decreased. The reward coins seemed to be considered endogenous to the task.

Reward offered before task engagement. Another hindrance may emerge when the reward is promised prior to task engagement. Promised rewards may be several of the types mentioned above. They may be either material or social. A promised reward is more likely to control the behavior that follows it since competence information would only be available after

the task engagement. Promised rewards are more likely to be contingent on some task performance; a promised non-contingent reward would be given at some arbitrary time which affects the task if it coincides. A promised reward may be exogenous or endogenous, but a promise would make an endogenous reward more salient since the reward is already expected to accompany the task.

With the promise of a reward, children tend to focus on the reward not on the inherent pleasure of task performance. The promise may serve to focus attention on the reward, enhancing its salience. In turn this may inhibit the task performance as in the Lepper et al. (1973) study. The importance of the promise of a reward was shown since rewards given after task performance, but not mentioned before, had no effect on subsequent task performance.

Summary of rewarding and motivation. Rewards used to promote initial task engagement or to enhance task performance may occur in several conditions, some having more detrimental effects than others on intrinsic motivation. Rewards that hinder intrinsic motivation are those that focus attention on the individual rather than on the performance of the

task. The hindering rewards seem to control behavior while rewards that give competence information do not. Rewards that are social, informational, non-contingent, endogenous, or not mentioned prior to task performance are less likely to hinder intrinsic motivation. Rewards that are material, controlling, contingent on task engagement, exogenous, or promised prior to task performance are more likely to hinder task-specific intrinsic motivation.

#### Detrimental Effects of Rewards

The detrimental effects of rewards occur in fairly predictable patterns (Deci, 1975). The long-term performance and interest in the task is adversely affected even if the immediate effect of the reward may be to improve some aspects of performance. Lepper et al. (1973) showed intrinsically motivated children to be hindered by a promised, controlling reward. Children who were initially interested in the drawing task drew many pictures for a reward, but they were of lower quality than the pictures of the non-rewarded children.

Attributions. Children's perceptions of rewards are related to attributions, the perceived causes of outcomes. Attributions of causality of behavior, as

studied by Lepper et al. (1973), serve as a mediator between the reward and the performance. Attributions will influence performance behaviors and affect for a task (Schunk, 1990). Children will function along the continuum of motivation according to their attributions of control and causality of behaviors. The attributions of behavior in the Lepper et al. (1973) sample seemed to depend on children's perceptions of causal conditions of their own behavior. Individuals' perceptions may also include their personal competence to perform tasks (Vallerand & Reid, 1984).

Children's perceptions are influenced by experience with causes of behavior (Miller, 1985) and experience with the socializing adults in their environment (Grolnick, Ryan, & Deci, unpublished personal correspondence, 1989). If external contingencies have not been perceived or have been unclear, invisible, or psychologically insufficient to account for behaviors, then the child will attribute actions to intrinsic interests. If a reward has been the salient factor in choosing an activity, children will attribute behavior to the attainment of the reward.

Hennessey et al. (1989) were able to overcome some of the decrease in intrinsic motivation by training children to focus on intrinsic reasons for achievement. Since rewards will have become expected, the children may focus more attention on the rewards and on the process of getting rewards than on the performance of any given task.

Children will perceive others to be intrinsically motivated to engage in some activity if there are no visible sufficient extrinsic conditions to which the behavior can be attributed. Likewise they will perceive their own actions as intrinsically motivated if there are no salient, unambiguous, and sufficient conditions to produce the behavior (Lepper et al., 1973). However, if a reward is added to an intrinsically motivated activity, there is an overjustification for engaging in the activity or the intrinsic motivation may be discounted in favor of the external reward (Dalenberg et al., 1984). Children with the common experience of being promised rewards may devalue enjoyable tasks (Sarafino, 1984). The reward becomes the more salient reason for continuing the behavior.

Trait or task effects. It is proposed in this study that a child may be situationally intrinsically motivated to perform a particular task, especially for a reward, while being either high or low on a trait measure of intrinsic motivation. The child who usually does not get a reward for task performance may score higher on the internalized trait measure of intrinsic motivation; the child who usually gets a reward and expects a reward for task performance may be relatively low on the trait measure of intrinsic motivation and need a reward to keep the immediate task performance high. This reward which enhances immediate performance may inhibit later performance. It may be necessary, for explaining more variance in the immediate as well as subsequent performances, to investigate the more stable trait intrinsic motivation (on a self-report measure) as opposed to situation-specific intrinsic motivation (as a behavioral measure of performance). The Lepper et al. (1973) subjects who were situationally intrinsically motivated may have been either high or low on a trait measure of intrinsic motivation. Those who were high on the trait intrinsic motivation should be hindered in the immediate and the subsequent performances by a reward,

according to the over-justification effect. Those children who were low on trait intrinsic motivation (perhaps after usually being rewarded for task performances) should have enhanced immediate performance but a lower subsequent performance. Since the detrimental effects on long term task performance have been shown to accompany material, contingent, controlling, and exogenous rewards, these are the rewards chosen for examination.

#### Experience with Rewards

Fabes et al. (1989) found evidence of the inhibition of children's prosocial helping behaviors when they were rewarded, mediated by parents' attitudes and behaviors concerning rewarding. Children who were usually rewarded engaged in fewer helping behaviors when the reward was not available. The effect of teachers' rewards on achievement may be similar to the effect of parents' rewards on prosocial behavior. First, task performance may be hindered by rewards if the teacher is low on the tendency to favor rewarding. Second, even though later performance is hindered by rewards, immediate task performance may not be hindered (or may even be increased) if the

teacher is higher on the attitudes and behaviors favoring rewards.

The Fabes et al. (1989) findings suggest that a child's experience with reward practices may influence or mediate the current task performance in relation to rewards. A possible explanation of the reward experience effect is that every separate task performance throughout life has its own reward condition and level of success, which is compared with all the task performances before it with their rewarding conditions and levels of success. The accumulation of task performances with their rewards and successes builds an expectation for future task performances.

In accord with this explanation of the effects of rewarding experience, subjects in a study by Sharpley (1988) compared their current reward condition with earlier experimental rewarding experiences; there was a difference due to prior experience in the effects of implicit or direct rewarding. Boggiano and Main (1986) also got differing results due to experience when they varied the familiar phrases usually used by parents in a contingency statement which offered one activity as a reward for engaging in another

activity. These children, younger than age seven, were able to use the discounting and augmenting principles as a result of the experimental statements being in the familiar form of statements in their experience. As another example, a child who usually got social rewards in school saw social rewards as informational (Pallak et al., 1982) and performance was not decreased by the social reward. The performance of children in schools that did not use social rewards went down in the presence of a promised social reward. The authors suggested that the prior experience with rewards and the current rewarding may affect the relative salience of the informational or controlling aspects of the reward.

Parents and teachers as socializing agents. Many researchers (Fabes, 1987; Gottfried, 1985, 1989, in press; Grolnick et al., unpublished personal communication, 1989; Harter, 1986) have suggested that the attitudes and practices of the adults in charge of socialization of the children may have influenced the variance in the children's responses to rewards by providing different task performance conditions. Current socialization agents, usually parents and teachers, may or may not be aware of the effects of

their use of rewards to control behavior or to promote the internalization of motivation for task performance. The adults may favor and use rewards to ensure children's compliance and desired level of performance behavior. In the socialization of children, rewards may be given to promote initial engagement in a task. The other children in the environment, who would engage in the task without any external inducement, are often offered the same reward. These more intrinsically motivated children did not need the reward to produce task engagement and may exhibit subsequent decreased levels of interest in task engagement because of the reward (Lepper et al., 1973). This experience in the amount of rewarding favored by the socialization agents may contribute to a stable trait of intrinsic motivation. More external rewarding would be expected to lead to lower levels of the intrinsic motivation trait.

Rewards may also be given in children's socialization experiences to maintain or raise a level of performance on a task. Children may be encouraged to persist at the task for a longer time and to seek a greater challenge to their existing skills by the promise of a reward. This current condition of

rewarding may affect the more transitory task-specific intrinsic motivation for short term performance. All the children in a given environment may be offered the reward contingent on a given level of task performance. Those children who were already performing with a higher level of persistence, affect, and competence (behavioral indices of situation-specific intrinsic motivation) may not need the reward; their performance may be hindered by the promise of the reward, as were the highly intrinsically motivated children of the Lepper et al. (1973) study.

Expectation of reward. When adults do not regularly use rewards for task engagement and task performance, the children do not usually expect a reward for task performance. They are more likely to perform interesting tasks for the pleasure inherent in the task. Also, the children who do not usually get rewards are more likely to be interested in tasks with moderate levels of novelty and challenge in relation to the child's skill level (Csikszentmihalyi, 1990). This study will examine task performance relative to experience with rewards and current rewarding conditions as discussed by Kassin and Ellis (1988) and

by Morgan (1982) in their accounts of over-justification and discounting in young children.

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Insert Figure 2 about here  
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Figure 2 compares the proposed performance results of children who have usually been rewarded for task performance with those of children who have not usually been rewarded for task performance. In this study, the baseline measure of trait intrinsic motivation may relate to prior rewarding in the child's socialization experiences with teachers or parents. The experimental condition is the current condition of a promised reward or no mention of a reward. The follow-up is the subsequent task performance in the absence of rewards.

Trait and task intrinsic motivation related to reward experience. The Lepper et al. (1973) study dealt with subjects who were high in task-specific intrinsic motivation. These children may have been either high or low in trait intrinsic motivation. Children who are low in trait intrinsic motivation may perform better with a reward in the short term if the reward motivates them to engage in the given task. If

these children who are low in trait intrinsic motivation have usually been rewarded for task performances, they may need to be studied according to their reward experiences. Their task performance scores may be lower because of experiences with rewarding for previous task performances, according to Fabes et al. (1989).

Trait intrinsically motivated children may be the ones who have not usually been rewarded for performance. Measures of motivation and of achievement were shown to be related (Luthar & Zigler, 1988). Likewise, children who expect a reward may not achieve as well as children who do not expect a reward since the children who expect a reward may spend some time and effort in acquiring a reward. Mothers in the Fabes et al. (1989) study of prosocial behaviors predicted their children's helping behaviors. Those mothers who favored and used rewards had children who were less likely to help without a reward. The children of those mothers who favored the use of rewards were expecting a reward because of their experience with usually receiving a reward for prosocial behaviors and task performances. The children who expect a reward for task performances can

be predicted to score lower on the trait measure of intrinsic motivation since they have not been socialized to perform tasks for the pleasure inherent in the activity. These children may not be hindered in their task performances by a promised reward since they are expecting a reward for any task performance.

It is possible that these children who score low on the trait measure of intrinsic motivation may still be intrinsically motivated to perform a particular task. A child could possibly be low in trait intrinsic motivation and high in task-specific intrinsic motivation. The trait intrinsic motivation could be expected to have long-term performance effects while the task-specific intrinsic motivation is more likely to have short-term performance effects. Even though Lepper et al. (1973) did not recommend the banning of rewards for task performance, it was shown that rewards adversely affect the performance of intrinsically motivated children. However, the group of children just described who are low in trait intrinsic motivation (accustomed to rewards) and high in task-specific intrinsic motivation may especially need a reward to enhance the short-term performance. Presumably the long-term

performance without a reward would have been low with or without a promised reward (since a reward was expected every time). A higher short-term performance with a reward may promote some competence.

Detrimental rewards for an experience effect.

Rewards may not hinder their short-term performance. Thus, children who usually receive a reward for task performance must be given a reward with a high probability for hindering task performance. Then it can be determined whether that child was hindered in a short-term task performance by the reward. If the performance of children with a history of external rewards is hindered by a promised reward, one can surmise that there was no effect due to experience. If the performance of a child with a history of external rewards is not hindered by a promised reward, then there was an effect due to experience. In this study, promised rewards will be material, controlling, task-contingent, and exogenous to the task since these are the types of reward known to hinder intrinsic motivation.

Performance differences according to rewarding experience. An initial difference in performance according to a child's experiences with rewards is

that the child's baseline performance level on a task should reflect the levels of the intrinsic motivation trait as measured by the Harter (1981b) scale. Children with histories of more external rewards should have lower levels of intrinsic motivation and lower baseline (no reward) performance scores. Those children in non-reward contexts should have higher levels of intrinsic motivation and higher baseline (no reward) performance scores.

A second difference in performance, according to a child's experience with rewards, is that the immediate short-term performance may be maintained or even enhanced by a promised reward for all children. The task in the experimental condition may seem to be attractive to the rewarded children, although it is not generally known whether the positive affect and interest are attributed to the task or to the reward (Fabes et al., 1988).

A third difference in experience with rewarding is that the subsequent longer-term performance of a task seems to be hindered more by a reward than the short-term performance (Fabes et al., 1989; McCullers et al., 1987). Short-term performance may be more susceptible to experimental effects of rewards on task-

specific intrinsic motivation. Long-term performance may be more stabilized with trait intrinsic motivation and may depend on reward expectations for the long-term detrimental effects. Children accustomed to a high-reward context, when promised a reward for performance, should increase the baseline level of performance in the experimental condition. However, a later opportunity to engage in the task with no mention of a reward should show a decreased level of performance. The absence of a reward in the longer term performance may be seen by the child as a withdrawal of a usually expected reward (Lonky & Reihman, 1980; Aronfreed, 1969). Any positive affect and interest in the task that are attributed to the reward would be absent in the non-rewarding condition.

Children who usually have been rewarded for tasks and who are given no reward for performance should maintain a low score or decrease from the baseline to the experimental non-reward condition. The subsequent follow-up performance with no mention of a reward should show a similar low or decreased level of performance. Each task performance without a reward may be seen as a withdrawal of a reward since a reward is expected.

Children who usually have not been rewarded for tasks and who are promised a reward for performance may maintain the relatively high baseline level of performance in the immediate experimental rewarding condition. A subsequent performance with no mention of a reward should show a decreased level of performance, according to the overjustification effect (Lepper et al., 1973).

Children whose socialization agents usually have not rewarded them for tasks and who are not given a reward for performance should maintain or increase from the baseline to the experimental non-reward condition. A subsequent performance with no mention of reward should maintain or increase the level of performance from the baseline and the experimental condition. This should be the optimum condition for intrinsically motivated behavior over a variety of tasks and on the persistence and interest in a particular task.

A final difference is that the affect for each task should follow the levels of intrinsic motivation according to prior experience with rewards (Loveland & Olley, 1979). Affect should vary according to the trait measure of intrinsic motivation, prior

experience with rewards, and the conditions of the detrimental effects of rewards. Affect should be higher at the baseline measure for those children scoring higher on the trait measure of intrinsic motivation (Harter, 1980). According to White (1959), these children should feel more effectance motivation and choose appropriate challenges for themselves. Affect also should be higher after each task for those children who express the most interest in the task by persisting longer.

Fabes et al. (1988), in a study of the negative effects of rewards on intrinsic motivation, investigated the relation of positive or negative affect and task performance. Interest and positive affect were correlated with the level of task performance and persistence; these are behavioral measures of task-specific intrinsic motivation. Higher affect and interest may spur more persistence and performance or a higher awareness of competence at the task performance may produce higher interest and affect/liking for the task. Both Fabes et al. (1988) and Gottfried (in press) questioned whether positive affect, in terms of a child's attribution of success or of a teacher's expectations of children's

achievement, produces higher achievement or whether the child's feeling of competence from higher achievement produces more positive affect, in the children and the teacher.

Positive affect should be higher when a reward is consistent with prior experience. Children should express more interest when they expect a reward and receive one and when they do not expect a reward and do not receive one. The experiences of seeming to have lost a reward (usually getting a reward but not receiving one) or of overjustification (usually not getting a reward but receiving one) should produce a lower affect rating after each task performance.

Summary of rewards and experience. Up to this point, reward conditions and experiences have been shown to affect motivation. Learning efficiency is increased as children move toward higher levels of intrinsic motivation (Nastasi, Clements, & Battista, 1990). Types of rewards either increase, do not increase, or decrease intrinsic motivation (Ryan & Deci, 1989). Each child's perceptions of rewards are drawn from the current conditions combined with past experience. Knowledge of prior experience with rewards will shed light on reward expectations.

Expectations, in turn, determine perceptions of offered rewards. The children receiving a reward will make the final attribution of the causality of their behaviors regardless of the planning and intentions of the teachers, parents, and researchers. The important perceptions are those of the children since their perceptions will mediate the effects of rewards on performance and motivation.

#### Tasks for Reward Conditions

The tasks to be performed in a rewarding or a non-rewarding condition must be chosen carefully because they are seen as a mediating variable between the individual child and the perception attached to the task (Rummel & Feinberg, 1988). With over-justification, attribution of the cause of task performance was to the salient reward rather than interest in the task. Tasks are also important because of the situation-specific characteristic of some intrinsic motivation. The task should be attractive enough to be inherently interesting children, but not so attractive as to make its behavioral measures of intrinsic motivation artificially high.

Optimally\_challenging. Optimal arousal, as a result of optimal information incongruity, has been seen as a factor in intrinsic motivation (Hunt, 1971). Too little incongruity may cause boredom or too much incongruity may cause frustration (Csikszentmihalyi, 1990). Optimal incongruity should encourage persistence to complete a possible goal. Seeking optimal incongruity in increasingly complex levels of intellectual play will result in increasing developmental levels toward higher intrinsic motivation (Deci, 1975). The feeling of effectance described by White (1959) dealt with children's desire to effectively manipulate their environment and to feel competent in the activities. Through optimal incongruity in an intrinsically motivating task, children can enjoy a feeling of effectance. A number of factors have been shown to be inherent in task-specific intrinsically motivating tasks. In Gottfried (1983), the nature of the attempted task is defined in terms of novelty and challenge. Children are more intrinsically motivated to achieve if the task is optimally challenging--novel yet possible (Rogers & Ponish, 1987; Csikszentmihalyi, 1990). Each individual's experience determines the perception of

novelty and the current level of functioning in a particular area determines challenge. An individual's perception of a task may be dependent on the early environmental background of familial and non-familial experience (Gottfried & Gottfried, 1989).

Computer task. A computer activity seems to fit the criteria for an optimally challenging task (Lepper & Gurtner, 1989). It will be attractive to many children because of the bright graphics and movement; there is the possibility of continuing interest through the three trials because of the capability of adjusting the challenge level of the activity to the child's skill level (Csikszentmihalyi, 1990; Gottfried, 1983). Computer games are available in most schools so that they are not entirely novel.

The sound effects on computer games provide an external feedback that is informational concerning the child's level of performance (Nastasi et al., 1990) and is endogenous to the task as described by Eisenstein (1985). Children who worked in a computer environment that did not provide explicit external feedback asked their teachers for more approval. Young children often demand some social feedback in judging their own competence (Harter, 1982). The

informational and endogenous nature of the "beeps" and "statements" should not interfere with the rewarding conditions. In this study, informational rewards have been hypothesized to have no negative effects; only controlling rewards are being used ("Will you choose the prize that you want from this board and then do this computer activity so that you can get the prize?"). Therefore, if the sound effects are rewarding, they are not interfering with the focus of this study. The game may be used with the sound turned on or turned off.

In experimental settings with an intrinsically motivating task, situational, or task-specific, intrinsic motivation is usually tapped by behavioral measures, such as performance and persistence. Performance on this computer task can be measured by the game scores and the number of minutes, up to about ten, spent engaging in the activity. This task-specific intrinsic motivation may be more affected by current rewarding conditions while the trait measure may be more affected by rewarding experience.

#### Summary of Intrinsic Motivation and Rewarding

Intrinsic motivation is an efficient facilitator of task performance and achievement. Rewards

influence motivation in the hindering of intrinsic motivation by controlling rewards and the less hindering effects of informational rewards, for a child who perceives a task to be challenging and interesting. Children have experiences with being rewarded for task performance from usually being rewarded to not usually being rewarded. It is the role of child caregivers in their socialization of children to maximize, and never deter, every child's level of intrinsic motivation from the individual beginning point to the current conditions (Fabes, 1987). Attributions of the causality of behavior are based in the current rewarding conditions along with the past experience with rewarding. Thus, rewards may either enhance or detract from the efficient learning in intrinsic motivation.

#### Statement of Purposes and Hypotheses

The purposes of this study are to examine the relationships between (a) trait versus task intrinsic motivation, (b) parent or teacher reward patterns and trait and task motivation, and (c) teacher reward experience and an experimental reward condition for task motivation.

Three hypotheses are used to examine these relationships and relevant studies suggested their existence. (1) The generalized trait of intrinsic motivation is hypothesized to be positively associated with initial task performance score, task level choice, task persistence, and positive task affect. This is based on Deci and Ryan's (1985b) discussion of two facets of intrinsic motivation in their performance of specific tasks and the relatively stable personality factors. (2) Trait intrinsic motivation is hypothesized to be negatively related to parent reward patterns, and task-specific intrinsic motivation is hypothesized to be negatively related to teacher reward patterns. This is suggested by the Fabes et al. (1989) finding of a negative relationship between maternal reward attitudes and behaviors and their children's tendency to engage in prosocial helping behaviors. The same negative relationship is hypothesized to exist between teacher reward patterns and children's classroom task motivation behaviors. (3) Task motivation should be related to the interaction of prior experiences with rewards and the reward condition at the experimental and the follow-up phases of the study. Lepper et al. (1973) suggested

this interaction in their study of the task intrinsic motivation of children who were initially motivated to perform a task. Their performance decreased after an experimental reward. The current study examined children who were either high or low in initial motivation, and it examined them in relationship to their experience with receiving rewards from their classroom teacher.

## Methods

Subjects

A sample of 235 children from sixteen first and second grade classrooms in two schools in southwestern Virginia was studied, along with their parents and teachers. As seen in Table 1, the children were fairly evenly divided between Grade 1 and Grade 2 and between boys and girls. The mean age was 89 months

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Insert Table 1 about here  
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(seven years and five months) with a standard deviation of 8.7. The mean achievement score was 69 on the national norm of the Metropolitan Achievement Test. Socioeconomic status scores were taken from the 1980 census (Stevens & Cho, 1985), with a mean for this sample of 59 (range of 12-94) and a standard deviation of 20.5. Of the original sample, two children were dropped because they did not speak enough English to understand the study, two did not wish to complete the project, and four were absent for extended periods. All of the children live in a university community and attend public schools there. There was a parent participation rate of 99%. School

1 had a participation rate of 135 / 197, or 69%, and School 2 had 100 / 138, or 72%. The total participation rate of children was 235 out of 335, or 70%.

The subjects were contacted after a presentation of the study to the county administration (Appendix A) and to the children's classroom teachers (Appendix B).

### Materials

Extant conditions and subjects' background information, along with the constructs of trait and task intrinsic motivation, were measured. Five instruments yielded measures on the variables of TEACHER REWARDING, SES, SEX, GRADE, PARENT REWARDING, TRAIT motivation, and AFFECT. A measure of ACHIEVEMENT came from the perusal of subjects' school records. Task intrinsic motivation was measured directly during the study as performance (SCORE), difficulty (LEVEL), persistence (MINUTES), and AFFECT on the instrument.

In the task motivation variables, since the LEVEL of difficulty involved increasing, by one letter per level, the number of letters to be matched for a score, the game SCORE used is a product of the raw game score and the LEVEL chosen. Both this product

SCORE and the separate LEVEL were analyzed. SCORE and LEVEL were significantly related (.25,  $p < .01$ ; .46,  $p < .01$ ; .43,  $p < .01$ ). Each of the four variables (SCORE, LEVEL, MINUTES, AFFECT) was assessed three times for each subject.

Five instruments--teachers' rewarding, subjects' demographics, parents' rewarding, children's trait intrinsic motivation, and children's affect for a task-- were administered. The teachers' survey took about ten minutes. Parents were asked to complete two instruments that required a total of about twenty minutes. Each child's total participation, with two instruments and three performance trials, involved about one hour.

Teacher rewarding attitudes and behavior survey. TEACHERS' REWARDING was derived through administration of the Teachers' Rewarding Attitudes and Behavior (Appendix C) survey, adapted from a rewarding survey developed for parents by Fabes et al. (1989). The adapted form used in this study changed the wording to fit teachers and their children in a class instead of parents and their children. Three items, about children's feelings after rewarding and rewards for levels of performance, were included to cover the

specific topics of this study. The one-factor alpha reliability coefficient was .83. On the basis of the teachers' rewarding attitudes and behaviors, the sample of teachers was split into a higher and lower rewarding group for some analyses. The top one-third and the bottom one-third of the teacher scores were used. Score range was 18-90.

Demographic information. Demographic information was collected from the parents, along with their consent for their children to participate in this study and for the experimenter to have access to their children's records (Appendix D). Data from these records were used to measure achievement (ACHIEVEMENT). The consent form and the request for demographic information were combined in an attempt to lessen the demands on the parents and to increase the response rate and efficiency of the study. The occupation and education information was used to estimate the family socioeconomic status (SES) so that results can be generalized to all occupational and educational levels. All information will be kept confidential by assigning a code for the school, class, and individual child; names will be removed when all the results for each child have been

collected and analyzed. All parents returned a survey.

Parent rewarding attitudes and behavior survey.

PARENTS' REWARDING was derived through administration of the the current form (personal communication) of the Parent Rewarding Attitude/Behavior Survey (Appendix E) from Fabes et al., (1989). The survey had ten rewarding attitude items ("The use of rewards to motivate children can be considered a type of bribery.") and five rewarding behavior items ("To what extent do you give your child a reward for behaving properly?"). Three statements related to this study were added ("Children are more interested in working on new activities if they usually get rewards for working on any activity.") for a total of eighteen items. Responses were on a five-point scale from 1-- "Strongly Disagree" to 5--"Strongly Agree" and from 1-- "Almost Never behave that way" to 5--"Almost Always behave this way". The score range was 18-90. The original scale (Appendix E) accounted for about forty five percent of the variance in Fabes' sample, on a factor analysis. The alpha reliability coefficient for the abbreviated ten-item Reward Scale was .85. The alpha reliability coefficient for the one-factor

scale in this study was .87. All but one parent returned this survey.

Scale of intrinsic versus extrinsic orientation in the classroom. Susan Harter's (1980) scale (Appendix G) assessed the TRAIT of intrinsic motivation for all participating children. Each of the thirty items had two descriptions of different children's attitudes ("Some kids like hard work because it's a challenge BUT Other kids prefer easy work that they are sure they can do) and two categories for each description ("Sort of True for Me" or "Really True for Me"). Only one of the four responses was possible for each item. The score range was 30-120. Acceptable reliability and validity have been established for the Harter scales (Harter, 1980; 1981b; 1982; 1985). The Intrinsic-Extrinsic Orientation Scale has subscale reliabilities ranging from .68 to .84 across samples of over 3000 students. Face validity was addressed in the early piloting by individual administrations to assess children's understanding of the items. Group administration was later shown to be as valid as individual administration. Construct validity is being explored; higher perceived competence, from the Pictorial Scale of Perceived Competence and Social

Acceptance for Young Children, has been shown to relate to intrinsic orientation according to the effectance motivation model (Harter, 1980). One evidence of the validity of the scale was a sample with compounded differences (school type, socioeconomic status, and ability levels) that showed a large difference in the predicted direction on the Scale. Predictive validity has been established for the Preference for Challenge subscale.

Factorial validity indicated five distinct components of motivation--challenge, curiosity, mastery, judgment, and internal criteria. Higher order factoring revealed a two-factor solution consisting of a motivational factor in the Challenge, Mastery, and Curiosity subscales and a cognitive-informational factor in the Judgment and Internal Criteria subscales. In this study, the higher order factoring of five subscales produced a clear two-factor solution, accounting for 67.6% of the variance in the sample. The alpha reliability is .84 for the MASTERY-motivational subscale and .77 for the informational JUDGMENT subscale. The intercorrelation of the two subscales is .30 ( $p = .000$ ). The whole scale reliability has an alpha coefficient of .85.

Susan Harter supplied the requested manuals and permission to print copies of the scales.

Survey of affect. After each of the three trials with the task, children were asked about their feelings of AFFECT or interest in the task (Appendix H), as suggested by Fabes (personal communication). The purpose was to determine if there is an affective pattern connected with the receipt of a reward (Fabes, Eisenberg, Fultz, & Miller, 1988). There were thirteen questions that attempted to assess interest, liking, and attribution of interest/liking ("I feel good playing this game."). Questions that tend toward positive AFFECT and intrinsic motivational attributions were interspersed with those tending toward negative affect and extrinsic motivation ("My friends will think this is boring."). Each question had three response choices of "Not True", "True", and "Really True". Score range was 13-39.

This scale of AFFECT was constructed for this study, from the suggestion of Fabes, who had previously used sets of stylized faces with a frown, straight line, and smile to assess liking. One item on the current scale, one of Fabes' original items, failed to contribute to the reliability of the scale

("This game is too easy.") and was subsequently deleted from the analysis. The resulting alpha reliabilities of the one-factor scale in the baseline, experimental, and follow-up conditions were .83, .85, and .88, respectively.

Task performance scores. The challenging task consisted of a computer game designed for children, with an academic-like subject (language arts) in a game setting (Sesame Street scene and character). The game recorded a player's performance SCORE and had six LEVELS of play (letters to whole words). A subject's choice in the degree of difficulty LEVEL provided an optimal challenge. LEVELS one and two were collapsed into one for the analysis, for a total of five LEVELS, because levels one and two each matched one letter at a time. The difference was that the original level one matched identical capital letters or lower case letters, while the original level two matched one capital letter with one lower case letter. The difficulty and the time required for the two were similar. MINUTES of persistence were recorded for each trial.

Procedure for Subject Identification

Administration. The local school district was invited to participate in this study (Appendix A). The goals and procedures of the study were presented first to the superintendent in the participating district. When the superintendent approved the study, then the recommended school principals were contacted for permission to approach first and second grade teachers in their schools. Next, teachers were given information about participating, with their classes, in the study (Appendix B).

The study began in the second semester of the school year. This should have allowed enough time into the school year to be adjusted to the current teacher's pattern of rewarding. Children in grades one and two, who have had rewarding experiences with fewer teachers, were studied.

Teachers. All first and second grade teachers were invited to participate and asked to complete a questionnaire about rewarding attitudes and behaviors on the modified Fabes et al. (1989) Teacher Attitude/Behavior Survey (Appendix C). Teachers returned the survey at their convenience throughout the study. In addition, data on the rewarding

preferences of kindergarten teachers from the children's previous years were collected.

After principals and teachers agreed to take part in the study, informed parental consent was necessary for the participation of all children. Participating teachers were asked to distribute parental permission forms to the children. Children who returned signed permission forms were eligible to begin the study.

Parents. The consent form (Appendix D) briefly explained the study to parents with a space for the parent's signature as permission for participation and access to achievement records. Along with the parental consent signature was a request for demographic information and a survey about PARENTS' REWARDING attitudes and behaviors (Appendix E). The children were instructed to return the surveys to their teacher on the following day.

Efforts were made to maximize the children's participation rate by a follow-up permission form to the parents who do not respond to the first invitation to participate. Also, teachers were encouraged to remind their children to return the forms and to feel positive about the intrusions into their classrooms by the experimenter volunteering specific helpful duties,

such as monitoring lunch time and reading with the children. Positive relations were maintained with all school staff by making appointments for convenient times to work with the children. The combination of a reminder to parents and positive relations with the school helped to maximize the participation rate.

Children. After the parental consent forms were returned, all of the children in the study heard an explanation of the project and were asked to sign their consent to participate (Appendix F). They were told repeatedly that they were not being required to play the game and that they did not have to answer any question that they did not want to answer.

Next, the children who were participating in the study completed Harter's (1980) group measure of TRAIT intrinsic motivation in whole class groups or in smaller groups to accommodate school schedules (Appendix G). They responded on their individual forms after hearing the stimulus statements read aloud.

#### Experimental Procedure

Baseline. The subjects in each classroom were studied according to the current TEACHER'S REWARDING-- "usually rewarded" or "not usually rewarded" from the

teacher survey (Appendix C). The children engaged in the computer task individually. Each child either observed the game being played or engaged in a short practice session to understand the procedure. A child's first game trial was recorded as a baseline measure of performance (game SCORE, LEVEL, and persistence time in MINUTES) and AFFECT (Appendix H). All children seemed to be familiar with a computer game and the use of a joystick for making a response. Everyone was able to play the game.

Experiment. For the second task trial, the children were randomly placed in one of the two current REWARD conditions (REWARD promised or no mention of a REWARD) for the task. No mention of a REWARD was made to the first half of the children in each school who played the game; the second half of the children in that school were offered a REWARD for the performance. The rewarded children were asked not to tell others about their REWARD, to try to minimize confounding effects on those who were not rewarded. The children accumulated a second task motivation rating (game SCORE, LEVEL, persistence time in MINUTES, and AFFECT score). All interactions with the children were warm but nonchalant, with no feedback on

level of performance. This was done to ensure that motivation comes from the child's response to the task, not to the experimenter.

Follow-up. The final task performance opportunity occurred at least one week after the second task performance. This time, all children in the study performed the task with no mention of REWARDS. Children who had heard about other children getting a reward and asked about getting one, were told that there were no REWARDS today; no one protested farther or refused to play. Again, a game SCORE, LEVEL, and persistence time in MINUTES were recorded, and AFFECT was assessed by the self-report.

A file of all individual children's record forms was accurately maintained. Included is the parent's consent and demographic information, achievement record, result of the TRAIT intrinsic motivation measure, three task performance SCORES, LEVELS and length of persistence in MINUTES, along with each of the AFFECT survey results.

School principals and teachers were contacted in overlapping time periods so that some children were experiencing their game conditions while other teachers were being contacted for their participation

information. Schools were at different stages of the study to make maximum use of the field work time, and according to the scheduling preferences of each principal. One principal permitted working with the children at any time that was convenient for each teacher. The other principal approved only the forty five minutes in the morning when some children had arrived earlier than classes began. This principal later approved some classroom time in order to preserve some experimental conditions of subject order of selection and privacy and to complete the study in a reasonable time period.

Procedures for increasing the power of the expected effects in the study include increasing the number of subjects, both children and teachers. This is expensive in terms of the time required of the schools. Also, the use of only the classes of children having teachers with more extreme rewarding attitudes scores may increase the variance of the sample; the problems are the possibility of having too few subjects and of delaying data collection until all teacher information is available. Collecting data for the measures of several dependent variables gives more potential power for effects; the addition of

children's ACHIEVEMENT and the rewarding attitude and behavior ratings from parents of the children in the study could provide more information for analysis or for comparison with teacher's ratings effects on children's performance and interest.

Task\_reward. Material rewards have been shown to be the most detrimental to intrinsic motivation to perform and persist at a task. The REWARD for this task for young children was a physical object, a small plastic toy. Each child was shown an array of five toys, so that each child could indicate a preference for a desired REWARD. All children had the same choices available. The task-contingent, controlling, exogenous REWARD was given for any level of task performance ("You may have the toy you choose if you play the game").

## Results

Background Variables and Motivation Scales

Measures, variables, scales. Measures of the background variables of SES, SEX, and GRADE were taken from the parents' demographic survey. Subjects' ACHIEVEMENT came from school records. Measures of the existing condition independent variables of parent rewarding, teacher rewarding, and trait intrinsic motivation came from survey instruments; the experimental reward condition was a part of the study design. Measures of the dependent task motivation variables of SCORE, LEVEL, and MINUTES were recorded during the three trials of the study design, and a measure of AFFECT was taken from a survey developed for that purpose.

Matching procedure. A statistically significant correlation between PARENT REWARDING and the condition of being REWARDED (.16,  $p = .008$ ) and between TEACHER REWARDING and the condition of being REWARDED (-.12,  $p = .03$ ) pointed to a lack of randomization in the experimental rewarding. Therefore, by matching subjects on the basis of their rewarding experience and rewarding condition, 28 subjects were eliminated. The results are based on a sample of 207.

Background variables and task motivation. The task motivation variables included a game SCORE, a LEVEL of difficulty rating, the number of MINUTES played, and an AFFECT score. Some Pearson Correlation Coefficients were significant for the background variables of ACHIEVEMENT, PARENTS' level of favoring REWARDING, and TEACHERS' level of favoring REWARDING, with the dependent measures of performance SCORES, LEVEL choice, MINUTES of persistence, and AFFECT measures. Table 2 shows that the TEACHER REWARDING

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was positively related to the LEVEL of difficulty chosen (children whose teachers were more in favor of rewarding chose higher LEVELS of difficulty). PARENT REWARDING was not significantly related to any task motivation variable.

A MANOVA was conducted on the three assessments of each of the four dependent variables of task motivation (SCORE, LEVEL, MINUTES and AFFECT), by grade. Because of the significance of the MANOVA, Wilks' Lambda,  $F(1,134) = 3.33$ ,  $p = .000$ , follow-up t-tests were conducted on each of the measures of the

task motivation variables. The means and standard

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Insert Table 3 about here  
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deviations of the variables, by GRADE, are presented in Table 3 with the significance of the findings. Because of the numerous GRADE differences, several analyses are reported separately by GRADE.

A regression analysis was performed on the effects of SEX, PARENT REWARDING, ACHIEVEMENT, GRADE, and TEACHER REWARDING on game SCORES, LEVEL of difficulty, MINUTES of persistence, and AFFECT. There was a significant F-change ( $p < .05$ ) for GRADE on some conditions of each variable. SEX was a significant predictor of the baseline game SCORE and of the AFFECT scores. The entry of TEACHER REWARDING showed a significant F-change for the LEVEL of difficulty.

Background and trait motivation variables. The measure of the TRAIT of intrinsic motivation on the Harter scale was positively correlated with the background variables of ACHIEVEMENT (.28,  $p = .000$ ) and with SES (.12,  $p = .046$ ). Table 4 shows some relationships between background variables and the two

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Insert Table 4 about here  
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factors of trait intrinsic motivation. Second grade children scored higher than first graders on the Harter scale. The JUDGMENT subscale was also negatively related to SEX. Boys reported higher internal criteria for judgment. A  $t$ -test revealed significant sex differences only for the experimental and follow-up affect measures ( $t(205) = 2.90, p = .004$  and  $t(205) = 3.08, p = .002$ , respectively). First grade teachers reported being more in favor of rewarding than did second grade teachers.

Background variables. Intercorrelations of background variables in Table 5 seem to imply that PARENTS' tendency to favor REWARDING was related to lower ACHIEVEMENT ( $-.27, p = .000$ ) and lower SES ( $-.17, p = .007$ ). Children of PARENTS who favor REWARDING have lower ACHIEVEMENT and lower SES.

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Insert Table 5 about here  
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In addition to relationships between the measures of trait and task motivation and measures of the

background variables and the interrelationships among the background variables, there are intercorrelations among the measures of task motivation. These are analyzed separately for Grade 1 and Grade 2 in Tables 6 and 7, respectively. The correlations between AFFECT and the other measures of task motivation have a great difference in Grade 1 and Grade 2.

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Insert Table 6 about here

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Insert Table 7 about here

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Interrelationships Across Trait and Task Motivation Scales

The other measure of intrinsic motivation, besides the measures of task motivation, was the Harter (1980) scale which assessed a generalized TRAIT of intrinsic motivation. The TASK and TRAIT measures of intrinsic motivation were related as shown in Table 8. This study was designed to measure task specific intrinsic motivation versus the general TRAIT of intrinsic motivation. The Harter MASTERY score was positively

related to all game SCORES. Negative correlations with the JUDGMENT subscale show that the AFFECT scores were lower for those children with higher Harter internal JUDGMENT scores.

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Insert Table B about here  
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According to a higher order factor analysis conducted by Harter and again in this study, the TRAIT of intrinsic motivation was analyzed in two factors, a MASTERY and an internal JUDGMENT factor. Correlations are shown for the four measures of task intrinsic motivation (SCORE, LEVEL, MINUTES, and AFFECT) in each of the three task trials (baseline--1, experimental--2, and follow-up--3), separately for each of the Harter TRAIT motivation factors. The relationships of trait and task intrinsic motivation have been shown, as well as the interrelationships among the task motivation variables and the relationships of the background variables and the measures of task motivation.

Hypothesis one. The generalized TRAIT of intrinsic motivation should be positively associated with the baseline task motivation variables of game

SCORE, persistence in MINUTES, and AFFECT. To show the effects of initial TRAIT intrinsic motivation on task motivation, each of the Harter subscales of MASTERY and Internal JUDGMENT was compared to the baseline measures of the SCORE, LEVEL, MINUTES, and AFFECT of task motivation. Earlier studies used a sample that was initially high in intrinsic

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Insert Table 9 about here  
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motivation. Table 9 shows the analysis that was performed to investigate the effect, by grade level, on the baseline task motivation measures, for children who were initially high or low in TRAIT intrinsic motivation. The correlation between the MASTERY and the JUDGMENT subscales was .27,  $p = .000$ , so each child in the sample did not always have similar scores on each subscale. TRAIT motivation scores are generally higher in Grade 2 and some task scores were slightly higher for higher JUDGMENT scores, but task motivation scores were not higher for the higher MASTERY scores. There was a significant correlation in Grade 2 for the Judgment and the AFFECT,  $-.25$ ,  $p < .01$ .

Effects of Parent and Teacher Rewards on TaskMotivation

Hypothesis two. The TRAIT measure of intrinsic motivation should be more strongly related to PARENT REWARDING while the task-specific measures of intrinsic motivation should be more strongly related to TEACHER REWARDING in the classroom. In this study, PARENTS' REWARDING attitudes were more highly correlated with the background variables of ACHIEVEMENT ( $-.27, p = .000$ ) and with SES ( $-.17, p = .007$ ) than with Harter MASTERY ( $-.16, p < .05$ ) or with Harter JUDGMENT ( $.03, p > .05$ ). Likewise, TEACHERS' REWARDING attitudes were not significantly related to Harter MASTERY ( $-.03, p > .05$ ) or to Harter JUDGMENT ( $.02, p > .05$ ). Neither TEACHERS' REWARDING nor PARENTS' REWARDING was significantly related to the initial TRAIT of intrinsic motivation in this study.

TEACHERS' REWARDING was positively related to task motivation in the LEVEL of difficulty chosen ( $.21, p < .01$ ;  $.28, p < .01$ ;  $.07, p > .05$ ) in the three playing trials. A regression analysis showed no effects of PARENT REWARDING on any task motivation variable. There was a significant E-change of TEACHER REWARDING on the game LEVEL of difficulty.

Therefore, the hypothesized effect of PARENT REWARDING on the TRAIT of intrinsic motivation was not shown. The effect of TEACHER REWARDING on task intrinsic motivation was shown for game LEVEL.

#### Reward History in Mediating the Effects of Rewards

The effects of rewards on task motivation were analyzed by dividing the sample into four groups, based on the classroom TEACHERS' attitude toward REWARDING and the experimental condition of being offered a REWARD or not. The children were divided into those who were experiencing more or less classroom rewarding and those who were rewarded in each of those groups. Group 1 was in the high teacher rewarding and got no reward; Group 2 was in low teacher rewarding and did get a reward; Group 3 was in the high teacher rewarding and did get a reward; Group 4 was in the low teacher rewarding and got no reward. The rewarding conditions of Groups 1 and 2 were inconsistent with their usual current experience of being rewarded for tasks, and the rewarding conditions of Groups 3 and 4 were consistent with the usual current experience of being rewarded.

The upper one third and the lower one third of the TEACHER REWARDING scores were used to analyze the

effects of TEACHER REWARDING and the REWARD condition on the task motivation measures of game SCORE, LEVEL, MINUTES of persistence, and AFFECT. TEACHER REWARDING cutoff scores were less than 47 and greater than 55. These extreme scores show more variation in the effects on the dependent variables. The resulting sample size was 138.

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Insert Figure 3 about here

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Figures 3 and 4 show the mean scores of the task motivation measures in the three playing trials, broken down by grade, according to the four groups of the sample based on rewarding experience with the current teacher and the experimental condition of being rewarded or not. Figure 3 shows Grade 1 and Figure 4 shows Grade 2. Patterns of performance can be detected from the figures. Game SCORES generally increase across game trials, except for the children who have experienced rewards from their teacher and get no REWARD on the second game trial (Group 1). The

LEVEL chosen tends to increase in all groups across the three trials. MINUTES of playing time tended to increase after the experimental condition in Grade 1 (except Group 1) and to decrease in Grade 2. AFFECT changed very little from the experimental to the follow-up condition, except for a drop in the Grade 2 children who did not usually get a reward from their teacher and did get one for the second game trial (Group 2).

In Grade 1, the LEVEL of difficulty in the follow-up playing condition was significantly different for Groups 3 and 4. In Grade 2, the LEVEL of difficulty in the experimental playing condition was significantly different for Groups 2 and 3 and for Groups 3 and 4.

For Grade 1 (Figure 3), in Group 1, three significant differences were between SCORES 1 and 2 with  $t(9) = -3.49$ ,  $p = .007$  and between LEVELS 2 and 3 with  $t(9) = -2.45$ ,  $p = .037$ . Group 2 significant differences were between SCORES 2 AND 3,  $t(11) = -2.26$ ,  $p = .045$ , between LEVELS 2 and 3,  $t(11) = -4.29$ ,  $p = .001$ , and between the baseline and the experimental AFFECT,  $t(11) = -2.19$ ,  $p = .05$ . Group 3 had significant differences between SCORES 2 and 3

with  $t(17) = -2.72$ ,  $p = .014$  and between LEVEL 2 and 3,  $t(17) = -3.53$ ,  $p = .003$ . There were also Group 3 differences between MINUTES 2 and 3,  $t(17) = -2.79$ ,  $p = .013$ . Group 4 had no significant differences.

For Grade 2 (Figure 4), in Group 1, significant differences were between LEVELS 2 and 3,  $t(16) = -3.13$ ,  $p = .007$ . Group 2 significant difference was between LEVELS 2 and 3,  $t(17) = -4.31$ ,  $p = .000$ . Group 3 significant differences were between LEVELS 1 and 2,  $t(25) = -2.43$ ,  $p = .022$  and between LEVELS 2 and 3,  $t(25) = -3.17$ ,  $p = .004$ . Group 4 difference was between LEVELS 2 and 3,  $t = -3.55$ ,  $p = .002$ .

Children who were not rewarded and were not accustomed to a reward from their teacher (Group 1) tended to maintain their baseline scores except for MINUTES of playing time in Grade 2. Children who were rewarded and were not accustomed to rewards from their teacher (Group 2) tended to increase all scores after the REWARD in Grade 1 and the increase only the LEVEL after the REWARD in Grade 2. Children who were rewarded and were accustomed to rewards from their teacher (Group 3) tended to increase their scores, except the MINUTES of playing time, throughout the three playing trials. Children who were not rewarded

and who were accustomed to a reward from their teacher (Group 4) tended to decrease their SCORES and MINUTES of persistence after the experimental condition, but to continually increase the LEVEL of difficulty.

Hypothesis three. The hypothesis of the interaction of TEACHER REWARDING and the condition of being REWARDED was only weakly supported in some groups. The children who were not accustomed to rewards from their teacher did not always score higher in the baseline, as had been predicted. Children who were rewarded consistent with their experience (Groups 3 and 4) did tend to increase in the follow-up scores. Children who were rewarded inconsistent with their experience (Groups 1 and 2) tended to maintain or to decrease scores at the follow-up, except for Group 2 in Grade 1 where an over-justification effect had been predicted. Figure 5 compares the predicted response patterns (from Figure 2) to the actual response patterns (from Figures 3 and 4).

A MANOVA was conducted with main effects for the group,  $F(3,130) = 1.62$ ,  $p = .02$ , and again for grade,  $F(1,130) = 3.49$ ,  $p = .000$ . The main effect for group is an interaction of TEACHER REWARDING and REWARD since the groups were formed according to high and low

TEACHER REWARDING scores and the experimental condition of getting a REWARD. This interaction effect was significant for LEVEL 2 and LEVEL 3. There was an interaction effect of group by grade,  $F(3,130) = 1.46$ ,  $p = .05$ . There was no significant effect of reward.

A regression analysis was performed on this sample of 138, with the middle one third on TEACHER REWARDING removed. Grade was the significant predictor of game SCORES, and TEACHER REWARDING was the significant predictor of game LEVEL. Sex was a significant predictor of AFFECT, with PARENT REWARDING and ACHIEVEMENT being significant on the baseline AFFECT.

## Discussion

### Trait and Task Motivation

It is known that socioeconomic status (SES) and achievement tend to be related to motivation (Pintrich & DeGroot, 1990; Reynolds, 1989), and in this study SES and achievement were related to the Harter Mastery portion of motivation.

Hypothesis one. In reference to the first hypothesis of the relationship between trait and task intrinsic motivation, children who scored higher on the Judgment subscale of the trait measure, also scored higher on half of the four task motivation variables in each grade (Table B). However, the children who scored higher on the Mastery subscale did not have higher scores than did those who scored lower on the Mastery subscale. It seems, both from observing the children as they reported their responses and from the results, that children who scored higher on Mastery were trying to please the teacher and that those who scored higher on Judgment were choosing to learn what interested them. This Judgment may be more related to intrinsic motivation to perform, where children had a choice in participating and in the level and time to

participate. These children who were more able to make independent decisions were more likely to report lower affect; they may have been more free from the need to please adults.

Higher levels of parent rewarding were related to lower achievement in the children (Table 9). Higher levels of parent rewarding were also related to lower scores on the Harter Mastery. Higher scores on the Harter Mastery were related to higher achievement. It seems possible that more parent rewarding is associated with dependence on the reward for task performance, hence to lower achievement overall. The children who score higher on the Mastery scale also seemed to want to please the teacher. Children who are anxious to please others, rather than pursue and satisfy their own interests, may have higher achievement (in pleasing parents and teachers) and may score higher on the Mastery subscale of trait intrinsic motivation (in reporting the pleasing of teachers). These relationships warrant further study.

Children in Grade two were more likely to report higher intrinsic motivation on the Harter scale, score higher on the game, play longer in the first two conditions, and to report higher affect for the

tasks. The Stipek (1981) study which showed no decrease in positive attitude toward school throughout first grade may be extended to second grade since the second graders had higher performance and affect scores than the first graders in the present study.

Boys scored higher on the internal judgment of intrinsic motivation. Boggiano et al. (1985) reported that girls seem to be more sensitive to the controlling potential of any reward; they may perceive themselves to be less in control of their own judgment for decision making. However, parents reported higher favoring of rewarding for boys; mothers in the Fabes et al. (1989) study of rewarding expected more prosocial acts from daughters than from sons. The girls in the present study reported higher affect after all three playing conditions. This is in agreement with Ryan et al. (1983) who believed that some of the differences in boys' and girls' intrinsic motivation was in differential enjoyment of the task, although the girls in the present study had lower intrinsic motivation on the Harter scale and on some performances while they had higher affect scores. The girls, in feeling more controlled, may report less

internal criteria for judgment and also report more (socially acceptable) liking for the task.

#### Effects of Parent and Teacher Rewards on Task

##### Motivation

Hypothesis two. As predicted in the second hypothesis, the task motivation in game scores and level choices tended to be related to the teacher's attitudes about rewarding, but in the positive direction. However, parent rewarding was not significantly related to either trait or task intrinsic motivation. The parent rewarding relation to lower socioeconomic status and to lower achievement was in the predicted direction, since parents who have fewer opportunities to offer their children and who reward more would seem to control their children more and to inhibit their children's tendency to internalize the pursuit of competence (Harter, 1981b). The scale used to assess parents' and teachers' rewarding attitudes asked specifically about material rewards in terms of physical objects; these are the rewards that are most likely to be used in a controlling way (Deci & Ryan, 1985b). The trait intrinsic motivation, as measured by the Harter scale, was positively related to achievement, SES, and

grade. However, the relationship between parental rewarding and trait intrinsic motivation did not reach statistical significance.

#### Reward History in Mediating the Effects of Rewards

Hypothesis three. The third hypothesis dealing with the interaction between rewarding experience in the classroom and the experimental rewarding condition had more varied results, according to the specific independent variable and the grade of the child.

Children who were rewarded were somewhat less likely to play the full allotted time in the experimental condition. Group 1 children who usually get rewards from their teacher but did not get one tended to drop in the game score and the number of minutes played in the follow-up trial. Group 2 children who usually do not get rewards from their teachers but did get one tended to increase in all areas except the Grade 2 number of minutes and the affect. Group 3 children who usually get rewards from their teachers and who did get a reward tended to increase in all playing trials. Group 4 children who usually do not get rewards from their teachers and who did not get a reward tended to stabilize or to

increase their game scores and level of difficulty but to decrease number of minutes played in Grade 2.

These results are generally in the predicted direction for children who are usually rewarded, but they do not show the overjustification effect as purported by Lepper et al. (1973). It seems that the Group 2 experimental condition showed no effect of getting the reward. However, they showed some increases at the follow-up. It is possible that the reward combined with getting out of class to play a game was a positive experience, so that scores did not drop. Perhaps the effect of rewarding must be shown in a more natural setting in a classroom and in more controlled conditions. In these two school settings, there was little control of the time, location, or order of working with subjects.

Some of the predicted effects of rewards, such as the Group 3 children who usually get a reward from their teacher and who got a reward, seemed to occur later than when the reward was actually given. The Group 3 children increased their performance in the follow-up instead of in the experimental condition. Perhaps the effect was a little longer-term than the experimental design showed. Since parental rewarding

was associated with overall achievement instead of with the trait measure in this study, the effect of a reward may be on a later performance than on the specific classroom performance for which the reward is given. Likewise, Group 2 children who do not usually get rewards from their teacher but did get a reward for this performance, generally showed an increase in performance. Perhaps they were responding to the unexpected pleasure of being rewarded, but would drop in performance with a longer term follow-up.

#### Study confounds

Relations between rewarding and task performances seldom reached significance in this study. Two possible reasons could be that the task was overly interesting and that less-than-controlled conditions in the public schools admitted some confounding error to the study. Children who were offered a reward could be seen visually attending to the reward and would talk about their choice of a reward even while they were playing; however, they often still wanted their maximum playing time, after asking about their total possible playing times during the entire study. Also, children often found out from their peers that rewards were sometimes offered, and so it was

difficult to determine when they were actually participating with an expectation of a reward (even though they were told when they asked that there would be no prizes for a given playing condition). The study was based on children's expectation of a reward according to experience with the teacher's reward pattern. Also, the quality of the reward may not have been high enough to significantly interfere with performance. The plastic toy reward choices were intended to produce an effect similar to a classroom setting reward, but not to have an overly exaggerated effect with a large reward. Perhaps the reward was not desirable enough to the children to produce the over-justification effect.

Another possible confound in the study involved some teachers' lack of enthusiasm for giving up time for children's participation in the study. Children sometimes came to the playing condition knowing that the teacher would prefer that they finish some class task. Some children who declined more playing time still answered the affect question ("If I had more time, I would want to play this game some more.") as "Really True"; upon questioning, they responded that they needed to be back with their class.

The lack of randomization in the study design interfered with internal validity. Since it was not possible in the public school setting to choose subjects randomly to be rewarded, the children who participated first were not rewarded. The intention was to keep children who were not offered a reward from knowing that other children were being offered a reward. A result of this procedure was that children whose parents were more in favor of rewards were less likely to be rewarded. It seemed that those children who played the game first were those whose parents were more in favor of rewards. A matching procedure, to lower the significant correlation between parent rewarding and the experimental condition of being rewarded, eliminated twenty eight subjects. The purpose of the matching procedure was to rectify the internal validity confound. Still, the internal validity would be higher with random selection of subjects for the experimental treatment. External validity, in generalization of the results to other first and second classes of children, must take into account the lack of randomization. Replication of the study design, with random selection of subjects and

randomization of the experimental treatment, is recommended.

### Implications

An application of these findings would involve information for well-meaning teachers who are actually inhibiting intrinsic motivation through improper use of rewards. The greatest decreases in score were for children who usually get rewards and they got no reward and in affect for children who usually get no reward and they got one for this performance. All of the Grade 2 children decreased in the number of minutes played in the follow-up trial except those who are usually rewarded and got a reward. It seems that the children who were rewarded according to their usual classroom experiences performed better in the follow-up game trial. If prior experience with rewards does affect the most efficient current use of rewards, child care professionals could learn to match rewarding conditions with rewarding experience. However, this is quite difficult with a large group of children; the same confounds of this study--children knowing of other's rewarding conditions--complicates optimum rewarding.

The goal is to enhance and/or maintain the highest possible levels of intrinsic motivation (Gottfried, in press). It seems that internalization of rewarding Harter (1980) must be the most efficient for education. The emphasis on rewarding in many school systems makes it difficult to study this problem, since there are fewer people who do not rely on some rewarding system to induce compliance in children. More controlled study, such as a sample of only the lowest rewarding and the highest rewarding teachers and of children who have no knowledge of others' rewarding experiences, may have more definitive answers for rewarding experience and rewarding condition questions.

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## Appendix A

## Presentation Of Study

Most parents and teachers are concerned about the motivation of their children and the ability of their schools to enhance children's achievement. At Virginia Tech, we are conducting a study on first and second grade children's motivation.

I would like to study about 200-300 children in 10 to 15 classrooms. This will require the consent of the County Superintendent, building principals, classroom teachers, and children and their parents.

We have selected a novel task, using a computer, to study children's motivation. Each child will participate about fifteen minutes at three separate times--as a baseline, with a reward condition, and as a follow-up. A class of children will be placed into a rewarding condition (promise of a reward for performance or no mention of a reward), answer one set of intrinsic motivation questions, do the activity three times over a two week period, and answer some interest questions. Their teacher will complete a survey of rewarding attitudes and behaviors.

Thank you,

Marilyn Gadomski

Appendix B

Teacher Information

I am conducting a study of children's interest in doing a computer game. The children will be asked to answer some questions about their learning preferences and they will do the tasks for about three fifteen minute sessions plus one 20-25 minute group session over a two week period in the school.

The children's parents will be sent a consent form and an attitude survey to authorize their children's participation.

Your involvement would entail completing the brief questionnaire which is attached. After responses are coded by school, class, and individual child, the names will be removed from all responses to ensure confidentiality. You may decline participation without prejudice and may stop participation at any time.

Thank you for your time and cooperation.

Marilyn Gadomski

Department of Family and Child Development  
Virginia Tech



RATING SCALE: If you Strongly Disagree, Circle 1  
 If you Disagree, Circle 2  
 If you are Undecided, Circle 3  
 If you Agree, Circle 4  
 If you Strongly Agree, Circle 5

- 8. The use of rewards to motivate children can provide a quick and effective way to get a child to do what you want them to do. 1 2 3 4 5
- 9. The use of rewards to motivate children can help to create positive relationships between parents and children. 1 2 3 4 5
- 10. When children become accustomed to receiving a reward for doing something, they become more interested in getting the reward than in the behavior which leads to the reward. 1 2 3 4 5
- 11. Children feel better about doing an activity for which they are promised a reward. 1 2 3 4 5
- 12. Children are more interested in working on new activities if they usually get rewards for working on any activity. 1 2 3 4 5

PART 2. These items concern the ways that teachers interact with the children in their classes. Before you begin, bear in mind that the children referred to in these items are the children participating in this study. Based upon your interactions with these children, indicate the extent to which the statement describes your tendencies.

RATING SCALE:  
 If you Almost Never behave that way Circle 1  
 If you Seldom behave that way, Circle 2  
 If you behave this way about half the time or are Unsure Circle 3  
 If you Often behave this way, Circle 4  
 If you Almost Always behave this way, Circle 5

TO WHAT EXTENT DO YOU...

- 13. give the children a reward for behaving properly? 1 2 3 4 5
- 14. give the children a reward for getting good grades? 1 2 3 4 5

RATING SCALE:

- |   |   |   |   |   |   |          |
|---|---|---|---|---|---|----------|
| If you Almost Never behave that way   |   |   |   |   |   | Circle 1 |
| If you Seldom behave that way,  |   |   |   |   |   | Circle 2 |
| If you behave this way about half the time or are Unsure,   |   |   |   |   |   | Circle 3 |
| If you Often behave this way,   |   |   |   |   |   | Circle 4 |
| If you Almost Always behave this way,   |   |   |   |   |   | Circle 5 |
|   |   |   |   |   |   |          |
| 15. provide the children with rewards or privileges for helping to keep the classroom neat and clean? | 1 | 2 | 3 | 4 | 5 |          |
| 16. provide the children with a reward for doing something they do NOT particularly like to do?       | 1 | 2 | 3 | 4 | 5 |          |
| 17. provide the children with a reward for doing something they particularly like to do?              | 1 | 2 | 3 | 4 | 5 |          |
|   |   |   |   |   |   |          |
| IF YOU GIVE REWARDS, TO WHAT EXTENT DO YOU  |   |   |   |   |   |          |
| 18. give rewards according to performance, such that "better" performance merits a "better" reward?   | 1 | 2 | 3 | 4 | 5 |          |

Appendix D

Parent Consent Form

Dear Parents:

Most parents are concerned about the motivation of their children and the ability of their schools to enhance children's achievement. At Virginia Tech, we are conducting a study on children's motivation. We have selected a task, using a computer, to help understand children's motivation. Children will be asked to answer some questions about their learning preferences, do the computer task for about fifteen minutes on three separate times over a two week period in the school, and answer some questions about their interest in the activity.

Your child is in one of the few classes in the county to be asked to participate in this study. It is vital to get the response of every child in the class; the results need to be shown to be true for all children in a group, and individual children may not understand being left out of the activity. Please sign and return the forms to school tomorrow if you want to give consent for your child to take part in the study and for permission for me to look at your child's school records for previous years' grades and

test scores. You or your child may decline participation without prejudice and may stop participation at any time. We hope that you will participate as your cooperation is vital to the success of the study of children's motivation.

The requested family information shows that the results apply to all parental occupational and educational levels and the child's grades show that the results apply to all achievement levels. Your ideas about rewarding will be matched with your child's responses and coded by school, class, and individual child. The names will be removed from all responses to ensure confidentiality.

Results of the effects of rewards on children's motivation may help parents and teachers to interact with their children more effectively for maximum performance. The results are available to parents and to the schools. If there are any questions, please call me at (703) 951-4233.

Thank you for your time and cooperation.

Marilyn Gadomski

Virginia Tech

Child's Name \_\_\_\_\_

Sex\_\_\_ Grade in School\_\_\_\_\_ Date of Birth \_\_\_\_\_

Parent's Signature \_\_\_\_\_



RATING SCALE: If you Strongly Disagree, Circle 1  
 If you Disagree, Circle 2  
 If you are Undecided, Circle 3  
 If you Agree, Circle 4  
 If you Strongly Agree, Circle 5

- 9. The use of rewards to motivate children can help to create positive relationships between parents and children. 1 2 3 4 5
- 10. When children become accustomed to receiving a reward for doing something, they become more interested in getting the reward than in the behavior which leads to the reward. 1 2 3 4 5
- 11. Children feel better about doing an activity for which they are promised a reward. 1 2 3 4 5
- 12. Children are more interested in working on new activities if they usually get rewards for working on any activity. 1 2 3 4 5

PART 2. These items concern the ways that parents interact with their children. Before you begin, bear in mind that the child referred to in these items is the child participating in this study. Based upon your interactions with this child, indicate the extent to which the statement describes your tendencies.

RATING SCALE:  
 If you Almost Never behave that way Circle 1  
 If you Seldom behave that way, Circle 2  
 If you behave this way about half the time or are Unsure, Circle 3  
 If you Often behave this way, Circle 4  
 If you Almost Always behave this way, Circle 5

TO WHAT EXTENT DO YOU...

- 13. give the children a reward for behaving properly? 1 2 3 4 5
- 14. give the children a reward for getting good grades? 1 2 3 4 5
- 15. provide the children with rewards or privileges for helping to keep the classroom neat and clean? 1 2 3 4 5
- 16. provide the children with a reward for doing something they do NOT particularly like to do? 1 2 3 4 5

RATING SCALE:

- If you Almost Never behave this way, Circle 1
- If you Seldom behave this way, Circle 2
- If you behave this way about half the time or are Unsure, Circle 3
- If you Often behave this way, Circle 4
- If you Almost Always behave this way, Circle 5

17. provide the children with a reward for doing something they particularly like to do? 1 2 3 4 5

IF YOU GIVE REWARDS, TO WHAT EXTENT DO YOU

18. give rewards according to performance, such that "better" performance merits a "better" reward? 1 2 3 4 5

Mother's Occupation

Father's Occupation

Mother's Highest Level of School Completed

Father's Highest Level of School Completed

## Appendix F

## Child Informed Consent

Day\_of\_Introduction

At Virginia Tech we are interested in what children want to learn and in how they feel. This study will try to find out about your interest in a computer game. You may stop at any time and there are no grades for playing or for not playing.

You will each have three different turns to do a computer game. I will ask you some questions about the game and about what you like to do, after each of your turns. There are no right and wrong answers to these questions.

If you want to do this, take the permission form home and ask one of your parents to sign it. Please return the form tomorrow so that we may begin to take turns with the game.

Day\_of\_Task\_Trial--Baseline

Today you will have your first turn to try a game. You may stop the activity at any time. This computer game matches letters and gives Cookie Monster a cookie from the oven. Match the letters on the oven with the moving letters under Cookie Monster's feet. The control stick moves from side to side to make

Cookie Monster chase the letters. It has to be straight up to make him stop. Press the red button to choose the letter you want and match the letter on the oven. This is the way to play.

Day\_of\_Task\_Trial--Experimental\_Condition

Promised\_Reward. You may do the computer game today to get a prize. If you play the game, you may choose one of these toys for your prize. Which one would you like to play for? Tell me when you have finished and you may have the toy.

No\_mention\_of\_reward. It is your turn to do the computer game again today. Tell me when you are finished.

Day\_of\_Task\_Trial--Follow-up

This is your last turn to do the computer game. There will be no prizes this time. Tell me when you are finished.

Child Consent Form

I agree to take part in the study by answering some questions and by playing the computer game. I know that I may stop the activity at any time.

-----

Appendix G

Harter's Intrinsic Motivation Measure  
Pupil's Form

Name \_\_\_\_\_ Age \_\_\_\_\_ Birthday (Month) \_\_\_\_\_ (Day) \_\_\_\_\_  
Grade \_\_\_\_\_ Teacher \_\_\_\_\_ Boy or Girl (circle which)

Sample Questions

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me	
(a)	<input type="checkbox"/>	<input type="checkbox"/>	Some kids would rather play outdoors in their spare time	<b>BUT</b>	Other kids would rather watch T.V.	<input type="checkbox"/>	<input type="checkbox"/>
(b)	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like hamburgers better than hot dogs	<b>BUT</b>	Other kids like hot dogs better than hamburgers.	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>							
M 1.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like hard work because its a challenge	<b>BUT</b>	Other kids prefer easy work that they are sure they can do	<input type="checkbox"/>	<input type="checkbox"/>
M 2.	<input type="checkbox"/>	<input type="checkbox"/>	When some kids don't understand something right away they want the teacher to tell them the answer	<b>BUT</b>	Other kids would rather try and figure it out by themselves	<input type="checkbox"/>	<input type="checkbox"/>
M 3.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids work on problems to learn how to solve them	<b>BUT</b>	Other kids work on problems because you're supposed to	<input type="checkbox"/>	<input type="checkbox"/>
T 4.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids almost always think that what the teacher says is O.K.	<b>BUT</b>	Other kids sometimes think their own ideas are better	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids know when they've made mistakes without checking with the teacher	<b>BUT</b>	Other kids need to check with the teacher to know if they've made a mistake	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like difficult problems because they enjoy trying to figure them out	<b>BUT</b>	Other kids don't like to figure out difficult problems	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids do their school-work because the teacher tells them to	<b>BUT</b>	Other kids do their school-work to find out about alot of things they've been wanting to know	<input type="checkbox"/>	<input type="checkbox"/>

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me	
M 8.	<input type="checkbox"/>	<input type="checkbox"/>	When some kids make a mistake they would rather figure out the right answer by themselves	BUT	Other kids would rather ask the teacher how to get the right answer	<input type="checkbox"/>	<input type="checkbox"/>
T 9.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids know whether or not they're doing well in school without grades	BUT	Other kids need to have grades to know how well they are doing in school	<input type="checkbox"/>	<input type="checkbox"/>
T 10.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids agree with the teacher because they think the teacher is right about most things	BUT	Other kids don't agree with the teacher sometimes and stick to their own opinion	<input type="checkbox"/>	<input type="checkbox"/>
M 11.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids would rather just learn what they have to in school	BUT	Other kids would rather learn about as much as they can	<input type="checkbox"/>	<input type="checkbox"/>
T 12.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like to learn things on their own that interest them	BUT	Other kids think its better to do things that the teacher thinks they should be learning	<input type="checkbox"/>	<input type="checkbox"/>
M 13.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids read things because they are interested in the subject	BUT	Other kids read things because the teacher wants them to	<input type="checkbox"/>	<input type="checkbox"/>
T 14.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids need to get their report cards to tell how they are doing in school	BUT	Other kids know for themselves how they are doing even before they get their report card	<input type="checkbox"/>	<input type="checkbox"/>
M 15.	<input type="checkbox"/>	<input type="checkbox"/>	If some kids get stuck on a problem they ask the teacher for help	BUT	Other kids keep trying to figure out the problem on their own	<input type="checkbox"/>	<input type="checkbox"/>
M 16.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like to go on to new work that's at a more difficult level	BUT	Other kids would rather stick to the assignments which are pretty easy to do	<input type="checkbox"/>	<input type="checkbox"/>
T 17.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids think that what the teacher thinks of their work is the most important thing	BUT	For other kids what they think of their work is the most important thing	<input type="checkbox"/>	<input type="checkbox"/>
M 18.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids ask questions in class because they want to learn new things	BUT	Other kids ask questions because they want the teacher to notice them	<input type="checkbox"/>	<input type="checkbox"/>
T 19.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids aren't really sure if they've done well on a test until they get their papers back with a mark on it	BUT	Other kids pretty much know how well they did even before they get their paper back	<input type="checkbox"/>	<input type="checkbox"/>

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
20.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like the teacher to help them plan what to do next	BUT	Other kids like to make their own plans for what to do next	<input type="checkbox"/>
21.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids think they should have a say in what work they do in school	BUT	Other kids think that the teacher should decide what work they should do	<input type="checkbox"/>
22.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like school subjects where its pretty easy to just learn the answers	BUT	Other kids like those school subjects that make them think pretty hard and figure things out	<input type="checkbox"/>
23.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids aren't sure if their work is really good or not until the teacher tells them	BUT	Other kids know if its good or not before the teacher tells them	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like to try to figure out how to do school assignments on their own	BUT	Other kids would rather ask the teacher how it should be done	<input type="checkbox"/>
25.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids do extra projects so they can get better grades	BUT	Other kids do extra projects because they learn about things that interest them	<input type="checkbox"/>
26.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids think its best if they decide when to work on each school subject	BUT	Other kids think that the teacher is the best one to decide when to work on things	<input type="checkbox"/>
27.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids know they didn't do their best on an assignment when they turn it in	BUT	Other kids have to wait til the teacher grades it to know that they didn't do as well as they could have	<input type="checkbox"/>
28.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids don't like difficult schoolwork because they have to work too hard	BUT	Other kids like difficult schoolwork because they find it more interesting	<input type="checkbox"/>
29.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like to do their schoolwork without help	BUT	Other kids like to have the teacher help them do their schoolwork	<input type="checkbox"/>
30.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids work really hard to get good grades	BUT	Other kids work hard because they really like to learn things	<input type="checkbox"/>

## Appendix H

## Affect Measure

1.	This game is fun.	NOT TRUE	TRUE	REALLY TRUE
2.	My friends will think this activity is boring.	NOT TRUE	TRUE	REALLY TRUE
3.	I feel good playing this game.	NOT TRUE	TRUE	REALLY TRUE
4.	If I had more time, I would want to keep playing this game for a while.	NOT TRUE	TRUE	REALLY TRUE
5.	I enjoyed playing this game.	NOT TRUE	TRUE	REALLY TRUE
6.	I would rather do something else than play this game.	NOT TRUE	TRUE	REALLY TRUE
7.	I wish I could play this game at home.	NOT TRUE	TRUE	REALLY TRUE
8.	This game is not much fun.	NOT TRUE	TRUE	REALLY TRUE
9.	This game is too easy.	NOT TRUE	TRUE	REALLY TRUE
10.	I am good at this game.	NOT TRUE	TRUE	REALLY TRUE
11.	I like this game.	NOT TRUE	TRUE	REALLY TRUE
12.	Most things are more fun than this game.	NOT TRUE	TRUE	REALLY TRUE
13.	I felt happy when I played this game.	NOT TRUE	TRUE	REALLY TRUE

Table 1

Numbers of Participants by Sex, School, and Grade

School	Sex	
	Boys	Girls
-----		
School 1		
Grade 1	38	27
Grade 2	40	30
School 2		
Grade 1	30	20
Grade 2	23	27
-----		

Table 2

Correlations of Background Variables and Task  
Motivation

	Background Variables		
	Achievement	Parent Rewards	Teacher Rewards
Score 1	.15*	-.10	-.09
Score 2	.07	-.00	.04
Score 3	.07	-.01	.03
Level 1	.05	-.01	.21**
Level 2	-.01	.02	.28**
Level 3	-.12	.01	.07
Minutes 1	-.02	.04	-.06
Minutes 2	-.07	.03	.01
Minutes 3	-.08	.02	.11
Baseline affect	.08	.09	-.03
Experiment affect	-.01	.04	-.04
Follow-up affect	.02	.04	.02

\*p &lt; .05.

\*\*p &lt; .01.

Table 3

Means and Standard Deviations on Variables by Grade

Variable	Grade		t (233)
	1	2	
	mean (SD)	mean (SD)	
Score 1	11.35 (3.85)	13.50 (3.47)	-4.73***
Score 2	12.44 (4.48)	14.34 (4.37)	-3.09**
Score 3	13.33 (4.47)	14.08 (5.66)	-1.05
Level 1	1.02 (.48)	1.02 (.33)	-.02
Level 2	1.17 (.78)	1.28 (.89)	-.91
Level 3	1.98 (1.20)	2.30 (1.26)	-1.88
Minutes 1	9.02 (2.03)	9.44 (1.60)	-1.66
Minutes 2	8.35 (2.41)	8.91 (2.10)	-1.78
Minutes 3	8.85 (2.10)	8.34 (2.41)	1.63
Affect 1	30.89 (3.72)	32.37 (3.90)	-2.79**
Affect 2	31.09 (3.98)	32.25 (4.37)	-1.99*
Affect 3	30.69 (4.73)	31.92 (4.87)	-1.85

\*p &gt; .05

\*\*p &lt; .01

\*\*\*p &lt; .001

Table 4

Correlations Between Background Variables and Trait  
Motivation

Variables	<u>Achievement</u>	<u>ParRew</u>	<u>Mastery</u>	<u>Judgment</u>
Achievement	---	-.18	.32**	-.15
ParRew	-.33**	---	-.11	.26**
Mastery	.33**	-.18	---	.14
Judgment	.25*	-.11	.34**	---

\*p &lt; .05

\*\*p &lt; .01

Note: Grade 1 above the diagonal

Grade 2 below the diagonal

Table 5

Intercorrelations Across Background Variables


---

	Achievement	SES	Teacher
SES	.29**		
Teacher Rewards	-.05	-.09	
Parent Rewards	-.27**	-.17*	-.10

---

\*p &lt; .05

\*\*p &lt; .01

Table 6

Intercorrelations Across Task Motivation MeasuresGrade 1


---

Task	Performance	Level	Persistence
------	-------------	-------	-------------

---

Baseline			
Level choice	.19		
Task persistence	.68**	.48**	
Task affect	.15	.13	.21*

---

Experimental			
Level choice	.42**		
Task persistence	.83**	.42**	
Task affect	.08	.14	.06

---

Follow-up			
Level choice	.41**		
Task persistence	.75**	.45**	
Task affect	.08	-.02	.01

---

\*p &lt; .05

\*\*p &lt; .01

Table 7

Intercorrelations Across Task Motivation MeasuresGrade 2

Task	Performance	Level	Persistence
-----			
Baseline			
Level choice	.37**		
Task persistence	.64**	.36**	
Task affect	.09	.11	.03
-----			
Experimental			
Level choice	.49**		
Task persistence	.78**	.43**	
Task affect	-.00	.03	.03
-----			
Follow-up			
Level choice	.44**		
Task persistence	.77**	.52**	
Task affect	.13	.12	.19*
-----			
*p < .05		**p < .01	

Table 8

Correlations of Trait Intrinsic Motivation with Task  
Motivation

Task Motivation	Subscales	
	Harter Mastery	Harter Judgment
Score 1	.07	.03
Score 2	.09	.07
Score 3	.15*	.04
Level 1	-.09	.03
Level 2	.04	.19**
Level 3	.13	.19**
Minutes 1	-.13	.02
Minutes 2	-.00	.08
Minutes 3	.05	-.03
Baseline affect	.00	-.16*
Experimental affect	-.03	-.17*
Follow-up affect	-.00	-.11

\*p < .05      \*\*p < .01

Table 9

Correlations Between Trait Motivation and Baseline  
Task Motivation

<u>Trait Motivation</u>	<u>Score</u>	<u>Baseline Task Motivation</u>		
		<u>Level</u>	<u>Minutes</u>	<u>Affect</u>
		Grade 1		
Judgment	-.11	.04	.02	-.12
Mastery	-.08	-.14	-.14	.02
		Grade 2		
Judgment	.08	.02	-.01	-.25**
Mastery	.14	-.05	-.16	-.05

\*\*p < .01

Figure Caption

Figure\_1. Mediators leading to detrimental effects of rewarding on intrinsic motivation.

Figure 1

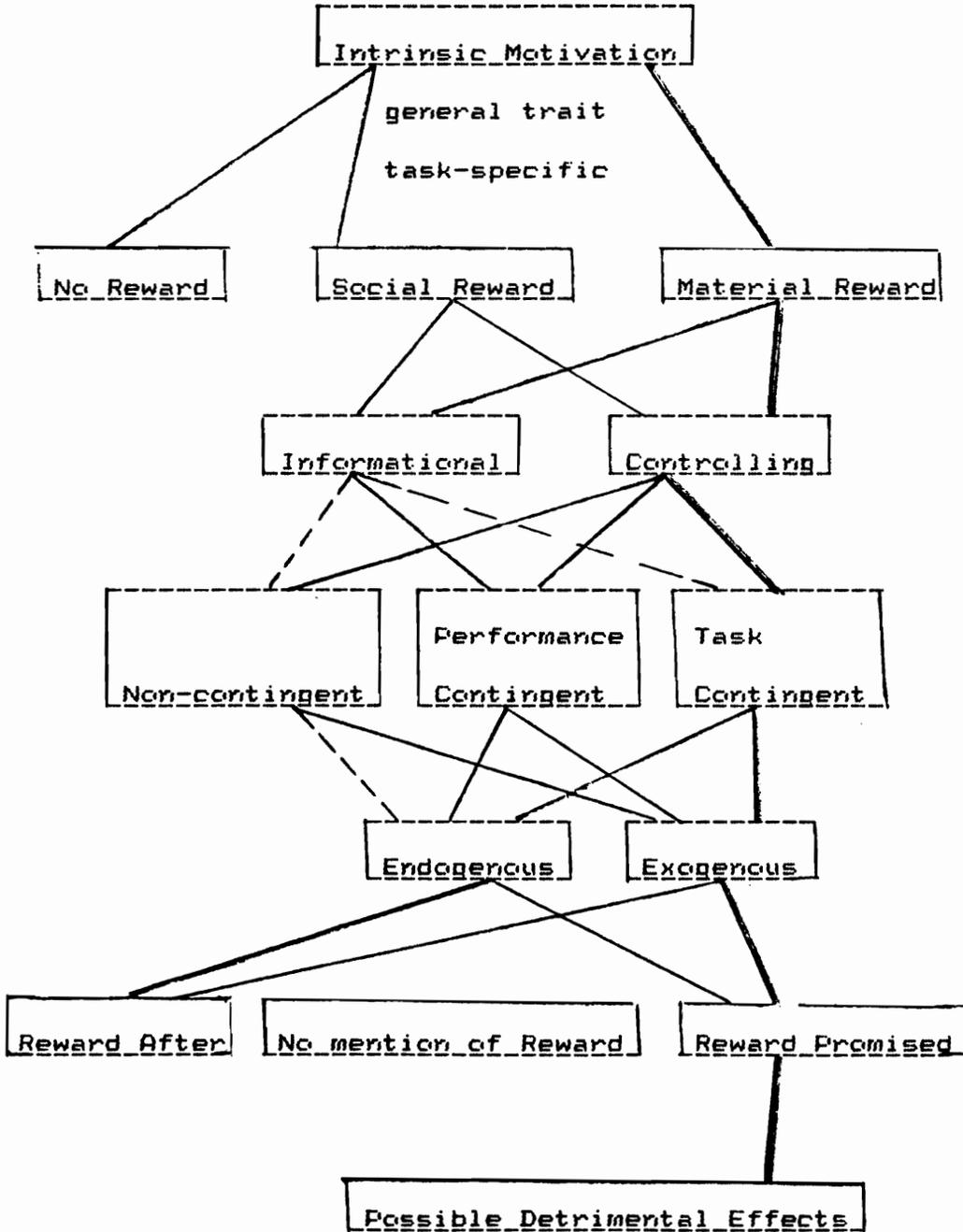
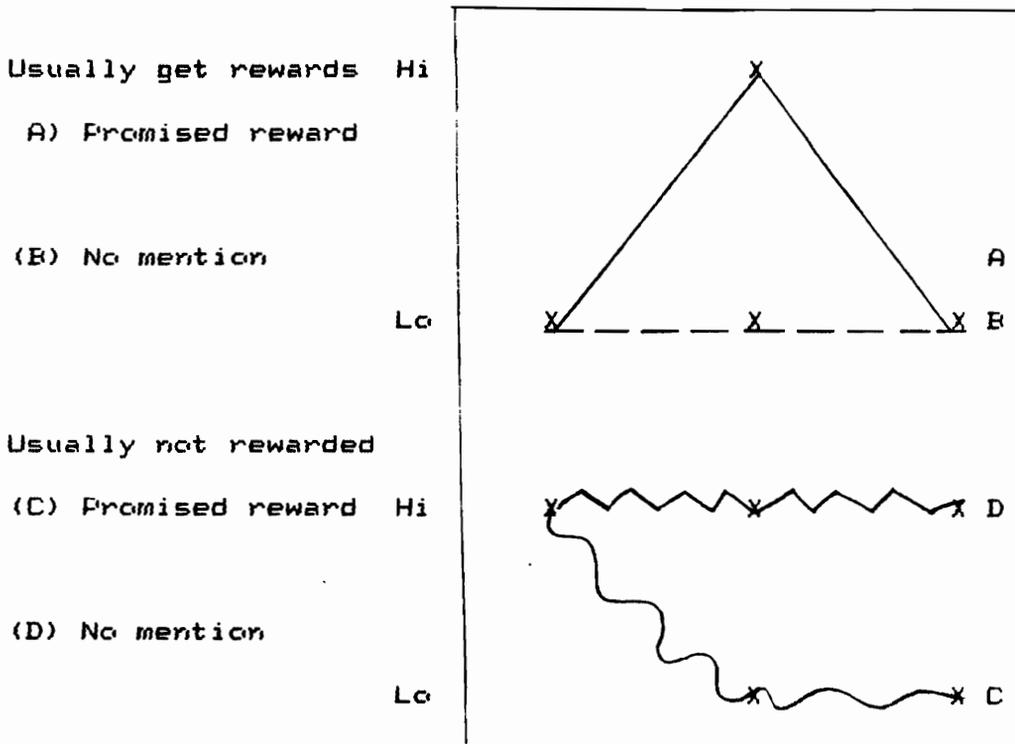


Figure Caption

Figure\_2. Interest measure of intrinsic motivation related to experience with rewarding.

Figure 2

Baseline Experiment Follow-up



(Lines collapsed into one Graph)

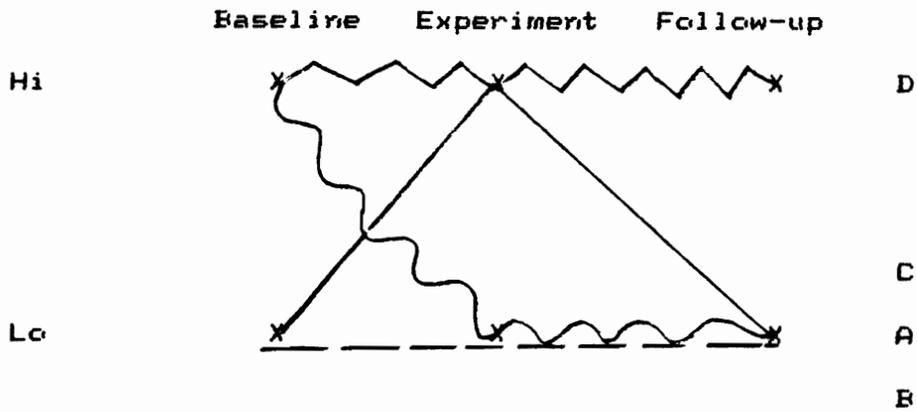
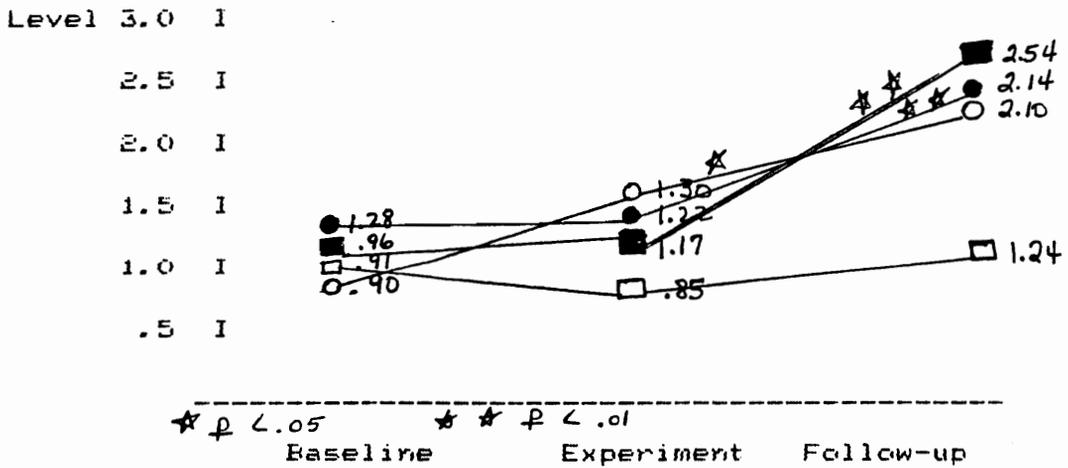
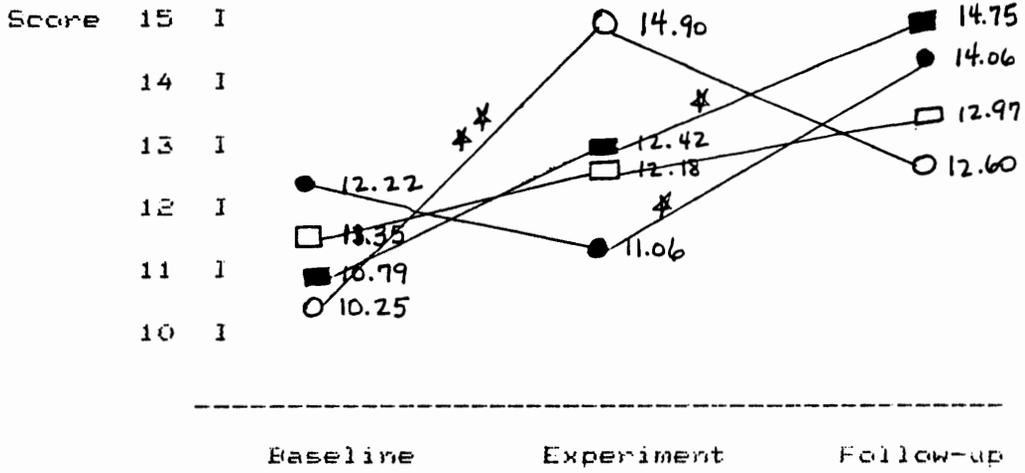


Figure Caption

Figure\_3. Means of task motivation in three conditions, by experience with teacher rewarding and the experimental rewarding condition, in grade one.

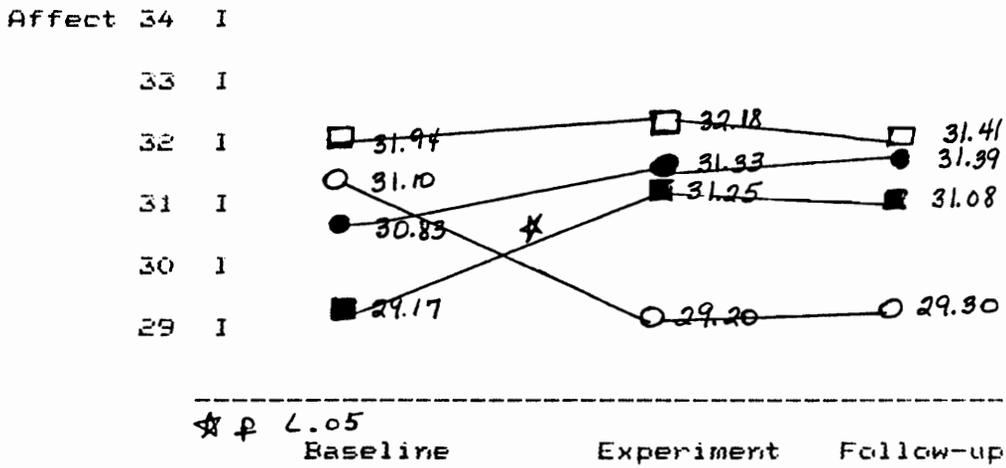
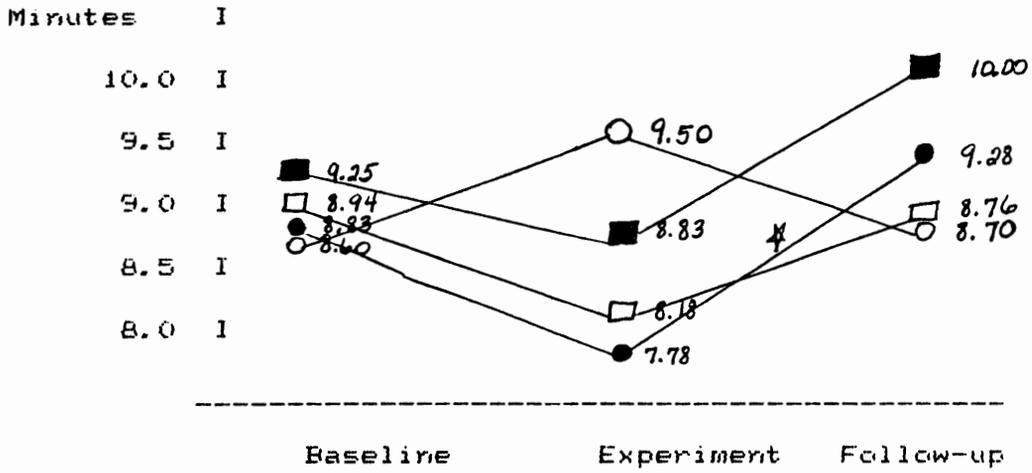
Figure 3



- Group 1--Hi Teacher Rewarding, No Reward
- Group 2--Lo Teacher Rewarding, Got Reward
- Group 3--Hi Teacher Rewarding, Got Reward
- Group 4--Lo Teacher Rewarding, No Reward

(figure continues)

Effects of Rewards



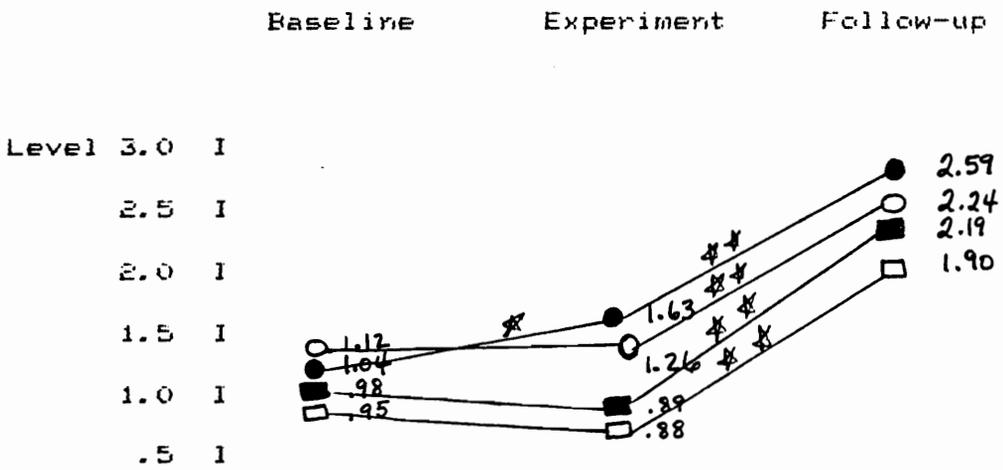
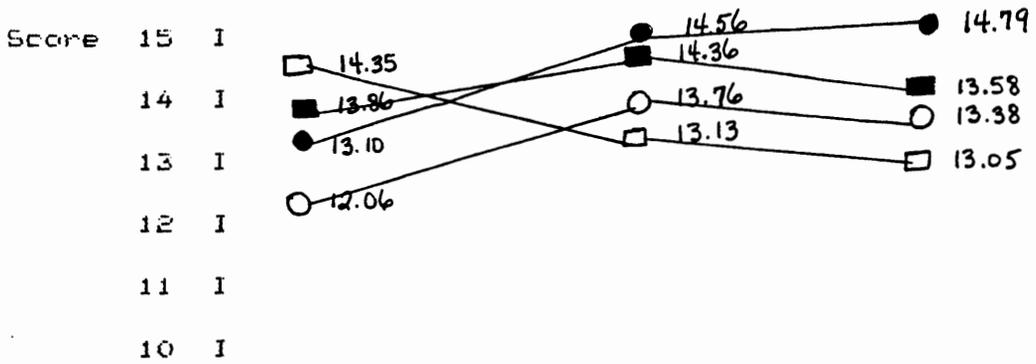
\* p < .05  
 Baseline Experiment Follow-up

- Group 1 Hi Teacher Rewarding, No Reward
- Group 2 Lo Teacher Rewarding, Got Reward
- Group 3 Hi Teacher Rewarding, Got Reward
- Group 4 Lo Teacher Rewarding, No Reward

Figure Caption

Figure\_4. Means of task motivation in three conditions, by experience with teacher rewarding and the experimental rewarding condition, in grade two.

Figure 4

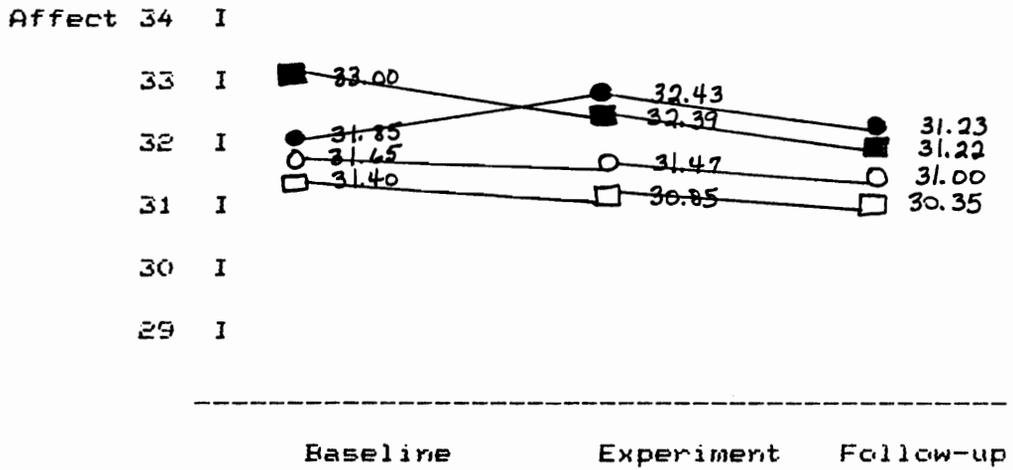
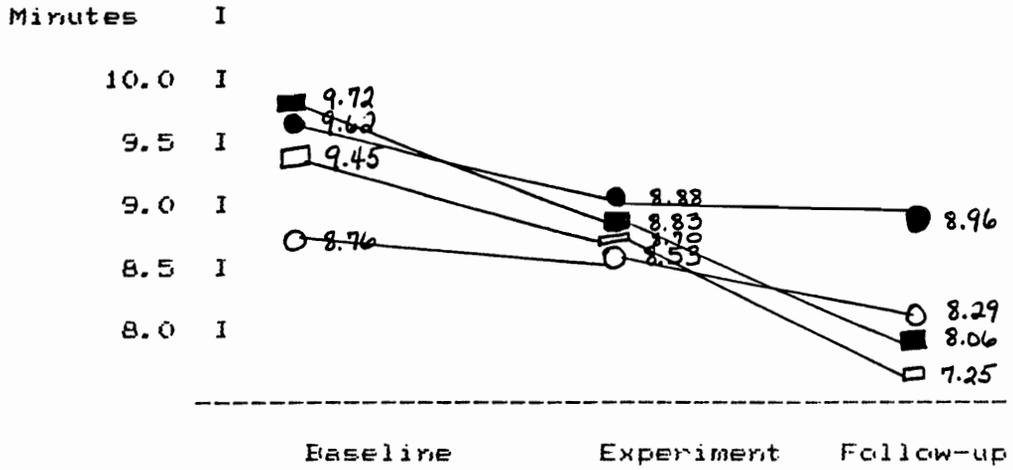


$\star p < .05$        $\star\star p < .01$   
 Baseline                  Experiment                  Follow-up

- Group 1--Hi Teacher Rewarding, No Reward
- Group 2--Lo Teacher Rewarding, Got Reward
- Group 3--Hi Teacher Rewarding, Got Reward
- Group 4--Lo Teacher Rewarding, No Reward

(figure continues)

Effects of Rewards

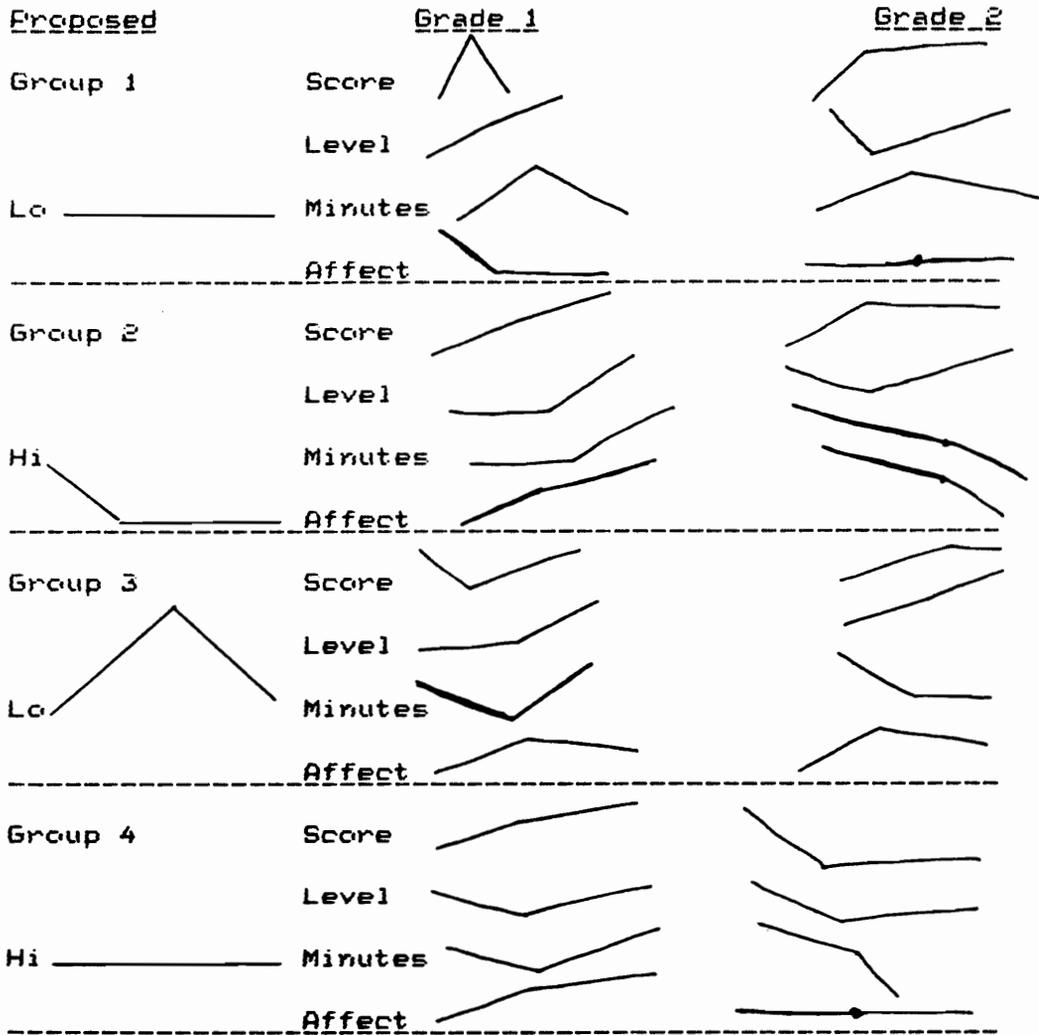


- Group 1--Hi Rewarding, No Reward
- Group 2--Lo Rewarding, Got Reward
- Group 3--Hi Rewarding, Got Reward
- Group 4--Lo Rewarding, No Reward

Figure Caption

Figure\_5. Comparison of predicted performance patterns (from Figure 2) with results of performance patterns (from Figures 3 and 4).

Figure 5



- --Group 1 Hi Teacher Rewarding, No Reward
- --Group 2 Lo Teacher Rewarding, Got Reward
- --Group 3 Hi Teacher Rewarding, Got Reward
- --Group 4 Lo Teacher Rewarding, No Reward

VITA

Marilyn L. Gadomski  
2507 Plymouth Street  
Blacksburg, Virginia  
(703) 951-4233

Education

1989-1990	Virginia Tech Blacksburg, Virginia Doctoral Candidate Family and Child Development
1988	College of Graduate Studies Institute, West Virginia MA - Educational Administration
1976	College of Graduate Studies Institute, West Virginia MA - Early Childhood Education
1971	Marshall University Huntington, West Virginia AB - Elementary Education Grades 1-9 Secondary Math, Grades 7-12

Teaching Experience

1990 Virginia Tech  
Graduate Teaching Assistant  
with Dr. Andy Stremmel in  
"Curriculum and Program  
Planning in Child  
Development"

1989-1990 Virginia Tech  
Graduate Teaching Assistant  
with Dr. Mark Benson in  
"Observation and Assessment  
of Children"  
Research Assistant to  
Dr. Mark Benson

1989 Virginia Tech  
Graduate Teaching Assistant  
Full responsibility for course  
"Marriage and Family  
Relationships"

1983 - 1989 Fayette County Board of  
Education  
Second Grade Teacher  
Fayetteville Consolidated School

1981 - 1982 Mountain View Christian School  
Day Care Center Director  
Kindergarten Teacher

1975 St. Andrews Day Care Center  
Teacher

1971 - 1974 Fayette County Board of  
Education  
Oak Hill East End Elementary  
Kindergarten Teacher

Conferences

1990 "Applications of Vygotsky  
in the Classroom"  
Virginia Association of Early  
Childhood Education--  
Charlottesville

1991 "Effects of Rewarding on  
Intrinsic Motivation  
Virginia Association of Early  
Childhood Education--Richmond

Service

1989 Graduation Reception  
Family and Child Development  
Department

